S. HRG. 115–892

NOMINATIONS TO THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY, THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, AND THE DEPARTMENT OF TRANSPORTATION

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED FIFTEENTH CONGRESS

SECOND SESSION

AUGUST 23, 2018

Printed for the use of the Committee on Commerce, Science, and Transportation

Available online: http://www.govinfo.gov

U.S. GOVERNMENT PUBLISHING OFFICE
58–442 PDF WASHINGTON : 2025

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED FIFTEENTH CONGRESS

SECOND SESSION

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NOMINATIONS TO THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY, THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, AND THE DEPARTMENT OF TRANSPORTATION

THURSDAY, AUGUST 23, 2018

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Committee met, pursuant to notice, at 10:15 a.m. in room SR–253, Russell Senate Office Building, Hon. John Thune, Chairman of the Committee, presiding.

Present: Senators Thune [presiding], Nelson, McConnell, Lankford, Inhofe, Wicker, Gardner, Udall, Hassan, Markey, Cortez Masto, Blumenthal, Cruz, and Lee.

OPENING STATEMENT OF HON. JOHN THUNE, U.S. SENATOR FROM SOUTH DAKOTA

The CHAIRMAN. Good morning. Thank you all for being here this morning. We'll begin the hearing. We have a couple of our colleagues who are going to be here today to introduce a couple of the nominees and we also have a couple of votes coming up here before too long, but we'll try and roll through those and get this process rolling for these terrific nominees.

I want to welcome our distinguished panel to today's hearing. We're going to be considering the nominations of Dr. Kelvin Droegemeier to be the Director of the Office of Science and Technology Policy; Mr. Jim Morhard to be the Deputy Administrator of NASA; and Mr. Joel Szabat to be Assistant Secretary of Transportation for Aviation and International Affairs.

I also want to thank Leader McConnell, Senators Lankford and Inhofe, and Secretary LaHood for being here today, to provide introductions for the nominees, and I'd like to welcome the nominees' families and friends who are joining us here today, as well.

Dr. Droegemeier's an accomplished scientist, has an extensive background in academia as well as public service at the Federal and state levels and should he be confirmed, he will advise the President on scientific, engineering, and technological aspects of major policies across the Federal Government.

Dr. Droegemeier's scientific background is predominantly in atmospheric science and weather prediction, receiving his Bachelor of Science in Meteorology from the University of Oklahoma and his

Ph.D. in Atmospheric Science from the University of Illinois, Urbana-Champaign.

Currently, he serves as the Vice President for Research, the Weather News Chair Emeritus of Applied Meteorology, and the Director Emeritus of the Center for Analysis and Prediction of Storms at his alma mater, University of Oklahoma.

In addition, he also serves on the Oklahoma Governor's Science and Technology Council and is the Governor's Cabinet Secretary of Science and Technology.

Dr. Droegemeier is well known to the Senate Commerce Committee. He previously worked with us as we developed the bipartisan American Innovation and Competitiveness Act when he testified before the Committee to make policy recommendations and notably said that we had, and I quote, "made science bipartisan again."

He has also previously testified before the Committee regarding science and the U.S. economy and on hurricane research.

Dr. Droegemeier has twice been confirmed by the U.S. Senate, each time by voice vote. The first time as a Bush nominee and the second as an Obama nominee to the National Science Board, serving his last term as Vice Chairman.

Dr. Droegemeier is eminently well qualified to lead the Office of Science and Technology Policy (OSTP) and I look forward to the Senate confirming him quickly to this position which has been vacant since January 2017.

Jim Morhard is also well known to many of us, having spent 25 years working in the U.S. Senate in numerous capacities.

Mr. Morhard currently serves as the Deputy Sergeant at Arms but prior to this role, Mr. Morhard served as the Staff Director of the Senate Appropriations Committee. In that position, he helped to develop and negotiate multiple appropriations bills, which included funding for space flight, spacecraft control, and NASA communications.

As a testament to his reputation on the Senate Appropriations Committee, Senator Leahy has submitted a letter of support for Mr. Morhard's nomination in which he says, and I quote, "Based on my experience with Jim on the Appropriations Committee, if confirmed, NASA can expect to have a deputy administrator who will push an agenda of common sense and cost-effective solutions."

Mr. Morhard's reputation for bipartisanship, deep knowledge and experience in the Federal budget and appropriations process as well as his experience in managing large organizations will undoubtedly serve NASA well, and I look forward to supporting his nomination.

Finally, Mr. Szabat has a distinguished and lengthy career in the Federal Government, particularly at the Department of Transportation (DOT), that makes him uniquely qualified for the position to which he's been nominated.

Mr. Szabat currently serves as the Deputy Assistant Secretary for Aviation and International Affairs and has been fulfilling the responsibilities of the position to which he's been nominated since January 2018.

If confirmed, one of his primary responsibilities will be to develop policies to improve air service and access to the commercial avia-

tion system for small and rural communities, like Aberdeen Pier and Watertown in my home state of South Dakota.

As I've noted, we're honored to be joined today by our former colleague and the former Secretary of Transportation, Ray LaHood.

Ray, welcome, good to have you back. Secretary LaHood is well known to this Committee as a bipartisan problem-solver and his willingness to appear on behalf of Mr. Szabat with whom he worked at the department speaks volumes about the nominee's qualifications.

As I've noted, all three of the nominees before the Committee today are exceptionally well qualified for the positions to which they've been nominated and, if confirmed, will have an extraordinary opportunity to advance American progress in science, space, and transportation.

So, once again, I would like to thank all of you for your willingness to serve in these important jobs, and I'll now recognize our Ranking Member, Senator Nelson, for his opening remarks.

Senator Nelson.

Senator NELSON. Mr. Chairman, I think it would be appropriate for me to defer my remarks until after the Majority Leader and the Secretary, so they can get on with their duties.

The CHAIRMAN. Very good. Thank you, Senator Nelson.

We are very fortunate today to be joined by our distinguished Majority Leader, Senator McConnell, and I want to recognize him to introduce Mr. Morhard.

Mr. Leader, welcome.

STATEMENT OF HON. MITCH MCCONNELL,
U.S. SENATOR FROM KENTUCKY

Senator MCCONNELL. Thank you, Mr. Chairman, Senator Nelson. I appreciate the opportunity to be here to introduce the distinguished public servant that we're all quite familiar with. We know a lot about the Jim Morhard brand of leadership, talent, dedication, patriotic commitment to excellence, the ability to set the bar high, meet it, and then raise it even higher.

We'll all be sorry to lose our Deputy Sergeant At Arms but it's actually for a good cause. Jim is completely qualified and uniquely prepared to serve as second-in-command at an agency as crucial as NASA.

So let's talk about subject matter expertise. One of the many impressive stations on Jim's resumé is six years as Clerk of the Senate Appropriations Subcommittee on Commerce, Justice, State, Judiciary, and Related Agencies. He was the point person on funding NASA and the scientific community, charged with strategically resourcing these agencies while also avoiding a culture of self-justifying spending growth.

Jim so mastered this role that he was subsequently asked to serve as Committee Chief of Staff. Mastery of the budgeting and legislative process, you can check that off. Directing a large staff, you can check that, as well. Skillful relationship-building at the highest levels of both Congress and the executive branch, check that off, too, and, of course, as Deputy Senate Sergeant at Arms, Jim has spent four years demonstrating even further capacity to

lead a large multifaceted workforce while growing a culture of diligence, responsiveness, and service.

I can attest personally to Jim's emphasis on safety and security. Of course, those are critical subjects at NASA, and they could not be more personal to this nominee.

Most of us know the remarkable story. Jim survived the 2010 plane crash in Alaska that claimed five lives, including our late friend, Senator Ted Stevens. The impact of the crash temporarily trapped Jim in his seat, but his leadership poured into those around him, encouraging his fellow survivors and leading them in prayer.

I understand Jim took more than a commitment to safety and security, as you can imagine, away from that tragedy. He's explained that his miraculous survival drove a renewed sense of personal faith and professional purpose alike.

As he explained in a speech at his alma mater a few years ago, we need to maximize our time here helping others. In short, Jim is a passionate and public servant who possesses precisely the unique combination of skills this position requires.

Specific expertise in what NASA does, demonstrated excellence in managing complicated government organizations, and a passion for ensuring that America leads in space exploration.

So, Mr. Chairman and Senator Nelson, thank you for the opportunity to come by and say some words on behalf of this really good man, and I hope he enjoys the support of the Committee.

The CHAIRMAN. Thank you, Leader McConnell, very much for that very compelling testimonial, and obviously many of us have known Mr. Morhard well from his many years of experience here on Capitol Hill, in addition to his other accomplishments and experience.

I now want to recognize Secretary Ray LaHood, who is here and wants to make some remarks and introduce one of our other nominees, Mr. Joel Szabat.

STATEMENT OF HON. RAY LAHOOD, FORMER SECRETARY, U.S. DEPARTMENT OF TRANSPORTATION

Secretary LAHOOD. Thank you, Mr. Chairman. It's good to be back. I spent a few hours before this Committee previously, and I enjoyed a wonderful relationship with many of the Members of this Committee, and thank you for your service and your support for DOT while we were in service there.

I'm here today to introduce Joel Szabat, who has been nominated to be the Assistant Secretary of Aviation and International Affairs at the Department of Transportation.

Joel has been an exemplary leader in Federal service for over 25 years. He's an excellent manager and proven problem-solver.

I first met Joel in the early 2009 period when he was the Deputy Assistant Secretary for Transportation Policy. He was DOT's Federal officer responsible for implementing the Recovery Act, and let me just say a word about that.

As many of you remember, DOT received $48 billion in the Recovery Act. All of that money was spent properly. There were no bad stories, no boondoggles, no earmarks, no sweetheart deals, and Joel stepped in and did this as a career employee before a lot of

our political appointees were appointed, and he did really, really good work and was a great team leader and a great member of our team.

Joel also helped manage the development and administration of the first round of TIGER, which I know is a very popular program, been renamed now, but still very popular in the Senate. It is for this dedication that Joel received the Presidential Meritorious Rank Award in 2012.

I'm also very proud of the work that Joel did as Executive Director of the Maritime Administration and in particular I appreciate his leadership and dedication to the men and women at the United States Merchant Marine Academy, which was a very high priority for the Obama Administration.

As you can see by his record, Joel is motivated by a spirit of public service and I believe he will do an outstanding job and he does have the very strong support of Secretary Chao, who is also one who encouraged him to really seek this appointment, and so I urge the Committee to support Joel. I know he'll do a great job, and I know that he will be very responsive to this Committee and to all Members of Congress.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Secretary LaHood, very much for coming here and giving your voice to support this terrific nominee, and we appreciate, as always, your many contributions to public service, both as a member of the House of Representatives and as our Secretary of Transportation.

Senator Nelson, I will now recognize you for an opening statement.

STATEMENT OF HON. BILL NELSON, U.S. SENATOR FROM FLORIDA

Senator NELSON. OK. The three panelists today, gentlemen, welcome, congratulations on your nominations. Thank you for your willingness to serve.

Mr. Morhard, after your confirmation, your experience managing, as the Majority Leader said, critical security activities in the Senate and also complex activities, it's going to come in handy at NASA, as will your experience in reviewing programs and negotiating budgets in the Senate Appropriations Committee.

Mr. Chairman, Senator Leahy wanted to be here today to introduce Mr. Morhard, also. Senator Leahy has a conflict. So I'd ask unanimous consent that the introduction of Mr. Morhard be included in the record.

The CHAIRMAN. Without objection.

[The statement from Senator Leahy follows:]

STATEMENT OF SENATOR PATRICK LEAHY (D-VT.), INTRODUCING JAMES MORHARD, NOMINEE TO BE DEPUTY ADMINISTRATOR OF NASA

Mr. Chairman, Senator Nelson, and members of the Commerce Committee, I am pleased as Vice Chairman of the Senate Appropriations Committee to add my introduction for the record of James Morhard for Deputy Administrator of the National Aeronautics and Space Administration (NASA). The Senate Appropriations Committee is one of the great institutional pillars of the Senate. It is a place where practical bipartisanship and effective, sensible solutions are the guiding ethos. As a clerk

and later as Staff Director, Jim played an important role in maintaining that tradition, and I believe he will approach his job with that same ethos at NASA.

Jim came to the Senate Appropriations Committee from the Navy's Office of the Comptroller. Working for what was then the Subcommittee on Commerce, Justice, and State, the Judiciary, and Related Agencies, Jim was known as someone that mastered the ins and outs of the Federal budget for Senator Ted Stevens, who chaired the Committee at the time. Senator Stevens believed that the Appropriations Committee was a place where good ideas rather than political party should carry the day, and Jim was an instrument of that philosophy as clerk.

It was during Jim's time and in the bill under Jim's purview that we first funded the Bulletproof Vest Partnership Grant Program, a Department of Justice grant program I was proud to author with former Senator Ben Nighthorse Campbell, and one that has saved lives in the 20 years since it was first authorized. Jim saw the promise of this bipartisan initiative, recognized it was above politics, and fought to provide meaningful funding for it. That is the bipartisan approach that was the hallmark of the appropriations process then; it's a hallmark we are working to restore now.

When he became staff director for the full Committee, Jim continued its honored bipartisan tradition and was known for his professionalism. What mattered most in the massive deliberations surrounding funding the discretionary budget continued to be finding the most practical solution, regardless of party or politics.

Based on my experience with Jim on the Appropriations Committee, if confirmed, NASA can expect to have a Deputy Administrator who will push an agenda of common sense and cost-effective solutions. I know based on his work in the Senate that he will be open to ideas from all comers, and will seek out detailed input from scientists and respected experts. He will make decisions with an eye towards the long-term benefit of our Nation and the many important missions at NASA.

Senator NELSON. Mr. Morhard, the lives of a lot of people, including the astronauts, and the success of some of the most ambitious science missions will depend on you and Administrator Bridenstein's ability to run the agency and to seek the expert scientific and technical people to advise you.

If confirmed, I would certainly urge upon you to seek out the counsel of career NASA professionals, such as Bill Gerstenmeier and also Bob Cabana.

We're also going to consider the nomination of Dr. Kelvin Droegemeier to be the Director of the White House Office of Science and Technology Policy, otherwise the President's science advisor.

There's certainly no question, Doctor, as to your qualifications. Indeed, Norm Augustine and Neal Lane wrote the Committee saying you would be an outstanding science advisor in any administration and that's a pretty good endorsement from some heavyweight people.

On a personal note, Dr. Droegemeier, your work on extreme weather is, of course, very important to the country. It's important to the people of Hawaii today as a Cat 4 closes in. It's certainly very important to the people of my state, but we're finding extreme weather all across the country, and we see it every night on the news. So I appreciate your working with this Committee to improve ways to get people to respond to this extreme weather that is happening.

And, if confirmed, you have a tough task ahead of you, but I think a lot of us on this Committee are going to be happy that you're the White House science advisor.

And, Mr. Szabat, recommendation coming from the former Secretary is certainly a long way. He is held in high regard in this Committee. In DOT, the office that you would be heading covers a

wide array of aviation matters important to Members of this Committee and throughout the Congress.

I appreciate your many years of public service, including your service in the military, and we look forward to working with you, especially as we move an FAA reauthorization bill in the near future.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Nelson.

We are now joined by our colleague, Senator Lankford, and he is here, along with the Senior Senator from Oklahoma, a member of this panel, to introduce Mr. Droegemeier.

Senator Lankford, welcome.

STATEMENT OF HON. JAMES LANKFORD,
U.S. SENATOR FROM OKLAHOMA

Senator LANKFORD. Thank you.

It's an absolute honor to be able to be here, as well, and to be able to speak for Kelvin Droegemeier.

I'll make just a brief short statement on his behalf because I know you all have a lot of important business to be able to do but just to be able to give you some context on this.

Dr. Droegemeier has served the science and engineering, research and education communities at the national level for more than 25 years. He was nominated by President George W. Bush and confirmed by the U.S. Senate. He served six years in the National Science Board, the governing body of the National Science Foundation. It also provides science policy guidance to the Congress and the President.

Dr. Droegemeier was renominated by President Obama and again confirmed by the Senate, serving a second six-year term on the National Science Board, the last four years as the Vice Chairman.

He took the University of Oklahoma and the research facilities and what was happening there when he was Vice President to Carnegie R-1 status, which is the top status.

He has an impressive record that I'm sure you have seen, have had the opportunity to be able to go through and see the research, to see his background. One of the most impressive statements I think that you'll get from him is science has no politics. Science is just science. It's just the facts that you're looking at.

So the key thing that he really brings to this is not only his extensive background, his experience working with the government, with Congress and with the White House in the past giving science recommendations, obviously the work that he has done in weather and climates for decades now, but he is just an honorable individual that I think you'll enjoy getting a chance to get to know not only his science background but his personal and his family background, as well.

It's interesting to see, if you've gone through his extensive resume and background, to be able to see backgrounds with all these different awards, all these different published articles, all these things that he has done over the years, but right in the middle of it, he also has listed as one of his honors and awards head usher at his church, which again shows the humanity of saying there are

a lot of things that you can do in personal life and that you can be engaged in and to be able to keep life in perspective, as well, and to be able to say all these are areas just to be able to serve people and to be able to find ways to do that.

So I hope you enjoy the dialogue with him. I wholeheartedly support his nomination, as well, and look forward to getting a chance to vote on him on the Floor in the days ahead.

Thank you.

The CHAIRMAN. Thank you, Senator Lankford for joining us today and voicing your support of this terrific nominee and, of course, as I mentioned, the Senior Senator from Oklahoma and somebody who is a distinguished leader on all these issues that come in front of our Committee is also here and, Jim, I'm going to recognize Senator Inhofe to make some opening comments, too, with regard to Dr. Droegemeier.

STATEMENT OF HON. JIM INHOFE,
U.S. SENATOR FROM OKLAHOMA

Senator INHOFE. Well, thank you, Mr. Chairman. I appreciate that.

Senator Lankford and I were fighting to see who could introduce you and so we're both introducing you, and I think he said it all very well.

I think all we need to know about Kelvin Droegemeier is that he's the one responsible for saving so many lives in Oklahoma. You know, I'm old enough and I've been around long enough to remember we're a tornado state. We have tornadoes. They are devastating, and I can remember when we had virtually no warning. We didn't really know, have any advance warning when things were taking place, and now because of what he has done, we have minutes and sometimes hours to warn people to take cover because of the impending severe weather.

If that's not impressive enough, the company he created employs a hundred people and has had a $350 million impact on our state of Oklahoma.

Now he knows science. He knows business. He's a celebrity. He may not know that he's a celebrity but he is. I mean, look at him.

[Laughter.]

Senator INHOFE. He's got a great smile but he is a celebrity.

In 1978, he was on the classic television thing called *In Search Of*. It was a science television series narrated by Leonard Nimoy where he was featured for his expertise on tornadoes. So he knows his stuff. He's going to be doing a great job, and, in addition to just being eminently qualified, there's no one in America that's better qualified for this position than he is, Democrats and Republicans alike agree with that, but I just want to add that, in addition to being eminently qualified, he is famous, he's fun, and he's entertaining.

Thank you, Mr. Chairman.

The CHAIRMAN. All right. That's a pretty glowing endorsement, I'd say, right there. So thank you, Senator Inhofe.

I'm going to invite the nominees to come forward, Dr. Droegemeier, Mr. Jim Morhard, and Mr. Joel Szabat, and look forward to hearing your opening statements. If you can, confine them

as close to 5 minutes as possible. Make sure your entire statements are included as part of the written hearing record, and then it'll give us an opportunity to ask some questions.

So we'll start on my left and your right with Dr. Droegemeier. So I look forward to hearing from you. Please proceed.

STATEMENT OF DR. KELVIN K. DROEGEMEIER, NOMINEE TO BE DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Dr. DROEGEMEIER. Thank you very much, Chairman Thune. Thank you, Senator Inhofe. Ranking Member Nelson, thank you, as well, and Members of the Committee.

I am truly honored absolutely beyond words to appear before you today as President Trump's Nominee of the Director of Science and Technology Policy.

I'm also pleased my wife of 35 years, Lisa, is just behind me there that she could join me along with lots of wonderful friends who've truly blessed my life throughout the years.

I was born in Kansas and at age 19, I went storm-chasing in the Texas Panhandle and saw my first tornado up close and personal. It was a pretty big experience and I know the power and the majesty of that awesome power really fueled my interest in meteorology, which was the focus of my undergraduate studies at the University of Oklahoma.

I then went on, as you heard, and earned a master's and doctoral degrees at the University of Illinois at Champaign-Urbana in Atmospheric Science.

I then returned to OU to begin my career as a researcher and an educator. My work has focused on using data to improve forecasts, giving people, as Senator Inhofe said, more time to find shelter when they're threatened by extreme weather events and unpredictable storms that really we feel are quite, quite dangerous. I later started a weather technology company based upon that work.

I am a scientist and I'm a storm-chaser and I'm an educator and as many of you know and you've heard, I have a fair bit of experience in science policy, having twice been nominated by the President and confirmed by the Senate for service on the National Science Board, first under President George W. Bush and then later under President Barack Obama.

In addition to having served as Vice President for Research at my institution, the University of Oklahoma, I also serve, as you heard, as Oklahoma's Cabinet Secretary of Science and Technology in the Cabinet of Governor Mary Fallin.

You know, we live in a time of absolutely extraordinary possibilities. The pace of discovery is accelerating and the global science and engineering ecosystem is rife with both competition and opportunities for cooperation.

I was privileged to speak both of those sentences here in this room to this Committee two years ago when I testified about the amazingly bipartisan and wonderful American Innovation and Competitiveness Act, AICA.

I want to thank all of you, Senators Peters and Gardner, also, for including me in the listening sessions and allowing me to be part of that wonderful process.

Now today, I appear before you again but with an even greater privilege and responsibility, to discuss the possibility with you of serving as the OSTP Director.

I would be absolutely honored to take on the challenge of ensuring American leadership in our science and technology enterprise, which for decades has contributed to our success and our prosperity, but what I really love the most about OSTP is that it measures its success not by what it does but, rather, by the extent to which America succeeds because of it.

Our nation today faces great challenges, no question about that, but no challenge is beyond our reach and science and technology are time-tested and powerful pathways toward solutions.

If confirmed, I will work closely with this committee, with other Members of Congress, with my colleagues throughout the Federal Government and the academic and private sector enterprises to ensure robust American leadership in science and technology.

I also would like to highlight just a few areas that would include, for example, a coordinated and comprehensive portfolio of Federal science and technology initiatives across the whole of government, everything from fundamental research that is commercially risky but really must be funded, an important role of the government, to applied R&D that brings these research outcomes to market.

Second, an education framework to produce a capable and diverse workforce that is absolutely critical to America's future, all the way from K–12 schools to career techs to colleges, 4-year colleges, and American preeminent research universities, the entire ecosystem.

And, finally, new initiatives and new models of public-private partnerships to move scientific research outcomes from the bench and the lab into the economy creating jobs and building the wealth of Americans.

There are an increasing number of threats to science and technology in America. I think you're all aware of that. Unnecessary regulatory burden stifle some of our best and brightest researchers, and it's clear that international competition is rising very rapidly, especially from China.

Now China has the wealth and the expressed desire to challenge our important leadership, our longstanding leadership. We have to recognize that challenge, but we also must embrace the value of collaboration.

Now global research is not a zero sum game and so all progress is valuable, but American leadership ensures that American values remain at the forefront of technological development.

We are in fact in a time of unprecedented opportunity. The tools and technologies and research capabilities of this country are absolutely unmatched in the world, and our scientists and engineers enjoy something very, very unique and that is unprecedented freedom to explore the boundaries of what's possible in their creative minds.

But we must not simply be comfortable simply to maintain. We must accelerate our progress through more effective planning, strategic investments, and by eliminating barriers that unnecessarily hinder us without sacrificing our fundamental freedoms.

If I am confirmed as OSTP Director, I pledge to work with all of you to help safeguard America's national and economic security for generations to come.

Thank you very much.

[The prepared statement and biographical information of Dr. Droegemeier follow:]

PREPARED STATEMENT OF DR. KELVIN K. DROEGEMEIER, NOMINEE TO BE DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Chairman Thune, Ranking Member Nelson, and Members of the Committee: I am truly honored beyond words to appear before you today as President Trump's nominee as Director of the Office of Science and Technology Policy (OSTP). I am pleased my wife of 35 years, Lisa, could join me, along with several wonderful friends and supporters who bless my life daily.

I was born in Kansas and at age 19 I witnessed my first tornado up close and personal in the Texas panhandle. The power and majesty of that incredible natural force fueled my interest in meteorology, the focus of my undergraduate studies at the University of Oklahoma, OU. I earned M.S. and doctorate degrees in atmospheric science at the University of Illinois at Urbana-Champaign.

I returned to OU to begin my career as a researcher and educator. My work has focused on using data to improve forecasts, giving people more time to find shelter when threatened by extremely violent and previously unpredictable storms. I later started a weather technology company based on that work.

I am a scientist, I am a storm chaser, and I am an educator. As many of you may know, I have a fair bit of experience in science policy, too, having been twice nominated by the President and confirmed by the Senate to the National Science Board, under Presidents George W. Bush, and Barack Obama. In addition to having served as Vice President for Research at OU, I also serve as Oklahoma's Secretary of Science and Technology in the Cabinet of Governor Mary Fallin.

"We live in a time of extraordinary possibilities. The pace of discovery is accelerating, and the global science and engineering ecosystem is rife with both competition and opportunities for cooperation." I was privileged to speak those two sentences to this Committee two years ago in testimony about the wonderfully bipartisan American Innovation and Competitiveness Act (AICA.)

Today I appear before you again, but with an even greater privilege and responsibility—to discuss the possibility of serving as OSTP Director. I would be honored to take on the challenge of ensuring continued American leadership in science and technology, which for decades has contributed to our success and prosperity. What I love most about OSTP is that it measures its success not by what it does, but rather by the extent to which America succeeds because of it.

Our Nation today faces great challenges. Yet no challenge is beyond our reach, and science and technology are time tested and powerful pathways towards solutions.

If confirmed, I will work closely with this Committee, other members of Congress, my colleagues throughout the Federal government as well as in academia and industry, to ensure robust American leadership across the science and technology enterprise. A few areas of particular focus include:

- A coordinated and comprehensive portfolio of Federal science and technology initiatives across the whole of government. This covers everything from fundamental research that is commercially risky but potentially transformative, to applied R&D further downstream.
- Second, an education framework to produce a capable and diverse workforce essential to America's future, covering K–12 schools, career techs, two-and four-year colleges, and America's pre-eminent research universities.
- Finally, initiatives and new models of public-academic-private partnerships that move scientific research outcomes out of the lab and into the economy more quickly and efficiently.

There are an increasing number of threats to S&T in America. Unnecessary regulatory burdens stifle our best and brightest researchers, It is clear international competition is rising rapidly, especially from China. China has the wealth and expressed desire to challenge our longstanding leadership. We must recognize that challenge but we must also embrace the value of collaboration. Global research is not a zero-sum game, and all progress is valuable. But American leadership ensures that American values remain at the forefront of technological development.

We are in a time of unprecedented opportunity. The tools, technologies, and research capabilities of the United States remain unmatched in the world. Our scientists and engineers enjoy unprecedented freedom to explore the boundaries of what's possible.

But we must not simply be comfortable to maintain. We must accelerate our progress through more effective planning, strategic investments, and by eliminating barriers that unnecessarily hinder us without sacrificing our fundamental freedoms. If I am confirmed as OSTP Director, I pledge to work with all of you to help safeguard America's national and economic security for generations to come.

Thank you very much.

A. BIOGRAPHICAL INFORMATION

1. Name (Include any former names or nicknames used): Kelvin Kay Droegemeier.

2. Position to which nominated: Director, Office of Science and Technology Policy (OSTP).

3. Date of Nomination: August 1, 2018.

4. Address (List current place of residence and office addresses):

Residence: Information not released to the public.
Office: 201 Stephenson Parkway, Suite 3100, Norman, Oklahoma 73019.

5. Date and Place of Birth: 23 September 1958; Ellsworth, Kansas USA.

6. Provide the name, position, and place of employment for your spouse (if married) and the names and ages of your children (including stepchildren and children by a previous marriage).

Spouse (Lisa Kim Droegemeier) is an uncompensated badged volunteer at Life Church South Oklahoma City Campus in Oklahoma City, Oklahoma.
No children.

7. List all college and graduate degrees. Provide year and school attended.

B.S. in Meteorology, University of Oklahoma, 1980.

M.S. in Atmospheric Science, University of Illinois at Urbana Champaign, 1982.

Ph.D. in Atmospheric Science, University of Illinois at Urbana-Champaign, 1985.

8. List all post-undergraduate employment, and highlight all management-level jobs held and any non-managerial jobs that relate to the position for which you are nominated.

University of Oklahoma

Assistant Professor of Meteorology 1985–1991.

Co-Founder and Deputy Director for Research, NSF Science and Technology Center for Analysis and Prediction of Storms 1989–1991.

Deputy Director, NSF Science and Technology Center for Analysis and Prediction of Storms 1991–1992.

Director of Model Development Program, NSF Science and Technology Center For Analysis and Prediction of Storms 1989–1994.

Associate Professor of Meteorology 1991–1996.

Visiting Senior Fellow (Sabbatical), Army High Performance Computing Research Center, University of Minnesota (1992).

Director, NSF Science and Technology Center for Analysis and Prediction of Storms 1994–2006.

Director, Environmental Computing Applications System 1996–2001.

Professor of Meteorology 1996 to present.

OU Associates Foundation *Presidential Professor,* 1998–2002

Regents' Professor 2001 to present.

Deputy Director, NSF Science and Technology Center for Collaborative Adaptive Sensing of the Atmosphere 2003–2008.

Roger and Sherry Teigen *Presidential Professor,* 2004 to present.

Associate Vice President for Research 2005–2009.

Director, Sasaki Institute, 2005–2009.

Weathernews Chair in Applied Meteorology, 2005–2009.

Director Emeritus, NSF Science and Technology Center for Analysis and Prediction of Storms 2006 to present.

Vice President for Research 2009-Present; Weathernews Chair Emeritus 2009 to present.

National Science Board (Special Government Employee)

Member, 2004–2010; 2011–2016.

Vice Chairman 2012–2016.

State of Oklahoma

Oklahoma Governor's *Cabinet Secretary of Science and Technology* (Uncompensated Position), 2017 to present.

Professional Consulting

Private Professional Consultant for Aviation Weather and Commercial Aircraft Accidents (1989 to present).

9. Attach a copy of your resumé.

A copy is attached.

10. List any advisory, consultative, honorary, or other part-time service or positions with Federal, State, or local governments, other than those listed above, within the last ten years.

- Member, Board of Directors, Norman, Oklahoma Chamber of Commerce (2003–2006; 2009–2012)
- Member, Board of Trustees, Riverside Church, Norman, Oklahoma (2007–2009)
- Elder, Riverside Church, Norman, Oklahoma (2009–2010)
- Board of Directors, National Weather Museum and Science Center (2009–2017)
- Council Member for American Meteorological Society (2004–2008)
- Member of Oklahoma EPSCoR (Established Program to Stimulate Competitive Research) Committee (2007 to present)
- Member of Search Committee for Director, National Center for Atmospheric Research (NCAR) (2008)
- Chair, University Corporation for Atmospheric Research (UCAR) Review Panel for the NOAA (National Oceanic and Atmospheric Administration) Aviation Weather Center, Storm Prediction Center, Environmental Modeling Center, NCEP (National Centers for Environmental Prediction) Central Operations (2008–2009)
- Member, Board of Directors, Council on Governmental Relations (COGR) (2009–2014)
- Member, Program Committee for e-Science 2009 Conference (2009)
- Member, Program Committee for the 10th IEEE/ACM (Institute of Electrical and Electronics Engineers/Association for Computing Machinery) International Symposium on Cluster, Cloud and Grid Computing (CCGrid 2010; 2009–2010)
- Member, Board of Directors, Oak Ridge Associated Universities (ORAU) (2010–2013)
- Member, Board of Directors, Oak Ridge Associated Universities (ORAU) Foundation (2010–2013)
- Member, Advisory Committee, Computer Science and Mathematics Division, Oak Ridge National Laboratory (2010–2012)
- Member, AAU (Association of American Universities) Task Force on Strengthening the University-Government Research Partnership (2010 to present)
- Member, Board of Trustees, Southeastern Universities Research Association (SURA) (2011 to present)
- Member, Presidential Search Committee, University Corporation for Atmospheric Research (2011)
- Member, Oklahoma Governor's Science and Technology Council (2011 to present)
- Member, Petroleum Club, Oklahoma City (one year membership, date unknown)
- Vice Chairman, Board of Directors, Oak Ridge Associated Universities Foundation (2011–2013)
- Member, Executive Committee, Association of Public and Land Grant Universities Council on Research Policy and Graduate Education (2011–2014)

- Member, Board on Research Data and Information, National Research Council of the National Academies (2012–2015, 2016–2019)
- Member, Search Committee for the Director of the NOAA National Weather Service (2012)
- Chairman-Elect, Council on Research Policy and Graduate Education, Association of Public and Land Grant Universities (2013–2014)
- Member, National Research Council Panel on Information Science at the Army Research Laboratory (2013–2015)
- Chair, Development and Relations Committee, Southeastern Universities Research Association (SURA) Board of Directors (2013–2015)
- Member, Board of Directors, Association of Public and Land Grant Universities (APLU) (2013–2014)
- Member, NCAR Director Blue Ribbon Advisory Panel (2014)
- Member, OU (University of Oklahoma) University Club Board of Trustees (2013–2016)
- President, OU University Club Board of Trustees (2014–2015)
- Chairman, Council on Research Policy and Graduate Education, Association of Public and Land Grant Universities (2014–2015)
- Member, Board of Directors, The Alliance for Science and Technology Research in America (ASTRA) (2014 to present)
- Member Presidential Search Committee, University Corporation for Atmospheric Research (2015–2016)
- Past-Chairman, Council on Research (Formerly the Council on Research Policy and Graduate Education), Association of Public and Land Grant Universities (2015–2016)
- Member, NSF Search Committee for Director of Office of Integrative Activities (2015–2016)
- Vice-Chairman of the Board of Trustees, Southeastern Universities Research Association (SURA) (2016–2018)
- Member, NSF Assistant Director of Geosciences Search Committee (2016)
- Member, State of Oklahoma EPSCoR Executive Subcommittee
- Invited Participant, Future of OSTP Planning Meeting, Sponsored by the Baker Institute, Rice University (2016)
- Member, Council on Competitiveness Technology Leadership and Strategy Initiative (2016 to present)
- Chairman of the Board of Trustees, Southeastern Universities Research Association (SURA) (2018 to present)
- Professional Consultant on airline accidents to Thompson and Knight, LLP (2006–2008, 2009–2013, 2010–2011)
- Member of Council on Competitiveness Technology Leadership & Strategy Initiative (2016 to present)
- Chair, Oklahoma Governor's Science and Technology Council (2017 to present)
- Chair, Oklahoma Governor's Aerospace and Autonomous Systems Council (2017 to present)

11. List all positions held as an officer, director, trustee, partner, proprietor, agent, representative, or consultant of any corporation, company, firm, partnership, or other business, enterprise, educational, or other institution within the last ten years.

- Member, Board of Directors, Norman, Oklahoma Chamber of Commerce (2003–2006; 2009–2012)
- Member, Board of Trustees, Riverside Church, Norman, Oklahoma (2007–2009)
- Elder, Riverside Church, Norman, Oklahoma (2009–2010)
- Board of Directors, National Weather Museum and Science Center (2009–2017)
- Member National Science Board (2004 2010 and 2011–2016)
- Council Member for American Meteorological Society (2004–2008)
- Member of Oklahoma EPSCoR Committee (2007 to present)
- Member of Search Committee for Director, National Center for Atmospheric Research (2008)

- Chair, UCAR Review Panel for the NOAA Aviation Weather Center, Storm Prediction Center, Environmental Modeling Center, NCEP Central Operations (2008 to present)
- Member, Board of Directors, Council on Governmental Relations (2009–2014)
- Member, Program Committee for e-Science 2009 Conference (2009)
- Member, Program Committee for the 10th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGrid 2010; 2009–2010)
- Member, Board of Directors, Oak Ridge Associated Universities (ORAU) (2010–2013)
- Member, Board of Directors, Oak Ridge Associated Universities (ORAU) Foundation (2010–2013)
- Member, Advisory Committee, Computer Science and Mathematics Division, Oak Ridge National Laboratory (2010–2012)
- Member, AAU Task Force on Strengthening the University-Government Research Partnership (2010 to present)
- Member, Board of Trustees, Southeastern Universities Research Association (2011 to present)
- Member, Presidential Search Committee, University Corporation for Atmospheric Research (2011)
- Member, Oklahoma Governor's Science and Technology Council (2011 to present)
- Member, Petroleum Club, Oklahoma City (one year membership, date unknown)
- Vice Chairman, Board of Directors, Oak Ridge Associated Universities Foundation (2011–2013)
- Member, Executive Committee, Association of Public and Land Grant Universities Council on Research Policy and Graduate Education (2011–2014)
- Member, Board on Research Data and Information, National Research Council of the National Academies (2012–2015, 2016–2019)
- Member, Search Committee for the Director of the NOAA National Weather Service (2012)
- Chairman-Elect, Council on Research Policy and Graduate Education, Association of Public and Land Grant Universities (2013–2014)
- Member, National Research Council Panel on Information Science at the Army Research Laboratory (2013–2015)
- Chair, Development and Relations Committee, Southeastern Universities Research Association (SURA) Board of Directors (2013–2015)
- Member, Board of Directors, Association of Public and Land Grant Universities (APLU) (2013–2014)
- Member, NCAR Director Blue Ribbon Advisory Panel (2014)
- Member, OU University Club Board of Trustees (2013–2016)
- President, OU University Club Board of Trustees (2014–2015)
- Chairman, Council on Research Policy and Graduate Education, Association of Public and Land Grant Universities (2014–2015)
- Member, Board of Directors, The Alliance for Science and Technology Research in America (ASTRA) (2014 to present)
- Member Presidential Search Committee, University Corporation for Atmospheric Research (2015–2016)
- Past-Chairman, Council on Research (Formerly the Council on Research Policy and Graduate Education), Association of Public and Land Grant Universities (2015–2016)
- Member, NSF Search Committee for Director of Office of Integrative Activities (2015–2016)
- Vice-Chairman of the Board of Trustees, Southeastern Universities Research Association (SURA) (2016–2018)
- Member, NSF Assistant Director of Geosciences Search Committee (2016)
- Member, State of Oklahoma EPSCoR Executive Subcommittee
- Invited Participant, Future of OSTP Planning Meeting, Sponsored by the Baker Institute, Rice University (2016)

- Member, Council on Competitiveness Technology Leadership and Strategy Initiative (2016 to present)
- Chairman of the Board of Trustees, Southeastern Universities Research Association (SURA) (2018 to present)
- Professional Consultant on airline accidents to Thompson and Knight, LLP (2006–2008, 2009–2013, 2010–2011)
- Member of Council on Competitiveness Technology Leadership & Strategy Initiative (2016 to present)
- Oklahoma Governor's Cabinet Secretary of Science and Technology (2017 to present)
- Chair, Oklahoma Governor's Science and Technology Council (2017 to present)
- Chair, Oklahoma Governor's Aerospace and Autonomous Systems Council (2017 to present)

12. Please list each membership you have had during the past ten years or currently hold with any civic, social, charitable, educational, political, professional, fraternal, benevolent or religious organization, private club, or other membership organization. Include dates of membership and any positions you have held with any organization. Please note whether any such club or organization restricts membership on the basis of sex, race, color, religion, national origin, age, or handicap.

- Member, Board of Directors, Norman, Oklahoma Chamber of Commerce (2003–2006; 2009–2012)
- Member, Board of Trustees, Riverside Church, Norman, Oklahoma (2007–2009)
- Elder, Riverside Church, Norman, Oklahoma (2009–2010)
- Board of Directors, National Weather Museum and Science Center (2009–2017)
- Member, OU University Club Board of Trustees (2013–2016)
- President, OU University Club Board of Trustees (2014–2015)

13. Have you ever been a candidate for and/or held a public office (elected, non-elected, or appointed)? If so, indicate whether any campaign has any outstanding debt, the amount, and whether you are personally liable for that debt. No.

14. Itemize all political contributions to any individual, campaign organization, political party, political action committee, or similar entity of $500 or more for the past ten years. Also list all offices you have held with, and services rendered to, a state or national political party or election committee during the same period. None.

15. List all scholarships, fellowships, honorary degrees, honorary society memberships, military medals, and any other special recognition for outstanding service or achievements.

- George Lynn Cross Scholarship, University of Oklahoma (1978–1979)
- Dresser Engineering Scholarship, University of Oklahoma (1979–1980)
- OU Engineering Dean's Student Advisory Council (1979–1980)
- Tau Beta Pi Fellowship (1980)
- Phi Kappa Phi Honor Society (1981)
- University of Illinois Fellowship (1981–1982)
- Outstanding Young Men of American (1982)
- Outstanding First-time Presentation, 12th Conference on Severe Local Storms, San Antonio, TX, American Meteorological Society (1982)
- University of Illinois Fellowship (1982–1983)
- University of Illinois Fellowship (1983–1984)
- Sigma Xi Research Paper Award, University of Illinois (1985)
- Who's Who in Technology Today (1985)
- OU Associates Distinguished Lectureship Award (1986)
- Presidential Young Investigator, National Science Foundation (1987–1992)
- Oklahoma State Senate Citation (1987)
- Fellow of the NOAA Cooperative Institute for Mesoscale Meteorological Studies (1987 to present)
- OU Associates Distinguished Lectureship Award (1987)
- OU Associates Distinguished Lectureship Award (1988)
- OU Associates Distinguished Lectureship Award (1989)
- Professor of the Year, College of Geosciences (1991)

- Discover Magazine Award for Technology Innovation (computer software category) to CAPS (Center for Analysis and Prediction of Storms) (1997)
- Computerworld Smithsonian Award to CAPS (science category) (1997)
- OU Associates Presidential Professorship (1998)
- NSF Pioneer Award (2001)
- Regents' Professorship, University of Oklahoma (2001)
- Fellow of the American Meteorological Society (2002)
- NOAATech 2002 Award for Best Use of Advanced Networks: "WSR–88D Radar Data over the Internet/NGI" (co-recipient, 2002)
- Federal Aviation Administration Excellence in Aviation Award (2002)
- Roger and Sherry Teigen Presidential Professorship (2004)
- Invited Speaker for the Millennium Lecture Series, UTEP (2006)
- Fellow of the American Association for the Advancement of Science (2014)
- University of Illinois Department of Atmospheric Sciences Distinguished Alumni Speaker (2016)
- Rod Rose Award for best article in the *Journal of Research Administration* (2017)

16. Please list each book, article, column, or publication you have authored, individually or with others. Also list any speeches that you have given on topics relevant to the position for which you have been nominated. Do not attach copies of these publications unless otherwise instructed.

Author of a 170-word, daily weather science column for the *Daily Oklahoman* newspaper (July 1999–July 2001)

"Miracle Machine of U.S. Innovation is in Danger," K. Droegemeier and Daniel Reed, in the Des Moines Register. 2017. *https://www.desmoinesregister.com/story/opinion/columnists/iowa-view/2017/06/11/miracle-machine-u-s-innovation-danger/382432001/*

"Advising the Government: Creating Sound Science Policy." Presented to the South Central Climate Science Center Early Career Workshop, 2014. Available at *https://www.youtube.com/watch?v=ZPZbEBT5E7w&t=2520s*

Refereed Book Chapters

Droegemeier, K.K., M. Xue, K. Johnson, M. O'Keefe, A. Sawdey, G. Sabot, S. Wholey, N.T. Lin, and K. Mills, 1995: Weather prediction: A scalable storm-scale model. Chapter 3 (p. 45–92) in *High Performance Computing,* G. Sabot (Ed.), Addison-Wesley, Reading, Massachusetts, 246pp.

Xue, M., K.K. Droegemeier, and D. Weber, 2007: *Numerical Prediction of High-Impact Local Weather: A driver for Petascale Computing.* Chapter 18 in *Petascale Computing: Algorithms and Applications,* Chapman and Hall/CRC Press.

Refereed Encyclopedia Contributions

Droegemeier, K.K., 1993: Weather forecasting and prediction. *McGraw Hill Yearbook of Science and Technology,* McGraw Hill, 476–480.

Refereed Publications in Print

Sasamori, T., and K. Droegemeier, 1983: A linear analysis on the acceleration of zonal flow by baroclinic instability. Part I: Jovian atmosphere. *J Atmos. Sci., 40,* 2323–2338.

Droegemeier, K., and T. Sasamori, 1983: A linear analysis on the acceleration of zonal flow by baroclinic instability. Part II: Terrestrial atmosphere. *J Atmos. Sci., 40,* 2339–2348.

Droegemeier, K.K. and R.B. Wilhelmson, 1985: Three-dimensional numerical modeling of convection produced by interacting thunderstorm outflows. Part I: Control simulation and low-level moisture variations. *J Atmos. Sci., 42,* 2381–2403.

Droegemeier, K.K. and R.B. Wilhelmson, 1985: Three-dimensional numerical modeling of convection produced by interacting thunderstorm outflows. Part II: Variations in vertical wind shear. *J Atmos. Sci., 42,* 2404–2414.

Droegemeier, K.K., and R.B. Wilhelmson, 1986: Kelvin instability in a numerically simulated thunderstorm outflow. *Bull. Amber. Meteor. Soc., 67,* 416–417.

Droegemeier, K.K. and R.B. Wilhelmson, 1987: Numerical simulation of thunderstorm outflow dynamics. Part I: Outflow sensitivity experiments and turbulence dynamics. *J Atmos. Sci., 44,* 1180–1210.

Robertson, M., and K.K. Droegemeier, 1990: NEXRAD and the broadcast weather industry: Preparing to share the technology. *Bull. Amer. Meteor. Soc., 71,* 14–18.

Carpenter, R.L. Jr., K.K. Droegemeier, P.R. Woodward, and C.E. Hane, 1990: Application of the piecewise parabolic method (PPM) to meteorological modeling. *Mon. Wea. Rev., 118,* 586–612.

Dietachmayer, G. and K. Droegemeier, 1992: Application of continuous dynamic grid adaption techniques to meteorological modelling, Part I: Basic formulation and accuracy. *Mon. Wea. Rev., 120,* 1675–1706.

Droegemeier, K.K., S.M. Lazarus, and R.P. Davies-Jones, 1993: The influence of helicity on numerically simulated convective storms. *Mon. Wea. Rev, 121,* 2005–2029.

Li, Y. and K.K. Droegemeier, 1993: The influence of diffusion on the adjoint data assimilation technique. *Tellus, 45A,* 435–448.

Straka, J.M., R.B. Wilhelmson, L.J. Wicker, J.R. Anderson, and K.K. Droegemeier, 1993: Numerical solutions of a non-linear density current: A benchmark solution and comparisons. *Int. J Num. Meth. in Fluids, 17,* 1–22.

Johnson, J.T., M.D. Eilts, and K.K. Droegemeier, 1993: Investigation of outflow strength variability in Florida downburst producing storms. FAA Final Report DOT/FAA/NR–93/5/111 pp.

Johnson, K.W., J. Bauer, G.A. Riccardi, K.K. Droegemeier, and M. Xue, 1994: Distributed processing of a regional prediction model. *Mon. Wea. Rev., 122,* 2558–2572.

Xu, Q., Xue, M., and K.K. Droegemeier, 1995: Numerical simulations of density currents in sheared environments within a vertically confined channel. *J Atmos. Sci., 53,* 770–786.

Emanuel, K., D. Raymond, A. Betts, L. Bosart, C. Bretherton, K. Droegemeier, B. Farrell, J.M. Fritsch, R. Houze, M. LeMone, D. Lilly, R. Rotunno, M. Shapiro, R. Smith, and A. Thorpe, 1995: Report of the first Prospectus Development Team of the U.S. Weather Research Program to NOAA and the NSF. *Bull. Amer. Meteor. Soc., 76,* 1194–1208.

Park, S.K., K.K. Droegemeier, and C. Bischof, 1996: Automatic differentiation as a tool for sensitivity analysis of a convective storm in a 3–D cloud model. Chapter 18 in *Computational Differentation: Techniques, Applications, and Tools,* M. Berz, C. Bischof, and G. Corliss, Eds., SIAM, Philadelphia, PA, 205–214.

Sathye, A., G. Bassett, K. Droegemeier, M. Xue, and K. Brewster, 1996: Experiences using high performance computing for operational storm scale weather prediction. *Concurrency: Practice and Experience, 8,* 731–740.

Xue, M., Q. Xu, and K.K. Droegemeier, 1997: A theoretical and numerical study of density currents in non-constant shear flows. *J. Atmos. Sci, 54,* 1998–2019.

Droegemeier, K.K., 1997: The numerical prediction of thunderstorms: Challenges, potential benefits, and results from realtime operational tests. *WMO Bulletin, 46,* 324–336.

Wang, Z., K.K. Droegemeier, L. White, and I.M. Navon, 1997: Application of a new adjoint Newton algorithm to the 3–D ARPS storm scale model using simulated data. *Mon. Wea. Rev., 125,* 1460–1478.

Sathye, A., M. Xue, G. Bassett, and K. Droegemeier, 1997: Parallel weather modeling with the advanced regional prediction system. *Parallel Computing, 23,* 2243–2256.

Park, S.K. and K.K. Droegemeier, 1997: The validity of the tangent linear approximation in a moist convective cloud model. *Mon. Wea. Rev, 125,* 3320–3340.

Wang, D.Z., K.K. Droegemeier, and L. White, 1998: The adjoint Newton algorithm for large-scale unconstrained optimization in meteorology applications. *Comput. Opt. and Appl., 10,* 281–318.

Lilly, D.K., G.M. Bassett, K.K. Droegemeier, and P. Battello, 1998: Stratified turbulence in the atmospheric mesoscales. *Theoretical and Comp. Fluid Dyn, 11,* 139–153.

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General results and comparison with observations. *J. Atmos. Sci, 55,* 3417–3432.

Carpenter, R.L. Jr., K.K. Droegemeier, and A.M. Blyth, 1998b: Entrainment and detrainment in numerically simulated cumulus congestus clouds, Part II: Cloud budgets. *J. Atmos. Sci, 55,* 3433–3439.

Carpenter, R.L. Jr., K.K. Droegemeier, and A.M. Blyth, 1998c: Entrainment and detrainment in numerically simulated cumulus congestus clouds, Part III: Detailed parcel analyses and conceptual model. *J. Atmos. Sci, 55,* 3440–3455.

Lazarus, S., A. Shapiro, and K.K. Droegemeier, 1999: Analysis of the Gal-Chen/Zhang single-Doppler velocity retrieval. *J. Atmos. and Oceanic Tech., 16,* 5–18.

Adlerman, E.J., K.K. Droegemeier, and R–P. Davies-Jones 1999: Numerical simulation of cyclic mesocyclogenesis. *J. Atmos. Sci., 56,* 2045–2069.

Rao, P.A., H.E. Fuelberg, and K.K. Droegemeier, 1999: High resolution modeling of the Cape Canaveral area land/water circulations and associated features. *Mon. Wea. Rev., 56,* 1808–1821.

Park, S.K., and K.K. Droegemeier, 1999: Sensitivity analysis of a moist 1–D Eulerian cloud model using automatic differentiation. *Mon. Wea. Rev., 127,* 2128–2142.

Gao, J., M. Xue, A. Shapiro, and K. Droegemeier, 1999: A variational method for the analysis of three-dimensional wind fields from dual-Doppler radars. *Mon. Wea. Rev., 127,* 2180–2196.

Grice, *G:K.,* R. J. Trapp, S. F. Corfidi, R. Davies-Jones, C. C. Buonanno, J.P. Craven, K. K. Droegemeier, C. Duchon, J. V. Houghton, R. Prentice, G. Romine, K. Schlachter, K. K. Wagner, 1999: The Golden Anniversary Celebration of the First Tornado Forecast. *Bull. Amer. Met Soc., 80,* 1341–1348.

Park, S.K. and K.K. Droegemeier, 2000: Sensitivity analysis of a 3–D convective storm: Implications for variational data assimilation and forecast error. *Mon. Wea. Rev., 128,* 140–159.

Ware, R.H., D.W. Fulker, S.A. Stein, D.N. Anderson, S.K. Avery, R.D. Clark, K.K. Droegemeier, J.P. Kuettner, J.B. Minster, and S. Sorooshian, 2000: SuomiNet: A real-time national GPS network for atmospheric research and education. *Bull. Amer. Meteor. Soc., 84,* 677–694.

Foufoula-Georgiou, E., J. Zepeda-Arce, and K.K. Droegemeier, 2000: Space-time rainfall organization and its role in validating quantitative precipitation forecasts. *J. Geophys Res., 105,* 10129–10146.

Droegemeier, K.K. and Co-Authors, 2000: Hydrological aspects of weather prediction and flood warnings: Report of the Ninth Prospectus Development Team of the U.S. Weather Research Program. *Bull. Amer. Meteor. Soc., 81,* 2665–2680.

Xue, M., K. K. Droegemeier, and V. Wong, 2000: The Advanced Regional Prediction System (ARPS)—A multiscale nonhydrostatic atmospheric simulation and prediction model. Part I: Model dynamics and verification. *Meteor. and Atmos. Physics., 75,* 161–193.

Ware, R.H., D.W. Fulker, S.A. Stein, D.N. Anderson, S.K. Avery, R.D. Clark, K.K. Droegemeier, J.P. Kuettner, J. Minster, and S. Sorooshian, 2000: Real-time national GPS networks: Opportunities for atmospheric sensing. *Earth Planets Space, 52,* 901–905.

Gao, J., M. Xue, A. Shapiro, Qin Xu, and K. Droegemeier, 2001: Three dimensional simple adjoint velocity retrievals from single Doppler radar data. *J. Atmos. and Oceanic Tech., 18,* 26–38.

Hou, D., E. Kalnay, and K.K. Droegemeier, 2001: Objective verification of the SAMEX '98 ensemble forecasts. *Mon. Wea. Rev., 129,* 73–91.

Lazarus, S., A. Shapiro, and K.K. Droegemeier, 2001: Application of the Gal-Chen/Zhang velocity retrieval to a deep convective storm. *J. Atmos. Sci., 58,* 998–1016.

Xue, M., K. K. Droegemeier, V. Wong, A. Shapiro, K. Brewster, F. Carr, D. Weber, Y. Liu, and D.-H. Wang, 2001: The Advanced Regional Prediction System (ARPS)—A multiscale nonhydrostatic atmospheric simulation and prediction tool. Part II: Model physics and applications. *Meteor. and Atmos. Physics,* 76, 134–165.

Anthes, R., 0. Brown, K. Droegemeier, and J. Fellows, 2001: UCAR and NCAR at 40. *Bull. Amer. Meteor. Soc., 82,* 1139–1149.

Harris, D., E. Foufoula-Georgiou, K.K. Droegemeier, and J. Levit, 2001: Multiscale statistical prope1ties of a high-resolution precipitation forecast. *J. Hydromet., 4,* 406–418.

Ware, R.H., D.W. Fulker, S.A. Stein, D.N. Anderson, S.K. Avery, R.D. Clark, K.K. Droegemeier, J.P. Kuettner, J.B. Minster, and S. Sorooshian, 2001: Real time national GPS networks for atmospheric sensing. *J. Atmos. and Solar-Terr. Phys., 63,* 1315–1330.

Weygandt, S.S., A. Shapiro and K.K. Droegemeier, 2002: Retrieval of initial forecast fields from single-Doppler observations of a supercell thunderstorm. Part I: Single-Doppler velocity retrieval. *Mon. Wea. Rev, 130,* 433–453.

Weygandt, S.S., A. Shapiro and K.K. Droegemeier, 2002: Retrieval of initial forecast fields from single-Doppler observations of a supercell thunderstorm. Part II: Thermodynamic retrieval and numerical prediction. *Mon. Wea. Rev, 130,* 454–476.

Adlerman, E.J. and K.K. Droegemeier, 2002: The sensitivity of numerically-simulated cyclic mesocyclogenesis to variations in model physical and computational parameters. *Mon. Wea. Rev., 130,* 2671–2691.

Xue, M., D.-H. Wang, J.-D. Gao, K. Brewster, and K. K. Droegemeier, 2003: The Advanced Regional Prediction System (ARPS): Storm scale numerical weather prediction and data assimilation. *Meteor. and Atmos. Physics, 82,* 139–170.

Pielke, R.A. Jr. and Co-Authors, 2003: The USWRP workshop on the weather research needs of the private sector. *Bull. Amer. Meteor. Soc., 84,* ES53–ES67.

Gao, J., M. Xue, K. Brewster, and K.K. Droegemeier, 2004: A three dimensional variational data analysis method with recursive filter for Doppler radars. *J Atmos. and Oceanic Tech., 21,* 457–469.

Gao, J. and K.K. Droegemeier, 2004: A variational technique for dealiasing Doppler radial velocity data. *J Appl. Meteor., 43,* 934–940.

Gao, J., K.K. Droegemeier, J. Gong, and Q. Xu, 2004: A method for retrieving mean horizontal wind profiles from single-Doppler radar observations contaminated by aliasing. *Mon. Wea. Rev, 132,* 1399–1409.

Plale, B., J. Alameda, R. Wilhelmson, D. Gannon, S. Hampton, A. Rossi, and K.K. Droegemeier, 2004: User-oriented active management of scientific data with my LEAD. *IEEE Internet Computing, 9,* 27–34.

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17. Please identify each instance in which you have testified orally or in writing before Congress in a governmental or non-governmental capacity and specify the date and subject matter of each testimony.

- U.S. House of Representatives Subcommittee on Science in the Re-Competition of the NSF Supercomputing Centers (1996)
- U.S. House of Representatives Appropriations Subcommittee on VA, HUD and Independent Agencies, on the Budgets of the NSF and NASA (2004)
- U.S. House of Representatives Subcommittee on Energy and Environment, and Subcommittee on Research and Science Education, U.S. House of Representatives Committee on Science and Technology, Regarding the State of Hurricane Research and H.R. 2407, the National Hurricane Research Initiative Act of2007 (2008)
- U.S. Senate Committee on Commerce, Science and Transportation for the hearing on *Weathering the Storm: The Need for National Hurricane Research Initiative* (2009)
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- U.S. House of Representatives Appropriations Subcommittee on Labor, Health and Human Services, Education and Related Agencies hearing on *The Role of Facilities and Administrative Costs in Supporting NIH-Funded Research* (2017)

18. Given the current mission, major programs, and major operational objectives of the department/agency to which you have been nominated, what in your background or employment experience do you believe affirmatively qualifies you for appointment to the position for which you have been nominated, and why do you wish to serve in that position?

To be most effective, the Director of OSTP needs to have the following qualifications and capabilities (in no particular order): experience and respect as an accomplished scientist; experience working on science, technology, and education policy issues, preferably with both the Executive and Legislative branches of the Federal Government as well as relevant agencies across Government, and at the international level as well; familiarity with the role, structure and function of OSTP; objectivity, devotion, dedication, confidence, and trustworthiness; respect for all dis-

ciplines; respect and appreciation for the importance and value of diversity and inclusion in all its dimensions, and a knowledge of how to enhance the participation of traditionally underrepresented groups in research and education; a tireless devotion to the position under consideration and to the Nation; an ability to communicate effectively with a wide range of audiences; solid values and an uncompromising ethical compass; a passion for progress; a strong background in and working knowledge of STEM (science, technology, engineering and mathematics) education at all levels; and the following leadership skills: (a) ability to understand and address complex issues, placing them in context and clarifying multiple points of view and possible solutions, including the ability to make decisions quickly if needed, (b) ability to steward a group of professionals and collaboratively define an agenda that reflects the President's priorities; (c) ability to actively seek and give value to all points of view, ensuring that all voices are heard and that a11 relevant sources of input are utilized in everything OSTP does; and (d) an approachability and openness for building trust with colleagues and a comfortable, pleasant and safe working environment.

With that preface, my career has afforded me the opportunity to both develop those attributes which arise through experience, as well as nurture those which are more innate. Especially relevant in this context is my service on a wide array of important national boards and committees, often elected as chair by my peers, which both engage and help shape the direction of the Nation's science and engineering research and education enterprise. My 12 years on the National Science Board (last four as Vice Chairman), nominated by Presidents of both parties and twice confirmed by the Senate, gave me an opportunity to actively engage on a number of important science policy issues (see my curriculum vitae at the end of this document for details regarding my activities on the National Science Board), as has my testimony before Congress and my active involvement in professional policy organizations, such as the Council on Governmental Relations, for which I served as a board member for six years.

I have worked with OSTP in the past, principally during my tenure on the National Science Board, on issues related to STEM education as well as research funding priorities, structure, and peer review. At the request in 2016 of the Baker Institute at Rice University, I participated in the creation of a document about OSTP for the new President following the 2016 election, and I also worked with OSTP on nominations for the National Science Board classes of 2014 and 2016, for which I chaired the Nominations Committee. Having given lectures on research policy, which required study of OSTP and other relevant organizations and activities (*e.g.,* President's Council of Advisors on Science and Technology, National Science and Technology Council), I am familiar with the role, structure and function of OSTP in the National policy framework.

As Vice President for Research at the University of Oklahoma, I have a multifaceted view of research, including the importance of public private partnerships and the manner in which multiple disciplines and organizations come together to solve some of the most intellectually challenging and societally relevant problems. I have been mentored by one of the Nation's most outstanding university presidents, former U.S. Senator David L. Boren, and I have worked extensively with members of the Oklahoma congressional delegation on matters of research policy, as well as other Members of Congress on occasion. In starting a private company, I have a deep appreciation for the importance of job and wealth creation and the value of research in moving local, regional and national economies forward. As Oklahoma Secretary of Science and Technology, in the Cabinet of Governor Mary Fallin, I have obtained additional insight into state-level policy issues in both education and research, including economic development, policies that stimulate growth, linking the academic and corporate research enterprises, and STEM education.

As a university professor, I led several major research projects and centers involving numerous institutions and complex budgets, and thus understand the "front lines" view as well as the national view of research and related policy issues. I have mentored numerous students and faculty, and have given presentations on science to a vast array of audiences—from nursing homes and grade schools to civic organizations such as Rotary, Chambers of Commerce and alumni clubs. I have initiated and led several major research collaborations with private industry and have worked on numerous STEM education issues within my institution, and at the state and national levels. I also have, over my 33 years at the University of Oklahoma, helped develop the academic Federal partnership within the National Weather Center, which involves several NOAA organizations as well as academic and research centers.

Finally, I believe, more than anything, that the OSTP Director must be an exceptional leader and have wisdom. I have learned about leadership by experiencing it

firsthand among some exceptional mentors, which led me to give presentations on leadership and develop a unique Faculty Leadership Academy at my university. With humility, I can attest that the list of leadership characteristics, enumerated as items a–d in the first paragraph of my response in this section (18), reflects my approach to leading and indeed my approach to life. I place great value on people, I deeply appreciate the privilege of working with a broad and diverse array of viewpoints, and I love solving difficult problems by bringing to bear on them the best ideas and approaches.

Regarding my wish to serve, I have unending love for my Country and passion for its science, technology and education enterprises. I want more than anything for them to thrive and to serve as beacons of leadership for the world. OSTP plays a pivotal collaborative role in achieving those objectives. Personally, my heart is one of serving, and throughout my life I have been blessed with opportunities to serve and to learn while doing so. Directing OSTP would be an extraordinary privilege and an opportunity for me to give back to a Nation which has given me so much.

19. What do you believe are your responsibilities, if confirmed, to ensure that the department/agency has proper management and accounting controls, and what experience do you have in managing a large organization?

As the Director of OSTP, I would have the ultimate responsibility of stewarding this important Federal agency, including ensuring that all management and financial controls are operating with efficiency, integrity, and in accordance with all established policies and procedures. I have experience doing so from a variety of circumstances. First, I have chaired the boards of non-profit organizations, such as the University Corporation for Atmospheric Research (UCAR), which operates a Federally Funded Research and Development Center (the National Center for Atmospheric Research) on behalf of the National Science Foundation. The UCAR Board, and of course the Chair, have ultimate fiduciary responsibility for accounting, budgeting, audits, personnel actions, and other aspects of this $173.lM (FYl7 funding received) organization. In that capacity I worked with the UCAR General Counsel on a variety of issues related to audits, personnel matters, planning, and reporting. The same is true for an organization I now chair, the Southeastern Universities Research Association (SURA), though SURA is much smaller, in size and financially, than UCAR.

Second, as a Member of the National Science Board and its Vice Chair for four years, I was involved in strategic planning, budgeting, audits (financial and technological), various Inspector General reviews, and management issues relevant to the National Science Foundation, including those of especially large projects. I worked directly with the Inspector General on a variety of matters, and as Vice Chair was a member of the Audit and Oversight Committee.

As Vice President for Research at the University of Oklahoma, I steward a staff of some 80 individuals and developed an entirely new cost accounting and data/commitment tracking system that brought fiscal discipline to the organization, which is now a role model for the institution. When I became Vice President, one of the first actions I took was to initiate an internal audit to ensure that my organization was complying with all rules, policies and procedures. The audit determined that some controls needed strengthening (*e.g.,* timely deposits of cash), and those actions were taken immediately.

Also in this capacity, units within my organization undergo both internal and external audits, with examples of the latter being White House Office of Management and Budget audits for compliance with 2 CFR 200 (Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards). During my tenure as Vice President, none of the units under my purview have had an 0MB audit finding.

I am now working with the OU Dean of Libraries, and the OU Interim Chief Information Officer/Vice President for Information Technology, on the outcome of an audit of the University's research-related information technology. One written recommendation was issued, and it concerns the University's need to develop an interim approach for compliance of grants and contacts subject to a DFARS (Defense Federal Acquisition Regulations Supplement) 252.204–7012 clause for Controlled but Unclassified Information (CUI). That process is now underway with a target completion date of July 2018.

20. What do you believe to be the top three challenges facing the department/agency, and why?

As a preface to my answer, I wish to note that the roles of OSTP and its Director are clearly defined in Public Law 94–282. Consequently, it is within that context I describe the following three challenges.

The first challenge is to ensure that the President's priorities in science and technology, their alignment with his policy objectives, and views held by the President

regarding the importance of science and technology in America's future are communicated effectively to all stakeholders (*i.e.,* the research community, Congress, the private sector, and non-profit organizations) and used to shape the Nation's future research and policy roadmaps. It is impo1iant that the U.S. remain a global leader in science, technology, and innovation, and that stakeholders understand the value placed by this Administration on research. Additionally, it is vitally important that research outcomes be translated efficiently and effectively to solve problems, create new companies and jobs, ensure the safety and security of America, prepare the workforce of the future; and ensure that the U.S. is seen as a trusted partner in important international research activities.

The second challenge involves OSTP working to ensure that the U.S. science and technology research and education enterprise (spanning the spectrum from basic or discovery research to applied research and development) is robust, efficient, operating with the highest levels of integrity and effectiveness, addressing the greatest challenges of today and preparing for challenges of the future, and is informing policies of the Executive Branch. This is especially important as China and other nations continue to exhibit rapid growth in important measures of research productivity and investment.

Finally, a secure, prosperous and healthy America depends upon the availability of a robust and diverse workforce that spans the spectrum from doctoral degree-holding researchers and practitioners in STEM fields to skilled trade and crafts persons trained and educated in career techs and two-year colleges. OSTP and PCAST (President's Council of Advisors on Science and Technology) have in the past opined on the STEM education and workforce issue, as has the National Science Board, principally in the context of post-secondary STEM degrees. And excellent work is happening today in STEM education policy led by OSTP. A comprehensive approach is essential for ensuring that the full ecosystem of jobs and skills, and the dynamic interaction among them, is understood and utilized as a way to most effectively create the workforce of the future. This is especially important because of the rapid pace of technology, which often requires, or affords an opportunity for, one to re invent oneself multiple times during the course of a career. To ensure such capability exists, and that all areas of the country and all individuals are able to contribute to the workforce, the connective tissue across all institutions and levels of education and training needs to be strengthened.

B. POTENTIAL CONFLICTS OF INTEREST

1. Describe all financial arrangements, deferred compensation agreements, and other continuing dealings with business associates, clients, or customers. Please include information related to retirement accounts.

As a faculty member and executive officer of the University of Oklahoma, I do not have any clients, customers, or business associates from a financial point of view. Below are shown my retirement accounts:

- TIAA/CREF OU Defined Contribution Plan, current value of [redacted]
- Fidelity Investments Defined Contribution Plan, current value of [redacted]
- TIAA/CREF Brokerage Account, current value of [redacted]
- Oklahoma Teacher's Retirement, current value unknown but likely approximately [redacted]
- U.S. Social Security, current value unknown.
- Weather Decision Technologies, Inc. Common Stock, current value [redacted]
- Met Life IRA (candidate), current value of [redacted]
- Met Life IRA (spouse), current value of [redacted]
- Personal savings account, Republic Bank and Trust, current value of [redacted]

2. Do you have any commitments or agreements, formal or informal, to maintain employment, affiliation, or practice with any business, association or other organization during your appointment? If so, please explain.

The only commitment I will maintain if confirmed is continued affiliation with the University of Oklahoma as a tenured professor, for which I am in the process of requesting a leave of absence without pay. I am eligible for such a leave; however, because such leaves must be approved by the University's Board of Regents, which conducts its business in a public forum, it is appropriate that I withhold submission of my request to the Regents, until directed by the White House, so as to avoid preempting the White House regarding any formal public announcement of intent to nominate or to nominate.

3. Indicate any investments, obligations, liabilities, or other relationships which could involve potential conflicts of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the U.S. Office of Government Ethics and OSTP's Designated Agency Ethics Official to identify potential conflicts of interest. If confirmed, any potential conflicts of interest will be resolved in accordance with the terms of the ethics agreement that I have entered into with OSTP's Designated Agency Ethics Official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

4. Describe any business relationship, dealing, or financial transaction which you have had during the last ten years, whether for yourself, on behalf of a client, or acting as an agent, that could in any way constitute or result in a possible conflict of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the U.S. Office of Government Ethics and OSTP's Designated Agency Ethics Official to identify potential conflicts of interest. If confirmed, any potential conflicts of interest will be resolved in accordance with the terms of the ethics agreement that I have entered into with OSTP's Designated Agency Ethics Official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

5. Describe any activity during the past ten years in which you have been engaged for the purpose of directly or indirectly influencing the passage, defeat, or modification of any legislation or affecting the administration and execution of law or public policy.

Apart from Congressional testimony noted in Section A17, which involved testifying on various bills, I have been asked by Members of my congressional delegation to assist them with bills by providing input and suggestions (the Grant Act by Senator Lankford, the Weather Forecast Improvement Act by Representatives Bridenstine and Lucas, and the FY17 Omnibus by Congressman Cole). As a member of the National Science Board from 2004–2016, I interacted with Chairman Lamar Smith of the House Science Committee on policy affecting the National Science Foundation. In my role as Vice President for Research at the University of Oklahoma (OU), I work with the OU Vice President for Governmental Relations, and OU's consultants, to provide input on the content of various bills. I have attempted to influence legislation, in my role as Vice President for Research and through the individuals at my university mentioned in the previous sentence, in a bill and/or amendments offered from 2014–2016 which sought to eliminate the Established Program to Stimulate Competitive Research (EPSCoR). Additionally, I provided input on a draft bill, never submitted to my knowledge, which would have improved the ability of universities to negotiate intellectual property provisions with corporate sponsors.

6. Explain how you will resolve any potential conflict of interest, including any that may be disclosed by your responses to the above items.

In connection with the nomination process, I have consulted with the U.S. Office of Government Ethics and OSTP's Designated Agency Ethics Official to identify potential conflicts of interest. If confirmed, any potential conflicts of interest will be resolved in accordance with the terms of the ethics agreement that I have entered into with OSTP's Designated Agency Ethics Official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

C. LEGAL MATTERS

1. Have you ever been disciplined or cited for a breach of ethics, professional misconduct, or retaliation by, or been the subject of a complaint to, any court, administrative agency, the Office of Special Counsel, professional association, disciplinary committee, or other professional group? If yes:

a. Provide the name of agency, association, committee, or group;

b. Provide the date the citation, disciplinary action, complaint, or personnel action was issued or initiated;

c. Describe the citation, disciplinary action, complaint, or personnel action;

d. Provide the results of the citation, disciplinary action, complaint, or personnel action.

No.

2. Have you ever been investigated, arrested, charged, or held by any Federal, State, or other law enforcement authority of any Federal, State, county, or municipal entity, other than for a minor traffic offense? If so, please explain. No.

3. Have you or any business or nonprofit of which you are or were an officer ever been involved as a party in an administrative agency proceeding, criminal proceeding, or civil litigation? If so, please explain. No.
4. Have you ever been convicted (including pleas of guilty or *nolo contendere*) of any criminal violation other than a minor traffic offense? If so, please explain. No.
5. Have you ever been accused, formally or informally, of sexual harassment or discrimination on the basis of sex, race, religion, or any other basis? If so, please explain. No.
6. Please advise the Committee of any additional information, favorable or unfavorable, which you feel should be disclosed in connection with your nomination. None.

D. RELATIONSHIP WITH COMMITTEE

1. Will you ensure that your department/agency complies with deadlines for information set by congressional committees? Yes.
2. Will you ensure that your department/agency does whatever it can to protect congressional witnesses and whistle blowers from reprisal for their testimony and disclosures? Yes.
3. Will you cooperate in providing the Committee with requested witnesses, including technical experts and career employees, with firsthand knowledge of matters of interest to the Committee? Yes.
4. Are you willing to appear and testify before any duly constituted committee of the Congress on such occasions as you may be reasonably requested to do so? Yes.

CURRICULUM VITAE OF KELVIN K. DROEGEMEIER

Education

B.S. in Meteorology with Special Distinction, University of Oklahoma, 1980

M.S. in Atmospheric Science, University of Illinois at Urbana-Champaign, 1982

Ph.D. in Atmospheric Science, University of Illinois at Urbana-Champaign, 1985
Advisor: Professor Robert B. Wilhelmson
Dissertation Title: *The Numerical Simulation of Thunderstorm Outflow Dynamics*

Professional Employment

Vice President for Research, University of Oklahoma, 2009 to Present

Weathernews Chair Emeritus of Applied Meteorology, University of Oklahoma, 2009 to Present

Director Emeritus, Center for Analysis and Prediction of Storms, University of Oklahoma, 2006 to Present

Associate Vice President for Research, University of Oklahoma, 2005–2009

Weathernews Chair in Applied Meteorology, University of Oklahoma, 2005–2009

Director, Sasaki Institute, University of Oklahoma, 2005–2009

Roger and Sherry Teigen Presidential Professor, University of Oklahoma, 2004 (life)

Co-Founder and Deputy Director, Center for Collaborative Adaptive Sensing of the Atmosphere (CASA) (NSF Engineering Research Center), University of Oklahoma (in partnership with University of Massachusetts at Amherst, Colorado State University, University of Puerto Rico at Mayaguez) 2003–2008

Regents' Professor, University of Oklahoma, November, 2001 (life)

Professor, School of Meteorology, University of Oklahoma, July 1998 to Present

OU Associates Foundation Presidential Professor, University of Oklahoma, 1998–2002

Founder and Director, Environmental Computing Applications System (research and educational supercomputing center), University of Oklahoma, 1996–2001

Co-Founder (1989) and Director (1994–2006), Center for Analysis and Prediction of Storms (CAPS) (NSF Science and Technology Center), University of Oklahoma

Associate Professor, School of Meteorology, University of Oklahoma, 1991–1998 Director of Model Development Program, Center for Analysis and Prediction of Storms, University of Oklahoma, 1989–1994

Visiting Senior Fellow, Army High Performance Computing Research Center, University of Minnesota (Sabbatical) 1 January–30 June 1992

Deputy Director, Center for Analysis and Prediction of Storms, University of Oklahoma July 1991–February 1992

Assistant Professor, School of Meteorology, University of Oklahoma, 1985–1991

Deputy Director for Research, Center for Analysis and Prediction of Storms, University of Oklahoma, 1989–1991

Graduate Research Assistant, University of Illinois, 1980–1985

Meteorological Technician, National Severe Storms Laboratory, 1978–1980

Meteorological Aide, National Severe Storms Laboratory, 1976–1978

Federal Government Appointments

Appointed by President George W. Bush to the National Science Board and confirmed by the U.S. Senate (2004–2010)

Appointed by President Barack H. Obama to the National Science Board and confirmed by the U.S. Senate (2011–2016) (Vice Chairman of the Board 2012–2016)

State Government Appointments

Appointed by Oklahoma Governor Mary Fallin to the Governor's Science and Technology Council (20ll to Present) and Chair of Sub-Committee on Research

Appointed by Oklahoma Governor Marry Fallin as Cabinet Secretary of Science and Technology, (2017 to Present)

Company Creation

Founder of Weather Decision Technologies, Inc. (1999)

Congressional Testimony

U.S. House of Representatives Subcommittee on Science in the Re-Competition of the NSF Supercomputing Centers (1996)

U.S. House of Representatives Appropriations Subcommittee on VA, HUD and Independent Agencies, on the Budgets of the NSF and NASA (2004)

U.S. House of Representatives Subcommittee on Energy and Environment, and Subcommittee on Research and Science Education, U.S. House of Representatives

Committee on Science and Technology, Regarding the State of Hurricane Research and H.R. 2407, the National Hurricane Research Initiative Act of 2007 (2008)

U.S. Senate Committee on Commerce, Science and Transportation for the hearing on *Weathering the Storm: The Need for National Hurricane Research Initiative* (2009)

U.S. House of Representatives Subcommittee on Environment, in the U.S. House of Representatives Committee on Science, Space and Technology, hearing on *Restoring U.S. Leadership in Weather Forecasting, Part 2.* (2013)

U.S. Senate Committee on Commerce, Science, and Transportation hearing on *America COMPETES: Science and the U.S. Economy* (2013)

U.S. Senate Committee on Commerce, Science, and Transportation hearing on *America COMPETES: Leveraging the U.S. Science and Technology Enterprise* (2016)

U.S. House of Representatives Appropriations Subcommittee on Labor, Health and Human Services, Education and Related Agencies hearing on *The Role of Facilities and Administrative Costs in Supporting NIH-Funded Research* (2017)

Professional Consulting

Sperry Commercial Flight Systems Group, Honeywell Corporation. (1989–1992)

Climatological Consulting Corporation (UAL Flight #585, Colorado Springs, Colorado, 1997)

American Airlines (AA Flight #242, Dickinson, North Dakota, 1997)

National Transportation Safety Board (NTSB) (AA Flight #903, Florida Peninsula, 1997–1998)

American Airlines (AA Flight #1420, Little Rock, Arkansas, 1999–2002)

American Airlines (AA Flight #587, New York, New York, 2002–2007)

Air France (AF Flight #358, Toronto, Canada, 2006–2008)

Continental Airlines (CAL Flight #1404, Denver, Colorado, 2009–2013)

Continental Airlines (CAL Flight #511, McAllen, Texas, 2010–2011)

Depositions Given as Expert Witness

American Airlines Flight #1420 accident deposition given 1 March 2001 in Dallas, Texas

Continental Airlines Flight #1404 accident deposition given 10 December 2010 in Dallas, Texas

Continental Airlines Flight #511 in-flight incident deposition given 31 May 2011 in Dallas, Texas

Continental Airlines Flight #1404 accident deposition given 21 June 2012 in Dallas, Texas

Continental Airlines Flight #1404 accident deposition given 13 September 2012 in Dallas, Texas

National Science Board Leadership Activities (2004–2016)

Member of Vannevar Bush Award Selection Committee, National Science Board (2006)

Co-Chair, Hurricane Science and Engineering Task Force, National Science Board (2005–2007)

[Publication: "Hurricane Warning—The Critical Need for a National Hurricane Research Initiative, available at *http://www.nsf.gov/nsb/committees/archive/hurricane/initiative.pdf*]

Member, Task Force on Transformative Research, National Science Board (2006–2007)

[Publication: "Enhancing Support of Transformative Research at the National Science Foundation," available at *http://www.nsf.gov/nsb/documents/2007/tr_report.pdf*]

Member, Vannevar Bush Award Selection Committee, National Science Board (2006–2007)

Chair, Task Force on Cost Sharing, National Science Board (2007–2009)

[Publication: "Investing in the Future: NSF Cost Sharing Policies for a Robust Federal Research Enterprise," available at *http://www.nsf.gov/pubs/2009/nsb0920/nsb0920.pdf*]

Chair, *ad hoc* Committee on Nominating for NSB Elections, National Science Board (2008)

Chair, Committee on Programs and Plans, National Science Board (2008–2010)

Member, National Science Board Executive Committee (2011–2016)

Chair, National Science Board *ad hoc* Committee on Nominating for NSB Elections (2011)

Member, National Science Board Sub-Committee on Facilities (2011–2014)

Co-Chair, National Science Board Task Force on Mid-Scale Research (2011–2012)

[Publication: "The National Science Foundation Support of Unsolicited Mid Scale Research," available at *http://www.nsf.gov/nsb/publications/2012/nsb1222.pdf*]

Vice Chairman, National Science Board (2012–2016)

Member, National Science Board Task Force on Administrative Burdens (2012–2013)

Chair, National Science Board *ad hoc* Committee on Nominating for NSB Elections (2013)

Chair, National Science Board Committee on Science and Engineering Indicators (2014–2016)

[Publication: Multiple documents at *http://www.nsf.gov/nsb/sei/index.jsp*]

Chair, National Science Board *ad hoc* Task Force on NEON (2015–2016)

[Report pending public release.]

Principal Accomplishments During Tenure as Vice President for Research

Achieved Carnegie R1 (Highest Research Activity) status (2011)

Led Aspire 2020 strategic planning process to create decadal roadmap for research and creative activity

Created new budgeting and commitment tracking/payment system in Office of the Vice President for Research (VPR)

Created the Center for Research Program Development and Enrichment in the VPR Office (works individually with faculty to scaffold their scholarly programs for the long term, build teams, identify funding, create opportunity)

Created the Broader Impacts in Research position in the VPR Office (diversity enhancement, engagement, education and outreach)

Created the Research Statistics and Analysis Group in the VPR Office (data analytics regarding all aspects of research enterprise)

Created the Office of Undergraduate Research reporting jointly to the VPR and Provost

Created the Defense/Security/Intelligence Research Initiative

Established Distinguished Faculty Fellow positions in the VPR Office

Created the VPR Advisory Committee

Created the Research Liaison Program (one faculty member in each academic department to liaise with the VPR Office)

Created the Center for Applied Research and Development within the VPR Office (assists faculty in working with companies and mission agencies on applied R&D projects)

Established the University Strategic Organization Program (institutional investment in centers and institutes that are foundational to the University's scholarship enterprise)

Restructured the Research Council internal funding portfolio (larger awards, less prescription, funding of faculty release time)

Established the Faculty Challenge Grant Program

Created the VPR Awards Program

Created the Arts and Humanities Faculty Fellowship Program

Helped establish and fund the Humanities Forum

Established bi-weekly informal lunches with a dozen faculty across all disciplines

Created the Center for Autonomous Sensing and Sampling (reports to VPR)

Created the Recognition Program for Exceptional Achievements in Research and Creative Activity (incentive and reward salary bonus program for highly prestigious achievement)

Created the Faculty Leadership Academy

Created the monthly *President's R&D Highlights* publication

Oversee production of the yearly Red Book of Federal Research Priorities for engaging the Oklahoma Congressional delegation

Supported creation of an electronic routing system (Cayuse) for grant proposals

Created Faculty and Staff Publication Support Program (subvention, open access) Restructured Faculty Travel Assistance Program

Established Annual State of Norman Campus Research town hall meeting

Established the National Institute for Risk and Resilience (reports to VPR)

Created the Plains Institute for coordinating environmental portfolio (reports to VPR)

Chaired the Research Campus (research/industrial park) Planning and Governance Committees

Assisted with the construction of Four Partners Place, Five Partners Place, and the Radar Innovations Laboratory on the Research Campus

Oversaw construction and management of the Devon Energy Hall Clean Room

Chaired campus STEM Education Committee and organized a planning charrette

Created VPR Annual Report

Coordinated several cluster hiring initiatives (radar, social science, environment)

Created and now Chair the Regional VPR/VCR Group (approximately 26 institutions among 12 states in the Midwest)

Established Memorandum of Understanding with Tsinghua University, Beijing, China

Established research engagement with Brazil via the OU in Rio Program

Assisting with recruitment of private companies to the Research Campus

Fundraising and Development

Worked with President David L. Boren and CEO of American Airlines to establish the American Airlines Professorship in Meteorology

Worked with President David L. Boren and Dean John T. Snow to establish the Williams Chair in the School of Meteorology

Worked with President David L. Boren and VPR Lee Williams to raise $16M for the Stephenson Life Sciences Research Center

Worked with Dean John T. Snow to establish the Mark and Kandi McCasland Chair in the School of Meteorology

Led an initiative to obtain a $3M gift from a private family to create the National Alliance for Social-Behavioral Systems and Extreme Environmental Events

Presenter at various Office of Development fundraising events

Professional/Honorary Society Memberships and Service

Tau Beta Pi Engineering Society, University of Oklahoma (1978)

Mortar Board, University of Oklahoma (1979)

American Meteorological Society, Student Member (1976–1985)

Sigma Xi Scientific Research Society (1983)

American Meteorological Society, Full Member (1986)

American Association for the Advancement of Science (1985)

American Geophysical Union (1986)

American Association of University Professors (1985)

Vice-President, OU Chapter of Sigma Xi (1987)

President, OU Chapter of Sigma Xi (1988)

Fellow of the Cooperative Institute for Mesoscale Meteorological Studies (1986 to Present)

Society of Industrial and Applied Mathematics (1989)

American Institute for Aeronautics and Astronautics (1989)

Vice President, Central Oklahoma Chapter of the AMS (1997–1998)

Vice President, Central Oklahoma Chapter of the NWA (1997–1998)

Councilor of the American Meteorological Society (2004–2008)

Member, Council on Competitiveness Technology Leadership & Strategy Initiative (TLSI) (2016 to Present)

Personal & Community Service and Leadership

Author of a 170-word, daily weather science column for the Daily Oklahoman newspaper (July 1999–July 2001)

Board of Directors, Norman, Oklahoma Chamber of Commerce (2003–2006; 2009–2012)

Chair, Weather and Climate Team, Oklahoma Economic Development Generating Excellence (EDGE) Governor's Task Force (2003)

Member, Worship Team, Riverside Church, Norman, Oklahoma (1994–2009)

Deacon, Riverside Church, Norman, Oklahoma (2003–2005)

Co-Chair, Norman, Oklahoma Chamber of Commerce Weather Committee

Board of Advisors, Riverside Church, Norman, Oklahoma (2005–2007)

Board of Trustees, Riverside Church, Norman, Oklahoma (2007–2009)

Elder, Riverside Church, Norman, Oklahoma (2009–2010)

Head Usher, Life Church, Oklahoma City, Oklahoma (2013 to Present)

Awards and Special Recognition

George Lynn Cross Scholarship, University of Oklahoma (1978–1979)

Dresser Engineering Scholarship, University of Oklahoma (1979–1980)

OU Engineering Dean's Student Advisory Council (1979–1980)

Tau Beta Pi Fellowship (1980)

Phi Kappa Phi Honor Society (1981)

University of Illinois Fellowship (1981–1982)

Outstanding Young Men of American (1982)

Outstanding First-time Presentation, 12th Conference on Severe Local Storms, San Antonio, TX, American Meteorological Society (1982)

University of Illinois Fellowship (1982–1983)

University of Illinois Fellowship (1983–1984)

Sigma Xi Research Paper Award, University of Illinois (1985)

Who's Who in Technology Today (1985)

OU Associates Distinguished Lectureship Award (1986)

Presidential Young Investigator, National Science Foundation (1987–1992)

Oklahoma State Senate Citation (1987)

Fellow of the NOAA Cooperative Institute for Mesoscale Meteorological Studies (1987 to Present)

OU Associates Distinguished Lectureship Award (1987)

OU Associates Distinguished Lectureship Award (1988)

OU Associates Distinguished Lectureship Award (1989)

Professor of the Year, College of Geosciences (1991)

Discover Magazine Award for Technology Innovation to CAPS (computer software category) (1997)

Computerworld Smithsonian Award to CAPS (science category) (1997)

OU Associates Presidential Professorship (1998)

NSF Pioneer Award (2001)

Regents' Professorship, University of Oklahoma (2001)

Fellow of the American Meteorological Society (2002)

NOAATech 2002 Award for Best Use of Advanced Networks: "WSR–88D Radar Data over the Internet/NGI" (co-recipient, 2002)

Federal Aviation Administration Excellence in Aviation Award (2002)

Roger and Sherry Teigen Presidential Professorship (2004)

Invited Speaker for the Millennium Lecture Series, UTEP (2006)

Fellow of the American Association for the Advancement of Science (2014)

University of Illinois Department of Atmospheric Sciences Distinguished Alumni Speaker (2016)

Rod Rose Award for best article in the *Journal of Research Administration* (2017)

Selected Departmental and University Service Activities

Undergraduate Advisor (1985 to Present)

Member of Advisory Council, Cooperative Institute for Mesoscale Meteorological Studies (1987–1988)

Member, School of Meteorology Graduate Studies Committee (1988–1990)

Coordinator of Oklahoma Symposium on High-Performance Scientific Computing (1987)

Chairman, OU Campus Computing Advisory Committee (1987–1989)

Administrative Director, Geosciences Computing Network (1987–1989)

Member, EECS Faculty Search Committee (1989)

Member, Math Department Chair Search Committee (1989)

Chairman, School of Meteorology Graduate Studies Committee (1989–1990)

Facilitator for Course on Numerical Grid Generation, Televised from Mississippi State University (Spring 1990)

Member of the State of Oklahoma Supercomputer Advisory Committee (1990)

Coordinated purchase and installation of the CAPS computer system (1992)

Faculty Advisor to School of Meteorology Student Affairs Committee (1993)

Chairman, University of Oklahoma Task Force on Computer Networking (1994–1995)

Capstone Course Mentor (1994–1997)

Member, Engineering Dean Search Committee (1996–1998)

Member, Budget Council (1996–1998)

Member, School of Meteorology Committee A (executive committee) (1996–1998)

Chair of Environmental Computing Applications System Steering Committee and Director of ECAS (1996–1999)

Chair of School of Meteorology Budget Sub-Committee (1996–1997)

Member of OU Research Council (1997–2000)

Member, Faculty Senate Task Force on Intellectual Property (1998)

Vice Chair of OU Top 10 Scientists Group (1998)

OU Speakers Bureau (1997–1998)

Member, Search Committee for the Director of the Office of Research Administration (1998)

Member, Presidential Professorship Selection Committee (1998–2001)

Member, Conflict of Interest Advisory Committee (1998–2000)

Member, Technology Development Council Task Force on Computing (1998)

Chair of OU Research Council (1999–2000)

Initiated Effort to Create the American Airlines Endowed Professorship in Meteorology (1999)

Member, Graduate Studies Committee, OU School of Meteorology (1999–2001)

Member of Ad Hoc Undergraduate Committee, OU School of Meteorology (1999–2005)

Search Committee, Associate Vice President for Technology Development (2000)

Member of Lowry Chair Search Committee (1999–2001)

Member of Williams Chair Search Committee (2001–2002)

Chair of SoM Undergraduate Studies Committee (2001–2005)

Member, Board of Advisors, OU Supercomputing Center for Education & Research (2001 to Present)

Member, OU Patent Advisory Committee (2003–2005)

Member, Two Faculty Search Committees in SoM (radar hires) (2003–2005)

Member, ECE Chair Search Committee (2004–2005)

Member, Search Committee for the Dean of the College of Earth and Energy (2005–2006)

Facilitator of Research Retreats for the College of Earth and Energy (2005)

Member, OU Renaissance Project Planning Committee (2006–2007)

Chair of Eddie Carol Smith Scholarship Selection Committee (2006)

Member, OU Research Cabinet (2006–2016)

Member, K20Center/Education College Faculty Search Committee (2006–2008)

Member, State of Oklahoma EPSCoR Committee (2007 to Present)

Member, McCasland Chair Search Committee (2007–2008)

Member, Graduate College Outstanding Dissertation Award Selection Committee (2008)

Member, Task Force on Establishing a Doctoral Program, OU College of Architecture (2009)

Member, Selection Committee, Regents' Award for Superior Staff Performance (2010)

Member, OU University Club Board of Trustees (2013–2016)

President, OU University Club Board of Trustees (2014–2015)

Member, Search Committee, Director of the Oklahoma Geological Survey (2014)

Chair, State EPSCoR Subcommittee on Strategic Planning (2014–2015)

Co-Chair, Environmental Leadership Search Committee (2015–2016)

Member, OU Graduate Education Task Force (2015–2017)

Founding Director of OU Faculty Leadership Academy (2015 to Present)

Convocation Address to Graduate College Graduating Class, OU Health Sciences Center (2016)

Selected Professional Development and Service Activities

Summer Faculty Fellow, Minnesota Supercomputer Institute (1986)

Member, Joint Peer Review Board, National Center for Supercomputing Applications and Pittsburgh Supercomputer Center (1987–1991)

Member, American Meteorological Society STAC Committee on Severe Local Storms (1987–1990)

Member, NCAR Supercomputer Upgrade Panel (1989)

Visiting Scientist, Minnesota Supercomputer Institute (1990)

Program Co-Chairman, 16th AMS Conference on Severe Local Storms (1990)

Member, AMS Committee on Severe Local Sto1ms (1987–1990)

Associate Editor, *Monthly Weather Review* (1991–1999)

Member, Review Panel, NSF High Performance Computing and Communications Program (1992)

Visiting Senior Fellow, Army High Performance Computing Research Center, University of Minnesota (1992)

Member, AMS/EPA Steering Committee on Air Quality (1992–1994)

Co-Organizer, Workshop on High-Performance Computing in the Geosciences, Leos Houches, France (1993)

Member, U.S. Weather Research Program Prospectus Development Team #1 (1994)

Member, University Relations Committee, University Corporation for Atmospheric Research (1995–2001)

Co-Organizer, 1st Joint US-Korea Workshop on Storm- and Mesa-Scale Weather Analysis and Prediction (1996)

Member, University Governance Examination Team, University Corporation for Atmospheric Research (1996)

Member, U.S. Weather Research Program Proposal Review Panel (1996)

Member, U.S. Weather Research Program Scientific Steering Committee (1997–2001)

Co-Organizer, 2nd Joint US-Korea Workshop on Storm- and Mesa-Scale Weather Analysis and Prediction (1997)

Member, National Centers for Environmental Prediction Review Panel for Aviation Weather Center (1998)

Co-Chair, U.S. Weather Research Program Prospectus Development Team #9 (1998)

Member, Geosciences-2000 Working Group, National Science Foundation (1998–1999)

Member, User Advisory Council, National Computational Science Alliance (1998–2000)

Member, Scientific Computing Division Advisory Panel, National Center for Atmospheric Research (1998–2003)

Chair, University Relations Committee, University Corporation for Atmospheric Research (1998–1999)

Member, Planning Committee of the World Weather Research Program Sydney Olympics 2000 Forecast Demonstration Project (1998–2000)

Co-Organizer of the First Study Conference on Aviation Weather Hazards (1998)

Member of the Oklahoma Secretary of Science and Technology Development's Terabit Testbed Network Advisory Panel

Founder and Manager of Project CRAFT: The Collaborative Radar Acquisition Field Test (CRAFT) (1998–2006)

Gave Congressional Briefing on the 3 May 1999 Oklahoma Tornado Outbreak (1999)

Organizer and Chair, National Symposium on the Great Plains Tornado Outbreak of 3 May 1999 (2000)

Member, Organizing Committee, U.S. Weather Research Program Workshop on Research Needs of the Private Sector (2000)

Organizer, Special Issue of the American Meteorological Society Journal *Weather and Forecasting*
evoted to the May 3rd Tornado Outbreak (2000–2001)

Leader, Analysis and Verification Team, Weather Research and Forecast (WRF) Model Project (2000)

Participant in the Higher Education Academy of the Oklahoma Educator's Leadership Academy (2000–2001)

Member, Advisory Committee, NSF Geosciences (GO) Directorate (2001–2005)

Member, Blue Ribbon Panel on Cyber Infrastructure, National Science Foundation (2001–2002)

Member, National Science Foundation Proposal Review Panel, 4th Science and Technology Centers Competition (2001)

Member, Board of Trustees, University Corporation for Atmospheric Research (2001–2008)

Member, Organizing Committee, Workshop 9n Cyberinfrastructure for Environmental Research and Education (2002)

Member, National Research Council Committee on Weather Forecasting Accuracy for FAA Air Traffic Control (2002)

Attendee, American Meteorological Society Summer Colloquium on Science and Public Policy (2002)

Adjunct Member of the National Weather Service Science and Technology Integration Plan (STIP} Observing Integrated Planning Team (ObsIPT) (2002)

Member, Organizing Committee, EPSCoR Workshop on Cyberinfrastructure (2002–2003)

Member, National Science Foundation Steering Committee for Cyberinfrastructure Research and Development in the Atmospheric Sciences (CyRDAS) (2002–2003)

Vice Chairman, Board of Trustees, University Corporation for Atmospheric Research (2003–2004)

Chair, U.S. Weather Research Program CONDUIT/CRAFT Steering Committee (2003–2007)

Member, Advisory Committee, NSF Directorate for Computing Information Science and Engineering (CISE) (2003–2004)

Member, Review Panel, NSF Extensible Terascale Facility (ETF) proposal solicitation (2003)

Member, ad hoc Search Committee for a Senior Scientist at Howard University (2003)

Chairman of the Board of Trustees, University Corporation for Atmospheric Research (2004–2008)

Member, Advisory Committee, NCAR Data Assimilation Strategic Initiative (2004–2006)

Member, Sasaki Applied Meteorology Research Institute (SAMRI) Council (2004–2006)

Member of Southeastern Research Universities Association (SURA) High Performance Computing/Grid Planning Group (2004–2005)

Appointed by President George W. Bush to the National Science Board (2004–2010)

Councilor, American Meteorological Society (2004–2008)

Member, Weather Research and Forecasting (WRF) Model Research Advisory Board (2005–2006)

Member, National LambdaRail (NLR) Science Research Council (NSRC) (2005–2007)

Member, Data Center Blue Ribbon Panel, National Center for Atmospheric Research (2005–2006)

Member, Advisory Committee, National Center for Computational Sciences and the Computer Science and Math Division, Oak Ridge National Laboratory (2006)

Member, Scientific Advisory Board, Microsoft Research Corporation (changed to Microsoft External Research Advisory Board in January, 2009) (2006–2008)

Member, National Advisory Council, Renaissance Computing Institute (2007–2010)

Member, Program Committee for e-Science 2007 Conference (2007)

Member, TeraGrid Requirements Analysis Team (2007–2008)

Member, Board of Directors, National Weather Museum and Science Center (2009–2017)

Member of Search Committee for Director, National Center for Atmospheric Research (2008)

Chair, UCAR Review Panel for the NOAA Aviation Weather Center, Storm Prediction Center, Environmental Modeling Center, NCEP Central Operations (2008–2009)

Member, Board of Directors, Council on Governmental Relations (2009–2014)

Member, Program Committee for e-Science 2009 Conference (2009)

Member, Program Committee for the 10th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGrid 2010; 2009–2010)

Member, Board of Directors, Oak Ridge Associated Universities (ORAU) (2010–2013)

Member, Board of Directors, Oak Ridge Associated Universities (ORAU) Foundation (2010–2013)

Member, Advisory Committee, Computer Science and Mathematics Division, Oak Ridge National Laboratory (2010–2012)

Member, AAU Task Force on Strengthening the University-Government Research Partnership (2010 to Present)

Member, Board of Trustees, Southeastern Universities Research Association (2011 to Present)

Member, Presidential Search Committee, University Corporation for Atmospheric Research (2011)

Member, Oklahoma Governor's Science and Technology Council (2011 to Present)

Vice Chairman, Board of Directors, Oak Ridge Associated Universities Foundation (2011–2013)

Member, Executive Committee, Association of Public and Land Grant Universities Council on Research Policy and Graduate Education (2011–2014)

Member, Board on Research Data and Information, National Research Council of the National Academies (2011–2015, 2016–2019)

Member, Search Committee for the Director of the NOAA National Weather Service (2012)

Chairman-Elect, Council on Research Policy and Graduate Education, Association of Public and Land Grant Universities (2012–2013)

Member, National Research Council Panel on Information Science at the A1my Research Laboratory (2013–2015)

Chair, Development and Relations Committee, Southeastern Universities Research Association (SURA) Board of Directors (2013–2015)

Member, Board of Directors, Association of Public and Land Grant Universities (APLU) (2013–2014)

Member, NCAR Director Blue Ribbon Advisory Panel (2014)

Chairman, Council on Research (formerly Council on Research Policy and Graduate Education), Association of Public and Land Grant Universities (2013–2014)

Keynote Speaker, Governor Mary Fallin's Annual STEM Summit (2015)

Creator of and Host for the Inaugural Meeting of Central and Southern Plains Vice Presidents and Vice Chancellors for Research, University of Oklahoma

Member, Board of Directors, The Alliance for Science and Technology Research in America (ASTRA) (2014 to Present)

Member Presidential Search Committee, University Corporation for Atmospheric Research (2015–2016)

Past-Chairman, Council on Research (Formerly the Council on Research Policy and Graduate Education), Association of Public and Land Grant Universities (2014–2016)

Member, NSF Search Committee for Director of Office of Integrative Activities (2015–2016)

Vice-Chairman of the Board of Trustees, Southeastern Universities Research Association (SURA) (2016–2018)

Member, NSF Assistant Director of Geosciences Search Committee (2016)

Leader of the Central and Southern Plains Vice Presidents and Vice Chancellors for Research Group and Chair of the Executive Committee (2014 to Present)

Member, State of Oklahoma EPSCoR Executive Subcommittee

Invited Participant, Future of OSTP Planning Meeting, Sponsored by the Baker Institute, Rice University (2016)

Member, Council on Competitiveness Technology Leadership and Strategy Initiative (2016 to Present)

Chairman of the Board of Trustees, Southeastern Universities Research Association (SURA) (2018 to Present)

Courses Taught at the University of Oklahoma (*indicates developed new)

Introduction to Meteorology (Undergraduate)

Atmospheric Dynamics I (Undergraduate)

Atmospheric Dynamics II (Undergraduate)

Mesoscale Meteorology (Undergraduate)

*Computational Fluid Dynamics I (Graduate)

*Computational Fluid Dynamics II (Graduate)

Convective Dynamics and Modeling (Graduate)

Numerical Weather Prediction (Graduate)

*Variational Data Assimilation (Graduate)

Physical Mechanics for Meteorology (Undergraduate)

*Severe and Unusual Weather (Undergraduate)

Advanced Synoptic Meteorology (Graduate)

Synoptic-Dynamic Meteorology (Undergraduate)

*Hazardous Weather Detection and Prediction (Senior Undergraduate/Graduate)

*Demystifying the Academic Research Enterprise—DARE (Online, All Disciplines, All Levels Undergraduate and Graduate)

Previous Externally-Sponsored Research Grants

NOAA	"Central Oklahoma Mesoscale Modeling and Analysis Project". Principal Investigator, $8,199. (6/15/86 to 8/15/86).
NSF	"Numerical Simulation and Observational Analysis of Thunderstorms and Subcloud Phenomena". Principal Investigator, $125,920. (7/15/86 to 7/14/88).
NOAA	"Central Oklahoma Mesoscale Modeling and Analysis Project". Principal Investigator, $12,891. (12/1/86 to 5/31/88).
Keck	Research Foundation—Proposal to Upgrade the Digital Image Processing Facilities of the Geosciences Computing Network. Co-Principal Investigator (with T.H.L. Williams), $350,000. (December, 1988)
OCAST	Oklahoma Center for the Advancement of Science and Technology, Computer System for Digital Image Processing and Graphic Visualization. Principal Investigator, $100,000 (November, 1989).
Honeywell	Sperry Commercial Flight Systems Group, Air Transport Systems Division—"Development of an Expert System for the Honeywell Windshear Computer Using Data from a Numerical Thunderstorm Model. Part I. Computations Support". Principal Investigator, $8,095. Yr 1.
Honeywell	Sperry Commercial Flight Systems Group, Air Transport Systems Division—"Development of an Expert System for the Honeywell Windshear Computer Using Data from a Numerical Thunderstorm Model. Part I. Computations Support". Principal Investigator, $8,900. Yr 2.
NSF	"Convective Modeling and Predictability Studies". Principal Investigator, $177,606. (2/15/89 to 7/1/91).
NSF	"Simulation of Meso-and Convective-Scale Dynamics". Presidential Young Investigator Award. Principal Investigator. (Funded 1987–1992) • 1st year funding, including NSF and industrial match: $247,040 (1987–1988) • 2nd year funding, including NSF and industrial match: $137,984 (1988–1989) • 3rd year funding, including NSF and industrial match: $142,500 (1989–1990) • 4th year funding, including NSF and industrial match: $ 99,500 (1990–1991) • 5th year funding, including NSF and industrial match: $100,000 (1991–1992)
NSF	"Center for Analysis and Prediction of Storms (CAPS)". Science and Technology Research Center. Co-Principal Investigator (with D. Lilly) and Deputy Director for Research, $4,900,000. (1988–1993, first 5 of 11 years).
NSF	"Center for Analysis and Prediction of Storms (CAPS)". Science and Technology Research Center. Co-Principal Investigator (with D. Lilly, F. Carr, and T. Gal-Chen) and Deputy Director, $8,617,076. (1992–1997).
FAA	"Parameter Retrieval from Doppler Radar Observations and Development of Related Mesoscale Prediction Models". Co-Principal Investigator (with D. Lilly and T. Gal-Chen), $295,092. (1991–1993).
NSF	"Further Development of the CAPS Advanced Regional Prediction System". Principal Investigator (supplement to CAPS grant from Army Atmospheric Sciences Laboratory), $17,529. (1992).
EDR	"Numerical Simulation of Fog Formation in Complex Terrain Using the ARPS Model". Principal Investigator, $63,633, (Nov 1993–Oct 1994). Year 1 of 3 Years.
NSF	"Dynamics and Predictability of Convective Storms". Principal Investigator, $118,100 (1 Jul 1993–30 Jun 1994)
EDR	"Numerical Simulation of Fog Formation in Complex Terrain Using the ARPS Model". Principal Investigator, $78,869 (Nov 1994–Oct 1995). Year 2 of 3 years.
FAA	"Supplement to the Center for Analysis and Prediction of Storms (CAPS)" Principal Investigator (with J.T. Lee), $292,262.
NSF	"Center for Analysis and Prediction of Storms (CAPS)". Principal Investigator (with D. Lilly, F. Carr, J. Straka, and Q. Xu), $1,586,383.

AMR Corp	"Project Hub-CAPS: Developing a Prototype Storm-Scale NWP System for Commercial Aviation. Principal Investigator, $342,630, year-1 of 3 years (1 July 1996–31 June 1997).
NSF	"Dynamics and Predictability of Convective Storms". Principal Investigator, $118,791 (year 3 of 3 years: 31 December 1995–30 Jun 1997).
EDR	"Numerical Simulation of Fog Formation in Complex Terrain Using the ARPS Model". Principal Investigator, $55,490 (Nov 1994–Oct 1996). Year 3 of 3 years.
NSF	"Center for Environmental Applications of the Oklahoma Mesonet". Co Principal Investigator. $1,010,000 (EPSCoR Program).
NSF	"Joint US-Korea Workshop on Storm- and Meso-Scale Weather Analysis and Prediction." PI, $44,394, 1 year.
Rome Labs	"Mesoscale Modeling of Lake Effect Snow." PI (with D. Jahn as Co-PI), $33,897, 1.5 years.
NSF	"Center for Analysis and Prediction of Storms (CAPS)". Principal Investigator (with F. Carr, J. Straka, A. Shapiro, K. Brewster, M. Xue), $1,592,810. (year 9 of 11)
NSF	"Research Experiences for Undergraduates at the Oklahoma Weather Center". Co-Principal Investigator, $72,695 (Fall 1997–Spring 1998).
NSF	"Center for Analysis and Prediction of Storms (CAPS)". Principal Investigator (with F. Carr, J. Straka, A. Shapiro, K. Brewster, M. Xue), $1,582,616. (year 10 of 11)
Various	"A Proposal to Upgrade the Cray J90 Supercomputer at the OU Environmental Computing Applications System (ECAS)." Principal Investigator, $233,000, 1 year (1 July 1997–31 June 1998). Funded by University of Oklahoma, AMR Corporation/American Airlines, Oklahoma State Regents for Higher Education.
NSF	"Acquisition of Equipment to Create the Environmental Computing Applications System". Principal Investigator, $580,000 (1 September 1995–31 August 1998).
AMR Corp	"Project Hub-CAPS: Developing a Prototype Storm-Scale NWP System for Commercial Aviation. Principal Investigator, $327,600, year-3 of 3 years (1 July 1996–31 June 1999).
NSF	"Center for Analysis and Prediction of Storms (CAPS)". Principal Investigator (with F. Carr, J. Straka, A. Shapiro, K. Brewster, M. Xue), $1,379,226. (year 11 of 11).
OSRHE	"Enhancement of the CAPS Storm-Scale Numerical Weather Prediction System and Real Time Access to Level II NEXRAD Radar Data." Principal Investigator, $256,000, 2 years. Funded by Oklahoma State Regents for Higher Education.
FAA	"Explicit Modeling of Convection in the Terminal Area." Principal Investigator, $25,000, 1 year (Oct 1998–Oct 1999).
NSF	"The Oasis Project: Oklahoma Atmospheric and Surface-Layer Instrumentation System." Co-Principal Investigator, $1,509,729, 3-years.
NSF	"Center for Environmental Applications of the Oklahoma Mesonet". Co Principal Investigator. $23,469 (EPSCoR Program).
NSF	"Research Experiences for Undergraduates at the Oklahoma Weather Center". Co-Principal Investigator, $150,000, 2 years.
FAA	"Comparison of Deterministic Thunderstorm Prediction with the Statistical Growth and Decay Tracker. Principal Investigator, 1 year, $60,000. Funded.
NSF	"National Symposium on the Great Plains Tornado Outbreak of3 May 1999." Principal Investigator, 1 year, $15,255.
NSF	"National Symposium on the Great Plains Tornado Outbreak of 3 May 1999." Principal Investigator, 1 year, $5,000. Funded by the Oklahoma EPSCoR Program.
KMA	"Continued Development of the Advanced Regional Prediction System for the Korean Meteorological Administration." Co-Principal Investigator, 1 year, $60,000.
AMR Corp	"Continued Enhancement of the Hub-CAPS Forecast System." Principal Investigator, 1 year, $25,000.

Williams	"Advanced Weather Forecasting for Energy." Principal Investigator, 5 years, $8,090,518. Funded by Williams Energy Marketing and Trading Company. Project was terminated due to the Enron scandal and associated disruption of energy marketing and trading industry; approximately $4.5M of the planned $8.1M were expended.
WDT	"Enhancement of the Advanced Regional Prediction System (ARPS) for Commercial Application." Principal Investigator, 1 year, $135,243. Funded by Weather Decision Technologies, Inc.
NOAA	"A Prototype Regional Fine-Scale Numerical Weather Analysis and Prediction System Using NEXRAD Radar Data." Principal Investigator, $474,200, 1-year.
NSF	"A Probabilistic Framework for Assessment and Interpretation of Quantitative Precipitation Forecasts from Storm-Scale Models." (USWRP Program). Co-Principal Investigator (with E. Foufoula-Georgiou, University of Minnesota), $334,171, 3 years.
NOAA	"Moving Realtime WSR–88D Base Data Over The NGI." Co-Principal Investigator, 1 year, $198,000.
METRI	"Assimilation of X-Band and WSR–88D Doppler Radar Data into a Mesoscale Forecast System." Principal Investigator, 1 year, $22,500.
NOAA	"A Real-time, NGI-Based, Direct Digital Ingest and Archive of WSR-88D Base Data as a Prototype for a National System." Co-principal investigator, 3 years, $540,000.
HRL	"Observing System Simulation Experiments for Airborne Weather Sensors." Principal Investigator (4/15/05–6/14–05), $33,560.
NSF	"Research Experiences for Undergraduates at the Oklahoma Weather Center." Co-Principal Investigator, 2 years, $163,467.
ATSC	"Preparation of SBIR Proposal on the Calibration of Ensemble Forecasts of Atmospheric Dispersion." Co-Principal Investigator, 3 months, $4,677.
NSF	"MRI: Acquisition of an Itanium Cluster for Grid Computing." Co Principal Investigator, 3-years, $340,000.
NSF	"On the Optimal Use of WSR–88D Doppler Radar Data for Variational Storm-Scale Data Assimilation." Co-Principal Investigator, 3-years, $599,846.
ATSC	"Calibration of Fine-Scale Ensemble Forecasts for On-Demand Probabilistic Dispersion Modeling." Principal-Investigator, 6 months, $6,468.
NSF	"Collaborative Research: ITR Linked Environments for Atmospheric Discovery (LEAD)." Principal Investigator (OU portion of 9-institutional collaborative proposal is $1,875,709. Total grant is $11,250,000.
NSF	"Collaborative Research: ITR Linked Environments for Atmospheric Discovery (LEAD)—Supplement" Co-Principal Investigator, $119,346.
NSF	"Advancing Biotechnology and Climatology (ABC): Educating for Economic Growth in Oklahoma." Co-Principal Investigator, 3-years, $598,559.
ATSC	"Technical Support for the WRF Ensemble Reforecast System." Co Principal Investigator (funded from DTRA), 2-years, $56,290.
NSF	"Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere (CASA)." Co-Principal Investigator and Deputy Director (OU portion of total budget for first 5 years is $5,478,109). (Total budget to date is $23,160,030.)
NOAA	"Life and Death Decisions: "An Integrative Approach to Understanding and Mitigating the Impacts of Extreme Weather." Principal Investigator, 1 year, $50,000. Funded (2014–2015)
NOAA	"A Partnership to Develop, Conduct and Evaluate Realtime High Resolution Ensemble and Deterministic Forecasts for Convective-Scale Hazardous Weather." Principal Investigator, 3 years, $374,825. (2007–2010)
NSF	"Assimilation of Doppler Radar Data for Storm-Scale Numerical Prediction Using an Ensemble-based Variational Method." Co-Principal Investigator, 3 years, $199,990. (2008–2011)
FAA	"Weather Processors Support Task: Rightsizing NextGen Weather Observation Network." Principal Investigator, 2 years, $186,667. (2009–2011)

Previous Internally-Sponsored Research Grants

OU	Associates Research and Creative Activity Fund—"Central Oklahoma Mesoscale Modeling and Analysis (COMMA) Project, Phase II". Principal Investigator, $22,110. (1988)
CAPS	"Initialization of a Convective Cloud Model From Observations". Principal Investigator (with C. Hane and C. Ziegler), $42,020 (2/1/90 to 2/1/91).
CAPS	"Initialization of a Convective Cloud Model From Observations". Principal Investigator (with C. Hane and C. Ziegler), $59,762 (2/1/91 to 1/31/92).
OU	"Instructional and Advising Improvement". Co-Principal Investigator (with F. Carr), $28,771.
CAPS	"Initialization of a Convective Cloud Model From Observations". Principal Investigator (with C. Hane and C. Ziegler), $35,994 (2/1/92 to 1/31/93).
OU	"Meteorological Classroom Visualization". Co-Principal Investigator (with K. Crawford), $13,375. (Funded for $9,125 on 13 April 1994).
VPR	"Support for CAPS' P/R and Marketing Specialist", $10,000 (1998–2000)

Current Externally-Sponsored Research Grants

NOAA	"Development of a Digital Collaboration for the Alliance for Integrative Approaches to Extreme Environmental Events." Principal Investigator, 1 year, $48,544. (2017–2018)
NOAA/NSSL	"Development of a Digital Collaboration for the Alliance for Integrative Approaches to Extreme Environmental Events, Phase I: Scoping and Functional Requirements Development." Principal Investigator, 1 year, $35,482. (2017–2018)

Philanthropic Support for Research

ImpactWx	"The Alliance for Integrative Approaches to Extreme Environmental Events." Account Sponsor, $3,000,000. (2018–2020).

Pending Proposals

NSF	"Atmospheric Science Gateway for Accelerating Research and Discovery (ASGARD)." Senior Personnel, 5-years, $861,213 (OU is a sub contractor to Indiana University, the lead institution).

Service as Chair of Graduate Student Committees (Degrees Completed)

Richard Carpenter (M.S., 1988) *Application of the Piecewise Parabolic Method to Meteorological Modeling* (with C.E. Hane)

Kimberly Carver (M.S., 1990) *The Origin of Rotation in Numerically Simulated Dry Convection*

Steven Lazarus (M.S., 1990) *The Influence of Helicity on the Stability and Morphology of Numerically Simulated Storms*

Kriste Lyon Paine (M.S., 1991) *A Comparison of Two Methods for Dynamic Grid Adaption in Two-Dimensional Scalar Transport*

William McPherson (M.S., 1991) *Sensitivity of Numerically Simulated Downbursts to the Horizontal Radius of the Initial Rain Disturbance*

Renee McPherson (M.S., 1991) *Predictability Experiments of a Numerically Modeled Supercell Storm*

James T. Johnson (M.S., 1992) *Investigation of Outflow Strength Variability in Florida Downburst-Producing Storms.*

Michael Babcock (M.S., 1992) *Aircraft Trajectory Analyses Through Simulated Microbursts*

Yong Li (Ph.D., 1994) *On the Topological Complexity of the Cost Function in Variational Data Assimilation*

Hao Jin (M.S., 1994) *Numerical Study of Cold-Air Damming* (with Q. Xu)

Richard Carpenter (Ph.D., 1994) *Entrainment and Detrainment in Numerically Simulated Cumulus Congestus Clouds* [Dissertation won the OU Outstanding Dissertation Prize in the Science and Engineering Category.]

David Jahn (M.S., 1995) *Simulation of Convective Storms in Environments with Independently-Varying Bulk Richardson Number Shear and Storm-Relative Helicity*

Seon-Ki Park (Ph.D., 1996) *Sensitivity Analysis of Deep Convective Storms*

Steven Lazarus (Ph.D., 1996) *Assimilation and Prediction of a Florida Multicell Storm Using Observed Single-Doppler Data*

Edwin Adlerman (M.S., 1997) *Numerical Simulation of Cyclic Mesocyclogenesis*

DeWayne Mitchell (M.S., 1997) Observations of Convection Initiation During CaPE 1991: A Case Study (Co-Chair with M. Eilts)

Stephen Weygandt (Ph.D., 1998) *Retrieval of Initial Forecast Fields from Single Doppler Observations of a Supercell Thunderstorm* (Co-Chair with Alan Shapiro)

Jason Levit (M.S., 1998) *A Simple Diabatic Initialization Technique for Storm-Resolving Models*

Xuechao Yu (M.S., 1999) *On Quantitative Precipitation Forecasting Using High Resolution Non-Hydrostatic Models*

Yvette Richardson (Ph.D., 1999) *The Influence of Horizontal Variations in Vertical Shear and Low-Level Moisture on Numerically Simulated Convective Storms*

Matthew W. Miller (M.S., 2000) *The Determination of Usefulness of Precipitation Forecasts and Probabilistic Precipitation Verification Using SAMEX 1998 Ensemble Data* (E. Kalnay principal supervisor)

Ernani de Lima Nascimento (Ph.D., 2002) *Dynamic Adjustment in an Idealized Numerically Simulated Bow echo.*

Hee-Dong Yoo (Ph.D., 2003) *The Impact of Radar Data Assimilation on the Chorwon Yonchon 1996 Heavy Rainfall Event.*

Janelle Janish (M.S., 2003) *Relationships Between Baroclinically-Generated Horizontal Vorticity and Mesocyclone Intensity as Revealed by Single-Doppler Velocity Retrievals Using WSR–88D Data*

Edwin Adlerman (Ph.D., 2003) *Numerical Simulations of Cyclic Storm Behavior: Mesocyclogenesis and Tornadogenesis*

Nicki Levit (M.S., 2004) *High-Resolution Storm-Scale Ensemble Forecasts of the 28 March 2000 Fort Worth Tornadic Storms*

Adam Lopes (M.S.P.M., 2004) *Forecasting Aircraft Turbulence: A Historical Perspective and New Approaches for Forecasting Aircraft Turbulence through Mesoscale Numerical Weather Prediction.*

Melissa Bukovsky (M.S., 2004) *Initiation and Propagation of Convection in Forecast Models Using Convective Parameterizations* (co-chair with J. Kain)

Jessica Proud (M.S., 2006) *Optimal Sampling Strategies for Tornado and Mesocyclone Detection Using Dynamically Adaptive Doppler Radars*

Ashton Robinson (M.S., 2007) *Impact of Low-Altitude Radar Data on Storm-Scale Numerical Weather Prediction*

Derek Rosendahl (M.S., 2008) *Identifying Precursors to Strong Low-Level Rotation Within Numerically Simulated Supercell Storms: A Data Mining Approach* (co chair with Amy McGovern)

Bob Fritchie (M.S., 2009) *Detection of Hazardous Weather Phenomena Using Data Assimilation Techniques*

Guoqing Ge (Ph.D., 2011) *On the Further Studies of Suitable Storm-Scale 3DVARData Assimilation for the Prediction of Tornadic Thunderstorms* (Co-advisor with Jidong Gao)

Service on M.S. Committees (Degrees Completed, Excluding Own Students)

Chuan-Lau Hwang, M.S. in Meteorology, 1987
A Comparison of Sigma-Coordinate and Pressure-Coordinate Primitive Equation Systems in a Regional Model

Stephen Allen, M.S. in Meteorology, 1988
An Investigation into the Gravity Current Aspects of a Cold-Air Outbreak using Variational Analysis Technique

Guang Ping Lo, M.S. in Meteorology, 1989
Observing Systems Experiments using FGGE/MONEX Data: Impact on numerical prediction of cyclones

Yu-Chieng Liou, M.S. in Meteorology, 1989
Retrieval of Three-dimensional Wind and Temperature Fields from One Component Wind Data by using the Four-dimensional Data Assimilation Technique

Daniel Zacharias, M.S. in Meteorology, 1989
A Case Study of the 10 Day 1985 Tornado Outbreak in Northern Kansas

Yvette Richardson, M.S. in Meteorology, 1993
Verification of NMC Short-Range Models Using Wind Profiler Data

David Dowell, M.S. in Meteorology, 1993
A Comparative Study of Two Supercells: Airborne Doppler Analyses

Gordana Sindic-Rancic, M.S. in Meteorology, 1994
Test of an Advanced Passive Scalar Advection Scheme for Numerical Weather Prediction

Yiping Wang, M.S. in Meteorology, 1994
The Effects of Sampling Error on Satellite IR and Microwave Rainfall Estimates Over the Open Ocean

Daniel Bickford, M.S. in Meteorology, 1994
Effects of Wind Filling in the Near-Environment of a Numerical Storm Simulation

Yunyun Lu, M.S. in Meteorology, 1994
Large-Scale Wind Field Retrieval Using Kinematic Models and a Reflectivity Conservation Equation

Travis M. Smith, M.S. in Meteorology, 1994
Three Dimensional Visualization of WSR–88D Data

John Krause, M.S. in Meteorology, 1995
Application of the Bratseth Technique to Mesoscale Objective Analysis

Robert D. Duncomb, Jr., M.S. in Meteorology, 1996
Verification of VORTEX '94 Forecasts

David S. Andrus, M.S. in Meteorology, 1996
An Observational and Modeling Study of Two EMVER–93 Gulf of California Surge Events

Andrew C. Wood, M.S. in Meteorology, 1997
Analysis of Supercell Storms on 8–9 June, 1994 in Northeastern Colorado

John J. Mewes, M.S. in Meteorology, 1997
Quantitative Verification of Non-Hydrostatic Model Forecasts of Convective Phenomena

Scott Ellis, M.S. in Meteorology, 1997
Hole-Filling Data Voids in Meteorological Fields

Jeffrey B. Basara, M.S. in Meteorology, 1998
The Relationship Between Soil Moisture Variation Across Oklahoma and the Physical State of the Near-Surface Atmosphere During the Spring of 1997

Christopher M. Stock, M.S. in Meteorology, 1998
Intercomparison of Icing Aviation Impact Variable Forecasts Produced During Realtime Mesoscale Numerical Weather Prediction

Dan Bikos, M.S. in Meteorology, 1998
Simulation of a Great Lakes Lake-Effect Snow Event

Eric Kemp, M.S. in Meteorology, 1999
Comparative Assessments of Mesoscale Aircraft Icing and Turbulence Forecasts from the Advanced Regional Prediction System

Justin Lane, M.S. in Meteorology, 2000
A Climatology of Heat Bursts as Detected by the Oklahoma Mesonet: October 1993 Through September 1998

Derek Arndt, M.S. in Meteorology, 2001
The Lasting Effects of Mesoscale Convective Systems Over Eastern Oklahoma during August 1994

Nicole P. Kurkowski, M.S. in Meteorology, 2002
Assessment of Implementing Satellite-Derived Land Cover Data in the Eta Model

Thomas A. Jones, M.S. in Meteorology, 2002
Verification of the NSSL Mesocyclone Detection Algorithm: A Climatological Perspective

Kevin McGrath, M.S. in Meteorology, 2003
Mesocyclone Climatology of The Southern Great Plains of The United States Using the National Severe Storms Laboratory's Mesocyclone Detection Algorithm

Geoffrey Stano, M.S. in Meteorology, 2003
A Case Study of Convective Initiation on 24 May 2002 during the IHOP Field Experiment

Kodi Nemunaitis, M.S. in Meteorology, 2003
Validation of the North American Land Data Assimilation System (NLDAS) Using Data from Oklahoma Mesonet Sites

Andrew A. Taylor, M.S. in Meteorology, 2003

Adjusting Model Output Statistics (MOS) Temperature Forecasts Using Linear Regression of Observations Against Past Errors

Elaine Godfrey, M.S. in Meteorology, 2003
A Study of the Environment and Intensity of Tornadoes from Quasi-Linear Convective Systems

Christy Carlson, M.S. in Professional Meteorology, 2004
A 1 percent Temperatures Climatology for the Continental United States

Robert Weinzapfel, M.S. in Professional Meteorology, 2004
High-Resolution Numerical Simulations of a Flooding Rainfall Event in Houston, Texas Associated with Tropical Storm Allison, June 2001

Suresh Marru, M.S. In Electrical Engineering, 2004
A Grid-Enabled Scientific Workbench for Integrated Predictive Earth System Simulation

Nathan Snook, M.S. In Meteorology, 2006
Sensitivity of Tornadic Thunderstorm and Tornadogenesis in Very High Resolution Numerical Simulations to Variations In Model Microphysical Parameters

Patrick Marsh, M.S. In Meteorology, 2007
Assessment of the Severe Weather Environment in North America Simulated by a Global Climate Model

Brittany Dahl, M.S. In Meteorology, 2014
Sensitivity of Vortex Production to Small Environmental Perturbations in High-Resolution Supercell Simulations

Service on Ph.D. Committees (Degrees Completed, Excluding Own Students)

Eugene McCaul, Ph.D. in Meteorology, 1988
The Dynamics of Simulated Convective Storms in Hurricane Environments

Jose Rodriguez Azara, Ph.D. in Aerospace Engineering, 1988
Substitution Theory for Compressible Flows

Rodger Brown, Ph.D. in Meteorology, 1989
Initiation and Propagation of Thunderstorm Mesocyclones

Bok Yoon, Ph.D. in Aerospace Engineering, 1990
Computational Analysis on Hypersonic Flow Past Elliptic Cone Waveriders

Carlyle Macedo, Ph.D. in Computer Science, 1990
Parallel and Vector Algorithms for Numerical Modeling Using Adaptive Grid Techniques

Wan-Shu Wu, Ph.D. in Meteorology, 1990
Helical Buoyant Convection

Juanzhen (Jenny) Sun, Ph.D. in Meteorology, 1992
Convective-Scale 4–D Data Assimilation Using Simulated Single-Doppler Radar Observations

Jiyu Zhan, Ph.D. in Physics, 1993
Several Investigations and Applications of Light Scattering by Small Particles

Litao Deng, Ph.D. in Meteorology, 1993
Dynamics of Tornado-Like Vortices

R. Jeffrey Trapp, Ph.D. in Meteorology, 1994
Numerical Simulation of the Genesis of Tornado-Like Vortices

Scott Richardson, Ph.D. in Meteorology, 1995
Multiplate Radiation Shields: Investigating Radiational Heating Errors

Yu-Chieng Liou, Ph.D. in Meteorology, 1995
Numerical Investigation of a Heated, Sheared Planetary Boundary-Layer

Chia-Rong Chen, Ph.D. in Meteorology, 1996
Improved Treatment of Surface Evapotranspiration in a Mesoscale Numerical Model

Pengfei Zhang, Ph.D. in Meteorology, 1997
Numerical Simulation of Nonlinear Buoyancy Waves in the Lower Atmosphere

Anil Rao, Ph.D. in Meteorology, 1998 (Florida State University)
A Numerical Modeling Investigation of the Cape Canaveral Land-Water Circulations

Xiaoguang Song, Ph.D. in Aerospace and Mechanical Engineering, 1998
Error Estimation and Structural Shape Optimization

Jian Zhang, Ph.D. in Meteorology, 1999

Moisture and Diabatic Initialization Based on Radar and Satellite Observations

Keith Brewster, Ph.D. in Meteorology, 1999
Phase-Correcting Data Assimilation and Application to Storm-Scale Numerical Weather Prediction

Katharine M. Kanak, Ph.D. in Meteorology, 1999
On the Formation of Vertical Vortices in the Atmosphere

Susan Stanislav Alguindigue, Ph.D. in Chemistry, 2000
Investigation of Ligand Misdirection Using the Kinetic Element Effect and the Kinetic Enthalpy Effect

Kazuhito Hatano, Ph.D. in Physics, 2000
The Direct Analysis of Spectra of Type 1A Supernovae

Renee A. McPherson, Ph.D. in Meteorology, 2003
The Impact of Oklahoma's Winter Wheat Belt on the Mesoscale Environment

Michael E. Baldwin, Ph.D. in Meteorology, 2003
Automated Classification of Rainfall Systems Using Statistical Characterization

Mostafa el Harnly, Ph.D. in Meteorology, 2004
North Atlantic Winter Surface Extratropical Cyclone Track Variability on Inter-annual-To-Decadal Time-Scales

Diandong Ren, Ph.D. in Meteorology, 2004
4DVAR Retrieval of Prognostic Land Surface Model Variables

David L. Montroy, Ph.D. in Meteorology, 2006
Characteristics of Wintertime US. Weather Systems During El Nino Events and their Physical Associations with Tropical Pacific Sea Surface Temperatures

Yong Sun Jung, Ph.D. in Meteorology, 2008
State and Parameter Estimation Using Polarimetric Radar Data and Ensemble Kalman Filter

Andrew Edward Mercer, Ph.D. in Meteorology, 2008
Discrimination of Tornadic and Non-Tornadic Severe Weather Outbreaks

Daniel Thomas Dawson II, Ph.D. in Meteorology, 2009
The Impact of Single- and Multi-Moment Microphysics on Numerical Simulations of Supercells and Tornadoes of the 3 May 1999 Oklahoma Tornado Outbreak

Andrew Taylor, Ph.D. in Meteorology, 2010
Ensemble Kalman Filter Data Assimilation in the Presence of Large Model Error

Jili Dong, Ph.D. in Meteorology, 2010
Applications of Ensemble Kalman Filter Assimilation from Convective Thunderstorms to Hurricanes

Guoqing Ge, Ph.D. in Meteorology, 2011
On the Further Studies of Suitable Storm-Scale 3DVAR Data Assimilation for the Prediction of Tornadic Thunderstorms

Elaina Burns, DMA in Piano Pedagogy, 2011
The Contributions of Jane Smisor Bastien to Piano Teaching

Gang Zhao, Ph.D. in Meteorology, 2013
Development of ARPS–LETKF with 4D-Extension and Inter-Comparison with ARPS–ENSRF

Kodi Lynn Nemunaitis, Ph.D. in Meteorology, 2014
Observational and Model Analysis of The Oklahoma City Urban Heat Island

Refereed Book Chapters

Droegemeier, K.K., M. Xue, K. Johnson, M. O'Keefe, A. Sawdey, G. Sabot, S. Wholey, N.T. Lin, and K. Mills, 1995: Weather prediction: A scalable storm-scale model. Chapter 3 (p. 45–92) in *High Performance Computing,* G. Sabot (Ed.), Addison Wesley, Reading, Massachusetts, 246pp.

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Refereed Encyclopedia Contributions

Droegemeier, K.K., 1993: Weather forecasting and prediction. *McGraw-Hi/I Yearbook of Science and Technology,* McGraw Hill, 476–480.

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Sasamori, T., and K. Droegemeier, 1983: A linear analysis on the acceleration of zonal flow by baroclinic instability. Part I: Jovian atmosphere. *J. Atmos. Sci., 40,* 2323–2338.

Droegemeier, K., and *T.* Sasamori, 1983: A linear analysis on the acceleration of zonal flow by baroclinic instability. Part II: Terrestrial atmosphere. *J. Atmos. Sci., 40,* 2339–2348.

Droegemeier, K.K. and R.B. Wilhelmson, 1985: Three-dimensional numerical modeling of convection produced by interacting thunderstorm outflows. Part I: Control simulation and low-level moisture variations. *J. Atmos. Sci., 42,* 2381–2403.

Droegemeier, K.K. and R.B. Wilhelmson, 1985: Three-dimensional numerical modeling of convection produced by interacting thunderstorm outflows. Part II: Variations in vertical wind shear. *J. Atmos. Sci., 42,* 2404–2414.

Droegemeier, K.K., and R.B. Wilhelmson, 1986: Kelvin-Helmholtz instability in a numerically simulated thunderstorm outflow. *Bull. Amer. Meteor. Soc., 67,* 416–417.

Droegemeier, K.K. and R.B. Wilhelmson, 1987: Numerical simulation of thunderstorm outflow dynamics. Part I: Outflow sensitivity experiments and turbulence dynamics. *J. Atmos. Sci., 44,* 1180–1210.

Robertson, M., and K.K. Droegemeier, 1990: NEXRAD and the broadcast weather industry: Preparing to share the technology. *Bull. Amer. Meteor. Soc., 71,* 14–18.

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Droegemeier, K.K., S.M. Lazarus, and R.P. Davies-Jones, 1993: The influence of helicity on numerically simulated convective storms. *Mon. Wea. Rev, 121,* 2005–2029.

Li, Y. and K.K. Droegemeier, 1993: The influence of diffusion on the adjoint data assimilation technique. *Tellus, 45A,* 435–448.

Straka, J.M., R.B. Wilhelmson, L.J. Wicker, J.R. Anderson, and K.K. Droegemeier, 1993: Numerical solutions of a non-linear density current: A benchmark solution and comparisons. *Int. J Num. Meth. in Fluids, 17,* 1–22.

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Rao, P.A., H.E. Fuelberg, and K.K. Droegemeier, 1999: High resolution modeling of the Cape Canaveral area land/water circulations and associated features. *Mon. Wea. Rev., 56,* 1808–1821.

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The CHAIRMAN. Thank you, Dr. Droegemeier.

Mr. Morhard, welcome.

STATEMENT OF JAMES W. MORHARD,
NOMINEE FOR DEPUTY ADMINISTRATOR,
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. MORHARD. Thank you, Members of the Committee on Commerce, Science, and Transportation. It's an honor to appear before you as the Nominee for the Deputy Administrator of NASA.

I begin by thanking the President and Vice President who put their trust and confidence in me, as well as Jim Bridenstein, who's really gone out of his way to be helpful, providing me wise counsel.

Also, I'm pleased to have my son and his family here and many friends and Sergeant at Arms' colleagues are here today, who've been so very kind.

If confirmed, I look forward to serving and working with you, the Administrator, and the very talented NASA professionals.

In the 1950s, my dad was working at NAVAIR and he worked side-by-side with Alan Shepherd and thought the world of him. In 1962, I was 5 years old, my brother Jay was nine, and after John Glenn orbited the Earth, my parents dropped us in front of his house in Arlington, Virginia, where we lived, also. Jay and I walked up to the front door and knocked. The astronaut opened the door and he welcomed us in.

As some of you who knew Senator Glenn, it was that type of person he was. After petting the cat and drinking the offered glass of water, we received his autograph. These men inspired America as well as the world and they influenced our psyche and they brought us together.

It's an inspiring time again for human space flight and once again NASA is leading the way, but it's also aspiring. I once asked my mother why are we here on Earth. She said to do the greatest good for the greatest number of people. My desire for this position is to be part of a purpose greater than any other.

This Committee is well aware of the many challenges that come with that purpose. I support the President's refocus on America's Space Program, on human exploration and returning astronauts to the Moon, for long-term exploration and use. It's all part of setting the table for NASA, its partners, and the eventual missions to Mars and beyond. The Moon is a stepping stone.

Also, I support the study of the Earth and the universe. In addition to the above-mentioned exploration missions, NASA must carry out earth science, planetary science, heliophysics, and astrophysics research, as well as aeronautics research.

There are four main strengths I bring to the mentioned table. First, over and over again, I've led organizations through difficult situations by creating an atmosphere of collaborative team work that turns visions and goals into realities.

When I was the Appropriations Staff Director, we got all the appropriations bills done but that entailed getting consensus with Democrat and Republican members, their staff, the agencies, CBO, the House, OMB, and the White House. One year, only two bills were expected to pass. We worked both sides of the aisle and together all 13 were enacted.

To do that, it took a complete command of the Federal budget and legislative processes. That was a feat then and as we're seeing, it remains one today.

Second, I'm able to focus helping to lead a situation that continually tends toward disorder. That goes from helping manage most of the Senate's operations to quickly reacting to cybersecurity threats.

Third, NASA is blessed with the most extraordinary and energized professionals whose ideas and talents must be allowed to flourish. I've spent my career attracting, mentoring, and retaining great talent.

Finally, but most importantly, on all levels and at all times, the safety of the entire NASA team is absolutely critical. On a daily basis, I'm responsible for helping to ensure that the proper processes work for the security of all Senators, staff, and visitors.

To conclude, I believe transformational leadership and the strength of collaboration will ensure a new era for America's Space Programs, advance scientific knowledge for the Earth, and inspire a new generation to enter the STEM fields. It's what NASA needs and it is time.

Thank you for this opportunity today.

[The prepared statement and biographical information of Mr. Morhard follow:]

PREPARED STATEMENT OF JAMES W. MORHARD, NOMINEE FOR DEPUTY ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. Chairman, Ranking Member Nelson, and members of the Committee on Commerce, Science and Transportation. It is an honor to appear before you today as the nominee for the Deputy Administrator of NASA. I will begin by thanking the President and Vice President who have put their trust and confidence in me—as well as Administrator James Bridenstine, who has gone out of his way to be helpful—providing very wise counsel. If you decide that I should be confirmed, I look forward to serving and working with you, Administrator Bridenstine, and the very talented NASA professionals.

The Senators of this Committee are well aware of the many challenges that NASA faces. I support the President's refocus on America's space program—on human exploration and returning astronauts to the Moon for long-term exploration and use. It is all part of setting the table for NASA and its partners and eventual missions to Mars and beyond. The Moon is a stepping stone.

I also support the study of the Earth and space sciences. If confirmed, I will support the scientific community's priorities that are shown in the decadal survey recommendations. In addition to the above-mentioned exploration missions, NASA must carry out Earth Science, Planetary Science, Heliophysics, Astrophysics research. Also, NASA must continue to make critical contributions in aeronautics by performing basic research that can open up new economic and commercial opportunities.

The commercialization of Low Earth Orbit is the beginning of the logistics tail for materials and supplies going to the Moon. This growing industrial base will promote our economic freedom and promote United States leadership in space. To accomplish these goals, NASA must establish a vision with a flexible step-by-step plan containing all critical components.

There are five main strengths I bring to that table. The first is that throughout my career, I have respectfully challenged the status quo, done things differently, and had the courage to "think outside the box." One year when I was the Appropriations Staff Director, only two appropriations bills were expected to be signed by the President. We worked on both sides of the aisle and, together, all thirteen bills were enacted. To do so, it took a complete command of the Federal budget and legislative processes. That was a feat then, and it remains one now.

The second is that, over and over again, I created an atmosphere of teamwork that turned those visions and goals into reality. Getting those bills done required attaining consensus of Democrat and Republican members and staff, agencies, the

Congressional Budget Office, the House of Representatives, the Office of Management and Budget, and White House. It was necessary to be adaptive, resilient, and a quick study of the ever-changing fabric of the Executive and Legislative Branches.

The third is that I am able to focus on moving forward in situations that continually tend toward disorder. That goes from managing most of the Senate's operations to quickly reacting to cyber-security threats. My positions on the Senate Appropriations Committee also provided opportunities to apply my skill sets to a myriad of agencies' procedural and budgetary processes, coupled with oversight and funding responsibilities.

The fourth is that I have spent my career attracting, mentoring, and retaining talent. The NASA team is blessed with the most extraordinary and energized people who serve all of us. To lead us into the future, they must be appreciated and their visionary ideas and talents must be allowed to flourish.

Also, I have established functioning financial mechanisms, and clear chains of command—while still being transparent. The President has called for successful NASA programs that are under budget and on time. I have attained similar goals during every phase of my career. To do so, valuable NASA resources will need to be leveraged with public/private partnerships.

Finally, and most importantly, on all levels and at all times, the safety of every member of the entire NASA team is absolutely critical. On a daily basis, I am charged with the responsibility of helping run the majority of Senate operations—including making sure the proper processes are working to ensure the security of all Senators, staff, visitors and the Capitol complex.

I believe transformational leadership and the empowerment and strength of partnering, will ensure a new era for America's space programs, advance scientific knowledge for the Earth, and inspire a new generation to enter the STEM fields. If confirmed, it would be my highest honor to help NASA in these endeavors. This is the time.

I recognize that it is only with the advice and consent of the Senate that I can be confirmed.

Mr. Chairman, Ranking Member Nelson, and members of the Committee thank you for the opportunity to share my thoughts with you.

A. BIOGRAPHICAL INFORMATION

1. Name (Include any former names or nicknames used): James William Morhard.
Nicknames: Jim, Jim Bob (used 40 years ago).

2. Position to which nominated: Deputy Administrator of the National Aeronautics and Space Administration.

3. Date of Nomination: 7/17/18.

4. Address (List current place of residence and office addresses):

Residence: Information not released to the public.
Office: The Sergeant at Arms, S–151, The Capitol, Washington, D.C. 20510

5. Date and Place of Birth: 09/20/1956; District of Columbia.

6. Provide the name, position, and place of employment for your spouse (if married) and the names and ages of your children (including stepchildren and children by a previous marriage).

Children: Daniel Thompson, 34
Hannah Thompson, 31

7. List all college and graduate degrees. Provide year and school attended.

J.D., 1993, Georgetown University Law Center, Washington, DC

M.B.A., 1984, George Washington University, Washington, DC

B.S. in Accounting, 1978, St. Francis University, Loretto, PA

8. List all post-undergraduate employment, and highlight all management level jobs held and any non-managerial jobs that relate to the position for which you are nominated.

United States Senate Deputy Sergeant at Arms (SAA), 2015 to Present. Manage 841 employees along with 190 contractors and work with the U.S. Capitol Police which have 2,264 sworn officers and civilians.

Sole proprietor of Morhard & Associates, L.L.C., 2005–2015. Developed and helped implement comprehensive strategies to aid and streamline organizations while keeping a focus on corporate leadership goals which primarily focused on their quarterly numbers.

Adjunct Professor for the Center for Defense and Homeland Security at the Naval Post Graduate School, 2005–2015. Lectured and participated in terrorism exercises for State and local officials.

Staff Director of the United States Senate Committee on Appropriations, 2003–2005. Led a staff of 68 to review and pass the annual discretionary appropriations for the United States.

Clerk of the Senate Appropriations Subcommittee on Commerce, Justice, State, Judiciary and Related Agencies, 1997–2003.

Clerk of the Senate Appropriations Subcommittee on Military Construction and Professional Staff Member on the Defense Subcommittee, 1991–1997.

Legislative Director and National Security Legislative Assistant for Senator Robert W. Kasten, Jr. 1984–1991, and Legislative Fellow for Senator Pete Wilson, 1983. Working for Senator Kasten I led a Legislative staff for two years.

Accountant and Budget Analyst for the Office of the Secretary of the Navy and Comptroller of the Navy, 1978–1983.

9. Attach a copy of your resumé.
Resumé is attached.

10. List any advisory, consultative, honorary, or other part-time service or positions with Federal, State, or local governments, other than those. listed above, within the last ten years. None.

11. List all positions held as an officer, director, trustee, partner, proprietor, agent, representative, or consultant of any corporation, company, firm, partnership, or other business, enterprise, educational, or other institution within the last ten years.

Sole proprietor of Morhard & Associates, LLC, 2005–2015.

Trustee at Saint Francis University, Loretto PA, 2005–2015.

As stated in the answer to question #8, lectured as an Adjunct Professor and participated in terrorism exercises for State and local officials as part of the Center for Homeland Defense and Security at the Naval Post Graduate School, Monterey CA, 2005–2014.

Board member of the National Center for Missing and Exploited Children, Alexandria VA, 2005–2007.

Member of the United States Institute of Peace Advisory Council, Washington, D.C., 2008–2015.

12. Please list each membership you have had during the past ten years or currently hold with any civic, social, charitable, educational, political, professional, fraternal, benevolent or religious organization, private club, or other membership organization. Include dates of membership and any positions you have held with any organization. Please note whether any such club or organization restricts membership on the basis of sex, race, color, religion, national origin, age, or handicap.

Member of the District of Columbia Bar.

Member of the Pennsylvania Bar.

Frogs—breakfast group who worked in the defense world, 2005–2014.

116 Club—private restaurant open for lunch a block from the Senate office buildings, 2003 to Present.

None of the above clubs or organizations restricted membership on the basis of sex, race, color, religion, national origin, age, or handicap.

13. Have you ever been a candidate for and/or held a public office (elected, non-elected, or appointed)? If so, indicate whether any campaign has any outstanding debt, the amount, and whether you are personally liable for that debt.

Arlington County Transportation Advisory Board member.

It was non-elected and appointed. There was never a campaign or any related funds. Served approximately one year sometime in the 1980s. or early 1990s. The Board does not keep records before 1999, so they have no record of my membership.

14. Itemize all political contributions to any individual, campaign organization, political party, political action committee, or similar entity of $500 or more for the past ten years. Also list all offices you have held with, and services rendered to, a state or national political pa1ty or election committee during the same period.

Collins, Susan M via Collins for Senator 07/31/2010 $500.00

Johanns, Michael O via Johanns for Senate Incorporated 08/05/2008 $1,000.00

Allen, George via George Allen for U.S. Senate 06/16/2011 $1,000.00

Murray, Patty via People for Patty Murray 12/21/2007 $1,000.00

Inouye, Daniel K via Dan Inouye for U.S. Senate 10/23/2007 $1000.00

McCaul, Michael via McCaul for Congress, Inc. 07/15/2010 $500.00

McCaul, Michael via McCaul for Congress, Inc. 03/02/2011 $500.00

McCaul, Michael via McCaul for Congress, Inc. 11/16/2011 $500.00

Praireland Leadership PAC 09/24/2009 $1,000.00. Affiliated with Michael O. Johanns (R-Neb)

Romney, Mitt/Paul D. Ryan via Romney for President, Inc. 11/01/2011 $500.00 for Primary

Romney, Mitt/Paul D. Ryan via Romney for President, Inc. 08/07/2012 $2,500.00 for Primary

Romney, Mitt/Paul D. Ryan via Romney for President, Inc. 08/15/2012 $500.00 credit for Primary

Romney, Mitt/Paul D. Ryan via Romney for President, Inc. 08/15/2012 $500.00 for General

Ed Gillespie for Governor 09/15/2017 $250.00

Joint Fundraising Contributions:

McConnell Victory Kentucky 09/29/2014 $2,600.00
Romney Victory, Inc. 08/21/2012 $1,000.00

Recipient of Joint Fundraiser Contributions:

These are the Final Recipients of Joint Fundraising Contributions

McConnell, Mitch via McConnell Senate Committee 14' 09/30/2014 $2,600.00

Romney, Mitt/Paul D. Ryan via Romney for President, Inc. 08/21/2012 $1,000.00

Have not held any office for a political party. Did work as staff on the 1988 Republican Platform National Security Subcommittee.

15. List all scholarships, fellowships, honorary degrees, honorary society memberships, military medals, and any other special recognition for outstanding service or achievements.

Fellowships: OPM Legislative Fellows Program, 1983.
Recognition: Navy Meritorious Civilian Service Award, 2004.

16. Please list each book, article, column, or publication you have authored, individually or with others. Also list any speeches that you have given on topics relevant to the position for which you have been nominated.

Articles: *Are Prosecutors Above the Law?,* Wall Street Journal 12/03/11

Columns: None.

Publications: Appropriations bills, reports, and Conference Reports for Military Construction, District of Columbia, Commerce, Justice and State and the Federal Judiciary, Supplementals and Omnibus bills (1991–2004)

1988 Republican Platform, National Security section

Speeches relevant to the position: None.

17. Please identify each instance in which you have testified orally or in writing before Congress in a governmental or non-governmental capacity and specify the date and subject matter of each testimony. None.

18. Given the current mission, major programs, and major operational objectives of the department/agency to which you have been nominated, what in your background or employment experience do you believe affirmatively qualifies you for appointment to the position for which you have been nominated, and why do you wish to serve in that position?

Background and Employment Experiences

Earning an MBA at George Washington University and a Juris Doctorate at Georgetown University were integral to securing my public service positions. My father's public service as the top civilian at the U.S. Navy Naval Air Systems Command and my experience working on a suicide hotline were catalysts for my journey, service and practiced leadership.

Organizational success requires the ability to attract, retain, and mentor talented people, develop and communicate a clear vision, and create an atmosphere of teamwork to turn that vision into a reality. Our nation has long held that NASA embodies the qualities of a visionary agency whose successes are driven through integrity, hard work, country above self, sacrifice, perseverance, resilience, and team work. My life's successes have resulted from having these practical traits, having a vision, and engagement of a committed team.

Improving the Sergeant at Arms culture to one of "Service to the Senate" has been my main focus over the last three years. This fundamental principle is demonstrated through two core missions of safety for members, staff, visitors, buildings, and grounds, and continuity of government and operations in any and all circumstances. The creation and execution of a strong financial management system has allowed for timely decision-making and more effective operations that keep the Senate functioning at acceptable risks levels in all conceivable circumstances. As part of that effort, our cybersecurity program has become the template to follow within the Capitol complex.

My position as the Staff Director of the Appropriations Committee required me to pass the annual discretionary appropriations for the United States. At the time, it totaled $731 billion and it included all funding for NASA. It was my responsibility to assemble and negotiate the Fiscal Years 2004 and 2005 Omnibus appropriations bills. Final passage required that I work collaboratively with Senate and House Leadership, the 0MB Director, and the Offices of the Vice President and President. These efforts required a complete command of the Federal budget and legislative processes.

As Clerk of the Appropriations Subcommittee on Commerce, Justice, State, Judiciary & Related Agencies, I understood that spending taxpayer dollars neither defines a program nor ensures its success. This bill was crafted to provide sufficient agency funding while discouraging a culture of funding for growth's sake. Passage of this $35 billion spending package failed to pass off the Senate Floor in each of the two years prior to my tenure there. At the time, it was surprising to see an appropriations bill not pass. My team's efforts led to its passage in each of the years during which I ran that subcommittee.

The Commerce Department's portion of this bill allowed me to manage the funds for many science-related programs. These programs included the acquisition and launching of both Polar and Geostationary spacecraft, scientific and technical research Within the National Institute of Standards and Technology, mapping and charting, tide and current data, the Ocean Assessment Program, and the National Weather Service including aviation forecasts and satellite observing systems.

My tenure also allowed me to help institute a Research and Development budget process at NOAA that was similar to that of the Department of Defense. The process established internal controls that allowed for better program management and ultimately improved undersea research.

As Clerk of the Appropriations Subcommittee on Military Construction we enacted over $5 billion a year for construction worldwide. Management of these funds included the first private/public pa.i1nerships, as well as repair, rehabilitation, revitalization, and modification of existing facilities. These private/public pa.t1nerships focused on military housing. Facilities management, planning and design. environmental compliance, and condemnation of real property as authorized by law are all challenges that NASA may also be required to address.

As a Professional Staff Member on the Defense Subcommittee, I reviewed the Shipbuilding Construction, Navy appropriation and attained approval of all the Navy's large ships and boats including the Seawolf Class Submarine. At the time, it was the most technologically advanced attack submarine in the world.

Finally, as a Budget Analyst for the Office of the Secretary of the Navy I reviewed and managed RDT&E, Navy and Other Procurement, Navy programs to assure their programmatic stability, and readiness to continue forward. It included performing the Navy Comptroller yearly budget review with program managers and ensuring that programs remained intact during the 0MB budget review. I was one of two people who reviewed all Navy RDT&E programs.

The Executive and Legislative Branches are uniquely complex. Their respective require1nents, operations, "language", and media interest require its leaders to be adaptive, resilient, and quick studies of the fabric of these unique environments. I have been afforded a keen understanding of the Executive Branches' needs and challenges. The positions on Appropriations provided opportunities to apply my skill sets to a myriad of agencies' procedural and budgetary processes, coupled with oversight and funding responsibilities. Differently, the Deputy Sergeant at Arms position presents additional leadership tasks posed by the day to day operational and security challenges equivalent to that of a small city.

Working with people with diverse and often opposing views in the ever changing legislative landscape has often challenged me to "lead change", as change is constant in life and is a required leadership skill at NASA. I have experienced the joys of success, and more importantly the humility that comes from setbacks. All are invaluable experiences that are complimentary ingredients of a leader.

As shown above, my responsibilities have grown as each of my career opportunities have gotten more and more complex. These challenging positions required integrity, courage, honesty, people skills, and the ability to communicate and lead. It is my hope that the Committee will find that my practice of leadership and success has prepared me for this position.

Why I wish to serve in this position

My record is of a public servant who enjoys the challenges of "leading change" and building teams. I am un-afraid to respectfully challenge the status quo, do things differently, and have the courage to think "outside the box." The "what, how and whys" of NASA have to be answered to be able to keep the Committee informed as well as making sure the NASA team knows where they are, where they are heading, and what is important to the Committee. It means involving everyone in the process.

Also, bringing together the traditional and new space companies, as well as our international partners, into a new vision for both science and exploration is the beginning of a new era for NASA. We must continue to be the protector of the "priority domain" of space while leading the way for new and free space lanes of commerce. These challenges are why I wish to serve in this position.

19. What do you believe are your responsibilities, if confirmed, to ensure that the department/agency has proper management and accounting controls, and what experience do you have in managing a large organization?

Responsibilities

My primary responsibility as the Deputy Administrator of NASA, if confirmed, is to ensure that the agency faithfully and efficiently executes the programs and policies of NASA as directed by the President and authorized and appropriated by the Congress. It includes providing clarity to the Agency's strategic vision and serving as a source of internal leadership to achieve NASA's mission.

In addition, the Deputy Administrator is responsible for the management of NASA operations, its programs and all its financial controls. This effort includes establishing the Agency's priorities, policies, personnel and budgets, legalities and contracts, interactions with the Congress, communications, and cost and performance assessments. Also, if confirmed, it would be my responsibility to ensure the ethical operations of all NASA activities and that NASA continues to be a diverse and equitable workplace.

Management Experience

As Deputy Sergeant at arms for the Senate, I supervise a staff of 841 and 190 contractors. Additionally, through the Capitol Police Board the Sergeant at Arms supervises and directs the Chief of the U.S. Capitol Police who has a force of 2,264 sworn officer and civilians working to protect the Senate and the House.

Over the last three years, we have implemented needed changes to an operational organization that have resulted in more consistent and timely products and services. I led initiatives to break down "Stove Pipes" within the organization that had resulted in a lack of communication and collaboration. These changes have positively affected operations, acquisitions, operational and physical security, training and human resources. Once these bureaucratic restraints were lifted we began to see strategic results, functionality, and prompt action being taken for the Senate.

20. What do you believe to be the top three challenges facing the department/agency, and why?

First, if confirmed, NASA must establish and implement a clear, compelling, and executable direction for the future of human space exploration. Without clarity and continuity in this core NASA competency, all others activities will suffer and languish. Setting NASA on a sustainable path for human exploration that draws together the entire space community including the rapidly expanding private sector enterprises and our international partners is the highest priority.

Next, NASA must define and adopt a new role in relation to emerging commercial and non-governmental space activities. For decades, NASA has led a national industrial team in accomplishing our national space goals. In the future,. NASA must learn to strategically partner with private sector entities to provide guidance, leadership; strategic investments and technical expertise in support of national goals. NASA will always be the indispensable partner for American space enterprises, however, it may not necessarily be the sole actor in achieving our goals..

Third, NASA must recognize that our national space acquisition process is outdated and inefficient. Many of the programs cost too much, take too long and underperform. 'We need to innovate at the speed of relevance' said Secretary of Defense James Mattis, and so does NASA. If confirmed, we will work to address the national space acquisition process, to radically reduce cost, improve schedules and safety, exceed performance expectations and bring NASA's culture back to the "cutting edge." It will require a unity of effort that integrates all the space sectors.

We will do so recognizing NASA's unique requirements and responsibilities, but also acknowledging that we must adhere to the Federal Acquisition Regulations (FAR) process. We will improve the NASA way, and learn from and shamelessly borrow from the innovations of others. Ultimately, it will provide the Committee improved results, better risk analysis, and flexibility in its decision-making

B. POTENTIAL CONFLICTS OF INTEREST

1. Describe all financial arrangements, deferred compensation. agreements, and other continuing dealings with business associates clients, or customers. Please include information related to retirement accounts.

There are no financial arrangements, deferred compensation agreements, and other continuing dealings with business associates, clients, or customers. Outside of any Federal retirement and TSP, I have two IRAs valued at less than [redacted] in total and a SEP valued at less than [redacted]

2. Do you have any commitments or agreements formal or informal, to maintain employment, affiliation, or practice with any business, association or other organization during your appointment? If so, please explain. No.

3. Indicate any investments, obligations, liabilities, or other relationships which could involve potential conflicts of interest in the position to which you have been nominated.

Have a bank account with the Royal Bank of Canada. It was set up to take advantage of currency differences. Besides minimal interest income, there has been no activity since the funds were deposited.

4. Describe any business relationship, dealing, or financial transaction which you have had during the last ten years, whether for yourself, on behalf of a client, or acting as an agent, that could in any way constitute or result in a possible conflict of interest in the position to which you have been nominated. None.

5. Describe any activity during the past ten years in which you have been engaged for the purpose of directly or indirectly influencing the passage, defeat, or modification of any legislation or affecting the administration and execution of law or public policy.

During the course of my time in the private sector I provided advice and guidance on the intricacies of appropriations legislation for such issues as the NEXTGEN Air Traffic Control System, energy efficiency, and network hardware and infrastructure.

6. Explain how you will resolve any potential conflict of interest, including any that may be disclosed by your responses to the above items.

I will resolve any potential conflicts by assuring beforehand that this official position is not used for personal gain and not undertake any outside activity that creates a conflict of interest, as well as following the guidance of the Office of Government Ethics and NASA's Legal Counsel and their of Office of Inspector General.

C. LEGAL MATTERS

1. Have you ever been disciplined or cited for a breach of ethics, professional misconduct, or retaliation by, or been the subject of a complaint to, any court, administrative agency, the Office of Special Counsel, professional association, disciplinary committee, or other professional group? No.

2. Have you ever been investigated, arrested, charged, or held by any Federal, State, or other law enforcement authority of any Federal, State, county, or municipal entity, other than for a minor traffic offense? If so, please explain.

Was coming home from a wedding in October 1982 and was arrested for Driving While Intoxicated in Loudon County, VA. I was released the same day.

3. Have you or any business or nonprofit of which you are or were an officer ever been involved as a party in an administrative agency proceeding, criminal proceeding, or civil litigation? If so, please explain. No.

4. Have you ever been convicted (including pleas of guilty or *nolo contendere*) of any criminal violation other than a minor traffic offense? If so, please explain.

Based on the charge stated in #2, I was convicted of a misdemeanor in the General District Court of Loudon County Virginia. My license was suspended but that sentence was not implemented due to taking a course on the subject matter.

In 2009, the Archives Department of the Circuit Court in Loudon County indicated that the records of the General District Court had been destroyed due to their age. It is my understanding that the records were held by the Circuit Court up until there destruction.

5. Have you ever been accused, formally or informally, of sexual harassment or discrimination on the basis of sex, race, religion, or any other basis? If so, please explain. No.

6. Please advise the Committee of any additional information, favorable or unfavorable, which you feel should be disclosed in connection with your nomination. None.

D. RELATIONSHIP WITH COMMITTEE

1. Will you ensure that your department/agency complies with deadlines for information set by congressional committees? Yes.

2. Will you ensure that your department/agency does whatever it can to protect congressional witnesses and whistleblowers from reprisal for their testimony and disclosures? Yes.

3. Will you cooperate in providing the Committee with requested witnesses, including technical experts and career employees, with firsthand knowledge of matters of interest to the Committee? Yes.

4. Are you willing to appear and testify before any duly constituted committee of the Congress on such occasions as you may be reasonably requested to do so? Yes.

RESUMÉ OF JAMES MORHARD

Objective

Serve as the Deputy Administrator of NASA.

Background

Senior executive leader integrating internal controls and processes affecting organizational and cultural change for the Senate Majority Leader. These changes include acquisitions, facilities management, budgeting, operational and physical security and human resources. Practiced in rebuilding outdated financial management systems rather than building around evolved bureaucratic constraints—such as base budgeting. At the same time, implementing needed changes to an operational organization which resulted in consistent and timely products and services. Known for cutting through unnecessary bureaucracies and using available funds to ensure effective strategic results, functionality and prompt action.

Experience

Sergeant at Arms of the United States Senate
Deputy Sergeant at Arms (2 years) 2015 to Present

- Moving the culture of over 3,000 employees to one of service to the Senate.
- Established effective operations based on timely decision-making to keep the Senate functioning at acceptable risk levels. This effort includes challenges with cybersecurity and IT. Built a multi-functioning cybersecurity program that is now a template for others.
- Establishing planning, programming, budgeting, and execution processes to create better financial management for proposing, managing and defending the $204 million Senate legislative appropriation.

Morhard & Associates, L.L.C.
Sole Proprietor (10 years) 2005–2015

- Developed and helped implement comprehensive strategies to streamline organizations such as Cisco Systems, DRS Technologies, LexisNexis, Owens Corning, and Booz Allen.

Committee on Appropriations, United States Senate
Chief of Staff (2 years) 2003–2005

- Lead a staff of 68 to review and pass the annual discretionary appropriations for the United States, which at the time totaled $731 billion. Required a complete command of the Federal budget and legislative processes.
- Assembled and negotiated the 2004 and 2005 Omnibus appropriations bills which included funding to conduct and support space flight, spacecraft control and NASA communications.
- Worked closely with Senate and House Leadership, the OMB Director and the Offices of the Vice President and President to win passage of all these bills.

Appropriations Subcommittee on Commerce, Justice, State, Judiciary & Related Agencies
Senate Clerk (6 years) 1997–2003

- Passed legislation appropriating $38 billion for these agencies—while routinely requesting the lowest possible funding allocation from the full committee to reduce the culture of growth. Beforehand, the bill had not passed out of the Senate for two years.
- Helped institute a budget process at NOAA similar to DOD s R&D process to establish internal controls that allowed for better program management and ultimately better undersea research.
- Reviewed and managed all funding for acquisition and launch of Polar and Geostationary spacecraft, NIST, mapping and charting, tide and current data, climate, air quality and weather research, and the National Weather Service including aviation forecasts and satellite observing.
- Before 9-11, created a vision of preparedness against terrorism. Passed legislation through mark-ups, floor action, and conferences with House Appropriations, OMB and the NSC.

Appropriations Subcommittees on Defense and Military Construction
Professional Staff Member and Senate Clerk (6 years) 1991–1997

- Enacted $7 billion for military construction worldwide. These funds included repair, rehabilitation, revitalization, modification and consolidation of existing facilities.
- Reviewed and approved facility planning and design, environmental compliance, acquisition and condemnation of real property as authorized by law.
- Reviewed the Shipbuilding Construction, Navy appropriation and attained approval for the Seawolf Class Submarine, the most technically advanced submarine of its time. Worked with program managers to address specific challenges to shipbuilding programs and DOD's Real Property Maintenance backlog.
- Created accounting controls for the Defense Environmental Restoration account.

Offices of Senator Pete Wilson (R-CA) and Senator Robert W. Kasten, Jr. (R-WI)
Legislative Director. National Security Legislative Assistant and Fellow (8 years) 1983–1991

- Secured authorization and appropriations for numerous defense programs.

Office of the Secretary of the Navy and Comptroller of the Navy
Accountant and Budget Analyst (5 years) 1978–1983

- Reviewed and managed Other Procurement, Navy and RDT&E, Navy appropriations. Recommended changes for the Navy's internal program review for accounts in both appropriations. Afterwards, performed the final Navy Comptroller budget review and ensured that programs remained intact during the OSD budget review.
- Trained as a Financial Management Trainee and worked at the Naval Audit Service.

Education

- J.D., Georgetown University Law Center, Washington, DC—1993
- M.B.A., George Washington University, Washington, DC—1984
- B.S. in Accounting, St. Francis University, Loretto, PA—1978

Memberships & Clearances

- Member of Bar in Washington, DC and Pennsylvania—1994 to present
- Trustee at Saint Francis University, Loretto, PA—2005–2015
- Board member of National Center for Missing and Exploited Children—2005–2007
- Top Secret, SCI clearances

The CHAIRMAN. Thank you, Mr. Morhard.
Mr. Szabat.

STATEMENT OF JOEL SZABAT, NOMINEE TO BE ASSISTANT SECRETARY FOR AVIATION AND INTERNATIONAL AFFAIRS, DEPARTMENT OF TRANSPORTATION

Mr. SZABAT. Chairman Thune, Ranking Member Nelson, Members of the Committee, I am Joel Szabat. I have the honor to be nominated to be the Assistant Secretary of Aviation and International Affairs for the United States Department of Transportation. I hope you will find my record of public service worthy of confirmation.

Joining me today is my happiness, my inspiration, my wife Chiling Tong, President of the Asian Pacific Islander American Chamber of Commerce and Entrepreneurship.

Almost 20 years ago, Chiling and I established a nonprofit to teach Asian Pacific American youth that our government derives its just powers from the consent of the governed. Fellows are taught how to use their power as citizens to make governments responsive to their needs and those of the community.

Three fellows from the foundation join us today: Jessica Li, Jamie Atilano, and Justin Lee, as well as Soo Kyung Koo, the foundation's former Executive Director.

If confirmed, I will pursue three key goals. First, support Secretary Chao's primary mission of safety through the economic licensing of air carriers.

Second, ensure that our antitrust immunity determinations and international agreements, to include Open Skies and other aviation accords, provide a fair deal to the American taxpayers, labor, industry, and traveling public.

And, third, work for the small rural communities that are the customers of the essential air service and small community air service development programs.

If confirmed, I will manage these programs to the benefit of the affected rural communities while controlling costs as a steward of the taxpayer's dollars.

Since 2002, I have been a senior executive in the Federal service. I have strived to exemplify the ideals of the Senior Executive Service whose members can be moved to lead programs wherever and whenever they are needed.

In my first 4 months as Chief of Staff of the Small Business Administration, we resolved a year-old backlog of a 100,000 Hurricane Katrina disaster assistance requests.

In DOT, I was the designated Federal Government official responsible for standing up $48 billion of Recovery Act programs, eventually completing over 15,000 transportation projects.

Under my watch, the Maritime Administration quantified the size of the U.S. Flag Fleet necessary to employ enough American mariners to meet our military sealift requirements.

I hope my record in these positions and elsewhere assures the Committee and the Senate that I have the skills necessary to lead this office.

Since January, I've been managing the Office of Aviation and International Affairs. I also have prior experience in most of the missions of this office, including negotiating with foreign governments during my time at U.S. EPA, serving as the transportation counselor at the U.S. Embassy in Iraq, and in multiple roles at the

Department of Transportation, to include talks on the agency's ascension into the U.S.-China Strategic and Economic Dialogue.

In two prior stints at the DOT, I managed the staffing and budget of the Office of Aviation and International Affairs, including the Essential Air Service and the Small Community Air Service Development Programs.

I have 25 years of Federal service as an Army cavalry man and as a civil servant. In every role, my philosophy of public service remained the same. I am oath-bound to follow the Constitution, honor-bound to follow the law, and the directions of my superiors in that order, and duty-bound to provide my superiors my best advice and the advice of my staff.

This office is staffed, for the record, is comprised of crackerjack professionals who would be the pride of any organization, civil, military, or corporate.

If confirmed, I will continue my commitment to public service unchanged.

Chairman Thune, Ranking Member Nelson, and Members of the Committee, thank you again for your consideration. I'd be pleased to answer any questions you may have.

[The prepared statement and biographical information of Mr. Szabat follow:]

PREPARED STATEMENT OF JOEL SZABAT, NOMINEE TO BE ASSISTANT SECRETARY OF AVIATION AND INTERNATIONAL AFFAIRS, DEPARTMENT OF TRANSPORTATION

Chairman Thune; Ranking Member Nelson; Members of the Committee,

I am Joel Szabat. I have the honor to be nominated to be the Assistant Secretary of Aviation & International Affairs for the United States Department of Transportation (DOT). I hope you will find my record of public service worthy of confirmation.

Secretary LaHood, thank you for your kind introduction. Joining me today is my wife, Chiling Tong, President of the Asian Pacific American Chamber of Commerce and Entrepreneurship. Almost 20 years ago, Chiling and I established a non-profit to teach Asian Pacific American youth that our government derives its just power from the consent of the governed. Fellows are taught how to use their power as citizens to make government responsive to their needs, and those of the community. Three Fellows from the foundation join us today—Jessica Li, Jamie Atilano and Justin Lee—as well as Soo Kyung Koo, the foundation's former Executive Director.

If confirmed, I will pursue three key goals; first, support Secretary Chao's primary mission of safety, through the economic licensing of air carriers; second, ensure that our Anti-Trust Immunity determinations and international agreements, to include Open Skies and other aviation accords, provide a fair deal for the American taxpayer, traveling public, labor and industry; and third, work for the small, rural communities that are the customers of the Essential Air Service and Small Community Air Service Development Programs. If confirmed I will manage these programs to the benefit of the affected rural communities while controlling costs as a steward of the taxpayers' dollars.

Since 2002, I have been a Senior Executive in the Federal service. I strive to exemplify the ideals of the Senior Executive Service, whose members can be moved to lead programs wherever and whenever they are needed. In my first four months as Chief of Staff of the Small Business Administration, we resolved a year-old backlog of 100,000 Hurricane Katrina disaster-assistance requests. In DOT, I was the designated Federal government official responsible for standing up $48 billion of Recovery Act programs, eventually completing over 15,000 transportation projects. Under my watch, the Maritime Administration quantified the size of the US-flag fleet necessary to employ enough American mariners to meet our military sealift requirements. I hope my record in these positions, and elsewhere, assures the Committee and the Senate that I have the skills necessary to lead this office.

Since January, I have been managing the Office of Aviation & International Affairs. I also have prior experience in most of the missions of this office, including negotiating with foreign governments during my time at USEPA; serving as the

Transportation Counselor at the U.S. Embassy in Iraq; and in multiple roles at the DOT, to include talks on the agency's accession into the US-China Strategic & Economic Dialogue. In two prior stints at the DOT, I managed the staffing and budget of the Office of Aviation & International Affairs, including the Essential Air Service and Small Community Air Service Development Programs.

I have 25 years of Federal service as an Army cavalryman and as a civil servant. In every role, my philosophy of public service remained the same. I am oath-bound to follow the constitution; honor-bound to follow the law, and the directions of my superiors-in that order-and duty-bound to provide my superiors my best advice, and the advice of my staff. If confirmed, I will continue that approach, unchanged.

Chairman Thune, Ranking Member Nelson and Members of the Committee, thank you again for your consideration. I would be pleased to answer any questions you may have.

A. BIOGRAPHICAL INFORMATION

1. Name (Include any former names or nicknames used): Joel Matthew Szabat.

2. Position to which nominated: Assistant Secretary for Aviation and International Affairs, U.S. Department of Transportation.

3. Date of Nomination: August 1, 2018.

4. Address (List current place of residence and office addresses):

Residence: Information not released to the public.
Office: 1200 New Jersey Avenue, SE W88–324 Washington DC 20590 (work)

5. Date and Place of Birth: 25 January, 1959; Fort Worth, TX.

6. Provide the name, position, and place of employment for your spouse (if married) and the names and ages of your children (including stepchildren and children by a previous marriage).

Spouse: Chiling Tong, Chief Executive Officer and President of the National Asian/Pacific Islander Chamber of Commerce and Entrepreneurship (National ACE); 1300 Pennsylvania Avenue NW, Suite 700, Washington, DC 20004
No Children

7. List all college and graduate degrees. Provide year and school attended.

Georgetown University, 1981 BA Economics and Public Administration
Harvard University, 1988 MBA

8. List all post-undergraduate employment, and highlight all management-level jobs held and any non-managerial jobs that relate to the position for which you are nominated.

Captain, U.S. Army, 1981–86

Management Consultant, Strategic Planning Associates, 1988–90

Executive Officer, U.S. EPA, 1990–93

Principal Consultant (Transportation), California State Assembly, 1993–2001

Principal, White Dragon Group (self-employed) 2001–02

Deputy Assistant Secretary for Transportation Policy, USDOT, 2002–03

Deputy Assistant Secretary for Management and Budget, USDOT, 2003–05

Transportation Counselor, U.S. Embassy, Baghdad, Iraq, 2005

Senior Counselor to the Secretary, USDOT, 2005–06

Chief of Staff, Small Business Administration, 2006–08

Deputy Assistant Secretary for Transportation Policy, USDOT, 2008–11

Executive Director, Maritime Administration, USDOT, 2011–18

Deputy Assistant Secretary for Aviation and International Affairs, USDOT, January 2018 to Present

9. Attach a copy of your resumé.
See Attached.

10. List any advisory, consultative, honorary, or other part-time service or positions with Federal, State, or local governments, other than those listed above, within the last ten years. None.

11. List all positions held as an officer, director, trustee, partner, proprietor, agent, representative, or consultant of any corporation, company, firm, partnership, or other business, enterprise, educational, or other institution within the last ten years.

Unpaid advisor to the International Leadership Foundation (ILF), an Educational non-profit my wife and I founded in 2000.

12. Please list each membership you have had during the past ten years or currently hold with any civic, social, charitable, educational, political, professional, fraternal, benevolent or religious organization, private club, or other membership organization. Include dates of membership and any positions you have held with any organization. Please note whether any such club or organization restricts membership on the basis of sex, race, color, religion, national origin, age, or handicap.

Unpaid advisor to the International Leadership Foundation (ILF), an Educational non-profit my wife and I founded in 2000.

13. Have you ever been a candidate for and/or held a public office (elected, non elected, or appointed)? If so, indicate whether any campaign has any outstanding debt, the amount, and whether you are personally liable for that debt.

Unsuccessful candidate for the Sacramento, CA Municipal Utility District (SMUD) in 1998. No debts.

14. Itemize all political contributions to any individual, campaign organization, political party, political action committee, or similar entity of $500 or more for the past ten years. Also list all offices you have held with, and services rendered to, a state or national political party or election committee during the same period. None.

15. List all scholarships, fellowships, honorary degrees, honorary society memberships, military medals, and any other special recognition for outstanding service or achievements.

Army Commendation Medal

Army Meritorious Service Medal

Presidential Rank Award (Meritorious Service)

USDOT War on Terror Medal

USDOT Inspirational Leader

Ellis Island Foundation Medal of Honor

Distinguished Visitor, Eisenhower School for National Security and Resource Strategy, National Defense University

16. Please list each book, article, column, or publication you have authored, individually or with others. Also list any speeches that you have given on topics relevant to the position for which you have been nominated. Do not attach copies of these publications unless otherwise instructed.

No books, articles, columns, or publications. Since joining Aviation & International Affairs, I have visited with and spoken to Essential Air Service communities, and spoken on panels of the U.S. Chamber of Commerce and at the Federal Aviation Administration.

17. Please identify each instance in which you have testified orally or in writing before Congress in a governmental or non-governmental capacity and specify the date and subject matter of each testimony.

(House) Committee on Small Business, March 12, 2009, Ensuring Stimulus Contracts for Small and Veteran-Owned Businesses

(House) Committee on Transportation and Infrastructure, March 26, 2009, DOT's Disadvantaged Business Enterprise Program

(House) Transportation and Infrastructure Committee, Subcommittee on Coast Guard & Marine Transportation, April 4, 2017, Authorization of Coast Guard and Maritime Transportation Programs

(Senate) Committee on Appropriations, Subcommittee on Transportation, Housing and Urban Development and Related Agencies, April 5, 2017, Preventing Sexual Assault and Sexual Harassment at the U.S. Merchant Marine Academy

(Senate) Commerce Committee, Subcommittee on Science, Commerce and Transportation, May 9, 2017, Maritime Transportation

18. Given the current mission, major programs, and major operational objectives of the department/agency to which you have been nominated, what in your background or employment experience do you believe affirmatively qualifies you for appointment to the position for which you have been nominated, and why do you wish to serve in that position?

I have been performing the duties of the position to which I have been nominated since January, 2018. Because of my work history, I had prior experience in two-thirds of the functions of my position when I joined the Office.

First, this position coordinates international activities across DOT and, in conjunction with the State Department, negotiates air access agreements with other countries. As the Transportation Counselor in Iraq, I had invaluable lessons in dealing with other nations and the State Department, including coordinating with Japan and other international donors to the U.S.-led effort in Iraq. I stood up USDOT's participation in the Strategic Economic Dialogue with China, and have negotiated for USDOT with foreign counterparts in China and Nigeria. I represented the Department at international forums in Germany and in the Philippines. In the Maritime Administration, I discussed items of mutual concern with officials in South Korea, Canada and Panama. I also worked with "the Cotton Club"—attaches with maritime and trade portfolios from NATO and other U.S. allies. At U.S. EPA, I led a U.S. trade mission to several Southeast Asian countries. I was also stationed in Germany for three years in the U.S. Army until the end of 1984.

Secondly, this position administers Essential Air Service and Small Community Air Service Development Program grants. In my two separate stints as Deputy Assistant Secretary for Transportation Policy, I managed budget and staffing of the entire Office of the Under Secretary, including these programs. I initiated and managed the first three years of DOT's TIGER grant program; oversaw the program offices with responsibility for grants and loan guarantees in the Maritime Administration; and as the Chief of Staff of the Small Business Administration, worked closely with the loan guarantee and government contracting program offices and spearheaded the initiation of a new loan guarantee program for veterans and their families.

Thirdly, this office handles economic aviation regulatory matters within USDOT, including analyzing proposed mergers and joint ventures. Although I do not have direct experience in this specialized field, I am equipped through my academic background (economics, MBA) to understand the issues and question the analysis and conclusions of each case.

I have the good fortune to be an American, and I appreciate that public service is one way to earn a living while giving back to the country. This particular job is important. I believe I can do it well, and I have the background to do it better than most.

19. What do you believe are your responsibilities, if confirmed, to ensure that the department/agency has proper management and accounting controls, and what experience do you have in managing a large organization?

I am already responsible for ensuring that the Office of Aviation & International Affairs has proper management controls. If confirmed, I would continue that responsibility, and continue to work closely with both the Chief Financial Officer of the Office of the Secretary and the management and procurement staff in the Office of the Under Secretary, who provide financial controls expertise for this office.

During the transition between Presidents Bush and Obama, I was the senior official managing the entire Office of the Under Secretary, including the Office of Aviation & International Affairs. During the transition between Presidents Obama and Trump, I was the senior official managing the Maritime Administration.

As Executive Director of the Maritime Administration, all the program and support offices reported to me, totaling over 700 Federal employees. As Chief of Staff of the Small Business Administration, I directly supervised numerous staff offices, including the CFO, procurement, human resources, administration, civil rights, and government affairs.

In the Army, I was a Tank Platoon leader, and then the Executive Officer and Acting Troop Commander of a Cavalry Troop of 200 officers and soldiers.

20. What do you believe to be the top three challenges facing the department/agency, and why?

Safety is Secretary Chao's top priority. The primary reason the Office of Aviation & International Affairs does economic regulatory reviews of air carriers is to ensure that the financial condition of airlines does not impair their ability to fully meet safety requirements and responsibilities. This is an ever evolving challenge as new carriers and new business models continually reshape the industry.

In negotiating air access agreements with foreign countries, the challenge is to advance both of our tandem goals; promote safe and efficient air transportation while ensuring that U.S. air carriers and the broader U.S. aviation industry are given the opportunity to compete on a fair and level playing field.

This office is entrusted to manage the Congressionally-mandated Essential Air Service (EAS) and Small Community Air Service Development Program (SCASDP) programs. At a time of rising costs, the Office of Aviation & International Affairs will be challenged to efficiently and effectively manage the two programs, while ensuring that each community receives quality and reliable air service.

B. POTENTIAL CONFLICTS OF INTEREST

1. Describe all financial arrangements, deferred compensation agreements, and other continuing dealings with business associates, clients, or customers. Please include information related to retirement accounts.

I have no financial arrangements, deferred compensation agreements or other continuing dealings with business associates, clients or customers. I am eligible to draw a CalPers Pension. I have not withdrawn any funds from it to date. This is reported in Part 3 of my Public Financial Disclosure report.

2. Do you have any commitments or agreements, formal or informal, to maintain employment, affiliation, or practice with any business, association or other organization during your appointment? If so, please explain. No.

3. Indicate any investments, obligations, liabilities, or other relationships which could involve potential conflicts of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the Office of Government Ethics and the Department of Transportation's Designated Agency Ethics Official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with DOT's Designated Agency Ethics Official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

4. Describe any business relationship, dealing, or financial transaction which you have had during the last ten years, whether for yourself, on behalf of a client, or acting as an agent, that could in any way constitute or result in a possible conflict of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the Office of Government Ethics and the Department of Transportation's Designated Agency Ethics Official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with DOT's Designated Agency Ethics Official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

5. Describe any activity during the past ten years in which you have been engaged for the purpose of directly or indirectly influencing the passage, defeat, or modification of any legislation or affecting the administration and execution of law or public policy.

As a Federal government employee since 2002, I have only ever been involved in representing the administration's position on legislative matters.

6. Explain how you will resolve any potential conflict of interest, including any that may be disclosed by your responses to the above items.

In connection with the nomination process, I have consulted with the Office of Government Ethics and the Department of Transportation's Designated Agency Ethics Official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with DOT's Designated Agency Ethics Official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

C. LEGAL MATTERS

1. Have you ever been disciplined or cited for a breach of ethics, professional misconduct, or retaliation by, or been the subject of a complaint to, any court, administrative agency, the Office of Special Counsel, professional association, disciplinary committee, or other professional group? If yes:

a. Provide the name of agency, association, committee, or group;

b. Provide the date the citation, disciplinary action, complaint, or personnel action was issued or initiated;

c. Describe the citation, disciplinary action, complaint, or personnel action;

d. Provide the results of the citation, disciplinary action, complaint, or personnel action.

No.

2. Have you ever been investigated, arrested, charged, or held by any Federal, State, or other law enforcement authority of any Federal, State, county, or municipal entity, other than for a minor traffic offense? If so, please explain. No.

3. Have you or any business or nonprofit of which you are or were an officer ever been involved as a party in an administrative agency proceeding, criminal proceeding, or civil litigation? If so, please explain. No.

4. Have you ever been convicted (including pleas of guilty or *nolo contendere*) of any criminal violation other than a minor traffic offense? If so, please explain. No.

5. Have you ever been accused, formally or informally, of sexual harassment or discrimination on the basis of sex, race, religion, or any other basis? If so, please explain. No.

6. Please advise the Committee of any additional information, favorable or unfavorable, which you feel should be disclosed in connection with your nomination. None.

D. RELATIONSHIP WITH COMMITTEE

1. Will you ensure that your department/agency complies with deadlines for information set by congressional committees?

Yes, insofar as it is in my power to do so.

2. Will you ensure that your department/agency does whatever it can to protect congressional witnesses and whistle blowers from reprisal for their testimony and disclosures? Yes.

3. Will you cooperate in providing the Committee with requested witnesses, including technical experts and career employees, with firsthand knowledge of matters of interest to the Committee? Yes.

4. Are you willing to appear and testify before any duly constituted committee of the Congress on such occasions as you may be reasonably requested to do so? Yes.

RESUMÉ OF JOEL SZABAT

2002–2006, 2008 to Present
U.S. Department of Transportation (DOT)
Washington, DC

Deputy Assistant Secretary for Aviation and International Affairs since January, 2018. Run the office in the absence of a non-career appointee. Oversee staff that: negotiates agreements for U.S. air carriers to operate internationally; licenses all foreign and domestic air carriers to operate in the United States; rules on airline merger and joint venture requests; manages the Essential Air Service and Small Community Air Service Development grant programs; and coordinates international activities and policy for the Secretary across DOT.

Executive Director of the Maritime Administration (MARAD) from 2011–2018. MARAD's senior career official and Chief Operating Officer, overseeing MARAD's career staff of nearly 800 Federal employees, and several hundred contractors, with an annual budget of over $700 million, and over $1 billion of outstanding loans and grants. MARAD runs the Nation's only civilian Federal service academy (university), the United States Merchant Marine Academy at King's Point, New York. MARAD maintains a reserve fleet of cargo ships for military sealift and manages a commercial program including most of the U.S.-flag international fleet. MARAD rose from the bottom third to the top half of agencies in the Federal Best Places to Work survey, during this period.

Deputy Assistant Secretary for Transportation Policy from 20Q2–2003, 2008–2011. Named DOT's Federal officer responsible for the Recovery Act in 2009. Stood up a dozen programs, which invested $48 billion in over 15,000 road, transit and rail surface transportation projects nationwide. Oversaw the initial development and administration of the first three rounds of TIGER grants. Coordinated a seven-federal agency effort in 2002 under a Presidential executive order, to streamline project reviews of key transportation infrastructure. Co-chaired, along with the Department of Defense, the steering group of a multi-agency committee that developed and coordinated the Federal Government's GPS policy. Managed budget, staff and contract resources for the Office of the Under Secretary, including Aviation & International Affairs.

*Senior Counselor for Transportation Infrastructure*from 2005–2006. Advised Secretary. Led special projects such as Pandemic Flu preparation, reviewing research and development across the department, and Hurricane Katrina Lessons Learned.

Deputy Assistant Secretary for Management & Budget from 2003–2005. Led DOT's participation in the President's Management Agenda. Tied for first Federal agency to meet all requirements in four measured areas (Human Capital, Budget and Performance Integration, Competitive Sourcing, E-Government).

2006–2008
Chief of Staff, Small Business Administration
Washington, DC
Spearheaded the creation of the Patriot Express loan program, to help veterans and their families. Helped to reform SBA's disaster-assistance program, and to establish a public scorecard to track the progress of Federal agencies in meeting their small business contracting goals. Supervised the Chief Financial Officer, Human Resources, and other administration. Inherited the lowest score among large agencies in the Best Places to Work survey. The very next survey gave SBA the largest increase (30 percent) of any large Federal agency.

Transportation Counselor to the Ambassador
Baghdad, Iraq
Directed the U.S. Government's transportation reconstruction program in Iraq. Managed $544m in Federal funds, and coordinated with foreign governments, to restore ports, airports and railroads in Iraq.

2001–2002
Principal, White Dragon Group
Sacramento, CA
Advised Asian Pacific American business leaders on how to increase their civic engagement and effectiveness.

1993–2001
Principal Consultant for Transportation, California State Assembly
Sacramento, CA
Served as the minority (Republican) party's sole transportation consultant. Analyzed bills, recommended how to vote, negotiated with stakeholders and with the majority. Developed a proposal for long-term infrastructure investment in California (the '20/20 vision'), adopted by the party.

1990–1993
Executive Officer, U.S. Environmental Protection Agency
Washington, DC—Sacramento, CA
Advised the Administrator and Deputy Administrator on management, budget and personnel issues. Piloted a program to embed Federal officials with state governments for better federal-state cooperation.

1988–1990
Associate, Strategic Planning Associates (now Mercer Management)
Washington, DC
As a management consultant, advised railroad and trucking firms. Helped develop an economic pricing model for long-haul trucking.

1981–1986
Captain, United States Army
Fulda Gap, Germany—Fort Devens, Massachusetts
Led a tank platoon and an Armored Cavalry Troop, as Executive Officer and Acting Commander, patrolling the East-West German border during the Cold War.

Education

Received a B.A. in Economics and Government from Georgetown University (1981) and an MBA from Harvard Business School (1988)

Personal

Born in Texas; grew up in Massachusetts. Co-founded the International Leadership Foundation (ILF), a non-profit organization promoting public service for Asian Pacific American college students. Married to Chiling Tong, a prominent APA activist, and co founder of the ILF.

Received the Presidential Meritorious Rank Award for leading the Recovery Act and TIGER within DOT. Named an 'inspirational leader' in DOT in 2015. Earned the Meritorious Service Medal in the Army, and awarded the Ellis Island Foundation Medal of Honor for work with the Asian Pacific American community.

Career and Non-Career Positions

Appointed to a Schedule C (Administratively Determined) position at USEPA from 1990–1993. Appointed to a Schedule C Senior Executive Service position from 2002–2008. While at the Small Business Administration in 2008, applied to, and was accepted for, a vacant career Senior Executive Service position at USDOT. Have been a career SES ever since.

Addendum
Specific Past Aviation & International Experience
Department of Transportation

Supervised MARAD's international office. Led trips to South Korea, Panama, Canada and the Philippines for bi-lateral discussions, to negotiate MOAs, and to represent MARAD at multilateral conferences. Met regularly with military attaches and diplomatic staff (the 'Cactus Club') from the European Union and other allies to discuss issues of mutual concern. Represented the Maritime Administration on the National Defense Transportation Association (NDTA). The NDTA is comprised of the major domestic commercial aviation, rail, trucking, maritime and logistics firms as well as the Department of Defense agencies which rely on them for most of DOD's logistics.

Responsible for budget, personnel and management issues for the Under Secretary, during both stints as Deputy Assistant Secretary (2002–2003, 2008–2011) including the Office of Aviation and International Affairs, and key programs in OST–X, such as EAS, SCASDP and Alaskan Mail Rates. Co-led DOT's accession into the U.S.-China Strategic Economic Dialogue (SED). Helped negotiate DOT's first MOAs with the newly-formed Chinese Ministry of Transport. Negotiated with Chinese counterparts to break a logjam in fireworks exports to the United States in time to prevent a shortage of fireworks for the 4th of July in 2008. DOT's representative on, and co-chair of, the Executive Steering Group of the seven federal-agency Executive Committee on Space-Based Position, Navigation and Timing (EXCOM). The EXCOM sets GPS policy, essential for FAAs Next Generation (NextGen) air transportation system. Worked closely with senior FAA executives to ensure their equities were represented in Federal Government policy. Served as DOT's representative to the annual GPS/Galileo conference in Oberpfaffenhoffen, Germany, in 2012.

Served as the Deputy Secretary's designated representative to the NDTA. Represented DOT in aviation negotiations in Abuja, as Nigeria sought to go from Tier 2 to Tier 1 in FAAs International Aviation Safety Assessment Program to comply with international safety standards, and allow direct flights between Nigeria and the United States.

U.S. Embassy, Baghdad, Iraq

Supervised U.S. DOT staff in Iraq, including a Federal Aviation Administration (FAA) team at the Baghdad airport. Oversaw $544m in contract work rebuilding Iraq airports, ports and railroads. Negotiated with the Government of Iraq (GOI) and U.S. corporations to complete work at the Baghdad International Airport, and secure payment for the finished work. Negotiated with foreign donors, especially the Government of Japan, for contributions to ship channel dredging and other important transportation infrastructure. Initiated discussions with FAA for a Special Federal Aviation Regulation (SFAR) to allow U.S.-connected air service into Kurdistan airports. Flights were eventually allowed in 2012. Negotiated with the GOI, Government of Kuwait, and other foreign countries, for the return of Iraqi commercial aircraft impounded in other countries, so Iraq could restart its national airline. Participated in discussions with the U.S. military, the Government of Jordan, and GOI over a smuggling ring led by GOI officials that threatened to shut down commercial air service in Baghdad.

U.S. Environmental Protection Agency

Led first trade mission to promote the sales of environmental technologies from U.S. businesses to Indonesia, Singapore, and Thailand. Led initial negotiations with ASEAN countries to establish the U.S.-Asian Environmental Partnership (AEP). Today, AEP is part of the State Department, located in six Southeast Asian countries.

The CHAIRMAN. Thank you, Mr. Szabat. Thank all of you for your remarks.

I know you all appreciate the importance of cooperation with Congress. Nevertheless, these nomination hearings give us an opportunity to underscore that point.

So the question I want to ask is, if confirmed, will you pledge to work collaboratively with this Committee and its members and to provide thorough and timely responses to our requests for information?

Dr. DROEGEMEIER. Yes, I will.

Mr. MORHARD. Yes, I will, Mr. Chairman.

Mr. SZABAT. Yes, I will.

The CHAIRMAN. Dr. Droegemeier, the Administration recently identified U.S. leadership in artificial intelligence, quantum information sciences, and strategic computing as top R&D budget priorities, and this committee also marked up a bill recently that I introduced with Ranking Member Nelson to prioritize quantum research and standards.

But countries like China are also investing significant resources in these fields, with China's overall R&D expenditures projected to surpass those of the United States by the end of this year.

What will you do at OSTP to enable U.S. advancements in AI and quantum so that we can maintain a competitive advantage over countries like China?

Dr. DROEGEMEIER. Well, thank you, Mr. Chairman. Those are extremely important areas.

As you say, China and Russia are both moving very, very rapidly, and I think quantum information science in particular is really the next major revolution, all the way from basic physics through devices and things like quantum computers related to that, of course, is artificial intelligence, which affects everything from financial services, looking at large amounts of data, analyzing large amounts of data, to assisting doctors with making diagnoses, and also things like enhancing the opportunity for our veterans to find jobs, do the matching. So these are extremely important areas.

The Federal Government, I think, is really prioritizing these. The President, in his own budget but also in the OMB OSTP Yearly Guidance Memo, has quantum information sciences, artificial intelligence, machine learning as top priorities.

At OSTP, there is an Assistant Director for Quantum Information Science and also an Assistant Director of Artificial Intelligence. So these are very high-priority items.

There were summits that were held and organized by OSTP. These are very large encompassing summits to bring multiple agencies together to really basically chart strategic courses for the Nation. Of course, they're not just in civilian work. There's also substantial military components, as well, so National Security Council and others like that in the Executive Office of the President are also involved.

So extremely important. I think OSTP has a very important role to play and has been playing it, but, as you say, China is investing very heavily and making no bones about it. It's very obvious they're putting that out there and in some sense challenging us and we have to rise to the challenge. It's extremely important, Mr. Chairman, that we take a leadership role. America leads in these areas.

The CHAIRMAN. I couldn't agree more and hope you'll be focused like a laser on those issues.

This would be to Dr. Droegemeier and Mr. Morhard. As you'll likely observe during this hearing, there's a lot of debate about the role of science in policymaking. So I want to ask you as the Director of OSTP and as the Deputy Administrator of NASA, respectively, should you be confirmed, what do you think is the appropriate role of science in guiding policy?

Dr. DROEGEMEIER. Thank you, Mr. Chairman. I believe science is extremely important in informing policy. I think science needs to be conducted, as you mentioned earlier, free from political interference. The science has to lead the way in terms of telling us whatever the facts are. So my role, if I am confirmed as Director, is to make sure that those scientific results, unbiased, are presented to the President and others for effective decisionmaking and policymaking.

The CHAIRMAN. Mr. Morhard.

Mr. MORHARD. Mr. Chairman, I think it's critical that it be assured there's no distortion or disregard for science or scientific evidence, especially with the amount of effort that goes on at NASA to collect scientific data.

The CHAIRMAN. This will be for Mr. Szabat, and it has to do with EAS. DOT's responsible for administering that program, which does play, as I mentioned in my opening remarks, an important role in enabling rural communities to stay connected to the national air transportation system.

I know that you're very familiar with the EAS System or Program, I should say, given your current position. If confirmed as Assistant Secretary, what will you do to ensure that the EAS Program is carried out in an efficient and effective manner?

Mr. SZABAT. Mr. Chairman, thank you for that question. You're exactly correct. The Essential Air Service is vitally important and important not just as a Federal program but especially to the communities that it serves.

Although I've only been serving in this position now for less than eight months, I've already visited six states, including to visit with EAS communities, including South Dakota, Nebraska, Montana, Mississippi, Virginia, and West Virginia, and spoken to the airport directors and community leaders in many more.

If confirmed, I will be a voice within the Administration to champion the importance of what the local community leaders tell us are the single-most important things for the communities, which is dependable, reliable, and frequent air service to these essential air service communities.

The cost pressures, as you alluded to, are enormous. Since 2011, costs have nearly doubled while the number of communities in the program have been roughly flat. These cost pressures are increasing.

I believe, and in my discussions with the airport directors, they've indicated they also believe, that there are a number of ways to contain these costs and to continue the effective management of essential air services to the benefit of the communities.

Some of these were suggested in the Administration's Fiscal Year 2019 budget proposal. There are others that have been suggested to me by the airport directors and community leaders.

If confirmed, I will work with interested members of Congress, with the staff of this committee, and with the EAS communities themselves to develop a consensus way forward.

The CHAIRMAN. Thank you, Mr. Szabat, and my time has expired for questions, and my time to vote on the Floor has expired, as well. So I need to go vote. I'm going to hand the gavel to Senator Wicker to recognize in order of appearance those who are here first.

Senator WICKER. Very good.
The CHAIRMAN. Senator Wicker.

**STATEMENT OF HON. ROGER F. WICKER,
U.S. SENATOR FROM MISSISSIPPI**

Senator WICKER. All right. It seems that we have Senator Gardner followed by Senator Cortez Masto.

Let me just observe, Mr. Szabat, that was an excellent list of states to visit. I don't know how you came up with that list but right on.

Mr. SZABAT. I have excellent staff, Senator.

Senator WICKER. Senator Gardner.

**STATEMENT OF HON. CORY GARDNER,
U.S. SENATOR FROM COLORADO**

Senator GARDNER. Thank you, Mr. Chairman.

Mr. Szabat, congratulations on your nomination and thank you so much for taking the time to meet with me. I appreciated hearing your thoughts, particularly as they related to the office's approach to China and Asia as a whole.

Aviation industry, aerospace industry extremely important to Colorado, as it is, indeed, a fastly growing industry.

If confirmed, part of your role will require you to oversee and engage in agreements and partnerships with foreign countries and carriers seeking to provide air service to and from the United States, is that accurate?

Mr. SZABAT. Senator, yes, it is.

Senator GARDNER. Yes. In our discussions, we talked about how important it is that we're holding our partners accountable to their commitments as part of such air transport agreements.

Could you talk about some of the things that affect and impact the current state of our agreement and partnership with China in particular?

Mr. SZABAT. Senator, thank you for that question and thank you for identifying what is, along with our air transportation agreements with Europe, you know, the United States' single-most important international partnership for aviation.

One of the things that I have learned since I joined the office in January, and I think is reinforced by the 25 years that I've had in Federal service, is the importance of not just making agreements but of working with your partners to ensure that they uphold the agreements that are made and so even before I joined the office, we have had that challenge in working with our partners, our aviation partners in China, and so as we had discussed, Senator, from our perspective, there are four areas where we would like to see improved progress going forward in our relations with them where we think that we have agreements and we need to see more progress in fulfilling those agreements.

They include on the freight side what's called co-terminalization, the ability of our freight carriers to be able to fly into China and then move from one airport to another. That fits their business model and this was agreed to and they have challenges in doing so.

Also, the problem that the Chinese have writ large, which is congestion in their airports, which affects their ability to provide us both the slots and the frequencies, the routes, the ability to fly into the country that, from our perspective, they have agreed to.

And then, finally, you know, among the four, so co-terminalization, the slots, the frequencies, but then we also have some of the, what I would call, niches, the basic day-to-day issues, such as speed with which normal requests are made, whether they are for inspections of air frames or for co-sharing among partners.

Senator GARDNER. And so it's fair to say that China is not meeting those four agreements at this point?

Mr. SZABAT. That is our perspective. Yes, Senator.

Senator GARDNER. There were reports this summer that China was calling on our domestic air carriers, including American Airlines and United Airlines, to change their content to consumers regarding Taiwan.

In response to this, the White House issued a statement saying, "This is Orwellian nonsense and part of a growing trend by the Chinese Communist Party to impose its political views on American citizens and private companies."

Senator Rubio and I, along with others, sent a letter to the CEO of United Airlines expressing our concern about the bullying tactics by China and bullying tactics of China toward U.S. businesses.

What are your thoughts on the Administration's comments on this issue?

Mr. SZABAT. Senator Gardner, thank you for that question, and this has been a major issue almost from the moment that I joined this office in January.

As you point out, the Administration's statement came out on May 5. This was after the Chinese had made their demands of all the international air carriers on April 27.

The challenge that we had in the Administration, and that's not just us but the partners that we worked with in the State Department as well as within the White House, such as the National Security Council, is we, of course, opposed the action that China took trying to force for political reasons private businesses, in this case aviation businesses, airlines, from complying with, you know, the political world as they would want to see it.

But the challenge from our perspective is we do not want to fall in that same trap and order U.S. businesses how they should respond. So, instead, we worked with those businesses, those affected airlines. We encouraged them to work together so that they cannot get picked off one by one by the Chinese Government and they did so and they came up with a common response to the Chinese Government.

Senator GARDNER. Mr. Szabat, if I can interrupt for a moment. I'm going to run out of time and I want to ask one question to Dr. Droegemeier but before that, I want to just state this.

I am really concerned about China's bullying tactics and bullying American companies, airlines today. Who will it be tomorrow? And if the airlines succumb to Chinese bullying tactics, then China will know they can bully other American companies and then pretty soon you have Internet companies going into China agreeing to censor sites, which is being done right now.

I drafted an amendment in this case to offer to the FAA Reauthorization Bill an amendment that would require that as a condition to operate in U.S. national air space any carrier must refer to Taipei, Taiwan.

Dr. Droegemeier, the U.S. obviously has some of the strongest science research laboratories in the world helping drive U.S. competition. I've talked a lot about China with Mr. Szabat.

Could you talk a little bit about innovation, staying on top of science research, development, funding importance, and how we can compete with China in the future?

Dr. DROEGEMEIER. Absolutely. It's extremely important, Senator Gardner.

I think we need to make sure that we are the strongest research enterprise in the world. OSTP sits on a committee called CFIUS, Committee on Foreign Investment in the U.S. That's one way to really monitor what China is doing in terms of its predatory trade practices and unfair advantage it tries to take of science.

It also has well-known history of stealing intellectual property, stealing research results, and things like that, while at the same time, as we welcome foreign researchers into the U.S., I think historically they've been a very important and robust part of our enterprise we have to do that with care, with some degree of care, and so this is something I think that the highest education communities needs to look at, certainly OSTP with its role on the CFIUS and other organizations need to be mindful of, and we need to manage this challenge because it's very openly done.

Actually in my own state, I've helped coordinate some of this stuff. I've been briefed by the FBI in my role as the VP for Research at the university and I can tell you it's happening. I've seen it happen. So it's a big threat to the U.S.

Senator GARDNER. Thank you, Dr. Droegemeier, and as the Committee recalls, Dr. Droegemeier helped lead the AMERICA COMPETES Reauthorization, the roundtables we did, that this Committee passed in a strongly bipartisan fashion.

It was you who said to this Committee thanks for making science bipartisan again. Thank you, Dr. Droegemeier.

Senator WICKER. Thank you, Senator Gardner.

Senator Nelson.

Senator NELSON. Thank you. Mr. Morhard, in the past in NASA, there have been times when the Administrator and the Deputy were not on the same page.

What do you see as the role of the Deputy when it comes to supporting the Administrator and what will you do to make sure the two of you get along?

Mr. MORHARD. Senator, I appreciate the question.

The Administrator is my boss and he has the vision and the voice of NASA, and I see it as I will help him run the organization.

I started out at the Navy Department and I'm very clear of how chain of command works and it has served me well through my tenure of working and I would use that but with that, I know your concerns regarding safety. It's making sure that those processes are working and it gets down, I think, to governance and it's the authorities and the accountability of governance structures that have to be aligned, so that if you have an issue that's somewhere in the

chain of command, it can get to you, whether it's through the chain of command or through the independent processes they have set up there.

I think part of the—if I'm confirmed, it's going there and with a new leadership, do those processes work with the new personalities that are there, and I assure you that if I am confirmed, I'm going to be looking at that.

Senator NELSON. Yes. Well, you and I have talked about this and you have certainly satisfied me when I shared with you my experience that, for example, the loss of two space shuttles, first Challenger and then Columbia, was because the management was not listening to the engineers on the line who were warning them about the technical problems, albeit different in the destruction of each space shuttle, but nevertheless the folks on the line understood, and management was not letting that filter into their decisions.

Dr. Droegemeier, what steps are you going to take to ensure the Federal science is conducted and communicated free from political interference?

Dr. DROEGEMEIER. Senator, that's an exceptionally important issue.

As a practicing scientist, as somebody who's overseen a science enterprise at a university and also been on the National Science Board, I can tell you that the ethical conduct of research with integrity, without political interference in the scientific process, is absolutely without question important and, to me, there is no other way to do it.

If we sacrifice, compromise on that, then the science, the entrusted public focus that we have, the public-private partnership that we have, the foundations of research and the public trust kind of come undone. So to me, that's very critical.

OSTP, I think, has a very important role to play in that activity. In the past, it has communicated and coordinated with all the Federal R&D agencies to have them provide their particular strategies for ensuring exactly what I was talking about and I think we need to make sure that we're vigilant, make sure that those practices are being followed, extremely important.

Senator NELSON. Since we're in hurricane season, you've worked with us in the past to improve the public's response to hurricane warnings.

You know what's happening. Fires, floods, storms. It's happening all over. We're seeing, because, in part, of heat, persistent algae blooms on both of Florida's coasts, although fueled by nutrients.

What should we be focusing our research efforts on to mitigate the risk of all of this that's happening?

Dr. DROEGEMEIER. Another extremely important question. We really have to understand in the case of harmful algae blooms, for example, how these things happen and how they explosively develop like they do, and my own university has done a lot of work in this area in harmful algae blooms. In fact, Senator Inhofe became quite ill one time with one of these things. So I think fundamentally in all the things you mentioned we have to understand the underlying issues, improve the science and prediction of these,

whether it's the biological things, whether it's hurricanes and so on.

But another really important thing we oftentimes don't talk much about is the communication of the threats to the public and understanding how the public responds and this is where the social behavioral sciences could really play an important role and when we worked together, you and I, on that hurricane research initiative 10 years ago that all-encompassing strategy that we worked on with the National Science Board did just that and, frankly, I wish we would have gotten funding for it because that looked at the hurricane in particular in its totality, not just the physical science, the observations, but the social behavioral dimensions because at the end of the day, everything you mentioned is about people.

It affects people, and we have to understand that people dimension, as well, and that's something I would commit to you, to work with you and others, on addressing those important issues were I confirmed.

Senator NELSON. I hate to have to bring this up, but the National Academies of Science put out a report that says there's sexual harassment in academic science. Your thoughts?

Dr. DROEGEMEIER. Yes, indeed, this again is something, as a Vice President for Research, that I deal with this in compliance at my university. That report came out in 2018 and it looked at—it was specifically targeted at women in the work place but especially in academia and it made some important conclusions.

It said this sort of thing inhibits recruiting women, retaining women, and then it inhibits their pathways as they move throughout their career. It looked at some best practices and that was really important. So I think that's good.

In fact, there's a November workshop, I believe, on this, but, Senator, something that happened I thought that was extremely important. The National Science Foundation put out a so-called Important Notice Number 144 earlier this year and as Vice President for Research, I was involved in taking that to my university, helping us to understand and ask questions and get clarification.

What NSF basically did, they agreed with my personal feeling and a lot of us who say this kind of behavior is absolutely unacceptable, never going to be acceptable, has to stop. We owe all of our researchers a safe environment in which to work and NSF put an important stake in the ground and they said we will not tolerate sexual harassment of women or any other individuals. The work place will be safe and we want you to do that but, on the other hand, we also reserve the right to come in and take away funding and take unilateral action.

I thought that was a really important strong statement. Bringing that to OSTP, what would OSTP do with that, Senator? I think OSTP could then take that and say, OK, let's have all the agencies in that conversation, maybe take that and promulgate it throughout all of the agencies that do R&D. Nothing more important than making sure that we have safe environments.

Senator NELSON. Mr. Chairman, one final question since I haven't spoken to Mr. Szabat.

You're going to be in a position to do something about the fact that this Committee has taken a very strong position with regard

to protection of passengers, consumer protections on airlines, and yet we have not seen the airlines do the things that we have in fact discussed in this committee, such as ensuring that young children are able to sit next to at least one parent with no charge, or the fact that when paid checked luggage is lost or not delivered in a timely manner, they don't even get a refund on paying for their bag. What can you do about this?

Mr. SZABAT. Senator, thank you for the question and for raising a valid and important concern.

Since I joined the Department of Transportation in 2002, safety and fair treatment of the traveling public have always been part of the culture and part of the regulatory role of the department.

The particular issues that you raise, the children sitting with parents, the treatment of luggage, falls under the purview of the Aviation and Consumer Protection Office, but if I am confirmed and sitting in the office as Assistant Secretary for Aviation and International Affairs, I commit to work with them, with the involved offices in the Federal Aviation Administration, with yourself, your staff, and interested members of this committee to address these concerns for the traveling public.

Senator NELSON. Thank you, sir.

Senator WICKER. Thank you, Senator Nelson.

Senator Udall.

STATEMENT OF HON. TOM UDALL,
U.S. SENATOR FROM NEW MEXICO

Senator UDALL. Thank you so much, Chairman Wicker, really appreciate the hearing today.

Don't worry about this bandage. I'm fine. You should see the other guy.

[Laughter.]

Senator UDALL. The *New York Times* recently published a lengthy article, Dr. Droegemeier, on the history of climate change actions in our country, called "Losing Earth." I mentioned this article to you when we met earlier in the week. The author concludes that we had an opportunity during the decade between 1979–1989 to take climate change head-on but we failed.

Will you dedicate yourself to work to address climate change impacts in America?

Dr. DROEGEMEIER. Well, thank you, Senator. I did pull that article down and you were right. It was a 40,000-some words and I enjoyed looking at it, a lot of familiar names in there. It was a very interesting history.

I absolutely believe that we have to look at the future. That was the past, right. It talked about, as you say, that era from 1979 to 1989. I'm really focused as sort of a guy who does weather modeling of predicting the future. I'm really looking at what we do in the future. So, absolutely, I'm very excited to work on that.

I think we need improvements in climate models. We need lots of things going forward, lots of things we could do, and I talked to various Senators, including Senator Hassan about this in her home state of resiliency.

You know, she made the point when we rebuild from destruction, we tend to rebuild and not build for the future. That's a great ex-

ample, Senator, of the things that I think we need to be doing. So, absolutely, I'm very excited to work on that with you and see what we can do to move forward.

Senator UDALL. Great. And what specific actions will you take as the leader of OSTP to act on climate change?

Dr. DROEGEMEIER. Absolutely. One of the important bills that was passed by this Committee and signed into law was the Weather Forecast Improvement Act and, for example, with regard to hurricanes, there's a National Hurricane Research Initiative that's part of that, also activities that look at doing more seasonal forecasting and bringing the climate and the weather communities together to work together. They could actually learn a lot from one another.

In the climate modeling going forward, we need to reduce uncertainty. There certainly is uncertainty, kind of an ironic way to say it, but in climate models, we need to reduce that. I think the weather modeling community can be very, very helpful there.

Also, when you're thinking about numerical prediction beyond sort of the weather times scales we see now of a few days, maybe out to 7 days into seasonal time scales, very important for agriculture, for other areas.

So kind of moving the weather forecasting further downstream sort of into the climate arena, so there's a real symbiosis there to be gained, Senator, and that would be something I would like to work on as well as things that I mentioned in risk and resilience with Senator Hassan.

Senator UDALL. Yes, and I assume from the question that was asked earlier about scientific integrity that you would also preserve scientific integrity in this climate change arena?

Dr. DROEGEMEIER. Yes, sir, absolutely.

Senator UDALL. Dr. Droegemeier, we discussed the importance of ensuring that the United States research and education enterprise is robust and competitive at the international level.

How will you ensure that the U.S. remains a global leader in science, technology, and innovation and continues to be a trusted partner in international research?

Dr. DROEGEMEIER. That goal that you just mentioned really is the goal to me, is to really ensure American leadership in all the things you mentioned.

I think, first of all, we need to have our strategy. We need to look at what the key things are and the Chairman mentioned a few of them a moment ago, the artificial intelligence, quantum information sciences. There's also AI and machine learning. There's advanced manufacturing and these kinds of things.

Other countries are aggressively pursuing these things, as well, because they see them as game-changers. So we have to be very smart in our planning. I kind of take a portfolio look across the Federal Government to look at what are we doing not just within an agency but topically across agencies.

I think we need to have efficiencies. We need to remove regulatory burden that hampers our best and brightest scientists. Some compliance activities are extremely important but others are very unnecessary and we know that. So I think we need to untie our hands.

Also, Senator, I think we need to be very efficient and effective in moving research outcomes into the applied arena, into the private sector, where they can then grow jobs and be put into practice. So all of those kinds of things, I think, are really critical.

Other countries don't have what we have. We have not only American ingenuity, we have a fabulous higher education system, incredible national labs. We have amazing private companies and innovative spirit. We really are leading despite what you see in terms of the dollars of other countries, but we've got to watch those dollars because they are on our heels. Absolutely, sir.

Senator UDALL. Thank you very much, and, Mr. Chairman, I'll submit additional—I didn't mean to just focus on you. I had questions for the other witnesses, but I'll put those in for the record. I know we have a lot of our colleagues here.

Thank you.

Senator GARDNER. Thank you, Senator Udall. Thanks for not roughing up Dr. Droegemeier.

[Laughter.]

Senator GARDNER. Senator Hassan.

STATEMENT OF HON. MAGGIE HASSAN,
U.S. SENATOR FROM NEW HAMPSHIRE

Senator HASSAN. Thank you, Mr. Chair, and thank you to our nominees for being here today, for your willingness to serve your country. Thank your families, as well, because this is a family affair, and we appreciate all of your willingness to serve and your service to date, as well.

I want to extend a particularly warm welcome to our nominee, to be Head of the Office of Science and Technology Policy, as we've been waiting a long time for this nomination—578 days to be exact, but who's counting? Actually, some of us were, and so I led two letters last year to the President urging action on this vacancy because of the critical importance of this position, and I'm really pleased to see that our calls have finally been answered and you're here. So I look forward to our discussion and I will start, Dr. Droegemeier, with a question for you.

When you visited my office earlier this week, and I really enjoyed our discussion, we talked about the importance of STEM education. The United States is currently facing a serious STEM challenge. We're not producing enough qualified new STEM graduates to meet the needs of our modern workforce, which is something I hear from employers in New Hampshire all the time, from science enterprises to advanced manufacturers.

Part of the problem is that women and people of color are not joining these fields at equitable rates, leaving behind a large portion of our talent and our future workforce pipeline.

Should you be confirmed, in what ways will you lead the Office of Science and Technology Policy in meeting these challenges?

Dr. DROEGEMEIER. Well, thank you, Senator. You hit upon something that really is something I'm passionate about but passion is not enough. You have to do things.

In Oklahoma, I've been part of the Governor—and I know you were a Governor, as well. We talked about this, of Governor

Fallin's STEM Initiatives and STEM activities, also at my own university.

Building the STEM workforce of the future is absolutely essential. It has to run the spectrum from K–12 all the way through higher education and we have to really understand what the need is out there.

Underrepresented populations is a huge challenge and I've worked a lot on that and I think this is one of the biggest and most important things, whether it's Native Americans, people of color, whatever. We've got to bring them in, and we've been spending, frankly, a lot of money on that and the needle is quivering. It's not really moving.

Senator HASSAN. Right.

Dr. DROEGEMEIER. So we have to really do more. Now I can tell you that the Office of Science and Technology Policy is working on a five-year STEM Strategic Plan for the Nation and I think that's a really important thing.

In fact, there was a committee just recently created. Out of 500 nominations, there were 18 phenomenal people chosen. Gabriela Gonzalez of Intel is leading that effort. So I think that's really good for the future. NSF, NOAA, NASA, and DOE, I think, are involved. NSF is the lead agency.

So we've really got to make progress there because we are really in a challenge in meeting the future need and my NSB colleagues behind here on the Science Board, we looked at this, as well, Senator, and, in addition to the STEM workforce, it's the STEM-enabled workforce.

Folks who get degrees not in STEM, we encourage them, look, take some courses in other fields because I think the statistics is something like one-fourth of all IT workers in this country don't have a STEM degree. So having a STEM degree isn't just the absolute end-all. You know, having STEM capabilities makes you employable in a lot of different areas. So we have to think about broadening participation to bring those folks in.

Senator HASSAN. Right. And I think we have to think about ways of offering stackable credentials in the fields so that people can do it while they're working, while they're raising family, and move forward that way.

Dr. DROEGEMEIER. Correct.

Senator HASSAN. I also wanted to follow up with you on something we just touched on in our conversation.

I've been working to free up additional spectrum to support the needs of the wireless industry as we move towards adopting 5G nationwide and one step I took was with my colleague, Senator Gardner. We introduced together the AIRWAVES Act, which sets goals and timelines to get additional licensed and unlicensed spectrum into the hands of industry, innovators, and the public.

The legislation also makes meaningful investments in rural broadband. In order to achieve goals like those outlined in the AIRWAVES Act, we'll need cooperation between Federal agencies, including the Department of Commerce, FCC, the Department of Transportation, and the Department of Defense, just to name a few.

Do you see the Office of Science and Technology Policy playing a leadership role in spectrum policy if you're confirmed, and, if so, what would that role look like?

Dr. DROEGEMEIER. Absolutely, I do, Senator. In fact, OSTP right now, there's a broadband initiative. The President has a broadband initiative. In the yearly OMB Guidance Memo, American connectivity is one of the key things that is highlighted as a priority, bringing broadband to rural communities, to empower rural communities, also to people who are immobile and don't have access otherwise to certain things, like education and healthcare through the mobile environment.

For OSTP, I think it's helping to make sure that the research gets done, to create the capabilities, the technological capabilities. The Federal Government can provide, as you say, the spectrum. That's really important, through the spectrum auction, I'm familiar with that because in our radar work, we've worked to free up spectrum. That's really critical, and then some of the infrastructure and then the private sector being a full partner in this thing, to actually deliver the capabilities.

To me, this is again one of the great priorities because we've got to empower all of America and living in a state that is a rural state, I recognize that some of those folks that live in rural Oklahoma, they're not participants but they need to be participants in our society, full participants, and broadband is an incredibly important way to bring them in and make them a part of the whole enterprise.

Senator HASSAN. Yes. It's critical to our democracy.

Dr. DROEGEMEIER. Absolutely.

Senator HASSAN. So thank you so much, and I, like Senator Udall, have other questions for the other nominees. I will submit them for the record.

Again, thank you both for your willingness to serve, and thank you, too, Doctor. Thank you, Mr. Chair.

Senator GARDNER. Senator Markey.

STATEMENT OF HON. EDWARD MARKEY,
U.S. SENATOR FROM MASSACHUSETTS

Senator MARKEY. Thank you, Mr. Chairman.

Mr. Morhard, the position for which you are nominated requires an understanding of climate science.

Do you agree with the overwhelming scientific evidence that human activity is the dominant driver in the warming of the planet?

Mr. MORHARD. Senator, I believe the climate's changing and that man has a significant impact on it.

Senator MARKEY. Do you agree that it's the dominant driver of climate change?

Mr. MORHARD. I can't speak authoritatively on that, Senator, to make that statement.

Senator MARKEY. Well, that's not with the consensus of scientists around the planet and have reached every National Academy of Science for every country in the world has reached that conclusion.

Let me come over to you, Dr. Droegemeier. Are you committed to protecting the scientists who work within the Administration to

ensure that if their consensus is that humanity, human beings are the dominant cause for the warming, that they will not be punished, that they will not be removed, that they will not be in any way intimidated by officials within the Administration for political rather than scientific reasons?

Dr. DROEGEMEIER. Yes, Senator Markey, it is my position that science must be conducted without political influence, and I believe that that includes the things that you mentioned.

Scientists have to be free to explore. That's what science is about, and we have to make certain that they are free to do so. So I absolutely agree that it has to be free from political influence and conducted with the highest integrity.

Senator MARKEY. So, Mr. Morhard, given the fact that you're kind of hedging on this issue and not willing to make a full-throated commitment to that scientific consensus that human beings are the dominant cause of the problem, how will you ensure that scientists at NASA will not be unduly influenced since they are part of that large consensus that climate change is caused by human beings? How are you going to give us a guarantee that they will not be in any way affected by your supervision over them?

Mr. MORHARD. Senator, first, thank you for asking me the question.

I certainly, if confirmed, would work to assure that there's no distortion or disregard for science and scientific evidence. If we compromise on it, we won't have science. So I can assure you that there—I think it's critical that we don't have—there is no influence on the outcome of the scientific method.

Senator MARKEY. Mr. Szabat, now that the United Kingdom has left the EU, the United States and the U.K. are negotiating an Open Skies agreement which will dictate the terms by which airlines can set routes, capacity, and pricing between the two countries.

How will you assure me that protecting U.S. jobs is a priority for the U.K. Open Skies discussions?

Mr. SZABAT. Senator, yes, I can, and I do.

Senator MARKEY. You will?

Mr. SZABAT. I will. I have.

Senator MARKEY. All right. All right. We just hope that there will be enough evidence to convict you of having done that, OK, of protecting these people.

Mr. Droegemeier, I've introduced a bill called "The Cyber Shield Act," which creates a cybersecurity certification program, allowing Internet of things, manufacturers to voluntarily certify that their products meet industry-leading cybersecurity and data security benchmarks.

Would you be supportive of that kind of legislation?

Dr. DROEGEMEIER. Yes, sir. I haven't read the bill, but as we talked in your office, I think cybersecurity is really one of the greatest threats facing the nation because of all of the connectivity and all the new things, artificial intelligence, coming online, all the nefarious things that could happen.

So you said of that kind, I absolutely support that, and I'd be happy to read the bill, but I think you're on the right track. We have to have those kinds of measures. Absolutely.

Senator MARKEY. Yes. Thank you. And just finally in terms of science and technology, the atmosphere within this Administration is very aggressively negative on science and technology in terms of allowing for the future to open up and for there to be protection of those apertures which have to be created and so from my perspective, that's going to be the criteria by which I am judging, you know, your nominations.

We thank you for being here. Thank you, Mr. Chairman.

Senator GARDNER. Thank you, Senator Markey.

Senator Cortez Masto.

STATEMENT OF HON. CATHERINE CORTEZ MASTO, U.S. SENATOR FROM NEVADA

Senator CORTEZ MASTO. Thank you. Gentlemen, thank you for your willingness to serve.

Dr. Droegemeier, it was really a pleasure to meet with you. Thank you for taking the time, as well. Welcome to your family. I don't know whose daughter this is but she has been awake and alert the whole time. It is fantastic to see that. Is that your daughter? Your daughter?

Mr. MORHARD. My granddaughter.

Senator CORTEZ MASTO. Your granddaughter, Mr. Morhard.

Mr. MORHARD. Yes.

Senator CORTEZ MASTO. So welcome to the families. This is fantastic.

So let me just say all three of you are going to play important roles in various areas of our economy and society. One of them that is most important that I'm really interested in is technology and innovation. It's playing a big part in Nevada right now of our recovery and economic future. That's why I've worked so hard to—my state, I think, is an innovation state and have introduced, hope to pass, various initiatives, including the Safe Drone Act, the Moving First Act, and the Code Like a Girl Act.

Dr. Droegemeier, let me start with you. Back in April, Senator Peters and I sent a letter to the White House asking for clarification on some of the activities of the Office of American Innovation which is run by Jared Kushner. Four months later, we have received no response at all. I note this because the Federal Government's role on innovation is a big priority of mine and we need to ensure that any office in charge of this issue is being transparent and working with all of us.

I know you're going to be in charge of OSTP and not OAI, but you will work closely with OAI and I just want to see if you're willing to help me get a commitment from that office on the letter with respect to innovation.

Dr. DROEGEMEIER. Well, certainly as you mentioned, Senator, innovation is very important and I'd be happy to be part of that team and work collaboratively with everyone on innovation, very important.

Senator CORTEZ MASTO. Thank you. Thank you. I appreciate that.

So to you and Dr. Morhard, as we talk about innovation and the evolution of technology involved in this space, we're always trying to find a sweet spot between advancing innovation and considering

things, like you've heard from my colleague, cybersecurity, safety, and privacy, as we develop these new technologies.

Can you just let me know how you will be working with other entities in the government to achieve these aims and how we can work with you, as well, to address these concerns?

Dr. DROEGEMEIER. I can tell you that in my view, Senator, it's a very important question. We develop technology very rapidly and we know the pace is huge.

What is much slower is the extent to which we really understand the human uptake, the social use of the technology, and those kinds of things.

We really have to at least get it caught up, get the latter caught up with the former to where we aren't putting technology out there and, all of a sudden, oh, my gosh, now what do we do? You know, people are posting suicide videos on Facebook. Who would have thought? Flash mobs. We've got a whole new thing to deal with.

So I think the pace of discovery and acceleration and innovation is there and we don't want to throttle it back. We have to accelerate the social behavioral aspects because at the end of the day again we're always dealing with people. So this is something that I think OSTP certainly is unique to doing in the government of again seeing the box top, the puzzle, and saying, OK, we've got the technology, we need to bring in these other dimensions and make sure that we're working as an ecosystem, not just purely the technology piece, and I think we've paid prices for that in the past, frankly, for not doing that.

Senator CORTEZ MASTO. Thank you. And, Mr. Morhard, do you have thoughts on that?

Mr. MORHARD. Yes, Senator. UAS traffic management is a good example and I know that's something that you're very much involved with, and it's not just in the United States, it's all over the world, and it's the standards that the Aeronautics Mission Directorate's working on now. They're going to affect the United States but it's going to affect the world, and it's so critical that we do that now before it gets out of control in other places and so I would say we look forward to working with you on it and certainly want to promote it as quickly as we can.

Senator CORTEZ MASTO. Thank you. And let me just highlight this because I say this all the time. As we build this architecture, infrastructure, whatever you want to call it, we should be putting those guardrails in for cybersecurity and privacy at the same time because it is so hard to come back in after the fact and try to lay those over the infrastructure that's been created. So I look forward to working with all of you on those, as well.

Mr. Szabat, one of the stated goals of your office is, and I quote, "Developing policies to improve air service and/or access to the commercial aviation system for small and rural communities."

I appreciate that you specifically noted in one of your priorities and in your testimony this small and rural communities, as well.

Can I get your thoughts on aviation competition for all airports, specifically how you plan to support the mid and small community air service between the two main programs that you noted in your testimony and, as well, in your statement? Nevada has remote places, and I've been to Elko, Nevada, as well as Alamo, and they

both have rural airports there. I'm always concerned about how we include them and should be including them as we talk about this space. So if you don't mind?

Mr. SZABAT. Senator, thank you for the question. I think, as you're aware, under President Trump's Administration, we do have a focus on rural infrastructure and development of technology in rural areas.

So specifically to your question about the airports, you know, you are correct. We have both the Essential Air Service and the SCASDP, Small Community Air Service Development Program, both of which continue to serve airports in Nevada as SCASDP has, and those communities are eligible to continue going forward.

The situation as it affects Nevada is also the same as it is nationwide, is our challenge is if we want to continue to provide these essential air services, we are going to have to work with the communities to find a better way, a cost-effective way to increase the frequency and especially the reliability of the air services to these communities. Without reliability, nothing else matters. Passengers will not come to those airports. They will drive much farther and as the leaders of the communities, I'm sure, have told you, have told us, without those airports, they cannot attract businesses. The economic growth of the community suffers.

So my commitment, if confirmed, Senator, is to work with you, interested members of this committee, and the staff, as well as the officials in these airports themselves to find a better way forward that we can work both between the carriers and the airports to increase the reliability and the frequency of the services to these communities.

Senator CORTEZ MASTO. Thank you very much. I appreciate it. I notice my time is up.

Thank you, Mr. Chair.

The CHAIRMAN. Thank you, Senator Cortez Masto.

Senator Blumenthal.

STATEMENT OF HON. RICHARD BLUMENTHAL, U.S. SENATOR FROM CONNECTICUT

Senator BLUMENTHAL. Thanks, Mr. Chairman.

Mr. Droegemeier, the role of your office and you personally will be in a sense to advocate for scientific integrity and I know a number of my colleagues have remarked on the somewhat disturbing lack of appreciation in this Administration for scientific integrity, undermining the role of science in public policy, withdrawing from the Climate Accord, giving industry undue influence in certain decisionmaking challenges, creating a hostile environment for some Federal scientists, and reducing public access to scientific information.

Do you intend to be an advocate against those kinds of tendencies?

Dr. DROEGEMEIER. Senator, I strongly advocate for—I don't know if I'd say I advocate against or advocate for the positives, but I agree that all the things you mentioned are challenges and problems and science has to be done with integrity. So I think I would either advocate that they be undone or advocate for the positive and if maybe one is the same as the other, but to me, integrity in

science is everything. We owe that to the American taxpayer, we owe it to science, and we owe it to the future of our country to be honest and to conduct science in the absolute most honest way full of integrity and without being encumbered by political influence. So I certainly want to advocate for that, yes.

Senator BLUMENTHAL. And so a hostile work environment for scientists is a threat to public health and safety, is it not?

Dr. DROEGEMEIER. It certainly can be and as we talked about earlier with regard to things like sexual harassment and the kind of work environments. We need environments where we attract people that want to come and do science and work for the government, for example. If we don't have that, then we're not going to get the people that we need and Federal Government scientific enterprise plays a very important role in our country. So we have to have the positive environment. Yes, sir.

Senator BLUMENTHAL. But apart from sexual harassment and other absolutely abhorrent and unacceptable practices elsewhere, respect for scientific integrity is something that you uniquely have to be an advocate for, would you agree?

Dr. DROEGEMEIER. I would absolutely agree with that and that is my plan, sir, yes.

Senator BLUMENTHAL. Thank you.

Dr. DROEGEMEIER. You bet.

Senator BLUMENTHAL. Mr. Morhard, I was interested in some of the questions that have been asked, but I want to repeat the same line at the risk of being overly-repetitive.

Your boss-to-be, if you are confirmed, said that he wanted "somebody who has a lot of space experience, a space professional. It needs to be somebody who has run large organizations, who understands the technology." That's what NASA Administrator Jim Bridenstein said he wanted in his deputy.

What do you say to critics who have indicated you meet none of those qualifications?

Mr. MORHARD. Senator, I appreciate the question. I believe the work at NASA, if I'm confirmed, is empowering scientists and engineers and astronauts and technicians and also the quiet professionals that are behind the scenes that really are the connective tissue of NASA.

For my part, it's really creating an atmosphere for these people of collaboration, of a team, where people can enjoy their jobs and they're able to see a clear vision of success, and that's——

Senator BLUMENTHAL. And I'm more than happy to allow you to make this response in writing for the record.

Mr. MORHARD. Yes.

Senator BLUMENTHAL. I'm going to run out of time.

Mr. MORHARD. OK. I'm sorry.

Senator BLUMENTHAL. So what do you say to critics who say you don't meet those qualifications, you don't have space experience, you're not a space professional, you've never run a large organization, and you have no background in technology? You're going to learn about those things or they're not necessary or what would you say?

Mr. MORHARD. Senator, I'm helping to run an organization right now that's the largest on Capitol Hill and the processes of an orga-

nization, whether it's working in operations or the safety and security side of it, the legal side of it, the H.R. side of it, the budget discipline that's needed, the schedule discipline, all those things are critical and that part, I think I can bring to NASA with folks that don't have that background.

Senator BLUMENTHAL. I appreciate your answer.

Mr. MORHARD. Yes, sir.

Senator BLUMENTHAL. My time has expired. Mr. Chairman, I'd just like to enter into the record the recent survey done by the Union of Concerned Scientists showing pervasive political interference in science in this Administration. I'd like that to be made part of the record.

The CHAIRMAN. Without objection. Thank you, Senator Blumenthal.

[The Union of Concerned Scientists Survey follows:]

Science under President Trump

Voices of Scientists across 16 Federal Agencies

HIGHLIGHTS

The Trump administration is sidelining science from decisionmaking and weakening the federal scientific enterprise. A survey of scientists at 16 federal agencies, conducted by Union of Concerned Scientists and Iowa State University in early 2018, demonstrated significant challenges related to the development and use of science to protect the public from environmental and public health threats at some federal agencies. These challenges include censorship and self-censorship, political interference in scientists' work, low morale, decreased agency effectiveness, and dwindling resources. However, the damage varies widely across agencies, with the EPA and DOI faring poorly and the FDA and NOAA doing relatively well. Political and civil service leadership have significant influence on the state of science at their agencies.

A year and a half into the Trump administration, its record on science policy in several agencies and departments is abysmal. Evidence rolls in daily that this administration is undermining long-established processes for science to inform public policy (Carter et al. 2017). Regulated industries possess increasing power to influence what science is used in policymaking, while public voices are increasingly excluded. In many cases, administration officials have clamped down on public communication and retaliated against experts who share information on politically contentious issues. Some officials have overruled the recommendations of scientific experts, dismissed independent science advisors, and hindered data collection and public access to scientific information.

The administration often disregards science in and excludes agency scientific staff from decisionmaking even when legally bound to consider such evidence. Aided and abetted by Congress, it delays or attempts to eviscerate science-based rules designed to safeguard the American people, protect workers from toxic work environments, and help communities prepare for the impacts of climate change.

Reporters and government investigations have documented scores of examples that demonstrate how the Trump administration has diminished the crucial

Fotki/Shutterstock

In early 2018, the Union of Concerned Scientists and the Center for Survey Statistics and Methodology at Iowa State University surveyed more than 63,000 federal scientists from 16 different agencies. The survey asked about a wide range of issues regarding that state of science in federal agencies including workforce reductions, adherence to scientific integrity policies, and communication of scientific work to the media and the public.

{cSD Center for Science and Democracy at the Union of Concerned Scientists

role of science in our democracy. Yet science and science-based policymaking has proceeded without interference on others. Further, there are significant disparities regarding how different departments and agencies treat science and scientists, with some agencies moving aggressively to limit the use of science and others recognizing its utility.

Yet how do the scientists working for the federal government perceive this administration's record on science policy? How do their views mesh with or contradict the findings of investigators and journalists?

To help gauge the extent and impact of the administration's attacks on science across the government, and to strengthen the voice of federal scientists in public policy, the Union of Concerned Scientists (UCS) and the Center for Survey Statistics and Methodology at Iowa State University surveyed more than 63,000 scientific experts employed by the federal government. Conducted in February and March 2018, the survey addressed issues of scientific integrity at 16 agencies. Detailed methodology and results can be found online at *www.ucsusa.org/2018survey*.

The survey follows and builds on others conducted by UCS since 2005, reaching thousands of federal scientists across multiple federal agencies under the administrations of President George W. Bush and President Barack Obama. Those earlier surveys offer additional insights into the current status of government scientific integrity, and, in some cases, comparisons can be made with the working environment for federal scientists under the Trump administration. More information on past surveys can be found at *www.ucsusa.org/surveys*.

In our 2018 survey, federal scientists echo many concerns raised by media reports on the Trump administration's treatment of science. Scientists report widespread political interference in the science policy process. At some federal agencies, the situation for scientists is worse than it was during the Bush or Obama administrations.

An overwhelming number of federal scientists report that various factors are hollowing out agency workforces.

> ***Federal scientists are doing the best they can, but many report that they lack the resources to inform agency decisions most effectively.***

Gary Perdue/USDA

Federal scientists report that they lack the support and resources they need to perform their job effectively, and that political influence is affecting the integrity of decision-making in their agencies.

This inhibits the ability of scientists to do their jobs effectively, and it compromises their agencies' missions, they report. Scientists also report that the influence of leaders, particularly political appointees and the White House, presents one of the greatest barriers to protecting public health and responding to environmental threats.

Many survey respondents also report censorship of their work, especially work related to climate change. Moreover, the survey provides evidence that scientists fear speaking up when they witness violations of scientific integrity. Many feel they must censor themselves, and they report working in environments inconducive to fulfilling the science-based missions of their federal agencies.

We should ensure that our country's scientists work in places where they can thrive so they can more effectively protect the public's health and safety as well as the nation's—and the world's—environment. Yet taking the survey results together, respondents report that the effectiveness of their agencies, divisions, and offices is low, as are job satisfaction and overall morale. In responses to open-ended questions, many scientists expressed the view that leadership, including officials lacking scientific expertise, are wasting taxpayer dollars through counterproductive reorganizations and clampdowns on scientists' ability to share their knowledge with the public.

Federal scientists are doing the best they can, but many report that they lack the resources and institutional support to inform agency decisions most effectively. That said, the federal government's scientific workforce is remarkably resilient, and the survey findings paint a considerably more positive picture at some agencies. Encouragingly, scientists

perceive significantly less political pressure at the Food and Drug Administration (FDA) and the National Oceanic and Atmospheric Administration (NOAA), where political leadership has been less likely to interfere with or sideline scientists' work. And at all agencies, scientists are aware of—and feel that the agencies generally adhere to—their scientific integrity policies, even while they identified numerous issues that fall beyond the scope of those policies.

Workforce Reductions Inhibit the Ability of Agencies to Fulfill Their Science-Based Missions

Scientific experts within the federal government are essential to ensuring that the best available science informs policymaking, yet many key science positions remain vacant. As of June 2018, the 18th month of his administration, President Trump had filled 25 of the 83 government posts that the National Academy of Sciences designates as "scientist appointees" (Partnership for Public Service and Washington Post 2018—the source is updated near daily). President Obama had filled 63 such positions and President Bush had filled 51 positions only 12 months into their administrations (NAS 2008).

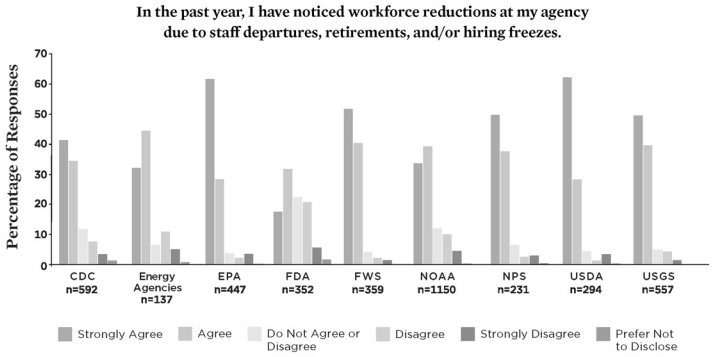
Not only are many positions left vacant, but concern is also widespread that science-based federal agencies are losing critical expertise and capacity due to early retirements, buyouts, sustained hiring freezes, and other departures of scientists from government service. For example, President Trump's budget proposal has included a 20 percent reduction in staffing at the Environmental Protection Agency (EPA); the agency's staffing—14,162 employees as of January 2018—is already the lowest in 20 years (Cama 2018). Other agencies have reported staff reductions, although concrete numbers are hard to come by.

The UCS survey results support concerns of diminished staffing levels, with most respondents reporting workforce reductions (Figure 1):

- Across all agencies, 79 percent of respondents (3,266) reported workforce reductions during the last year due to staff departures, retirements, or hiring freezes.
- Of the respondents who noticed workforce reductions in the past year, 87 percent (2,852) reported that such reductions made it more difficult for their agencies to fulfill their science-based missions.

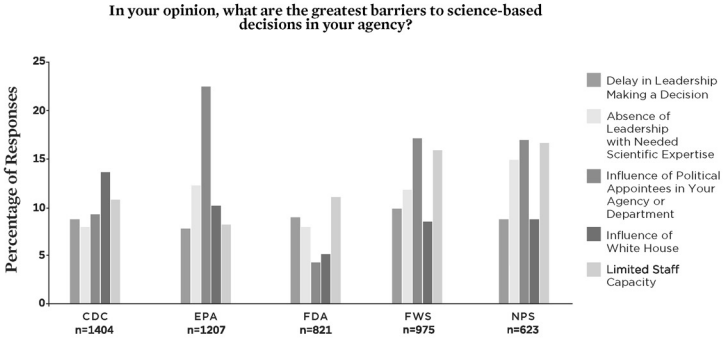
A loss of expert scientists means a loss of independent science and slower progress on critical issues. A respondent

FIGURE 1. Workforce Reductions over the Past Year



Across all agencies surveyed, respondents strongly agreed that they had noticed workforce reductions. More than 90 percent of responding federal scientists at the EPA agreed that the agency's workforce had been reduced over the past year.

FIGURE 2. Top Barriers to Science-Based Decisionmaking



Survey respondents reported that the top barriers to science-based decisionmaking related largely to leadership and limited staff capacity. Survey respondents could choose up to three barriers out of 14 options: delay in leadership making a decision; absence of leadership with needed scientific expertise; uncertainty or disagreement with the science; influence of political appointees in your agency or department; influence of the White House; influence of Congress; influence of other agencies; influence of industry stakeholders; influence of nongovernmental interests (such as advocacy groups); inefficient decisionmaking process within the agency; potential discrepancy with existing rules and regulations; uncertainty of agency jurisdiction; complexity of the issue; limited staff capacity; other; and prefer not to disclose. This figure reflects the five barriers most frequently identified by survey respondents.

from the US Fish and Wildlife Service (USFWS) summed up the problem: "Many key positions remain unfulfilled, divisions are understaffed, and process has slowed to a crawl."

Political Interference Is a Barrier to Scientists' Work

Scientists surveyed widely agree that the influence of political appointees within their agencies and by the White House presents a major barrier to science-based decisionmaking (Figure 2).

This finding is consistent with ongoing reports of political interference in government science over the past 18 months. For example, at the EPA and at agencies within the Department of Interior, the administration has upended the process of reviewing science-based grants and cooperative agreements. Too often, the work of scientists is evaluated based on its alignment with Trump administration priorities

> *"Political appointees at the department level require review and approval of all research grants over $50,000. This impedes new and ongoing research. They react negatively to any surprises; hence, even positive research findings often are not publicized. They want to know who is funding and who is a partner on every research project. They want to see a list of all proposed publications well in advance."*
>
> — Survey respondent from the US Geological Survey

Leadership can strongly influence federal scientists' morale, job satisfaction, and overall effectiveness, and reports of low morale were generally associated with respondents' perceptions of poor leadership.

rather than on its scientific merits (Eilperin 2018). "Political appointees at the department level require review and approval of all research grants over $50,000," noted a respondent at the US Geological Survey (USGS). "This impedes new and ongoing research. They react negatively to any surprises; hence, even positive research findings often are not publicized. They want to know who is funding and who is a partner on every research project. They want to see a list of all proposed publications well in advance."

Further, the White House inappropriately influences scientific work. For example, in early 2018, it delayed publication of a study measuring the health effects of per- and polyfluoroalkyl substances (PFAS), a group of hazardous chemicals found in drinking water and household products throughout the United States (Hiar 2018). Emails released to UCS several months later revealed that the EPA, the White House Office of Management and Budget, and the Department of Defense strong-armed the Agency for Toxic Substances and Disease Registry into censoring the report, stating its release would be "a potential public relations nightmare." When asked to describe any potential problems related to scientific integrity, one EPA survey respondent stated, "[The government] and industry combine to let [the PFAS chemical perfluorooctanoic acid] enter the marketplace too easily without clearly recognizing the consequences to human health and the environment." This type of undue influence is not unique to the EPA:

- Across all agencies surveyed, 20 percent of respondents (2,266) selected either "influence of political appointees in your agency or department" or "influence of the White House" as a top barrier to science-based decisionmaking.
- 32 percent of EPA respondents (319) listed either "influence of political appointees in your agency or department" or "influence of the White House" as a top barrier to science-based decisionmaking; about 25 percent of respondents at the National Park Service (NPS) (159), USFWS (248), and USGS (347) listed these same top barriers. This is particularly notable at the USGS, which, as a nonregulatory agency, had experienced lower levels of political interference in previous years.
- Across all agencies, 50 percent of respondents (1,947) either agreed or strongly agreed that the level of consideration of political interests hindered the ability of their agencies to make science-based decisions. At the Centers for Disease Control and Prevention (CDC), 48 percent of respondents (255) were in agreement; at the USFWS, 69 percent of respondents (235) agreed; 76 percent of NPS respondents (168) agreed; and 81 percent of EPA respondents (345) agreed.
- Across all agencies, 31 percent of respondents (1,208) agreed or strongly agreed that the presence of senior decisionmakers who come from regulated industries or who have a financial interest in regulatory outcomes inappropriately influenced their agencies' decisionmaking. 70 percent of EPA respondents (293) agreed, as did more than 40 percent of respondents at both the USFWS (137) and NPS (94).

Job Effectiveness, Job Satisfaction, and Morale Are Low at Many Agencies

According to several sources, the morale of federal employees has declined. Possible contributing factors include: poor leadership, hiring freezes, proposed budget cuts to many programs and areas of work, and a brief government shutdown. At least two surveys prior to the UCS survey documented a decrease in morale among federal workers under this administration: one conducted by the largest federal workers' union, the American Federation of Government Employees, and another by the Partnership for Public Service, a nonprofit organization. In the survey conducted by the Partnership for Public Service, two-thirds of government employees reported low morale (Naylor 2018; Partnership for Public Service 2017).

The 2018 UCS survey found similar responses. A higher percentage of respondents from the EPA, NPS, USFWS, US Department of Agriculture (USDA), and USGS reported low morale relative to scientists surveyed at other federal agencies. In a comparison with earlier UCS surveys, twice as many EPA respondents rated morale as either poor or extremely

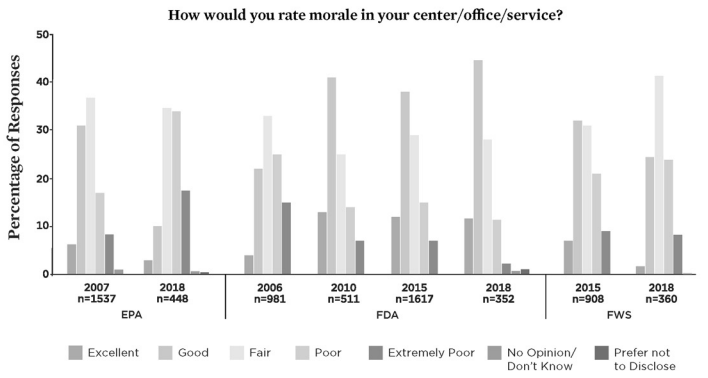
poor in 2018 than in 2007, while it has generally been reported as fair or good over time at both the USFWS and FDA (Figure 3).

The results suggest that leadership can strongly influence federal scientists' morale, job satisfaction, and overall effectiveness, and reports of low morale were generally associated with respondents' perceptions of poor leadership. "The general attitude and morale are negative," noted a respondent from the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE). "This is a leadership problem and it comes from the very top. The attitude is derisive and dismissive. This can make it tough to go to work every day. Government employees are just people."

Poor leadership was reported by more than 39 percent of respondents at the CDC (552), EPA (632), NPS (305), and USFWS (457); in each case, the respondents reported that leadership issues presented major barriers to science-based decisionmaking. In contrast, FDA respondents reported higher morale than at other agencies: only 26 percent of FDA respondents (215 respondents) reported leadership as a barrier (Figure 2). FDA respondents generally supported the work of their commissioner, Scott Gottlieb. One FDA scientist stated, "Fortunately, our new commissioner has knowledge of drug development and we did not get someone from outside the field (such as some of the potential candidates who would have come from Silicon Valley). Although I would likely disagree with many of Dr. Gottlieb's political positions, he is competent and cares about FDA's reputation."

> *"The general attitude and morale are negative. This is a leadership problem and it comes from the very top. The attitude is derisive and dismissive. This can make it tough to go to work every day."*
>
> — Survey respondent from the Department of Energy

FIGURE 3. Reported Morale at Agency Offices and Divisions and across Time



Morale appears to be at an all-time low at the EPA (Goldman et al. 2015; Donaghy et al. 2010; Donaghy, Grifo, and McCarthy 2008; UCS 2006). Federal scientists surveyed by UCS generally reported morale to be fair in their divisions or offices at the USFWS and the FDA over time.

A majority of respondents reported decreased job effectiveness and satisfaction in addition to low morale. Fewer respondents reported that effectiveness and morale had improved. For many federal scientists, this may be due to a hostile work environment, with a large body of research showing that negative work cultures can decrease productivity (Seppala and Cameron 2015). Additionally, many scientists reported that their agencies did not provide them with adequate time and resources to keep up with advances in their professions, such as by attending scientific conferences and meetings. One EPA scientist noted, "There is so much fear and anxiety that my coworkers and management are afraid to make a decision or those above them are afraid for us to make a decision." EPA scientists weren't the only ones to speak out:

- Across all agencies, 39 percent of responding federal scientists (1,624) reported that the effectiveness of their divisions or offices had decreased over the past year. The percentage varied across agencies, from 64 percent of EPA respondents (284) reporting decreased job effectiveness compared with 16 percent of FDA respondents (58).
- 15 percent (643) reported an increase in the effectiveness of their divisions or offices.
- 46 percent (1,921) reported an overall decrease in personal job satisfaction. Such reports were most common at the EPA (65 percent; 292 respondents), NPS (61 percent; 140 respondents), and USFWS (58 percent; 210 respondents).

> *"Fortunately, our new commissioner has knowledge of drug development and we did not get someone from outside the field (such as some of the potential candidates who would have come from Silicon Valley). Although I would likely disagree with many of Dr. Gottlieb's political positions, he is competent and cares about FDA's reputation."*
>
> — Survey respondent from the Food and Drug Administration

Top: Kasha Patel/NPS; bottom: NPS

Scientific evidence clearly shows that climate change is happening, that human activity is causing it, and that we're already feeling the effects in the forms of drought, wildfires, and sea level rise. Yet the Trump administration continues to deny the facts. Survey respondents report censorship of the term "climate change" at multiple agencies, a directive that may cause scientists to censor their own work even further to avoid unwanted attention from agency leadership.

- 45 percent (1,804) of respondents disagreed when asked if they were provided with adequate time and resources to keep up with advances in their profession.
- 37 percent of federal agency scientists surveyed (1,550) reported no change in their personal job satisfaction over the past year; 591 (14 percent) reported an increase in job satisfaction.

Censorship Is an Issue, Especially When It Comes to Climate Change Science

Censorship related to climate change has made headlines since the start of the Trump administration. Right out of the gate, the administration took all mentions of climate change off the White House website. Various agencies followed suit, as has been well documented, removing climate change language from their webpages and suggesting to staff that future communication was forbidden (EDGI 2018). A superintendent for Joshua Tree National Park, which the NPS manages, was flown to Washington, DC, to be reprimanded for tweeting about how climate change would affect the park. Among all

agencies surveyed, NPS respondents were most likely to report climate change censorship. "We've been told to avoid using words like climate change in internal project proposals and cooperative agreements," said one NPS respondent. "Although some projects can be adequately described without using words like climate change, some are harder to do so, and it puts a pall on work involving climate change, which is central to managing the parks."

Across agencies, scientists reported omitting work on issues related to climate change even without explicit orders to do so—in other words, they self-censored their work. A scientist from an energy agency stated, "Although there are staff that work hard to maintain the core work and mission amidst ever-changing guidance on messaging (what words trigger leadership attention), it has become overly burdensome and it would be understandable for staff to, in essence, give up and limit scientifically sound work to avoid conflicts. In my opinion, it is not the majority that continues to creatively think of how to maintain scientific integrity given the current environment, but rather takes the path of least resistance and I honestly cannot blame anyone who does."

In these cases, scientists may get an indirect message that it would be better for themselves and their colleagues to avoid any unwanted attention from agency leadership that might come with mentioning politically contentious topics. Even in the absence of explicit political interference, such self-censorship inhibits scientific expression among the federal workforce, depriving the public and decisionmakers of access to accurate scientific information. The possibility that hundreds of government scientists may be choosing to censor their scientific work and its communication is a strong danger sign about the state of science in the federal government. Scientists reported censorship across four agencies that work on climate change:

- 631 respondents at agencies that work on climate change (18 percent) agreed or strongly agreed that they had been asked to omit the phrase "climate change" from their work. The highest numbers were 100 respondents at the NPS (47 percent) and 147 respondents at the EPA (35 percent).
- 703 respondents (20 percent) reported that they had avoided working on climate change or using the phrase "climate change" without explicit orders to do so. Responses on what is, in effect, self-censorship varied by agency. The highest levels were 169 respondents at the USGS (32 percent) and 134 respondents at the EPA (30 percent).

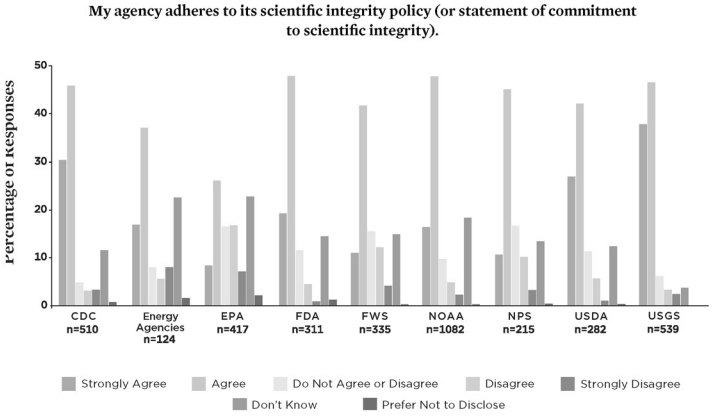
Scientific Integrity Policies at Federal Agencies Are Functioning—But Challenges Loom

At least 28 federal agencies have scientific integrity policies that guide how science should be protected in agency decisionmaking; how federal scientists should conduct and communicate science; how conflicts of interest should be minimized and disclosed; and how scientific disagreements should be resolved. Many agencies also charge scientific integrity officials and committees with implementing these policies. Survey results indicate that many respondents believe their agencies adhere to these policies, and they report receiving training on their whistleblower rights and scientific integrity (Figure 4). Nevertheless, only a minority of scientists would feel comfortable reporting a violation of the scientific integrity policy:

- 64 percent of respondents (2,452) agreed that their agencies adhered to their scientific integrity policies.
- 60 percent of respondents (2,274) agreed that they had received adequate training regarding the contents and procedures in their agencies' scientific integrity policies.
- 42 percent of respondents (1,384) said they would be willing to come forward and report a scientific integrity issue and would trust their agencies to deal with the issue fairly.
- 68 percent of respondents (2,609) agreed that they had been adequately trained on whistleblower rights and protections.

> *"Although some projects can be adequately described without using words like climate change, some are harder to do so, and it puts a pall on work involving climate change, which is central to managing the parks."*
>
> — Survey respondent from the National Park Service

FIGURE 4. Adherence to Agency Scientific Integrity Policies



Most federal scientists reported that their agencies adhere to their scientific integrity policies.

Advancing Scientific Integrity in the Federal Government

When government scientists cannot do their jobs effectively, the public suffers. Every day, Americans depend on the work of experts across the federal government to protect health and safety across our nation. It is crucial that the federal government upholds scientific integrity and that taxpayer-funded scientists are free do their jobs effectively.

The general adherence to scientific integrity policies at federal agencies is a positive note, yet overall the survey results suggest that inappropriate influences loom over federal science. While the survey results suggest that most scientific experts have received adequate training on both scientific integrity policies and whistleblower protections, the need to improve the state of science in the government extends far beyond the scope of such policies. The interference of political leaders in scientific work and the manipulation of well-established decisionmaking processes seem to be diminishing the morale, job satisfaction, and effectiveness of responding federal scientists. As one USGS scientist stated, "USGS scientific integrity guidelines are among the best in the federal service. They are robust and followed by the agency. What happens at the political level is another story."

Survey results show that when employees perceive that political leaders support an agency's mission, such as at the FDA, work effectiveness and overall morale increase. However, results from the UCS survey suggest that political leaders are creating work environments that diminish the overall effectiveness of scientific staff, instill fear in the workforce, and lead to counterproductive self-censorship. As a NOAA scientist stated, "Appointed officials are openly climate change deniers. Climate change has been removed from [White House] webpages. The administration has pulled out of the Paris Climate Accord. Many scientists are reluctant to speak up about science-based evidence that supports climate change observations, let alone discuss how our science can support efforts to build a [nation prepared for extreme weather]."

> ***This state of affairs is unfortunate and dangerous: the public deserves, indeed requires, access to vital scientific information.***

Survey results also suggest that communication issues extend beyond censorship of science to the right of scientists to speak about their work to the public, the news media, and at professional meetings. Many survey respondents feel challenged by review processes added over the past year and a half regarding agency communication of their work. An EPA scientist stated, "EPA employees [have to] undergo a significantly higher degree of review and multiple levels of approval to get information out to the public and this task is time consuming and leads to a time lag for providing timely and important information to the communities within our nation." Many scientists reported feeling that the administration had added mandatory review processes to prevent the public release of anything that ran counter to its agenda.

This state of affairs is unfortunate and dangerous: the public deserves, indeed requires, access to vital scientific information. Leadership should work hand in hand with government scientists to ensure that sound science informs policies vital to the American people's health and safety. Basic principles include the need to:

- demonstrate respect for the value that science instills in decisionmaking processes by transparently allowing independent expertise to inform agency decisionmaking and by publicly supporting agency science;
- through ethics and recusal requirements, reduce the perception that regulated industries influence agency scientific work and decisionmaking, and prohibit political appointees with clear ties to industry from influencing policies on which they lobbied prior to joining the administration;
- foster an environment of trust among agency scientists by creating spaces conducive to effective work, and reassure scientists that the focus of their work should be its quality, not the political acceptability of results;
- fully utilize agencies' peer-review processes for quality control and assurance rather than censoring results or terminology that are legitimate products of the scientific process;
- encourage scientists to speak freely to the public and the news media about their work;
- remove barriers to the timely dissemination of scientific information to the public as much as possible, particularly when related to matters of public health and safety;
- provide the appropriate resources and time for federal scientists to pursue professional development opportunities, including attending and speaking at professional meetings; and
- continue to facilitate training on scientific integrity policies and whistleblower protection rights.

Methodology Details

Sixteen federal agencies were chosen for the survey sample based on their science-based missions, commitment to scientific integrity, and history of past scientific integrity challenges:

- Agricultural Research Services (ARS)
- Bureau of Ocean Energy Management (BOEM)
- Bureau of Safety and Environmental Enforcement (BSEE)
- Centers for Disease Control and Prevention (CDC)
- Economic Research Service (ERS)
- Food and Drug Administration (FDA)
- National Agricultural Statistics Service (NASS)
- National Highway Traffic Safety Administration (NHTSA)

> ***Leadership should work hand in hand with government scientists to ensure that sound science informs policies vital to the American people's health and safety.***

- National Institute of Food and Agriculture (NIFA)
- National Oceanic and Atmospheric Administration (NOAA)
- National Park Service (NPS)
- Office of Energy Efficiency and Renewable Energy (EERE) at the Department of Energy (DOE)
- US Census Bureau
- US Environmental Protection Agency (EPA)
- US Fish and Wildlife Service (USFWS)
- US Geological Survey (USGS)

Due to low response rates, the ARS, ERS, NASS, and NIFA were combined to form a "USDA" category. Similarly, the EERE, BOEM, and BSEE were combined to form an "Energy Agencies" category.

The survey received Iowa State University Institutional Review Board approval (IRB #18-017).

Federal agency staff lists were obtained through publicly available online staff directories and Freedom of Information Act (FOIA) requests. FOIA requests were filed for government agencies with an incomplete online employee directory or no directory at all. FOIA requests resulted in full staff lists from the BOEM, BSEE, NHTSA, NPS, and USFWS. The DOE, EPA, and Census Bureau did not respond to FOIA requests within six months. For these agencies, lists were obtained from either incomplete or inside sources.

From these staff lists, each employee was identified as holding a scientific or nonscientific position based on job title and office within an agency. For the purposes of this survey, a scientist was considered a person whose job involved a significant level of science, including but not limited to research, analysis, modeling, inspection and oversight, and science policy. Full-time federal employees, contractors, and associates were included in the survey; fellows, students, and interns were not. When available, the specific office in which the employee worked was used to exclude large amounts of people who were unlikely to perform the above scientific functions. Common non-scientific offices such as administration, finance, information technology, and facility maintenance were consistently excluded from lists.

As an additional check on job type, the first question on the survey instrument asked respondents to indicate the percentage of time spent on science. Respondents answering zero were routed to the final survey question and excluded from aggregate survey statistics.

Potential survey respondents were sent invitations to fill out the survey via their work email addresses. Participants could complete the survey in any of three ways: online via a link provided in the email, by calling a phone number, or by clicking a link to download a PDF survey instrument that they could complete by paper and mail in. Each email to a potential respondent included a unique identifier associated with the online survey link. Participants completing phone or paper surveys were prompted to supply this code for quality control purposes. The survey was open for responses between February 12, 2018, and March 26, 2018; potential respondents received reminder emails almost weekly. A total of 4,211 scientists responded to the survey; response rates ranged from 19 percent for the USGS to 2 percent for the Census Bureau where scientific staff could not be identified from the sample.

Michael J. Hannah/EPA

The American public deserves policies and decisions rooted in sound science. When the Trump administration puts up barriers to scientific integrity in our federal agencies, they put our health and safety at risk.

Job titles were not available at the EERE, EPA, or Census Bureau when the survey was administered; therefore, it was not possible to identify survey participants with scientific expertise. For these reasons, response rates for these agencies may be skewed lower relative to other agencies.

Survey items included multiple-choice as well as open-ended response types. All quotes contained in this report come directly from open-ended responses.

***Jacob Carter** is the research scientist in the Center for Science and Democracy at the Union of Concerned Scientists. **Gretchen Goldman** is the research director in the Center. **Charise Johnson** is the research analyst in the Center.*

ACKNOWLEDGMENTS

This report was made possible by the support of the Bauman Foundation, the Broad Reach Fund, the Common Sense Fund, the Doris Duke Charitable Foundation, the John D. and Catherine T. MacArthur Foundation, the David and Lucile Packard Foundation, the Rockefeller Foundation, the Wallace Research Foundation, the Walton Family Foundation, the Wilburforce Foundation, and UCS members.

Additionally, the scientific society the American Geophysical Union and other nonprofit organizations, including the Government Accountability Project, Greenpeace, and Friends of the Earth, have provided funding or expert input into elements of the survey. We also would like to thank Iowa State University's Center for Survey Statistics and Methodology and its staff for their support; their deep expertise in the technical and operational aspects of sample surveys through research and operational services made the administration of this survey possible.

The authors would also like to thank the many UCS staff members who reviewed, edited, and otherwise helped shape the direction of this report: Cynthia DeRocco, Michael Halpern, Kathleen Rest, Andrew Rosenberg, Karen Perry Stillerman, Bryan Wadsworth, and David Wright. We also would like to thank Marc S. Miller for editing and Penny Michalak for designing the report.

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The CHAIRMAN. Senator Cruz.

STATEMENT OF HON. TED CRUZ,
U.S. SENATOR FROM TEXAS

Senator CRUZ. Thank you, Mr. Chairman.

Welcome to each of the witnesses. Thank you for your testimony. Congratulations on your nominations.

Mr. Morhard, can you share with this Committee what your views are on what the approach should be to the International Space Station?

Mr. MORHARD. Senator, thank you for the question. I think the International Space Station is one of the greatest technical achievements of our time, and I think there are a number of musts that go with it.

One is that we have got to have the continuity of human space flight. It's critical for our future that that does not get interrupted. Second, I think we need to protect the talent pool in places like Johnson Space Center, and I think, third, we've got to find a viable transition plan that's attractive to this committee because it's not going to go anywhere unless you all agree to it but also attractive to private industry and that allows them, NASA, to focus on deep space if we can find such a transition plan.

Senator CRUZ. Do you agree that we should get the maximum usable life out of the Space Station after the taxpayers have invested over a $100 billion in it?

Mr. MORHARD. I agree that we should get the best use out of it we can.

Senator CRUZ. Do you also agree that it would be catastrophic to cede low earth orbit to the Chinese and have the Chinese operating the only platform in low earth orbit?

Mr. MORHARD. I completely agree with that, and I think they would if they had the opportunity.

Senator CRUZ. Since 2011, Congress has used the appropriation process to prohibit NASA from cooperating with China on space exploration. Do you agree with that prohibition?

Mr. MORHARD. Yes, sir. I worked with Congressman Wolf on the Commerce-Justice-State bill and I'm familiar with the Wolf Amendment and I think it's very appropriate.

Senator CRUZ. Dr. Droegemeier, on the question of global warming that has been an issue that has been deeply politicized in Washington. What are your views on whether questions of science should be driven by political agendas in Washington?

Dr. DROEGEMEIER. It's a great question, Senator. As we talked about earlier before you arrived, I am absolutely firm on the point that science should be conducted without political interference or political influence.

By that, I mean they should not—politicians, appointed individuals, political appointees should not be involved in the scientific process. They should also be free to explain and express their results without any encumbrance from a political process.

If priorities are set, for example, by Congress and then scientists follow the priorities, then, you know, that's a different matter because the research is still being conducted independent of political influence but it's following, OK, artificial intelligence is a priority,

so therefore Congress has said, OK, there's money for artificial intelligence and it should be conducted and so on and so forth, that kind of thing.

But I think fundamentally it should be free from political influence. That's absolutely to me non-negotiable and completely conducted with integrity.

Senator CRUZ. Should questions of policy concerning science be dictated by actual data and evidence rather than political agendas of Members of Congress who want to expand government control over the economy?

Dr. DROEGEMEIER. Well, certainly my role, if I'm confirmed as Director of OSTP, is to bring unbiased science, the best science available to the Executive Branch, to all parties and make sure that that information is at the table and available for policymaking.

Senator CRUZ. Do you believe there is only one acceptable and permissible view when it comes to issues of climate?

Dr. DROEGEMEIER. I know that there are multiple views. To me, Senator, I welcome all points of view. As a scientist, I get very concerned, and I've read articles where they say, OK, this particular viewpoint is science, not climate necessarily, but is absolutely settled.

Science rarely provides immutable answers about anything. We thought we understood the atom. Now there are quarks and subatomic particles.

So we have to, I think, be open and inclusive to all points of view. I think science is the loser when we tend to vilify and marginalize other voices. I think we have to have everyone at the table talking about these things and let the science take us where it takes us and that's certainly how I've run my whole career.

Senator CRUZ. And are you familiar with the empirical data from satellite measurements that this committee, Subcommittee on Science and Space, has heard testimony on that from the satellite measurements show no statistically significant warming over the past 18 years?

Dr. DROEGEMEIER. Yes, I'm familiar with some of the studies. I don't study climate personally but I'm aware of those studies, yes.

Senator CRUZ. Thank you.

Dr. DROEGEMEIER. Yes, sir.

The CHAIRMAN. Thank you, Senator Cruz.

Senator Lee.

STATEMENT OF HON. MIKE LEE,
U.S. SENATOR FROM UTAH

Senator LEE. Thank you, Mr. Chairman. Thanks to each of you for being here.

I'd like to start with you, Mr. Szabat. I want to talk to you a little bit about supersonic flights. As you know, since 1973, the FAA has prohibited commercial supersonic flight over land. There's been just a complete ban on this. Since then, there have been a lot of technological developments, of course, that might change that picture.

Do you support the idea of revisiting that ban so that the U.S. could become a leader yet again in supersonic flight?

Mr. SZABAT. Senator Lee, thank you for the question and for talking about this important emerging or, in the case of supersonic flight, re-emerging technology that we're looking at as a possible way to advance the national air system that we have in the United States.

So the short answer to your question is yes. The longer answer is within the Department of Transportation, we always want to relook at technologies as there are advances and as there are different ways of looking at them to find and integrate them into our aviation system.

Secretary Chao's Number 1 priority to do this is in a safe way and if we can find a way to integrate it, we will. This is primarily the responsibility of the Federal Aviation Administration, but, Senator, if confirmed, I would work with you, with your staff, with other interested parties to ensure that your input and your concerns are addressed by the affected offices within the Office of The Secretary as well as the Federal Aviation Administration.

Senator LEE. I appreciate that, and as we address this issue, I'd suggest that we have a look-back at 1973. 1973 was a long time ago. It's the year my wife was born, so I shouldn't refer to it as that long ago.

But in technological terms, 45 years ago might as well be a millennium. I mean, we didn't dream of any of the devices that we each now have within an arm's reach. The computing processing power that each of us has in our own pocket at any given moment outpaces anything in existence back then, and with those technological developments, we've had other scientific developments that have made it possible to revisit the all-out ban on overland supersonic commercial flight.

And so I assume you would agree that at least a strong argument can be made that the total ban I'm referring to has outlived its usefulness and has outlived its relevance in our modern technological age. Do you agree with that?

Mr. SZABAT. Yes, Senator.

Senator LEE. OK. Thank you.

Mr. Droegemeier, I want to talk about spectrum for a minute. We live in an exciting time. Exciting opportunities are already here. They're getting even more exciting as we imagine newer and more efficient uses of spectrum, Spectrum that could improve the quality of life not only for hundreds of millions of Americans but for billions of people throughout the globe, from basic communication to sophisticated offerings, like tele-medicine and like driver-assisted technology.

The development of our spectrum and our increased ability to use it is becoming more and more important to more people. It's going to save lives and it's going to improve the quality of life for basically everyone.

Some have estimated that upwards of 60 percent of radio and spectrum is set aside not eligible for auction for any kind of commercial use, upwards of 60 percent, and that is predominantly for government use. There are a few other uses built into that 60-percent set-aside, but the overwhelming majority of that is set aside for government use.

Would you agree that in order to reach our potential that Congress and the Administration will need to make Federal spectrum holdings more transparent and more efficient and perhaps revisit the presumption that 60 percent of the spectrum needs to be kept off limits?

Dr. DROEGEMEIER. That's a very important question. I'm not familiar with the 60-percent issue you raise, but in the work that I've been involved with in terms of radars across the country, the idea was to consolidate several different bands, spectral bands of radars into a single system, so that other Spectrum could be auctioned and made available.

So I'm familiar with the topic and the importance of it, but I'd have to get read up on this particular issue. It does sound like something extremely important because it addresses the issue of commercial entities being able to use spectrum and have it available to do things with and so on. So I'd love to get back to you on that, but I certainly would work with you on that. It sounds like it's something very important to work on together.

Senator LEE. Thank you.

Dr. DROEGEMEIER. So I would love to do that.

Senator LEE. I appreciate that, and I want to be clear, I certainly understand the need for the government to retain——

Dr. DROEGEMEIER. Right.

Senator LEE.—a portion of it. For military and other government uses, there's absolutely a strong, even compelling need for the government to have some spectrum and for that spectrum not to be auctioned off for commercial use, but I will note, generally speaking, what has been allocated for commercial use is usually utilized far more efficiently. People figure out how to make the most of it and when the majority of it is never even allowed to enter into that sphere, I worry that we're neither being transparent nor efficient in our utilization of the government's set-aside spectrum. So I hope you'll work with me on that.

Thank you very much. I see my time has expired, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Lee, and a very important point and one that this Committee has a very sincere interest in. We've got to make more spectrum commercially available. There are going to be tremendous needs out there and demands for it and particularly given the fact that, as we are in the race to 5G, that's going to be an important component of winning. So we've got to make sure that we're doing everything we can and we hope that you will, in follow-up to your discussions with Senator Lee, work with him and with this Committee to try and figure out ways to make more of that.

Government sits on a lot of spectrum and it's not in some cases efficiently utilized and we've got to do better. So thank you for that, for your responses to that.

Mr. Morhard, NASA's one of the country's greatest resources when it comes to inspiring young Americans to study STEM-related fields.

What do you view NASA's role to be in inspiring the next generation of STEM professionals?

Mr. MORHARD. Senator, thank you for that question. I've been looking at this, trying to get up to speed on it, and I sat on the

Senate Floor in the 1980s with Barry Goldwater and Sam Nunn talking about the same issue. They weren't talking about STEM but they were talking about the concern of the growth in education outside of the United States and that we weren't there and we were losing it and we're still talking about it now.

The role of NASA is a core mission for NASA and, as you know, in the appropriations process, the House has put in $90 million and the Senate has put in a 110 last year, this year's budget's a hundred, and so we're going to—I expect we'll see somewhere a level playing field, but the real question is, for me, is the money being used for the best purposes of providing that inspiration, and I think, if I'm confirmed, it's looking at how it's being used.

I've seen hearsay evidence that it's much more effective in middle school versus in colleges because people are already making their decisions when they're getting to college and it's really inspiring people, like my granddaughter, that they're at that sweet spot.

I think that's—you know, if I'm answering your question correctly, that's what I will try to focus on is are we using it correctly?

Space grants are a consortium. Judd Gregg had me put together a consortium for counterterrorism grants and I saw over time consortiums take on a life of their own and they begin to expect the money and I think that we still need to provide funding but it has to be effectively used.

The CHAIRMAN. I absolutely don't disagree with that, and I do think that figuring out, yes, how to do get to that next generation of young people who might aspire to these fields are really critical. We look forward to working with you and obviously with Dr. Droegemeier and others in that endeavor because I think it's an important one to have the workforce of the future, those young people who hope and dream to be a part of something that's greater than themselves and to serve those higher purposes. I think this is certainly a field where that's been true for previous generations of Americans and we want to make sure it's available to those in the future.

Dr. Droegemeier, in AICA, we also directed OSTP and OMB to establish an interagency working group to reduce administrative and regulatory burdens of federally funded researchers to maximize our basic research dollars.

How will you ensure that this ongoing effort continues and is prioritized at OSTP?

Dr. DROEGEMEIER. Thank you for that, Senator Thune, and thank you for doing that.

When I was on the National Science Board, we wrote a report on reducing administrative burden. Now the National Academies has opined on that, as well, in a report.

It's got to be a great priority because it's wasteful. When we talk about wasting taxpayers' money, this is a waste not only of money, I believe, but also intellectual capacity and wasting the talent of Americans in science to me is really a horrible thing.

My colleague, I think she's sitting back there, Maria Zuber, has opined on this, as well, that there is a lot of money to be saved if we can reduce the administrative burden, free up time. It will recapture a lot of the funding that is now being spent on wasteful activities that really don't enhance the research enterprise.

So were I to be confirmed for OSTP, this would be a high priority. It's in the AICA Bill, as you say, and it's also something that is in the gun sights of OSTP with the interagency working group that you mentioned. So OSTP is definitely working on it but we've got to see it over the finish line. We're not there yet.

The CHAIRMAN. OK. We hope you will. I think we've kind of exhausted obviously the members' questions. We appreciate your responses.

I will ask unanimous consent to include in the record an introductory letter for Mr. Jim Morhard from Senator Patrick Leahy and letters for Dr. Kelvin Droegemeier from the EPSCoR/IDeA Coalition and Foundation, Association of American Publishers, American Psychological Association, American Association for Cancer Research, Association for American Medical Colleges, Council of Graduate Schools, Consortium for Ocean Leadership, IEEE-USA, a letter from retired Chairman and CEO of Lockheed-Martin Corporation, Norman Augustine, and former Director of the National Science Foundation and White House Office of Science and Technology, Neal Lane, EPIC, and Research America. So you're obviously very well supported out there.

So we'll ask that those be included as a part of the record without objection.

[The information referred to follows:]

The EPSCoR/IDeA Coalition and Foundation
800 Maine Avenue, SW
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August 15, 2018

The Honorable John Thune
Chairman
Senate Committee on Commerce, Science & Transportation
512 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Bill Nelson
Ranking Member
Senate Committee on Commerce, Science & Transportation
425 Hart Senate Office Building
Washington, DC 20510

Dear Chairman Thune and Ranking Member Nelson:

We write to strongly endorse and support the nomination of Dr. Kelvin K. Droegemeier, the Oklahoma Secretary of Science and Technology and Vice President for Research at the University of Oklahoma, to become the next Director of the White House Office of Science and Technology Policy. We believe that Dr. Droegemeier will seek to implement a strong research and development portfolio for the entire Nation.

Dr. Droegemeier's qualifications for the position of Science Advisor are superb and have been well documented. He founded Weather Decisions Technology, a private company employing almost 100 people. This company was a result of his leadership as co-founder, and later Director, of the National Science Foundation (NSF) Science and Technology Center for Analysis and Prediction of Storms, which is recognized around the world as the pioneer of storm-scale numerical weather prediction.

Dr. Droegemeier was appointed to the National Science Board twice. First by President George W. Bush and then again for a second six-year term by President Barack Obama. In both cases, his appointment was confirmed by the United States Senate. While serving on the National Science Board, Dr. Droegemeier chaired several important committees including the Task Force on Administrative Burdens, which reviewed the administrative workload placed on federally funded researchers and recommended ways to alleviate unnecessary or duplicative requirements. In the last four years of his term on the National Science Board he was elected and served as Vice-Chairman.

Dr. Droegemeier is a Fellow of the American Meteorological Society and the American Association for the Advancement of Science. He has served as Chair of the Association for Public and Land Grant Universities Council on Research and is on numerous other boards. Dr. Droegemeier has testified before Congress and provided insight on legislative issues important to the research community including before your committee during consideration of the American Competitiveness and Innovation Act.

Dr. Droegemeier has the respect of both Republicans and Democrats in Congress. As members of the EPSCoR/IDeA Coalition and the EPSCoR/IDeA Foundation Boards of Directors, we have witnessed Dr. Droegemeier's scientific expertise, keen insights, his ability to forge alliances between academia and industry and his commitment to demonstrating the tangible, economic impacts of research throughout the United States.

As Vice Chairman of the National Science Board, Dr. Droegemeier reminded his peers of the mandate in the NSF Act of 1950 that "it shall be an objective of the Foundation to strengthen science and engineering research potential and education at all levels throughout the United States and avoid undue concentration of such research and education, respectively…" The 27 jurisdictions currently participating in the NSF EPSCoR program receive only about 10 percent of the NSF budget, and it is critical to have a Science Advisor who will work to improve the research capacity and capability of every state in the Nation. A strong research base means enhanced education, training and workforce development as well as the ability to assist local businesses and industries to respond to local issues and needs. Federal research funding has economic and quality of life implications for states, communities and individuals across the nation.

Given that the majority of college freshman attend public four-year colleges within 50 miles from home, it is imperative that the Science Advisor understand that the next Albert Einstein or Bill Gates could hail from anywhere in the United States, that our higher education systems should be superlative in all states in order to nurture local talent, and that students should not be required to leave their states to aggregate in just a few places for research opportunities. Through his affiliation with the University of Oklahoma, an institution in an EPSCoR/IDeA state, Dr. Droegemeier is well aware of these challenges and we believe that he can fairly address research disparities.

Finally, we would be remiss if we did not highlight some of Dr. Droegemeier's qualities that make him the right choice for this position. He is humble and forthright. He treats everyone with fairness and respect. He truly wants to find solutions to problems and has the ability to bring discordant groups together to arrive at practical compromises. In short, Dr. Droegemeier has the energy and enthusiasm to ensure that the United States remains a global leader in scientific knowledge and innovation.

We would welcome the opportunity to provide any other information or discuss further the selection of Dr. Droegemeier as the President's Science Advisor. We respectfully ask the Committee to support this nomination.

Sincerely,

Chris Lawson, Ph.D.
EPSCoR/IDeA Coalition of States
Chairman

Larry Cornett, Ph.D.
EPSCoR/IDeA Foundation
Chairman

AAP ASSOCIATION OF AMERICAN PUBLISHERS

August 20, 2018

The Honorable John Thune
Chairman, Committee on Commerce,
Science and Transportation
United States Senate
512 Dirksen Senate Office Building
Washington, D.C. 20510

Via email

The Honorable Bill Nelson
Ranking Member, Committee on Commerce,
Science and Transportation
United States Senate
425 Hart Senate Office Building
Washington, D.C. 20510

Via email

Re: Nomination of Dr. Kelvin K. Droegemeier as Director of the White House Office of Science & Technology Policy

Dear Chairman Thune and Ranking Member Nelson:

On behalf of the Association of American Publishers (AAP), I write in support of the nomination of Dr. Kelvin K. Droegemeier for the position of Director of the White House Office of Science and Technology Policy. AAP represents the leading book, journal, and education publishers in the United States on matters of law and policy. We believe in a strong copyright system that incentivizes and protects the publication and dissemination of creative expression and professional content.

AAP members are important stakeholders of the Office of Science and Technology Policy and important partners in the greater, competitive research community that is so important to the United States. More than 150 members of AAP publish in scientific, technical and medical (STM) fields. Together, these publishers support approximately 40,000 jobs across the country.

AAP urges the Committee to move forward with the confirmation of Dr. Droegemeier. The Office has been without a confirmed leader for more than a year-and-a-half, to the detriment of U.S. interests and global advancements in the areas of science and technology.

Dr. Droegemeier is a strongly qualified scientist who has the additional advantage of bringing policy experience to the position. This experience includes his work as founder and director of the National Science Foundation's (NSF) Science and Technology Center for Analysis and Prediction of Storms and the NSF Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere, as well as Vice-Chair of the National Science Board.

AAP notes with interest Dr. Droegemeier's longstanding commitment to public-private partnerships that transform research into marketable products that improve the lives of Americans and enhance American competitiveness. The publishing industry shares this results-oriented mindset, as we contribute enormously to the marketplace that makes such results possible and maximally useful. Publishers have played a key role in the most successful science and technology commercialization

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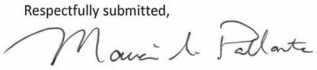
ecosystems in the world, by which scientists, engineers and others collaborate with the private sector to build on, invest-in and further disseminate critical knowledge.

In 2013, the Office of Science and Technology Policy acknowledged these critical contributions, noting that scientific publishers "provide valuable services...that are essential for ensuring the high quality and integrity of many scholarly publications." Because Dr. Droegemeier is a published scientist of some 80 refereed journal articles, we trust that he too will appreciate the importance of the publishing industry and actively work with AAP and our members in the course of his government service.

Thank you very much for considering the views of the publishing industry.

Respectfully submitted,



Maria A. Pallante
President and CEO

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August 22, 2018

The Honorable John Thune
Chairman
U.S. Senate Committee on Commerce,
Science, and Transportation
Washington, DC 20510

The Honorable Bill Nelson
Ranking Member
U.S. Senate Committee on Commerce,
Science, and Transportation
Washington, DC 20510

Dear Senators Thune and Nelson:

On behalf of the American Psychological Association (APA) and its 115,700 members and affiliates, we would like to submit the following questions for the record for the nomination hearing of Dr. Kelvin Droegemeier, of Oklahoma, to be the Director of the Office of Science and Technology Policy (OSTP):

- Given the number of priorities competing for funding across the federal government, why is it imperative that we invest in basic research at agencies like NIH and NSF? Specifically, what do you see as the value of the behavioral and social science research from these agencies in addressing our national priorities, and what role do you see OSTP playing in guiding future scientific advances at these agencies?

- As tragedies relating to the opioid epidemic continue to mount, it becomes essential to examine new methods of addressing the crisis. Prescription drug monitoring databases are already an essential tool for combating substance use. How can we use big data, AI, psychology-based provider-level interventions, and other available tools in coordination with these monitoring programs to further reduce the odds of anyone else losing loved ones to this epidemic, and what role do you see OSTP serving in this process?

- Healthcare costs continue to be a significant driver of federal spending. What do you see as the greatest opportunities for behavioral science, health information technology, big data, and AI to reduce these costs?

- The Office of Management and Budget (OMB) recently released a Request for Information (RFI) to gather input to be used in establishing a Government Effectiveness Advanced Research (GEAR) Center, an initiative similar to the work performed by the Social & Behavioral Sciences Team (SBST) from the last Administration. The SBST effectively scaled up and applied research to a range of societal issues, including improving retirement security, improving college access and affordability, advancing economic opportunity and

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AACR American Association for Cancer Research
FINDING CURES TOGETHER℠

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August 22, 2018

The Honorable John Thune
Chairman
Committee on Commerce, Science,
and Transportation
United States Senate
Washington, D.C. 20510

The Honorable Bill Nelson
Ranking Member
Committee on Commerce,
Science, and Transportation
United States Senate
Washington, D.C. 20510

Dear Chairman Thune and Ranking Member Nelson:

The American Association for Cancer Research (AACR), with over 40,000 members, is the oldest and largest scientific organization in the world dedicated to the prevention and cure of cancer through research, education, communication, and collaboration. **As the Committee on Commerce, Science, and Transportation moves forward with Senate confirmations of executive branch nominees, the AACR urges you to support the appointment of Kelvin K. Droegemeier, PhD, as director of the White House Office of Science and Technology Policy (OSTP).**

Droegemeier is an accomplished meteorologist who has been at the University of Oklahoma for more than 30 years and currently serves as Vice President for Research, Regents' Professor of Meteorology, Weathernews Chair Emeritus, and Roger and Sherry Teigen Presidential Professor. Droegemeier's academic research has focused on understanding severe weather dynamics and improving weather prediction, particularly for thunderstorms and tornados. His many contributions to the field include helping develop the use of supercomputers in atmospheric modeling.

In addition to his strong scientific credentials, Droegemeier has acted in a high-level advisory capacity to state and federal government entities. He served on the National Science Board of the National Science Foundation, having been appointed by both Republican and Democratic administrations. As testament to his leadership on the National Science Board, he was elected as its vice chair in 2012. He also played a role in crafting bipartisan federal legislation to improve weather forecasting.

Science and technology touch every aspect of American life and policy including health, commerce, agriculture, environment, and defense. Having a strong OSTP Director is vital to sustaining innovation and incorporating scientific evidence into policy. The AACR is confident that Droegemeier has the scientific expertise, policy experience, and

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temperament to bring stakeholders together to solve America's pressing science and technology policy challenges.

Sincerely,

Margaret Foti, PhD, MD (h.c.)
Chief Executive Officer
American Association for Cancer Research

George D. Demetri, MD
Chair, Science Policy and Government Affairs Committee
American Association for Cancer Research

Cc: Majority Leader Mitch McConnell
Minority Leader Charles E. Schumer

AAMC

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American Medical Colleges
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August 23, 2018

The Honorable John Thune
Chair
Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

The Honorable Bill Nelson
Ranking Member
Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Chairman Thune and Ranking Member Nelson:

The Association of American Medical Colleges (AAMC) is pleased to support the nomination of Kelvin Droegemeier, PhD, to be Director of the White House Office of Science and Technology Policy (OSTP).

The AAMC is a not-for-profit association dedicated to transforming health care through innovative medical education, cutting-edge patient care, and groundbreaking medical research. Its members are all 151 accredited U.S. medical schools; nearly 400 major teaching hospitals and health systems, including 51 Department of Veterans Affairs medical centers; and more than 80 academic societies. Through these institutions and organizations, the AAMC serves the leaders of America's medical schools and teaching hospitals and their more than 173,000 full-time faculty members, 89,000 medical students, 129,000 resident physicians, and more than 60,000 graduate students and postdoctoral researchers in the biomedical sciences.

As you know, for over 40 years, the OSTP Director has served as the President's Science Advisor, helping to inform the Executive Office of the President and the broader federal government on matters related to science, engineering, and technology. The AAMC strongly believes Dr. Droegemeier's extensive experience, including his tenure as Vice President for Research at the University of Oklahoma and his time as Vice Chair of the governing board of the National Science Foundation, provide him with a solid understanding of the scientific landscape. These qualifications will equip him well to oversee the office, offer sage counsel, and help shape a thriving, evidence-based federal science agenda.

Every American benefits from a strong national commitment to research and development, and ensuring strong leadership at OSTP is instrumental to achieving such a goal. The nation's medical schools and teaching hospitals are proud to support Dr. Droegemeier's candidacy in filling that role. We urge the Committee to support his nomination as well, and we hope the full Senate will follow suit with a swift vote to confirm him as the OSTP Director.

Sincerely,

Atul Grover, M.D., Ph.D.
Executive Vice President

cc: Members of the Senate Committee on Commerce, Science, and Transportation

COUNCIL OF GRADUATE SCHOOLS

August 21, 2018

The Honorable John Thune
Chair, Committee on Commerce, Science & Transportation
United States Senate
Washington, DC 20510

The Honorable Bill Nelson
Ranking Member, Committee on Commerce, Science & Transportation
United States Senate
Washington, DC 20510

Dear Chairman Thune and Ranking Member Nelson:

On behalf of the Council of Graduate Schools (CGS), I write in support of the nomination of Kelvin Droegemeier, PhD, for Director of the Office of Science and Technology Policy (OSTP). For more than five decades, the Council of Graduate Schools (CGS) has served as the national organization dedicated solely to advancing graduate education and research—our membership includes over 500 institutions of higher education in the United States, Canada, and internationally. Our institutions award the majority of U.S. doctoral and master's degrees.

OSTP is vital to the overall functioning of the federal government's various science programs and agencies, all of which have an impact on the graduate education enterprise and its ability to perform science and research, at the highest levels, and to develop innovations critical to our economy, national security, and global competitiveness.

Dr. Droegemeier's impressive resume and qualifications, including his leadership at the University of Oklahoma, his role as Oklahoma's secretary of science and technology, and as former Vice Chair of the National Science Board, make him an exceptional candidate to lead OSTP. He is well-respected and lauded by the scientific community.

I urge the committee, and then the full Senate, to swiftly review and confirm his nomination.

I hope you will consider CGS as a resource in your work. If you have further questions, or if CGS can be of assistance, please contact our Vice President of Public Policy and Government Affairs, Lauren Inouye, at Linouye@cgs.nche.edu or (202)-461-3864.

Sincerely,

Suzanne T. Ortega

Suzanne T. Ortega
President

CC: Members of the Senate Committee on Commerce, Science & Transportation

August 21, 2018

The Honorable John Thune
Chairman
Committee on Commerce, Science and Transportation
United States Senate
Washington, D.C. 20510

The Honorable Bill Nelson
Ranking Member
Committee on Commerce, Science and Transportation
United States Senate
Washington, D.C. 20510

Dear Chairman Thune and Ranking Member Nelson:

On behalf of the Consortium for Ocean Leadership (COL), which represents our nation's leading ocean science, research, and technology organizations from academia, industry, and aquaria, I want to express my support for the nomination of Dr. Kelvin Droegemeier to be director of the White House Office of Science and Technology Policy (OSTP). His vast experience with both geoscience and science policy make him a decidedly qualified nominee to lead OSTP and help set federal science priorities.

At a time when the changing climate and ocean threaten our security and prosperity, his expertise in atmospheric science will prove invaluable in guiding the critical work OSTP does advising the executive branch on crucial scientific challenges and opportunities related to earth sciences that face our nation, and in reviewing associated federal funding priorities.

In addition to his impressive science credentials (including 33 years as faculty at the University of Oklahoma in Norman and serving as the school's vice president for research since 2009), Dr. Droegemeier is no stranger to the intersection of scientific research and public policy. During his 12-year tenure on the National Science Board (including four years as vice chair), he helped guide many National Science Foundation initiatives and task forces, and as Oklahoma's Secretary of Science and Technology, he advised the governor on science and technology strategies for the state. His time spent in academia, public service, and the private sector would serve him well in this role.

COL looks forward to working with Dr. Droegemeier on ensuring that sound science continues to underpin our national policy decisions and that federal science agencies receive the resources they need to successfully fulfill their missions. I hope the committee (followed by the Senate) moves quickly to review and confirm Dr. Droegemeier to this position, which has been unfilled for nearly 600 days.

Respectfully,

Jonathan W. White, RADM (Ret.), USN
President and CEO
Consortium for Ocean Leadership

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CONSORTIUM FOR Ocean Leadership

VOTING MEMBERS
Bermuda Institute of Ocean Sciences
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Mote Marine Laboratory
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Pennsylvania State University
Rutgers University
Skidaway Institute of Oceanography of the University of Georgia
Stanford University
Stony Brook University
Texas A&M University
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University of California, Davis
University of California, San Diego (Scripps)
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Consumer Energy Alliance (CEA)
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Gordon and Betty Moore Foundation
Hubbs-SeaWorld Research Institute
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U.S. Arctic Research Commission
University of Maine
University of Victoria Ocean Networks Canada
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IEEE★USA

IEEE

August 20, 2018

The Honorable John Thune
Chairman
Committee on Commerce, Science, and Transportation
United States Senate
Washington, DC 20510

The Honorable Bill Nelson
Ranking Member
Committee on Commerce, Science, and Transportation
United States Senate
Washington, DC 20510

Dear Senators:

On behalf of the 180,000 men and women represented by the IEEE-USA in the United States, I urge you to approve the nomination of Dr. Kelvin Droegemeier as the Director of the White House Office of Science and Technology Policy, and to do so quickly.

Dr. Droegemeier is eminently qualified to be the next Director of OSTP. He is a tenured professor of Meteorology at the University of Oklahoma and an internationally recognized expert in extreme weather events. Moreover, Dr. Droegemeier has already helped set America's research priorities for over twenty years – as a leader with the National Science Board (including two terms as Vice Chair) and as Director and Deputy Director at the National Science Foundation's Center for Analysis and Prediction of Storms. Additionally, Dr. Droegemeier has also served as the Secretary of Science and Technology for the Governor of Oklahoma since 2017.

In short, Dr. Droegemeier is a highly accomplished researcher, a globally respected scientist and an experienced adviser on public policy, which is exactly what this country needs in an OSTP Director.

The position of Director of the White House Office of Science and Technology Policy plays a critically important role in setting technology and science policy for the United States. IEEE-USA is certain that Dr. Kelvin Droegemeier is the person to fill this role.

We urge you to expeditiously approve Dr. Droegemeier's nomination.

Thank you.

Sincerely,

Sandra L. Robinson

2018 President, IEEE-USA

cc: Senate Committee on Commerce, Science, and Transportation Committee members

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August 20, 2018

The Honorable John Thune
Chair, Committee on Commerce, Science & Transportation
United States Senate
Washington, DC 20510

The Honorable Bill Nelson
Ranking Member, Committee on Commerce, Science & Transportation
United States Senate
Washington, DC 20510

Dear Chairman Thune and Ranking Member Nelson:

We would like to offer our strong support for the President's nomination of Dr. Kelvin Droegemeier to be Director of the Office of Science and Technology Policy (OSTP).

Dr. Droegemeier is highly respected for his research on extreme weather. His work has led to improvements in providing warnings to communities ahead of severe storms. He has taught courses on weather and climate for many years at the University of Oklahoma. He is a highly respected administrator, having served as the University's Vice President for Research and as Secretary for Science and Technology in the Oklahoma governor's office. He has advised both the George W. Bush and Obama administrations in Washington through his service on the National Science Board, an important arm of the National Science Foundation. He understands the importance of integrating science and technology into the decision-making process associated with pressing issues facing the nation (e.g., national security, economic resiliency, environmental management, etc.). In our view he would be an outstanding Science Advisor in any Administration.

The Nation will be well served by the expeditious confirmation of Dr. Droegemeier to be the next Director of the Office of Science and Technology Policy. Thank you for the opportunity to offer our support for his nomination.

Sincerely,

Norman Augustine
Retired Chairman & CEO, Lockheed Martin Corporation
16-year Member of President's Council of Advisors on Science and Technology

Neal Lane
Senior Fellow, Rice University's Baker Institute for Public Policy
Former Director of the National Science Foundation and White House OSTP

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August 21, 2018

The Honorable John Thune, Chairman
The Honorable Bill Nelson, Ranking Member
U.S. Senate Committee on Commerce, Science, & Transportation
512 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Thune and Ranking Member Nelson:

We write to you in advance of the Nominations Hearing for Dr. Kelvin Droegemeier, of Oklahoma, to be the Director of the Office of Science and Technology Policy.[1] We express no views for or against the nominee, but we believe it is vitally important for the OSTP to begin a public consultation on the future of Artificial Intelligence.

EPIC, leading scientific organizations, including AAAS, ACM and IEEE, and nearly 100 experts recently urged the White House to solicit public comments on artificial intelligence policy in a petition to the Office of Science and Technology Policy.[2] We sent the petition to the OSTP because that is the agency that the White House designated to lead the Administration's work on this topic. However, the current structure excludes public participation and has already failed to identify key issues that the nation should consider as Artificial Intelligence plays a greater role in our lives. The OSTP should recommend, and Congress should implement, extensive oversight mechanisms to oversee the use of AI by federal agencies to require algorithmic transparency, particularly for government systems that involve the processing of personal data.

The Electronic Privacy Information Center ("EPIC") is a public interest research center established in 1994 to focus public attention on emerging privacy and civil liberties issues.[3] EPIC has promoted algorithmic transparency" for many years and has litigated several cases on the frontlines of AI in the federal government.[4] EPIC successfully sued U.S. Customs and Border Protection for documents relating to its use of secret, analytic tools to assign "risk assessments" to U.S. travelers.[5] In *EPIC v. DHS*, EPIC sought to compel the Department of Homeland Security to produce documents related to a program that assesses "physiological and behavioral signals" to determine the probability that an individual might commit a crime.[6] EPIC also sued the Department

[1] *Nominations Hearing*, 115th Cong. (2018), S. Comm. on Commerce, Science, and Transportation (Aug. 23, 2018), https://www.commerce.senate.gov/public/index.cfm/2018/8/nominations-hearing.
[2] Letter from EPIC et al. to Mr. Michael Kratsios, Deputy U.S. Chief Technology Officer (July 4, 2018) [hereinafter *Open AI Policy petition*], *available at* https://epic.org/privacy/ai/OSTP-AI-Petition.pdf.
[3] EPIC, *About EPIC*, https://epic.org/epic/about.html.
[4] EPIC, *Algorithmic Transparency*, https://epic.org/algorithmic-transparency/.
[5] *EPIC v. CBP (Analytical Framework for Intelligence*), https://epic.org/foia/dhs/cbp/afi/.
[6] *EPIC v. DHS- FAST Program*, https://epic.org/foia/dhs/fast/.

of Justice to produce documents concerning the use of "evidence-based risk assessment tools," algorithms that try to predict recidivism, in all stages of sentencing.[7] The algorithms at issue in these three lawsuits are examples of problematic uses of AI by the federal government.

These problems could now become more widespread across the federal government. On May 10, 2018 the White House held a summit on "Artificial Intelligence for American Industry."[8] According to the OSTP summary report, the participants discussed "the promise of [artificial intelligence] and the policies we will need to realize that promise for the American people and maintain U.S leadership in the age of artificial intelligence."[9] However, the meeting was not open to the public and many critical issues in the AI-field were not discussed.

For example, the words "accountability," "transparency," "ethics," and "fairness" do not appear in the report of the White House AI summit.[10] The only reference to "privacy" is an assurance that personal data can be opened to research without compromising privacy. There is a similar assurance about public safety.[11]

At the summit, the White House also announced the creation of the Select Committee on Artificial Intelligence.[12] According to the charter, the Select Committee will:

> address significant national and international policy matters that cut across agency boundaries and shall provide a formal mechanism for interagency policy coordination and the development of Federal artificial intelligence activities, including those related to autonomous systems, biometric identification, computer vision, human-computer interactions, machine learning, natural language processing, and robotics.[13]

Despite the broad social implications of these topics, the Charter identifies only the "private sector" as a source of advice. Unless the channels of input are formally broadened and deepened substantially, the Select Committee will fail to understand and mitigate the risks of AI deployment.

Several professional organizations have developed significant policy frameworks to help policymakers understand and assess AI technology. For example, the Association for Computing Machinery's ("ACM") Statement on Algorithmic Transparency and Accountability states that, "the ubiquity of algorithms in our everyday lives is an important reason to focus on addressing challenges

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[7] *EPIC v. DOJ (Criminal Justice Algorithms)*, https://epic.org/foia/doj/criminal-justice-algorithms/.
[8] Office of Science and Technology Policy, *Summary of the White House Summit on Artificial Intelligence for American Industry*, (May 10, 2018), https://www.whitehouse.gov/wp-content/uploads/2018/05/Summary-Report-of-White-House-AI-Summit.pdf.
[9] *Id.* at 2.
[10] *Id.*
[11] *Id.* at 10.
[12] Office of Science and Technology Policy, *Summary of the White House Summit on Artificial Intelligence for American Industry*, Appendix A (May 10, 2018), https://www.whitehouse.gov/wp-content/uploads/2018/05/Summary-Report-of-White-House-AI-Summit.pdf.
[13] *Id.* at 1.

associated with the design and technical aspects of algorithms and preventing bias from the onset." [14] The IEEE-USA stated in 2017 that, "Effective AI public policies and government regulations are needed to promote safety, privacy, intellectual property rights, and cybersecurity, as well as to enable the public to understand the potential impact of AI on society."[15]

Leading computer scientists and legal scholars have expressed concern that the development of the nation's policy for Artificial Intelligence should be more open and more inclusive. There are several related issues for OSTP and the Select Committee to consider:

(1) What potential harms arise from the use of AI and how are these risks currently addressed?

(2) What are the legal frameworks currently governing AI, and are they adequate?

(3) How could companies and government agencies be more transparent in the use of AI?

(4) What technical measures could promote the benefits of AI while minimizing the risks?

(5) What experience have other countries had trying to address the challenges of AI?

(6) What future trends concerning AI could inform the current discussion?

EPIC and others in the scientific and legal community have urged the Office of Science and Technology Policy to establish a public comment process for the Administration's work on AI.[16]

Dr. Droegemeier should be asked what steps the OSTP will take to ensure public participation in the development of AI policy.

* * *

Democratic governance is built on principles of procedural fairness and transparency. And accountability is key to decision making. We must know the basis of decisions made by government, whether right or wrong. But as decisions are automated, and organizations increasingly delegate decision making to techniques they do not fully understand, processes become more opaque and less accountable. It is therefore imperative that algorithmic processes be open, provable, and accountable.

When the government uses AI to make decisions about people, it raises fundamental questions about accountability, due process, and fairness. Algorithms deny people educational opportunities, employment, housing, insurance, and credit.[17] Many of these decisions are entirely opaque, leaving individuals to wonder whether the decisions were accurate, fair, or even about them.

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[14] *See,* ACM US Public Policy Council, *Statement on Algorithmic Transparency and Accountability* (Jan. 2017), https://www.acm.org/binaries/content/assets/.../2017_usacm_statement_algorithms.pdf.
[15] IEEE-USA, *Artificial Intelligence Research, Development and Regulation* (Feb. 10, 2017), http://globalpolicy.ieee.org/wp-content/uploads/2017/10/IEEE17003.pdf.
[16] *Open AI Policy petition*, *supra* note 2.
[17] Danielle Keats Citron & Frank Pasquale, *The Scored Society: Due Process for Automated Predictions*, 89 Wash. L. Rev. 1 (2014).

The Privacy Act of 1974, which governs data processing across the federal government, sought to ensure fairness and accountability in the government's use of personal data.[18] But many new activities, including AI-based analysis, may fall outside the reach of the law.

The Department of Homeland Security released a white paper last year outlining potential uses of AI techniques.[19] DHS proposed the development of predictive systems to assess future risk. A similar proposal a few years ago – The Future Attribute Screening ("FAST") – was developed to detect "malintent." The program collapsed after it became clear the system would not work.[20]

DHS also proposed to use social media analytics to predict human behavior to counter violent extremism.[21] Algorithms are simply not equipped to understand the nuances of online communication and make positive or negative determinations about individuals.[22] Government scrutiny of social media accounts also chill First Amendment-protected activities. When DHS previously monitored social media for criticism of the agency, Congress held hearings and the program was suspended.[23]

Congress should regulate the use of AI by the federal government to ensure accountability and transparency. EPIC supports legislation that would do the following:

- Establish a **Commission on AI Accountability and Algorithmic Fairness.** New York City recently passed legislation establishing an Algorithmic Accountability task force that could serve as a helpful model for the federal government.[24]

- Amend the **E-Government Act** to require an **Algorithmic Fairness Assessment** any time an agency newly develops, implements, or relies on an algorithmic decision tool that implicates personally identifiable information. The Assessment should require disclosure of the logic of algorithms that make determinations about individuals.

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[18] 5 U.S.C. § 552a; *see also* EPIC, *The Privacy Act*, https://epic.org/privacy/1974act/.
[19] Homeland Security Science and Technology Advisory Committee (HSSTAC): Quadrennial Homeland Security Review Subcommittee, *Artificial Intelligence White Paper* (March 10, 2017), https://www.dhs.gov/sites/default/files/publications/Artificial%20Intelligence%20Whitepaper%202017_508%20FINAL_2.pdf.
[20] DHS, *Future Attribute Screening Technology Fact Sheet*, https://www.dhs.gov/publication/future-attribute-screening-technology; Alexander Furnas, *Homeland Security's 'Pre-Crime' Screening Will Never Work*, The Atlantic (Apr. 17, 2012), https://www.theatlantic.com/technology/archive/2012/04/homeland-securitys-pre-crime-screening-will-never-work/255971/; *See*, EPIC v. DHS - FAST Program, https://epic.org/foia/dhs/fast/.
[21] *Id.* at 7.
[22] *See* Computer Scientist Coalition, Letter to The Honorable Elaine C. Duke, Acting Secretary of Homeland Security, Department of Homeland Security (Nov. 16, 2017), https://www.brennancenter.org/sites/default/files/Technology%20Experts%20Letter%20to%20DHS%20Opposing%20the%20Extreme%20Vetting%20Initiative%20-%2011.15.17.pdf.
[23] Marc Rotenberg, President and Ginger McCall, EPIC Open Government Project Director, *Statement for the Record for Hearing on DHS Monitoring of Social Networking and Media: Enhancing Intelligence Gathering and Ensuring Privacy*, 1-3, Feb. 16, 2012, https://epic.org/privacy/socialmedia/EPIC-Stmnt-DHS-Monitoring-FINAL.pdf.
[24] EPIC, *NYC Establishes Algorithm Accountability Task Force* (Dec. 21, 2017), https://epic.org/2017/12/nyc-establishes-algorithm-acco.html.

- Amend the **Privacy Act** to require publication of an **Algorithmic System Notice** any time an agency newly develops, implements, or relies on an algorithmic decision tool that implicates personally identifiable information.

- Amend the **Privacy Act** to allow any person affected by a rule, policy, or action of an agency—where such decision was made by or with the assistance of an algorithmic decision tool—to request and receive an explanation of that rule, policy, or action and the basis for it.

- Amend the **Freedom of Information Act** to clarify that (b)(4) does not exempt algorithmic decision tools/rule-based techniques from disclosure, even if they would otherwise constitute trade secrets.

We do recognize the value of AI techniques for a wide range of government programs. But government activities that involve the processing of personal data trigger specific legal obligations; the use of new techniques will raise new challenges that OSTP will need to contend with.

We ask that this Statement from EPIC be entered in the hearing record. We look forward to working with you on these issues of vital importance to the American public.

Sincerely,

/s/ *Marc Rotenberg*
Marc Rotenberg
EPIC President

/s/ *Caitriona Fitzgerald*
Caitriona Fitzgerald
EPIC Policy Director

/s/ *Christine Bannan*
Christine Bannan
EPIC Policy Fellow

RESEARCH AMERICA
AN ALLIANCE FOR DISCOVERIES IN HEALTH

August 9, 2018

The Honorable John Thune
Chair
Senate Commerce, Science,
Transportation Committee
512 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Bill Nelson
Ranking Member
Senate Commerce, Science,
Transportation Committee
520 Hart Senate Office Building
Washington, DC 20510

Dear Chairman Thune and Ranking Member Nelson,

On behalf of Research!America, the nation's largest not-for-profit advocacy and public education alliance committed to ensuring fast-paced scientific and medical progress, we urge you to move swiftly to confirm Dr. Kelvin Droegemeier as the next head of the Office of Science and Technology Policy (OSTP).

We appreciate the President's decision to nominate Dr. Droegemeier, who is extraordinarily well equipped for this multi-faceted role. We recognize that the Director of OSTP not only leads this critically important office, but serves as trusted counsel to the President and ensures federal agencies have the benefit of dispassionate scientific input on policy and regulatory issues. Dr. Droegemeier's academic and professional contributions – from providing leadership to numerous science and engineering centers that have dramatically advanced atmospheric science, to serving on the National Science Board under both Republican and Democratic Administrations – speak to his capacity to ably fulfill the role of OSTP Director.

We are confident that Dr. Droegemeier will serve our nation with vision, integrity, and a determination to ensure the U.S. fully capitalizes on science and technology to advance the goals and aspirations of the American people. Thank you for considering Research!America's views, and please call on our alliance if we can be of assistance to you and your staff members during the confirmation process.

Sincerely,

Mary Woolley
President and CEO

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uite 501
rlington, VA 22202
' 703.739.2577
: 703.739.2372
: info@researchamerica.org

August 24, 2018

Senator John Thune, Chairman
U.S. Senate Committee on Commerce,
Science and Transportation
United States Senate
c/o SD-511
Washington, DC 20510

Dear Chairman Thune:

As Chairman of ASTRA, the Alliance for Science & Technology Research in America, I have been asked to convey our enthusiastic support for President Trump's nomination of Dr. Kelvin Droegemeier as Director of the Office of Science and Technology Policy (OSTP).

Across our community, this nomination is being celebrated. We urge immediate confirmation of Dr. Droegemeier without delay. Filling the OSTP Directorship slot needs to be accomplished ASAP as it has gone without a Director since President Trump was inaugurated in 2017.

Dr. Droegemeier's nomination comes at a critical time in the nation's quest to maintain its scientific and engineering leadership when faced with unprecedented challenges from abroad. Dr. Droegemeier is expert in understanding the massive shifts and effects of scientific and engineering advances. His record shows a profound understanding of complex issues that affect our workforce, innovation capacity, national security, and economic well-being.

As Secretary for Science and Technology for Oklahoma Governor Mary Fallin, Vice President for Research at the University of Oklahoma, past Vice Chairman of the National Science Board and Vice Chairman – Midwest for ASTRA for the past three years, Dr. Droegemeier has proven that he is exceptionally well prepared to promote the scientific, engineering and technology interests of our country.

We are excited about working with Dr. Droegemeier and the OSTP under his leadership. This is an exciting time for our nation, and we endorse his nomination with absolute confidence in his leadership and vision. If you have further questions, please contact me at rpalazzo@uab.edu or Dr. Robert Boege, ASTRA Executive Director at rboege@comcast.net

Sincerely,

R. L. Palazzo

Dr. Robert Palazzo
Chairman
ASTRA, The Alliance for Science &
Technology Research in America

Cc: Members of the United Senate

The CHAIRMAN. And then I would just say to our nominees that we hope to at our next markup process your nominations and I would ask that as quick as you can, as we get questions for the record from members of the Committee, that you respond as quickly and ask you to return those, if you can, and I know this is going to be asking a lot, but we're going to try and just keep the record open until tomorrow, and if our Senators can get those questions for the record to you, as soon as you receive them, submit your written answers so that we can move forward, and we're going to ask you to try and get those back to us by Monday of next week. I know that's a compressed timeframe, but it is possible that if we are here next week and it looks like we will be, we might be able to schedule a markup and keep this process moving forward. So we want to do that as quickly as we can and so we would appreciate your timely response.

With that, again, thank you to you and to your families for your willingness to serve and to sacrifice on behalf of our great nation. Many of you have in the past, but we appreciate your continued service and look forward to getting you installed in these important positions where you can make a difference for the betterment of our country.

Thank you. This hearing is adjourned.

[Whereupon, at 12:05 p.m., the hearing was adjourned.]

A P P E N D I X

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. JOHN THUNE TO
DR. KELVIN K. DROEGEMEIER

Question. The President's Council of Advisors on Science and Technology (PCAST), a group of outside experts created by President George H. W. Bush and reestablished under all subsequent Administrations, has traditionally advised the President, the OSTP Director, and the National Science and Technology Council on science, technology, and innovation policy matters. PCAST's charter expired in September 2017 and the panel has not been reconvened. Do you believe PCAST performs an important function in advising both the President and the OSTP Director on matters of science and technology policy, and if so, would you seek to reestablish and re-charter PCAST once you are confirmed to your new role?

Answer. Yes, PCAST is an essential advising body. On September 29, 2017, President Trump renewed Executive Order 13539, as amended by 13596, which continued PCAST. If confirmed as OSTP Director, one of my top priorities will be to recharter PCAST and begin inviting experts to serve on the council. My initial focus for PCAST would be to choose diverse members with impeccable scientific credentials and a balance across disciplines including industry experience. I would focus their initial work on topics of critical need for the Nation, with high likelihood for significant short-term impact.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. JIM INHOFE TO
DR. KELVIN K. DROEGEMEIER

Question. Dr. Droegemeier, your record of working on public-private partnerships shows an appreciation for the benefits of a cooperative and consultative relationship between government agencies and the private sector. Particularly for an office that works at the intersection of science, technology, business, and law, do you agree that robust stakeholder involvement is essential to the decision-making process?"

Answer. Yes, I agree that robust stakeholder involvement is essential to the planning and decision-making processes. If confirmed, I will seek to ensure that OSTP engages key stakeholders, to include those across the Federal government, Congress, academia, industry, nonprofits, and international partners. I will leverage my past experience in assembling multi-faceted groups and continue my work with public-private partnerships to ensure that sound science and robust stakeholder involvement are considered in the planning and decision-making processes to benefit the American people.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. TODD YOUNG TO
DR. KELVIN K. DROEGEMEIER

Question 1. Dr. Droegemeier, artificial intelligence has the ability to double our economy's annual economic growth rates by 2035 and boost labor productivity by up to 40 percent. However, it doesn't come with some downsides. That is why I have partnered with Senator Cantwell to develop a Federal advisory committee to study and prepare for the development of AI.

Answer. Artificial intelligence (AI) is a critical technology for the future of our Nation. I strongly believe that we should not cede America's leadership in AI to other countries. As this technology advances and becomes more powerful and ubiquitous, we must ensure that American values are central to its development and deployment. If confirmed, I look forward to working with Congress to ensure that national AI policy reflects the perspective of multiple stakeholders.

Question 2. Do you support a whole-of-government approach to developing a national strategy to lead in the development of AI?

Answer. Yes. I am very pleased that the Administration specifically identified machine learning and artificial intelligence as a national research and development (R&D) priority in the OMB–OSTP R&D Priorities Memo, included AI as a specific budget priority, and addressed AI's importance in the President's National Security Strategy and National Defense Strategy.

I understand that the National Science and Technology Council (NSTC)—the Cabinet-level Council that is the principal means within the Executive Branch to coordinate science and technology policy across the diverse entities that make up the Federal research and development enterprise, which is Chaired by the President—has several bodies dedicated to artificial intelligence, made up of key stakeholders from across the government. The Select Committee on Artificial Intelligence is comprised of high-level R&D officials to advise White House senior officials on interagency AI priorities and to leverage Federal data and computation resources; the Machine Learning and Artificial Intelligence Subcommittee implements the Select Committee's initiatives; and the AI R&D interagency working group under the Networking and Information Technology Research and Development (NITRD) program serves as a community of practice for highly technical AI R&D.

If confirmed, I will ensure that the Office of Science and Technology Policy (OSTP) remains focused on AI, which is critical for American national and economic security, and will engage stakeholders, including Congress, to ensure that these important perspectives are considered as we work on coordinated Federal AI policy.

Question 3. Would you support legislation like the Future of AI Act, which establishes a Federal advisory committee to study and prepare for AI's continued use in our society?

Answer. I appreciate your and the Committee's leadership on this critically important issue, and if confirmed I look forward to collaborating closely with you on AI related issues. We must ensure that the Nation is optimally prepared to drive critical advances in artificial intelligence, and to make sure those advances can be transformed, free from undue barriers, from the lab into the market.

AI is critical to the long term economic and national security of the Nation, and public trust in AI is crucial to safeguarding America's global leadership in this critical frontier. Given the potentially transformative power of this technology, we must work to ensure that American values and America's respect for individual rights and freedoms are integral to global AI development.

Our Federal agencies are working on studying the integration of AI into our society. The National Science Foundation, for example, funds basic research into machine learning and algorithmic bias to help future AI designers build security, trust, and safety into their systems. DARPA has created "The Explainable AI program" which aims to develop new machine learning systems that can explain their rationale, score the strengths and weaknesses of the information being used, and provide some insight into future decision making. OSTP can help by making trustworthiness and the reduction of algorithmic bias priorities for all agencies conducting AI research or utilizing AI systems.

OSTP not only convenes the Federal scientific workforce, but outside stakeholders and those representing consumers and the general public. The office began engaging with experts from private industry and academia at its "White House Artificial Intelligence for American Industry" summit in May 2018. As we address these questions of American leadership and American values within the development of a technology like AI, it is crucial that we as policymakers prioritize stakeholder engagement throughout the process. If confirmed, I will continue and expand the work OSTP has done to bring in external views and perspectives on AI.

Question 4. Would you commit to working with my office as we develop and push the government to create a whole-of-government approach to developing a national strategy on AI?

Answer. Yes. As discussed in Question 2, if confirmed, I look forward to engaging with Congress, and will work with your office to ensure that your perspectives are considered, and that all relevant Federal agencies are coordinated as we work on AI policy.

Question 5. Dr. Droegemeier, you have spoken of the need for integrated funding across all sciences—and more from the onset of projects. Can you speak to your work in Oklahoma and how developing these integrated approach at the onset of projects has improved your results?

Answer. In Oklahoma, I have taken a "portfolio" approach to prioritizing research areas at my institution and within the State of Oklahoma and believe the same concept would be fruitful if applied across the Federal government. Specifically, the portfolio approach begins by identifying areas of capability, capacity, and competitiveness based upon existing resources (*e.g.,* personnel, knowledge, infrastructure,

funding). It then takes an integrative view as to how these resources—which often exist in relatively isolated "stove pipes" across fields of study and organizations—can most effectively be assembled to provide powerful new capabilities in tackling America's most important challenges. In this manner, inefficiencies and redundancy are reduced, synergy is maximized, and the taxpayer benefits via lower costs. In Oklahoma, the portfolio approach has helped us develop collaborations and leverage resources in ways that have allowed us to tackle problems we otherwise would not have been able to approach, and do so with fewer resources.

Question 6. Dr. Droegemeier, one of the areas that OSTP has previously identified as vital to advancing the national security and economic prosperity of the United States is quantum information science. In fact, the recently released the FY 2020 Administration Research and Development Budget Priorities document highlights the need for continued Federal investments in this area. If appointed as the OSTP director, how do you envision strengthening the Federal government's partnership role with higher education institutions across the country as well as the private sector to advance this quantum science agenda?

Answer. Quantum computing is another emerging technology that is critical to our national interests. There are so many different elements that go into the Quantum Information Science (QIS) ecosystem that the Federal government cannot shoulder the burden of ensuring American QIS leadership alone. We must engage with academia and research institutions as well as the private sector to ensure that we are working towards a common goal, and maximizing the value of every dollar spent on QIS R&D.

Earlier this year OSTP established the NSTC Quantum Information Science (QIS) Subcommittee to convene all relevant Federal stakeholders, enabling them to invest effectively in QIS, coordinate R&D, and share information, expertise, and best practices for program management. Leaders from across the Federal government have voiced their support for this critical initiative. We must build on that which makes the American R&D ecosystem so great—a strong partnership among the Federal government, industry, and academia. If confirmed, I will seek to ensure that QIS basic and lab-to-market research funding is prioritized, which will help to drive innovation in academia and industry. I support science, technology, engineering, and mathematics education initiatives to help grow the quantum workforce of tomorrow, and I will ensure that OSTP brings the leading voices within industry and academia to the table to inform QIS national policy. I envision leveraging the resources of the QIS Subcommittee and relevant advisory bodies and working closely with academia on behalf of the Administration and the interagency to pursue these goals.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. BILL NELSON TO DR. KELVIN K. DROEGEMEIER

Question 1. In multiple bills, OSTP is directed to consult with a variety of stakeholders when determining science policy and priorities. These include the public, institutions of higher education, scientific and professional societies, industry, including small businesses, nonprofit and for-profit publishers, libraries, federally funded and non-federally funded research scientists, federally funded research and development centers, national laboratories, non-governmental organizations and representatives from diverse manufacturing companies, academia and other relevant organizations and institutions. Do you commit to consult with these stakeholders on policies with the potential to impact the research community or the individual stakeholder's operations or areas of expertise? Are there other stakeholders that you believe are central to the U.S. research enterprise and therefore relevant to OSTP?

Answer. Diverse stakeholder engagement is absolutely critical to the policy making process and if confirmed, I will emphasize this priority to inform OSTP's position on national policies. In addition to the stakeholders listed above, Congress is a key stakeholder informing science and technological policy, and I am committed to working with other key stakeholders as they are identified.

Question 2. Do you agree with the findings articulated in the Fourth National Climate Assessment by the U.S. Global Change Research Program, which was compiled by Federal science agencies, and specifically that the period over the last 115 years is "now the warmest in the history of modern civilization," and that "human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century?"

Answer. The Fourth National Climate Assessment is a heavily reviewed scientific publication that is still in draft form. I agree that the world's climate is changing and that human activity plays a significant role in climate change in addition to natural variability.

Question 3. How do you plan to work with the Federal science agencies, other EOP offices and Congress to ensure that many scientific disciplines are supported, particularly in light of recent efforts by some in Congress to encourage agencies to shift resources to fund specific disciplines?

Answer. If confirmed, I will work with Congress throughout the budget process to ensure alignment and prioritization of America's science and technological goals. In addition, I will also help to coordinate funded efforts across the interagency to make sure programs are complimentary across similar areas.

In Oklahoma, I have taken a "portfolio" approach to prioritizing research areas at my institution and within the State of Oklahoma and believe the same concept would be fruitful if applied across the Federal Government. Specifically, the portfolio approach begins by identifying areas of *capability, capacity,* and *competitiveness* based upon *existing resources* (*e.g.,* personnel, knowledge, infrastructure, funding). It then takes an integrative view as to how these resources—which often exist in relatively isolated "stove pipes" across fields of study and organizations—can most effectively be assembled to provide powerful new capabilities in tackling America's most important challenges. In this manner, inefficiencies and redundancy are reduced, synergy is maximized, and the taxpayer benefits via lower costs.

Question 4. In trying to describe that the planet is resilient in 2014, you said that the oil from Deepwater Horizon "is gone—and there's no catastrophe." While I understand your point—that Mother Nature can bounce back—given the role you will have guiding science policy for the Federal Government, it is important that your statements on the impacts of catastrophic events be precise. While you are correct to point out that some of the oil was ingested by microbes, there were major impacts to fishing, tourism and the livelihoods of residents, and some of the oil was ingested by fish and has spread through the food web with consequences that we have yet to fully understand. Can you please clarify your comments?

Answer. The Deepwater Horizon explosion was a terrible event that had a devastating impact on the local communities and natural environments along the Gulf of Mexico, and resulted in the tragic deaths of 11 workers on the offshore drilling rig. To best address such events in a measured and thoughtful way, we must use objective information based on scientific data and what we know about likely consequences. And we must be ready to be surprised when nature reacts in ways that we were not expecting.

Thank you for the opportunity to clarify those remarks from 2014, as it was incorrect for me to assert that the oil "is gone." Certainly some remains, and as you rightly note, the spill had terrible and significant consequences to many areas of the economy, and to many individuals who relied on the natural environment of the Gulf coast for their livelihood. In phrasing my comments the way I did, I threw away nuance in favor of a sweeping generalization.

I am in complete agreement that as scientists we must strive to be as precise and complete as possible in any given situation. This goes doubly for those in a position of public trust, whose words can have such an impact on how policies are shaped and applied.

If confirmed as OSTP Director I will work hard to ensure that the best scientific information available is brought to bear to inform, improve, and guide the Federal Government's work, particularly in disaster response efforts.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. EDWARD MARKEY TO DR. KELVIN K. DROEGEMEIER

Question 1. Dr. Droegemeier, the 2nd Volume of the 4th National Climate Assessment is due in December. Will you ensure that it will be delivered to the President and acted on?

Answer. I understand that the NCA4 is well underway and if confirmed as OSTP Director I will work with the U.S. Global Change Research Program (USGCRP), the National Coordination Office responsible for coordinating Federal environmental research, to continue meeting the development milestones necessary to deliver this important product to Congress and the President, as well as ensure it receives appropriate consideration.

Question 2. As you know, this administration disbanded the Federal advisory committee charged with strengthening the National Climate Assessment. The committee has been revived in the State of New York and will offer recommendations in its report to be issued this coming year. Are you prepared to accept these recommendations and would you work to reinstate the Committee so it can ensure the 5th National Climate Assessment meets the needs of decision makers and the public?

Answer. I have not been briefed on the specific details of the Committee referenced here but if confirmed, I look forward to receiving the recommendations from New York. Stakeholder engagement is critically important, particularly regarding reports with the potential to have significant impact on future policy making.

I am committed to ensuring that the National Climate Assessment (NCA) meets the needs of decision makers and the public, and if confirmed I will work with key stakeholders to determine the best course of action for accomplishing that objective.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. TOM UDALL TO DR. KELVIN K. DROEGEMEIER

Question 1. What specific actions are you going to take in your first 100 days at OSTP?

Answer. If confirmed, I will move swiftly to ensure that OSTP is structured to provide the best scientific advice available to all levels of the decision-making process in this Administration, and I will also begin to work on the priorities that I laid out in my confirmation hearing, including a coordinated and comprehensive research and development (R&D) portfolio of Federal science and technology (S&T) initiatives across the whole of government; an educational and skills-development framework capable of producing wonderful job opportunities for all Americans, ready to fulfill the jobs of tomorrow; and new models of public-private-academic partnerships to bring new technologies to market and to put scientific breakthroughs to work on behalf of the American people more quickly and efficiently.

To ensure that OSTP is structured for success, one of my first actions will be to meet with other White House components, as well as Cabinet Department science and technology officials. I will work with colleagues on the National Security Council to ensure that the best scientific information is used in shaping our response and recovery efforts for natural disasters.

I also plan to reinvigorate the President's Council of Advisor's on Science and Technology (PCAST), which President Trump renewed on September 29, 2017. PCAST would spearhead strategies to rapidly progress on issues and advise the President and senior White House staff on matters of utmost importance to our Nation.

I will also assess the staffing at OSTP and consider new personnel, including reviewing potential candidates for Associate Directorship positions. I will inform communities about the importance of science and technology in the Trump Administration, helping bring a spotlight to critical science and technology initiatives coming out of the White House.

I will engage with interagency groups, particularly through the National Science and Technology Council (NSTC)—the Cabinet-level Council that is the principal means within the Executive Branch to coordinate science and technology policy across the diverse entities that make up the Federal research and development enterprise, which is Chaired by the President—and begin a plan to build the foundation for conversations regarding a multi-year planning effort for science and technology priorities, and start to plan how to identify sustained priorities.

Beyond the high level priorities outlined above, in my opening statement and testimony I also referred to several specific issues that I would like OSTP to address, including reducing and eliminating wasteful administrative burdens faced by our research community; bringing increased predictability to scientific R&D budgets for longer horizon projects that can otherwise suffer under annual budget churn; ensuring that our institutions are safe and free from harassment for all researchers; and advancing critical areas of science and technology including artificial intelligence and quantum computing.

Question 2. Will you commit to maintaining a culture at OSTP that does not compromise the integrity of rigorously researched or tested scientific findings?

Answer. Yes, scientific integrity must be central to OSTP's role of providing the best, most unbiased scientific advice to the President and White House senior staff. I am firmly committed to this goal and will use appropriate resources to ensure it remains a core characteristic of OSTP.

Question 3. How will you ensure that everyone at OSTP will maintain the highest standards of scientific integrity?

Answer. If confirmed, I will continue to support policies to ensure that OSTP staff adhere to the best practices of scientific integrity, ensure science is conducted free from political interference, and provide unbiased scientific results to senior leaders for effective decision-making. While OSTP staff do not conduct science research and development, the office is responsible for convening interagency groups and report-

ing science findings. I will support agency policies that require the highest standards of scientific integrity.

Question 4. Ninety seven percent of scientists with articles in peer-reviewed journals have concluded that climate change is real, is caused by human activity, and is already causing devastating problems in our country and around the world. Do you agree with this statement? What is your view on the administration's overall science and technology budget levels?

Answer. Indeed, the world's climate is changing and human activity plays a significant role in climate change in addition to natural variability. My view of the Administration's overall science and technology budget levels is that, as stewards of the taxpayer dollars, Federal agencies must find efficiencies, harness Federal innovations and move them from lab to market, use collaborative approaches with stakeholders, reduce regulatory burdens to enable American S&T innovations to flourish in the marketplace of ideas, and enhance public-private partnerships to address effectively the Nation's most critical science and technology needs. I am committed to prioritizing the most important investments and reducing administrative burdens, while maintaining proper safeguards, in order to maximize the research dollars utilized in our Federal science and technology enterprise.

Question 5. What is your plan to work across the agencies to harness science, technology, and innovation to solve important national and global problems? What specific actions are you going to take to work with all the Federal science agencies?

Answer. In Oklahoma, I have taken a "portfolio" approach to prioritizing research areas at my institution and within the State of Oklahoma and believe the same concept would be fruitful if applied across the Federal Government. Specifically, the portfolio approach begins by identifying areas of *capability, capacity,* and *competitiveness* based upon *existing resources* (*e.g.,* personnel, knowledge, infrastructure, funding). It then takes an integrative view as to how these resources—which often exist in relatively isolated "stove pipes" across fields of study and organizations—can most effectively be assembled to provide powerful new capabilities in tackling America's most important challenges. In this manner, inefficiencies and redundancy are reduced, synergy is maximized, and the taxpayer benefits via lower costs.

If confirmed as OSTP Director, I will work across agencies to harness science, technology, and innovation to solve important national and global challenges through both the National Science and Technology Council (NSTC) and other interagency S&T policy development and coordination bodies.

Specifically, I will work with the OSTP NSTC Executive Director to continue streamlining the NSTC, ensuring it is populated by empowered agency decisionmakers, and focusing the NSTC's products on clear national goals for Federal science and technology investments. If confirmed, I plan to utilize PCAST and the National Science Board as independent bodies to advise the President and Congress.

Question 6. What is your plan to engage the national labs across the country in advancing basic and applied science?

Answer. America is blessed with an exceptional ecosystem of National Labs, which play an integral role in the Nation's science and technology enterprise. The Labs' basic and applied science are of unparalleled quality and envied throughout the world. If confirmed, I will work with DOE, NOAA, and all National Labs to ensure that multidisciplinary issues are addressed to better translate research and development from the lab to the outside world. I will meet with Lab directors and consider convening a government-wide Lab director summit to discuss cross-cutting challenges.

Question 7. What is your plan to address and improve Science, Technology, Engineering and Math (STEM) education?

Answer. Science, Technology, Engineering and Mathematics (STEM) education is essential to the success of our Nation and I recognize the importance of STEM Education in today's workforce. If confirmed, I intend to work with leaders from across the Federal STEM education enterprise, including the Committee on STEM Education within the National Science and Technology Council, and with stakeholders across the Nation to ensure that Federal plans and programs are consistent, coordinated, and effectively implemented to strengthen STEM education throughout the United States. I will seek to broaden the participation of underrepresented groups, enhance minority engagement, and improve access to future opportunities that come with a STEM-enabled workforce.

OSTP has already taken great steps in furthering the successes of STEM Education including through OSTP's State-Federal STEM Education Summit, held in June 2018. This event included attendees from all 50 states and multiple U.S. territories, and was used to gather input to inform the development of the upcoming Federal 5-Year STEM Education Strategic Plan. If confirmed, I will prioritize

OSTP's delivery of this plan by the end of the year, and will then work with the interagency to deliver the actions laid out in the plan.

Question 8. What is your plan to strengthen America's STEM workforce, and what specific actions are you going to take to address this?

Answer. Current and future workers need access to high quality, affordable education and training that will equip them for today's unfilled jobs and the careers of the future. The Trump Administration has consistently prioritized increasing access to and the effectiveness of apprenticeship and job training programs to better prepare the future workforce. In July, the Administration established the President's National Council for the American Worker to help Americans rapidly and effectively develop new skills—often technology-focused—needed to succeed in the jobs of today and of the future. OSTP's Director sits on that council and if confirmed I would be honored to participate in this critically important initiative. I will seek to ensure that STEM education remains a priority in K–12 through university levels, and that as we create workforce development policies, we prioritize access to training for the kinds of jobs that will help maintain the United States' global leadership.

If confirmed as OSTP's Director, I will also support ongoing OSTP initiatives that aim to cultivate a strong, inclusive, and tightly connected STEM education ecosystem in America. Our economy thrives when all Americans are prepared to engage with the emerging industries of the future, so diversity at all levels of the STEM education spectrum is important.

Question 9. How are you going to engage agency leaders and scientists in addressing OSTP's grand challenges?

Answer. OSTP leads interagency science and technology coordination. Among other interagency-related duties, the office oversees the National Science and Technology Council (NSTC), a Cabinet-level Council that is the principal means within the Executive Branch to coordinate science and technology policy across the Federal Government. If confirmed, I will work with agency leaders, both directly and through the NSTC, to address the important challenges facing America's science and technology enterprise. I will also utilize PCAST and collaborate with the National Academies to better engage scientists.

Question 10. What is your view on the administration's overall science, technology, research and development budget levels?

Answer. As Vice President for Research at Oklahoma University, the need to prioritize programs in light of budgetary realities was constant. The Federal Government must utilize taxpayer dollars as effectively and as efficiently as possible—and investments in science and technology are no exception.

Understanding this, policy makers should focus on creating the right conditions for our national science and technology enterprise to thrive, even when budgets tighten. Our agencies must step back and plan strategically and for the long term to achieve our national goals. I will work with OMB on prioritizing the most important investments and reducing administrative burdens, while maintaining safety protocols, in order to maximize Federal spending on research and development.

Question 11. How are you going to communicate the importance of objective scientific facts to the President?

Answer. If confirmed as OSTP's Director, it will be my duty and privilege to present objective and unbiased scientific advice to the President and other senior White House staff. OSTP provides objective science to the President and his senior advisors personally during meetings and policy discussions; through the NSTC; through the advice of the President's Council of Advisors on Science and Technology; through scientific reports that are shared with others in the Executive Branch and with the public; and through scientific information OSTP's staff share in internal Executive branch policy processes, including every level of the National Security Council NSPM–4 process and the Committee on Foreign Investment in the United States.

Question 12. How will you promote the development of good science and technology to the President?

Answer. If confirmed as OSTP Director, I will promote the development of good science and technology to the President using the methods described in my answer to Question 11. OSTP will provide the President and his senior staff with unbiased advice on the scientific, engineering, and technological aspects of the economy, national security, homeland security, health, foreign relations, the environment, and the technological recovery and use of resources, among other topics. OSTP will continue to lead interagency science and technology policy coordination efforts, assist the Office of Management and Budget with an annual review and analysis of Federal research and development in budgets, and serve as a source of scientific and

technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government.

Question 13. Given that artificial intelligence (AI) produces a new set of risks regarding bias and ethics, how do you plan on working with the stakeholders, interested groups, and the private and public sector to address these risks?

Answer. AI is critical to the long term economic and national security of the Nation, and public trust in AI is crucial to safeguarding America's global leadership in this critical frontier. Given the potentially transformative power of this technology, we must work to ensure that American values and America's respect for individual rights and freedoms are integral to global AI development.

Our Federal agencies are looking into this issue. The National Science Foundation, for example, funds basic research into machine learning and algorithmic bias to help future AI designers build security, trust, and safety into their systems. DARPA has created "The Explainable AI program" which aims to develop new machine learning systems that can explain their rationale, score the strengths and weaknesses of the information being used, and provide some insight into future decision making. OSTP can help by making trustworthiness and the reduction of algorithmic bias priorities for all agencies conducting AI research or utilizing AI systems.

OSTP not only convenes the Federal scientific workforce, but outside stakeholders and those representing consumers and the general public. The office began engaging with experts from private industry and academia at its "White House Artificial Intelligence for American Industry" summit in May 2018. The office can build upon those efforts and seek a wider spectrum of perspectives from additional stakeholders as OSTP continues to prioritize this important field.

If confirmed, I will work with Congress as well as a diverse set of stakeholders, academic leaders, public interest groups, PCAST, and the private and public sector to address these risks, and build public trust and confidence.

Question 14. In a recent Commerce Committee hearing regarding Global Internet Governance, the former Secretary of Homeland Security, Michael Chertoff, stated that AI introduces a new set of national security risks from countries like China. How do you plan to work with the State Department, the Department of Defense, and other relevant stakeholders to ensure that these risks are adequately addressed?

Answer. This is a critically important area for America's future. We must understand the risks that countries like China pose as a threat to American AI leadership, and the specific actions that most directly challenge our status. China has outlined its strategic objective and investments to dominate the future of this technology. We must not ignore a long history of intellectual property theft from our technology industry, nor must we ignore the threat posed by foreign researchers working on highly sensitive projects.

If confirmed, I will partner with the National Security Council, which includes senior level decision makers from the State Department, the Department of Defense, and other relevant stakeholders, to convene stakeholders and develop national policy to address these and other risks inherent to global AI competition. I will participate in the Committee on Foreign Investment in the United States (CFIUS), which increasingly must deal with science and technological issues associated with foreign companies attempting to acquire U.S. technologies. Additionally, I will request that PCAST provide input into maintaining and securing America's preeminence in AI leadership.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO DR. KELVIN K. DROEGEMEIER

Space Weather. Scientists are just beginning to understand the interactions between our sun and the Earth. Given the growing national importance and reliance on technology, it is critical that we expand this understanding so we can improve forecasting and mitigate the effects of space weather events. That is why I worked with Senator Gardner to develop and the Space Weather Research and Forecasting Act. Our bill calls for the Director of OSTP to 1, coordinate the development and implementation of Federal Government activities to improve the Nation's ability to prepare, avoid, mitigate, respond to, and recover from potentially devastating impacts of space weather events, and 2, coordinate activities of a space weather interagency working group that will leverage capabilities across participating Federal agencies to understand and respond to the adverse effects of space weather.

Question 1. Is this an appropriate role for OSTP in the area of space weather?

Answer. Thank you for the important question, I very much appreciate your bipartisan leadership in the effort to advance America's space weather programs. Generally speaking, this seems like an appropriate role for the OSTP Director, being mindful that he or she is enhancing and not duplicating any of the duties and responsibilities best addressed by experts at agencies such as FEMA, NASA, or NOAA (among others) for disaster planning, mitigation, and response.

I chaired the review of a National Science Foundation science and technology center on space weather at Boston University several years ago. The threat from space weather is real and potentially very significant. So many of the technological and communications systems in orbit that we depend on are vulnerable to the effects of space weather, and we must be prepared to try and reduce the impact of a potentially catastrophic event.

OSTP plays an important role in coordinating many of the Federal Government's efforts in this area, including the work of the Space Weather Operations, Research, and Mitigation Subcommittee of the National Science and Technology Council (NSTC)—the Cabinet-level Council that is the principal means within the Executive Branch to coordinate science and technology policy across the diverse entities that make up the Federal research and development enterprise, which is Chaired by the President. Continued research and development (R&D) is required to enhance forecasts, understand vulnerabilities, and improve resilience. In addition, robust coordination is critical to responding appropriately when space weather events occur. If confirmed, I look forward to working with the Committee, others in Congress, and leadership in Federal agencies to continue to ensure that all aspects of this challenge are properly addressed.

Social, Behavioral, and Economic Sciences. Science and technology alone cannot solve all of our problems—there is a human component needed as well. For example, I don't think we know how pedestrians will interact with traffic when they know the cars are driven autonomously, not by humans. These are social and behavioral issues. We need a strong program for basic research in these areas at the National Science Foundation, and we also need applied research in these areas at several agencies to help address the specific challenges we will have as humans interact with more and more technology.

Question 2. What role can OSTP play in this area?

Answer. I agree that this is a very important topic and we need to do more to understand the implications of the human uptake and the social use of emerging technologies. Technology is developing rapidly, often outpacing society's ability to adapt. We do not want to slow the pace of discovery and the acceleration of innovation, but we must get better at understanding and evaluating the social and behavioral impacts of emerging technologies. If confirmed I will work through OSTP's established processes to determine the best way forward in this crucial area.

I have a particularly strong and longstanding interest in integrating the social, behavioral, and economic sciences (SBES) into research involving physical science, technology, and engineering. I have testified on this topic, co-led a National Science Board task force on hurricane science and engineering that took an integrative approach to hurricanes that included SBES, and led the creation of the Alliance for Integrative Approaches to Extreme Environmental Events, which was funded by a $3M private gift to integrate SBES into how the Nation responds to extreme events (see *http://alliance.ou.edu*).

Social and behavioral sciences are critical to addressing this challenge, and the Federal Government already has initiatives underway to address it. One such initiative is the NSF effort on "Cyberlearning for Work at the Human-Technology Frontier." Applied research will also play a key role in building on the results of basic research, such as DARPA's "Explainable Artificial Intelligence" initiative, helping to directly inform advancements in AI. OSTP plays a key role in this spectrum of activities, from partnering with OMB to prioritize investments in these fields of R&D, to serving as a co-lead on the Lab to Market Cross Agency Priority Goal as part of the President's Management Agenda to ensure that these advancements benefit the American people. If confirmed, I will ensure that OSTP plays a key role in driving research into the social behavioral aspects which compliment these technological advancements.

Artificial Intelligence. Artificial intelligence is starting to have a significant impact on people's lives, and that influence is likely to grow exponentially in the coming years. Many areas of the Federal Government are looking at how AI can improve their services and processes. However, the public may not yet trust these technologies, and we want people to be assured that they are being treated fairly and compassionately when they're interacting with the government. OSTP is the lead

agency for the Administration's work on AI, so you will likely be able to make impact in this area.

Question 3. In your opinion, what can be done to improve the transparency, accountability, and fairness in AI, especially in government applications, to build the public trust and confidence?

Answer. AI is critical to the economic and national security of the Nation and public trust in Federal AI—through demonstrated transparency, accountability, and fairness to the public—is required to ensure America remains the global leader in this technology. I support efforts to ensure that transparency, accountability, and fairness are prioritized in Federal applications of AI, as well as efforts that encourage private sector applications to consider these principles. Research into developing AI that is explainable and predictable without compromising trade secrets or the security of the underlying algorithms is incredibly important for the future of this technology.

Our Federal agencies are looking into this issue. The National Science Foundation, for example, funds basic research into machine learning and algorithmic bias to help future AI designers build security, trust, and safety into their systems. DARPA has created "The Explainable AI program" which aims to develop new machine learning systems that can explain their rationale, score the strengths and weaknesses of the information being used, and provide some insight into future decision making. OSTP can help by making trustworthiness and the reduction of algorithmic bias priorities for all agencies conducting AI research or utilizing AI systems. If confirmed, I will work with you, stakeholders, and the rest of the Federal Government to identify and implement solutions to build public trust and confidence.

Question 3a. How do you propose engaging with the public to get direct feedback about the challenges faced in this area?

Answer. Public outreach is essential in forming good government policy. OSTP hosted the Artificial Intelligence for the American Industry Summit on May 10, 2018, to hear from academic and industry leaders in this space. As Director of OSTP, I would continue that work in several ways. First, I would ensure that the members of the Select Committee on Artificial Intelligence and the Machine Learning and Artificial Intelligence Subcommittee, both within the NSTC, are engaged with the public as they carry out their work. I would encourage those agency leaders to host public meetings and use the RFI process to hear from the public. Additionally I will seek to ensure that OSTP's leadership and policy leads are engaged with stakeholders and the public during the policy making process.

Industry-University Collaboration. Here in the U.S., we are still the leaders in research and higher education. But many countries are now making significant investments in these areas, especially targeting commercialization of research. I think it is imperative that we continue to lead the world in this area and I think it makes sense to look at where we can improve. One area that seems to have potential is in industry-university collaborations, where you have a fair bit of experience.

Question 4. What are the barriers in this area and what improvements can we make to break through them?

Answer. It is critical that the U.S. continue to lead in research and higher education, and the Federal Government must do a better job of providing frameworks for translating research results into economic prosperity and technology that secures our Nation. I am very pleased that the Administration has already identified technology transfer as a high priority in the President's Management Agenda, the OMB–OSTP Research and Development Priorities Memo, and under the National Science and Technology Council. In addition to traditional technology transfer activities, the Federal Government can promote commercialization of research through public-private partnerships supported, in part, by targeted Federal funding and by helping make innovations developed through Federal grants more attractive for private investment.

I have spent the better part of my career focused on university-industry interaction, beginning with my 1987 NSF Presidential Young Investigator Award and later including major partnerships with Williams Energy Marketing and Trading, American Airlines, and a nascent project with Southwest Airlines to name a few.

As Oklahoma Secretary of Science and Technology, I created a program, called "Access for Success" that brings universities and private companies into collaborative relationships in 10 different areas of mutual interest, including intellectual property and technology commercialization. Yet a number of factors continue to inhibit success in this arena, despite the good outcomes from Bayh-Dole and the Stevenson-Wydler Technology Transfer Act. In particular, certain rules within the IRS

tax code inhibit the ability of universities to set terms for intellectual property depending upon how the facilities used to develop the innovation are funded.

Private companies often mistakenly see universities as having interest only in basic research, and universities often have unrealistic expectations about the potential value of technology they develop. Although many studies have examined these and other issues, change has been slow in coming and other countries, such as Canada, are reaping the rewards of more effective systems. If confirmed, I look forward to working closely with Undersecretary of Commerce and NIST Director, Dr. Walter Copan—who shares my strong interest in this subject—to increase the return on investment of the billions spent annually by the Federal Government in research and development at Federal labs, universities, and other research organizations.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. MAGGIE HASSAN TO DR. KELVIN K. DROEGEMEIER

Question. A major part of our Nation's infrastructure is the critical scientific facilities located in our Nation's universities and colleges, like the University of New Hampshire's flow physics facility. These facilities can support our scientific understanding of mechanisms and phenomena needed to develop new ways to solve problems, such as renewable energy technologies. Please explain how, under your leadership, OSTP would investigate and establish a plan for funding and collaboration with scientific facilities in government, academia, and industry?

Answer. State-of-the-art infrastructure is an extremely important component to maintaining American leadership science and technology and these assets must be developed, maintained, and made available in the most efficient manner. Priority should be given to widely-shared infrastructure and that improves capabilities across a range of disciplines. OSTP has recently established a top-level body under the National Science and Technology Council (NSTC)—the Cabinet-level Council that is the principal means within the Executive Branch to coordinate science and technology policy across the diverse entities that make up the Federal research and development enterprise, which is Chaired by the President—the NSTC Committee on Science and Technology (S&T) Enterprise that includes a subcommittee specifically focused on research and development (R&D) infrastructure.

As Oklahoma Secretary of Science and Technology, I created a program called "Access for Success" that brings universities and private companies into collaborative relationships in 10 different areas of mutual interest, including use of university facilities by the private sector. This initiative, which I believe can be applied nationally, was driven by three factors.

First, our extraordinary colleges and research universities have exceptional facilities—established over many decades and worth billions of dollars—that have been funded in large part by taxpayers. Yet the amount of corporate R&D funding coming to universities has been essentially flat, as a percentage, during the past four decades, during which R&D funding by the private sector grew dramatically and now accounts for two-thirds of total R&D funding in the Nation. This means corporations are not leveraging university assets as they might.

Second, small and medium sized companies cannot afford expensive physical facilities, but they can work collaboratively with universities—which have such facilities—to develop new products and services that will, in turn, create jobs.

And third, partnerships between universities and corporations yield many benefits. To universities, these partnerships provide jobs and internships for students, funding for R&D and facilities, guidance in developing programs responsive to industry needs, and more. To companies, these partnerships provide access to intellectual capital, facilities for solving problems, a trained workforce, intellectual property, data sets, and more.

If confirmed, I will work with stakeholders to ensure that the Nation's R&D infrastructure, and the scientific and engineering workforce it supports, remain preeminent, relevant, and ready to address the Nation's economic and national security priorities.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CATHERINE CORTEZ MASTO TO DR. KELVIN K. DROEGEMEIER

Office of American Innovation. As I mentioned during your hearing, in April myself and Senator Peters sent a letter to the White House asking for clarification on some of the activities of the Office of American Innovation, which is run by Jared Kushner. Four months later we have heard no response at all. The Federal Government's role in innovation is a big priority of mine, and we need to ensure that any

office in charge of this issue is being transparent, which frankly we have serious concerns about with regards to this office.

Question 1. I know you are not going to be in charge of OAI, but since OSTP works closely with them will you commit to working with my office to get a response to our questions in that letter sent four months ago?

Answer. If confirmed as OSTP Director, OSTP will commit to accommodating authorized requests from Congress relating to official OSTP activities.

Sexual Harassment in Science. The National Academy of Sciences issued a report showing half of women in science experience sexual harassment that take economic and emotional tolls on researchers, stifling their scientific contributions, with LGBTQ and women of collar more likely to be harassed.

Question 2. How are you going to address these concerns, improve morale, and foster a more inviting scientific sector?

Answer. As I mentioned during the hearing, any form of sexual harassment, delivered to any individual, is absolutely abhorrent and is something I will never tolerate. Such as been my position my entire career and also my clear position as a university senior research officer. If confirmed, I will address the concerns you raised by making clear my stance on the issue to the national community. Second, I will leverage recommendations from the Academies' report, and other resources—especially engagement with industries, Federal research labs, and other government research environment—to identify specific, actionable ways to assure harassment-free working conditions for all researchers. Third, I will review NSF's Important Notice #144 regarding sexual harassment and utilize interagency processes to see if it can be part of a government-wide initiative in much the same manner as OSTP did for topics such as open access and research integrity. (I led the effort at my university to implement the Important Notice.) I am pleased you share my passion for addressing this foundationally vital issue and would be grateful to work in partnership with you on it.

Question 2a. Can I get your commitment to working on a legislative effort with my office to help address these concerns?

Answer. Yes, I will be pleased to work with your office and Congress to identify any actions which will help to address these concerns on this very important issue.

Commercialization. One of the very exciting things happening in my state is we have an emerging startup scene that is launching innovative ideas and really transforming our economy. In both the north and south, our universities and colleges play a major role in this, they're working on programs that help students like UNLV's Troesh Center for Entrepreneurship and Innovation and UNR's Ozmen Center. One of the most important things we need to do in the modern economy is facilitate the ability of students to take their research ideas from the University to the marketplace, and in Nevada training these future entrepreneurs can help ensure that investors feel the workforce there is ready to start businesses that bring jobs and opportunity to our communities.

Question 3. Can you talk about if you see importance of this issue and if so, what will you do if confirmed to help facilitate the commercialization of research?

Answer. This is a very important issue. It is critical that the U.S. continue to lead in research and higher education, and the Federal Government must do a better job of facilitating the transfer of research results into economic prosperity and technology that secures our Nation. I am very pleased that the Administration has already identified technology transfer as a high priority in the President's Management Agenda, the OMB–OSTP research and development (R&D) Priorities Memo, and under the National Science and Technology Council (NSTC)—the Cabinet-level Council that is the principal means within the Executive Branch to coordinate science and technology policy across the diverse entities that make up the Federal research and development enterprise, which is Chaired by the President. In addition to traditional technology transfer activities, the Federal Government can promote commercialization of research through public-private partnerships supported, in part, by targeted Federal funding and by helping make innovations developed through Federal grants more attractive for private investment.

I have spent the better part of my career focused on university-industry interaction, beginning with my 1987 NSF Presidential Young Investigator Award and later including major partnerships with Williams Energy Marketing and Trading, American Airlines, and a nascent project with Southwest Airlines to name a few. As Oklahoma Secretary of Science and Technology, I created a program called "Access for Success" that brings universities and private companies into collaborative relationships in 10 different areas of mutual interest, including intellectual property and technology commercialization.

Yet a number of factors continue to inhibit success in this arena, despite the good outcomes from Bayh-Dole and the Stevenson-Wydler Technology Transfer Act. In particular, certain rules within the IRS tax code inhibit the ability of universities to set terms for intellectual property depending upon how the facilities used to develop the innovation are funded. Private companies often mistakenly see universities as having interest only in basic research, and universities often have unrealistic expectations about the potential value of technology they develop. Although many studies have examined these and other issues, change has been slow in coming and other countries, such as Canada, are reaping the rewards of a more effective system.

If confirmed, I look forward to working closely with Undersecretary of Commerce and NIST Director, Dr. Walter Copan—who shares my strong interest in this subject—to increase the return on investment of the billions spent annually by the Federal Government in R&D at Federal labs, universities, and other research organizations.

Question 3a. Will you work with my office to facilitate legislative ideas to address some of these issues?

Answer. Yes, I hope I have been able to communicate my personal commitment to this issue. If confirmed, I will be pleased to work with your office and Congress to identify any actions which will help accelerate the commercialization of scientific research. I am pleased you understand the importance of this issue and would be grateful to partner with you in addressing it.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JON TESTER TO DR. KELVIN K. DROEGEMEIER

Broadband's Role in Building the Nation's Technical-Trained Workforce. Developing the next generation of well-trained technical workers requires a nation-wide commitment and investment in foundational resources. It is well understood that the Internet allows students from diverse communities across the Nation to explore, discover and learn. With the growing complexity of Internet content, robust and reliable broadband is increasingly vital to educational achievement and success.

Question 1. As OSTP Director, what are you prepared to do to expand broadband access to students in rural communities like in Montana and on Indian reservations so that they have equal opportunities to contribute and participate in scientific breakthroughs and developing future technological innovations?

Answer. Thank you for calling attention to this issue. Living in Oklahoma, a rural state with numerous Native American tribes, I understand firsthand the importance of connectivity for communities to fully participate in the global economy.

Broadband enables all Americans to participate fully in our 21st century digital society, particularly those in rural and tribal communities. If confirmed, I will work across the Federal agencies that are tasked with broadband deployment, including Department of Commerce and USDA, and seek to ensure that Federal policies are conducive to promoting private sector investment, and that we reduce unnecessary regulatory burdens and barriers to entry wherever possible.

Additionally, it is critical to coordinate the various existing sources of Federal subsidies and funding for broadband to ensure that they are being used efficiently and effectively, and having the greatest possible impact on broadband deployment. Finally, I will continue the work that has begun to allow greater access to Federal assets for private sector deployment, as was done in the January 2018 Presidential Memorandum that increased access to Department of Interior's towers and infrastructure.

Public Access to Federal Scientific Data and Information. There are disturbing reports that the Trump Administration has removed from Federal agencies' websites scientific information *and data which do not align with Administration policy priorities. In addition to media reports (e.g.,* Scientific American *and* Mother Jones*), individual organizations such as Columbia Law School's* Silencing Science Tracker *and the* Environment Data and Governance Initiative document individual cases. Removing scientific data from Federal websites makes it harder for policymakers at state, local and tribal levels and the public to access scientific and related policy research that was funded by U.S. tax dollars. Transparency is essential to instilling and sustaining public trust.

Question 2. Do you agree that it is vital to our democracy that U.S. citizens have access to federally-funded scientific information and data?

Answer. I agree that it is very important that the public be able to access and trust the science funded by the Federal Government and that Federal research be

conducted free from political influence. OSTP issued memoranda on the issue of both scientific integrity and public access to federally funded research in 2009 and 2013, respectively, and if confirmed, I commit to supporting and carrying out their requirements. Based on both of those memoranda, agencies were required to develop and implement independent plans that were tailored to the specific circumstances they faced. As of December 2016, with regard to scientific integrity, 24 agencies had implemented policies pursuant to the 2009 Memorandum. Similarly, all agencies subject to the Memorandum on "Increasing Access to Federally Funded Scientific Research" had authorized public access plans as of December 2016.

Question 2a. Will you commit that Federal agencies will not censor or remove unclassified scientific information and data from their websites?

Answer. Yes, it is critical that Americans have access to legally-accessible, federally-funded scientific information and data. OSTP has spearheaded this issue across the Federal Government and, if confirmed, I would continue OSTP's commitment to making such research publicly available.

Question 2b. Will you commit that OSTP will review allegations of government censorship of scientific information data and/or politically induced constraints on federal-supported scientists and engineers?

Answer. I am firmly committed to the principle that federally funded scientific research be conducted free from political interference. If confirmed, I also commit to carry out the responsibilities established in the aforementioned OSTP memoranda and to working with agencies across the Federal Government to assess 1) whether such policies are effective; and 2) whether additional actions are necessary to ensure that the important principles of scientific integrity and public access are upheld.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DEB FISCHER TO JAMES W. MORHARD

Question 1. The NASA EPSCoR program helps build valuable research capacity in states like Nebraska, which ultimately supports NASA's mission. If confirmed, will you support the NASA EPSCoR program?

Answer. Yes.

Question 2. NASA programs such as the National Space Grant College and Fellowship Program, or Space Grant, provide important opportunities to connect students at Universities such as the University of Nebraska with NASA centers and other resources. If confirmed, will you support programs such as the Space Grant?

Answer. Yes.

Question 3. The Center for Advanced Surgical Technology at the University of Nebraska has provided research to NASA through grants and agreements for more than seven years. This research has provided NASA important technology development in the areas of robotic and remote surgical options for use in space, diagnostic tools, and surgical training simulation. As NASA prepares for its future space missions, this medical technology is vitally important to the health and welfare of our astronauts. These medical technologies are important to ensure that space missions are not cancelled in midflight due to a medical situation. Do you favor continuing development of remote and robotic medical technologies needed for space missions?

Answer. Yes.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. JIM INHOFE TO JAMES W. MORHARD

Question. Last year, President Trump reestablished the National Space Council, to ensure all aspects of our Nation's space power—national security, commerce, foreign relations, exploration, science—are coordinated and aligned at the highest levels of government. What role do you see for National Space Council in the development of American space policy?

Answer. The main role of the National Space Council (NSpC) is to monitor and coordinate implementation of the objectives of the President's national space policy and strategy in order to foster close coordination, cooperation, and technology and information exchange among the civil, national security, and commercial space sectors. The NSpC has and will continue to provide American space policies the high level of attention that was previously lacking by providing strategic goals like that of SPD–1. It will also play a role in helping to ensure government agencies like NASA has the budgetary resources it needs to implement strategic space policies. If confirmed, I look forward to working with the Senate and the NSpC to implement

America's space policies and ensure America is the leader in space exploration for generations to come.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. BILL NELSON TO JAMES W. MORHARD

Question. Please review the website climate.nasa.gov, particularly the "Fact" pages on "Evidence," "Causes," and "Scientific Consensus," as well as the executive summary of the Fourth National Climate Assessment by the U.S. Global Change Research Program, which was compiled by Federal science agencies including NASA. Please state whether or not you accept the statements articulated in the "Highlights" section on page one of the USGCRP report that states that the period over the last 115 years is "now the warmest in the history of modern civilization," and that "human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century."

Answer. I have read the fact pages from the website climate.nasa.gov and the executive summary of the Fourth National Climate Assessment by the U.S. Global Change Research Program (USGCRP). I accept the statements in the "Highlights" section in the USGCRP report that it is "extremely likely that human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century," and "[t]his period is now the warmest in the history of modern civilization," (*https://science2017.globalchange.gov/chapter/executive-summary/*).

NASA is the key data collector of such information provided in these reports, if confirmed, I will continue to enable our NASA scientists to conduct new missions to collect important information on the climate.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. EDWARD MARKEY TO JAMES W. MORHARD

Question 1. Mr. Morhard, as Deputy Administrator, you would be responsible for helping Administrator Bridenstine set the priorities and policy direction for NASA. Without a technical or scientific background, how would you be able to weigh in on which missions to support and prioritize?

Answer. If confirmed, I will rely on the many intelligent engineers and scientists among NASA's senior civil servants and ensure they have the resources to accomplish NASA's missions. I will also work with this committee, the FACA committees and councils that advise NASA on mission prioritization.

Project Budgets, Timelines, and Safety. Several large programs at NASA have struggled to meet cost and schedule projections.

Question 2. Do you think there are systemic problems with program and project management at NASA's field centers, where programs are managed?

Answer. NASA's field centers are the core source of its engineering and program management expertise. Although some complex space projects and programs have struggled to meet original cost and schedule projections, this has been the case since the beginning of the Space Age due to the inherent technical complexity of space missions. Nonetheless, even with this technical complexity, many of NASA's projects—though assuredly not all—remain on track and on budget. If confirmed, I will work with NASA Center leadership and Senators on this committee to understand how we can further improve budget and schedule performance while continuing to assure mission success.

Question 2a. How would you propose to improve the formulation and management of large programs at NASA?

Answer. As many of NASA's missions remain successful, safe, and on time and on budget, the focus should be on assessing and addressing the challenges in the specific large programs at NASA that are experiencing budget and schedule issue. If confirmed, my effort will be to become familiar with the relevant programmatic issues and support the Administrator in providing guidance to the programs in order to improve performance and budget discipline.

Question 2b. Do you support revisions to the procurement process, including for large strategic science missions?

Answer. The NASA procurement process delivers world-class science and exploration missions by using cost plus contracts, fixed price contracts, and Space Act Agreements. If confirmed, I will work with this committee to thoroughly investigate

what other acquisition strategies might be valuable to pursue for new and upcoming programs.

Question 3. In addition to adhering to budgets and timelines, is also imperative that we keep safety as a priority in all missions, especially as we work toward landing humans on Mars. Mr. Morhard, how would you work with career NASA staff to ensure that safety is prioritized alongside budgets and timelines in evaluating projects?

Answer. If confirmed, I will work to create a human spaceflight program characterized by a culture of consensus and safety. The Flight Readiness Review process will have clear "go/no go." It is important that the Mission Management Team is not pressured by schedule or budget concerns and that the only factors they need to consider for a "go/no go" decision are technical risks. Should disagreements arise after the Flight Readiness Review, the Mission Management Team will have my full support in placing a hold on a launch until disagreements are resolved. I will also rely on the safety recommendations proposed by the Aerospace Safety Advisory Panel (ASAP) and other councils to ensure that safety is paramount in all that NASA does, and our astronauts are safely launched into space and safely return to Earth.

Earth Science Programs. NASA carries out critical Earth-observing missions that have advanced our understanding of climate change—one, ICESat-2, is set to launch next month to track polar ice changes. Associate Administrator Zurbuchen told the Subcommittee on Space, Science, and Competitiveness earlier this month that Earth Science will remain a priority for NASA going forward.

Question 4. If appointed as Deputy Administrator, would you continue to prioritize Earth Science programs?

Answer. Yes.

Space Council. A little over a year ago, an Executive Order revived the National Space Council, chaired by the Vice President, to "provide a coordinated process for developing and monitoring the implementation of national space policy and strategy."

Question 5. In your view, which NASA policies and programs warrant—and could benefit from—the attention of the Space Council?

Answer. The National Space Council (NSpC) has provided NASA its goal of getting to the moon through a cooperation of the HEO and Science Mission Directorates. I think the Aeronautics Mission Directorate could benefit from the NSpC's attention as well as science missions that are unrelated to SPD–1. If confirmed, I look forward to working with the NSpC and this committee in implementing SPD–1 and all future policies related to NASA and America's aerospace endeavors.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CATHERINE CORTEZ MASTO TO JAMES W. MORHARD

Unmanned Aerial Systems. In Nevada we have an exciting and developing industry leadership on drones. We have the Nevada Institute for Autonomous Systems, which is a nonprofit that partners with various organizations to develop drone technology. We're one of the FAA designated UAS Test Sites, the only one which is statewide, as well as home to a recently awarded FAA UAS Integration Pilot Program site given to Reno.

Question 1. Do you agree with me that these FAA UAS test sites are a vital part of the research and development that goes into safely and effectively integrating drones into the national air space and realizing some of the tremendous benefits that can come along with this new technology?

Answer. Yes.

Question 2. Can you commit continuing this partnership with NASA so long as Congress continues to authorize these test sites?

Answer. Yes.

Diversity at NASA. Back at the beginning of August we had a resolution here in the Senate to award Congressional Gold Medals to Katherine Johnson, Dorothy Vaughn, Mary Jackson and Christine Darden, four African-American women who did incredible work at NASA during the space race. I think this is great because, one of the most important things for empowering young women and minorities to pursue these jobs is they need role models and mentors, they need to see representation in these fields. It has been great to see NASA have a commitment to increas-

ing the diversity of its employees, but work still remains to be done as women and minorities are still underrepresented in many fields at the agency.

Question 3. Do you believe diversity and inclusion are important to the success of NASA?

Answer. Yes.

Question 4. Will you commit to continuing these efforts, and working with my office to help provide more opportunities for women and minorities both at NASA and in STEM fields as a whole?

Answer. Yes.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JON TESTER TO JAMES W. MORHARD

Future Role of NASA's Office of Education. The Office of Education has proven instrumental in exposing future scientists and engineers as well as the public to the wonders of our universe and to learning experiences that will impact their lives forever. This year, students from Laurel Public Schools in Montana connected with astronauts aboard the International Space Station—asking questions about living in space and conducting scientific research on the space station. During last year's solar eclipse, students at Montana universities participated in unique data collection activities. For the FY18 and FY19 budgets, the Administration eliminated the Office of Education. Each time, Congress has funded the office. NASA's recommitment to expanding opportunities for young, talented people via time-tested and successful educational programs is essential to ultimately enabling the whole nation to reach new heights.

Question 1. Will you commit today to personally support the Office of Education—both its mission and functions?

Answer. Yes.

Space Grants—A Tool for Retaining Students in STEM Fields in order to go onto STEM professions. For NASA to fulfill its mission, it requires world-class scientists and engineers. At your nomination hearing, you spoke about the importance of inspiring kids in middle school. You are right. However, attracting bright and curious minds is a first step. It is well documented that retaining scientific and engineering talent through college, graduate school and beyond is an ongoing challenge—especially from underrepresented groups, *e.g.,* women, minorities and people with disabilities. For our Nation to continue to be the global leader in science and space, we will need to attract the best STEM talent from across our society and support their development throughout their education and early career. The NASA Space Grants program provides an important foundation in the development of scientific and engineering talent by bridging academic and hands-on experiences. Equally important to note, students engaged in NASA Space Grant programs today are often NASA's workforce in the future. For example, a student at the University of Montana Western interned last summer at NASA Goddard Space Flight Center. Her mentors were so impressed, they invited her back this summer. Her hope is to enter the Pathways program which will groom her for a NASA civil servant position.

Question 2. Will you commit—before eliminating individual NASA education programs and particularly NASA's Space Grant program—to engage STEM educators and NASA human resources experts and directorate managers about the challenges of developing, attracting and retaining the best STEM talent to support NASA's mission and how the Space Grants program has impacted the workforce (NASA and industry) that carries out NASA's mission?

Answer. Yes.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO JAMES W. MORHARD

Balanced NASA. The NASA Space Act of 1958 spells out the guiding principles for a balanced portfolio in science and discovery in the atmosphere and space. It has served the Agency well for 60 years. In fact, it has taken us to the Moon in the Apollo program; given us the Space Shuttle, Mars Rovers, International Space Station, Hubble Telescope, and X-planes. It has enabled exploration of every planet in the solar system and into interstellar space. It has also allowed for numerous game changing technologies to spur our economy and provide a spirit of partnership and diplomacy unlike any other Agency.

Question 1. Do you support a balanced NASA?

Answer. Yes.

SLS/Orion. Mr. Morhard, in your questionnaire, you list the top challenge for the Agency as the need to "establish and implement a clear, compelling, and executable direction for the future of human space exploration." The Administration's Space Policy Directive-1 directs the return to the Moon, and from there to lay the pathway to Mars.

Question 2. Do you believe the Administration's policy, utilizing SLS and Orion, is the right one for human space flight?

Answer. Yes.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. TOM UDALL TO JAMES W. MORHARD

I appreciate your extensive public service background. However, I am concerned that you lack the technical background that many of your predecessors have had. This is especially important in light of the current Administrator's lack of technical expertise. It is critical that senior leadership at NASA is able to critically examine technical and scientific issues—and be able to resolve issues when there could be disagreements between departments.

Question 1. How are you planning to get up to speed to understand NASA's many scientific and technical programs?

Answer. I will rely on the many intelligent scientists like Dr. Zurbuchen and Dr. Mike Watkins to provide me with the best advice on all scientific matters. I will also continue to read reports from our scientific community like the recently published 2017 Decadal survey, "Thriving on Our Changing Planet: A Decadal Strategy for Earth Observations from Space," and work to implement the recommendations. If confirmed, I will work to ensure our NASA scientists have the resources and tools available to them to carry out NASA's science missions.

Question 1a. How will you resolve these types of issues?

Answer. I will ensure there is a culture of leadership where NASA civil servants are allowed to raise disagreements, but I will also provide the leadership to create a consensus so we can move forward with missions. I will also rely on this committee, FACA committees and councils that advise NASA leadership on science missions.

Question 2. In your most recent position with the Sergeant of Arms' office, what experience do you specifically have in resolving complex issues?

Answer. The Senate's e-mail Service was temporarily stopped two months after I began the position. We then embarked on an effort to identify and resolve all the Senate's cyber vulnerabilities.

It included new defenses to address each threat that we identified. Our initial efforts were through contracts with subject matter experts who could address respective challenges. As time went on it became apparent that in some cases long term civil servants were needed instead of contractors to keep the continuity of the successes we had already attained. With that increase in staff, I had a new challenge of establishing and hiring a new branch and continue our cyber security at the same risk level is a continuation of a complex issue—where no mistake can be afforded at any level. This is just one example of the many issues the Sergeant at Arms faces.

Question 3. In your most recent position with the Sergeant of Arms' office, what experience do you specifically have in managing complex projects?

Answer. The job itself entails managing a complex project which is keeping the Senate safely operating. What I mean is that it ranges from making sure that all members, staff, visitors and the Capitol complex are safe. At the same time, the risk levels of our Information Technology must be at an acceptable level. This effort means addressing challenges from spamming and phishing all the way up to network defense. We have done so and my focus is now on keeping the projects on track and ensure collaboration among all the stakeholders.

This is all part of a greater process to maintain and constantly improve the Senate operations so that the Senate can successfully check and balance any Administration. These operations span the spectrum from all physical security and IT, to parking and furniture movers. Because of the range in-between is so large and each part must be successfully accomplished for members and staff, I believe it is a complex management challenge that I have enjoyed mastering.

Question 4. Will you commit to ensure that the research and science-based activities by NASA employees are protected from political interference including science related to climate change?

Answer. Yes.

Question 5. Will you commit to maintaining a culture at NASA that does not compromise the integrity of rigorously researched or tested scientific findings?

Answer. Yes.

Question 6. Ninety seven percent of scientists with articles in peer-reviewed journals have concluded that climate change is real, is caused by human activity, and is already causing devastating problems in our country and around the world. Do you agree with this statement?

Answer. Yes.

Question 7. How would you address the arguments of outside entities—and those serving in the current Administration—who refute NASA's scientific research on climate change?

Answer. I would direct them to read information presented on NASA's website *https://climate.nasa.gov/evidence/* and the executive summary from the Fourth National Climate Assessment.

Question 8. I am interested in working with you to support NASA's workforce and activities in New Mexico. NASA has a presence at White Sands Missile Range and we want to increase activity at that site. Many commercial companies are preparing to offer spaceflight services not only for tourism, but also for science and technology development. New Mexico's Spaceport America is one of the best places for this kind of activity. How do you see these platforms, many of which have already manifested payloads, fitting into NASA's overall mission? And, could these vehicles be a viable opportunity to expand the agency's science and human spaceflight opportunities?

Answer. NASA must further leverage its international and commercial partnerships to accomplish its many missions involving exploration and discovery. I think emerging spaceports like the one in New Mexico will play a significant role in NASA's future missions and I look forward working with you and other Senators on this committee to expand NASA's commercial partnerships.

Question 9. How do you plan to balance making changes and improvements to NASA with understanding and respecting NASA's primary functions, programs, and culture?

Answer. I will follow the guidance in the NASA Transition Authorization Act of 2017, which was authored by this committee and signed into law by the President, that reaffirms NASA should remain a multi-mission agency with a balanced set of core missions in science, space technology, aeronautics, human space flight and exploration, and education. The law also reaffirms the continuance of the SLS/Orion and Commercial Crew and Cargo programs. If confirmed, it will be my duty to ensure these missions and programs are executed on budget and on schedule as directed by the law.

Question 10. Will you commit to ensuring that transparency and accountability are integral components of management and decision-making at NASA?

Answer. Yes.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DAN SULLIVAN TO JOEL SZABAT

Question 1. Can you assure this committee and my constituents in Alaska that the Department of Transportation recognizes the unique need for EAS in Alaska and will protect and preserve existing EAS in the state of Alaska?

Answer. Yes.

Question 2. Would you agree that any effort to address costs or efficiency cannot be done in a way that would undermine EAS for the State of Alaska?

Answer. Congress has made clear that Alaska has unique transportation needs, and since I joined the Office of Aviation and International Affairs and began overseeing the EAS program, I have become attuned to these needs. While more than one-third of all EAS communities are in Alaska, collectively, those communities represent less than 9 percent of program costs. The average EAS subsidy in the contiguous 48 states is $2.9 million annually; only three Alaskan communities have a subsidy over $1 million. This data suggests that Alaska would not be the place to look to address excessive costs or inefficiencies, if such measures are considered in the future.

Question 3. As you consider the best ways to manage the EAS program, will you consult with communities that depend on EAS and the air carriers that serve those communities to ensure that your decision making is well informed about the potential impact and avoiding unintended consequences?

Answer. Yes. I have already begun to do so. Since I joined the office in January, I have already spoken to most of the EAS air carriers. I have visited with the EAS communities in South Dakota, Nebraska, Montana, Mississippi, West Virginia, and Virginia. I have joined conference calls with the Pennsylvania, New York, and Maine communities, and spoken to individual communities in Arizona, Hawaii, and Kansas. I am planning a visit to Alaska in October to learn from the communities there. I recognize that each community has unique challenges; if confirmed I will continue to reach out to the communities and carriers to find ways to make EAS more effective, more efficient, and to avoid unintended consequences.

Question 4. Instrument Flight Rules

Your assistance working with your colleagues at FAA on the following questions is appreciated:

Following the Radio Technical Commission for Aeronautics (RTCA) publication "FAA Performance Based Navigation (PBN) Enroute Structure," FAA developed a follow on document referred to as AkEnt, that outlines requirements for Alaska's future IFR enroute system. (AkEnt is not available to the public, as it is a document internal to the FAA.) When will FAA disseminate a comprehensive, cohesive, and time lined Alaska solution?

Answer. To address this question, the Office of Aviation and International Affairs, which I currently manage, reached out to the FAA for a response.

FAA Response: The FAA is committed to the safety and efficiency of the National Airspace System (NAS). We continually study and evaluate ways to improve the NAS to support the operations, including Alaska's IFR enroute system. We are currently working internally, as well as with stakeholders as needed, to identify issues and potential solutions to address the enroute system in Alaska. At this time, we cannot provide a timeline of the possible solutions; however, we will continue to look for ways to improve the Alaska's airspace and infrastructure.

Question 5. To address the IFR navigation solution for Alaska when Global Positioning System (GPS) is unavailable? What will air carriers in Alaska utilize for navigation if a VOR-Minimum Operational Network is not planned?

Answer. To address this question, the Office of Aviation and International Affairs, which I currently manage, reached out to the FAA for a response.

FAA Response: Commercial operators seeking to fly under Instrument Flight Rules (IFR) are required by current regulation, *e.g.,* Chapter 14 of the Code of Federal Regulations parts 121 and 135, to be equipped with navigation systems suitable for navigating the aircraft along the route to be flown with the degree of accuracy required for Air Traffic Control. The preponderance of aircraft used for commercial operations in Alaska do not possess any autonomous navigation capability, such as inertial navigation. Therefore, in the absence of a Minimum Operational Network (MON), most Alaska commercial operators would revert to relying on conventional navigational aids or radar vectors for route navigation during periods when GPS is unavailable. No VORs are scheduled to be decommissioned in Alaska under VOR MON. If GPS is out of service, Alaska aviation would be limited to airways/navigation serviced by existing VORs. There would be service volume limitations, because of terrain and distances between VORs. Radar vectors or monitoring could potentially fill in gaps where radar coverage is available.

Question 6. What will the standard be for GPS NextGen equipage following the 2020 mandate on ADSB? Will FAA require commercial air operators to equip with Technical Standard Order 145/146 Wide Area Augmentation System GPS and a ground-based legacy Navigational Aid backup? What will the standard be moving forward?

Answer. To address this question, the Office of Aviation and International Affairs, which I currently manage, reached out to the FAA for a response.

FAA Response: Following the 2020 mandate for ADS–B, GPS will remain the standard both for performance based navigation (PBN) and ADS–B. PBN and ADS–B are both fundamental elements of NextGen. Both underpin FAA plans to improve the efficiency of air traffic management through time based and trajectory based flow management. ADS–B will remain the principal means of aircraft surveillance.

While the Wide Area Augmentation System (WAAS) will continue to provide access for many pilots to the vast majority of the country's runways, there are no plans, nor any pending rule-making initiatives, that would require any operators to be equipped with Technical Standard Order (TSO) 145 or 146 GPS equipment.

Commercial operators are now required, by regulation, *e.g.,* 14 CFR part 121 § 121.349, to be equipped with two approved independent navigation systems suitable for navigating the airplane along the route to be flown with the degree of accuracy required for ATC. Operators flying under Part 135 face similar requirements. Given that the FAA intends to maintain a minimum ground-based navigation infrastructure as a back-up to GPS, commercial operators will need to maintain some equipment capability to use ground-based navigation as a back-up.

Question 7. When will FAA develop and adopt a plan on whether to convert colored (Non-Directional Beacon based) airways to T-Routes (GPS based), NDB physical locations to GPS waypoints, and amend requirements for mountainous regions and the remaining recommendations contained within the FAA PBN Enroute Structure for Alaska?

Answer. To address this question, the Office of Aviation and International Affairs, which I currently manage, reached out to the FAA for a response.

FAA Response: The FAA has initiated a detailed assessment of feasibility for all 92 recommendations in the 2017 RTCA Recommendations for the Performance Based Navigation (PBN) Route System report. Included in the Tactical Operations Committee report are the 23 Alaska-specific Low Altitude recommendations. We anticipate this activity will be completed by the end of CY2018. Subsequent to completion of this assessment, the FAA will evaluate resource requirements and prioritization of the recommendations in relation to all other National Airspace System (NAS) needs.

The FAA 2016 PBN NAS Navigation Strategy en route plan identifies efforts in the near term (2016 -2020) to begin the transition to an improved PBN-based route structure. The focus in the en route domain is to shift to a PBN-based service environment, and to increase the agility with which these services can be provided to balance emerging operator and systemwide needs.

In the midterm (2021–2025) en route environment, the FAA will focus on continuing efforts to provide additional PBN routes and point-to-point navigation where operationally beneficial, and will remove most conventional ATS routes. Commitments include replacing conventional Jet routes with Q-routes where route structure continues to be needed, implementing T-routes where beneficial, and eliminating Victor airways, except where needed in mountainous regions and areas without radar coverage.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. DEB FISCHER TO JOEL SZABAT

Question. The Essential Air Service (EAS) program is critical for airports in Nebraska, especially those that have experienced service disruptions. I have repeatedly objected to cuts to EAS support in Nebraska. Will you commit to maintaining the EAS program, recognizing that airports experiencing service disruptions may need this support to improve their air service?

Answer. In April, I visited EAS communities in South Dakota, Montana and Nebraska. In Scottsbluff, I invited all of Nebraska's EAS communities to an open conversation. I met with airport officials and leaders from six of the seven communities to learn from them firsthand the importance of EAS. From the local leaders, I have learned that reliable service, multiple daily flights, and, where possible, interline agreements with carriers at hub airports, are the keys to successful EAS. Passengers are driven away by repeated service disruptions. When a carrier unexpectedly stops serving a community, it can take 90 days or more to resume service with a replacement carrier. If confirmed, I will do all in my power to mitigate or eliminate service disruptions, to improve the value of EAS to the communities it serves.

The Office of Aviation and International Affairs has the statutory responsibility to advocate for the aviation industry. If confirmed, I will ensure that senior officials in the Department and in the Administration are aware of the importance of EAS to rural communities, and how the EAS program ties to President Trump's rural initiatives.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CATHERINE CORTEZ MASTO TO JOEL SZABAT

Unmanned Aerial Systems. In Nevada we have an exciting and developing industry leadership on drones. We have the Nevada Institute for Autonomous Systems, which is a nonprofit that partners with various organizations to develop drone technology. We're one of the FAA designated UAS Test Sites, the only one which is

statewide, as well as home to a recently awarded FAA UAS Integration Pilot Program site given to Reno.

Question 1. How are you working to get your office more engaged with new aviation technologies, such as drones, urban air mobility, and ensure businesses know they need to obtain authority if they want to operate in the national airspace?

Answer. The Office of Aviation and International Affairs, within the Office of the Secretary (OST), recognizes the transformational changes that automation is bringing to aviation and surface transportation systems. The Secretary has identified the safe integration of unmanned aviation technology into the national airspace as a high priority. The Office plays two important roles with regard to unmanned aviation.

First, by statute, the Office is responsible for reviewing applications for economic authority from entities that seek to engage in air transportation, which means transporting persons or property to, from, or within the United States for compensation. Economic authority is separate from safety or operational authorities granted by the Federal Aviation Administration, with which we coordinate closely on these matters. On April 30, 2018, in my role as Deputy Assistant Secretary, I signed and published a notice to operators explaining the streamlined procedures that the Office will use to evaluate new applications for unmanned cargo operations. The notice may be reviewed at *https://www.federalregister.gov/documents/2018/04/30/2018-09057/notification-to-uas-operators-proposing-to-engage-in-air-transportation.*

Second, the Office is at the forefront of advising the Secretary on UAS issues and developing nationwide unmanned aviation policy. The Office worked closely with the FAA to design and implement the UAS Integrated Pilot Program, which is a joint OST-FAA program that the Office supports by participating in the program's Executive Steering Group and by engaging directly with program partners, including the City of Reno and its private partners. We have established four objectives for the pilot program:

Accelerate the safe integration of UAS into the National Airspace System by testing and validating new concepts of beyond-visual-line-of-sight operations;

1. Address ongoing concerns regarding safety and security risks;
2. Promote innovation in the United States economy; and
3. Identify the most effective models of balancing local and national interests in UAS integration.
4. We expect that one outcome of the program will be improved communication with operators and technology businesses, as well as streamlined procedures for obtaining approvals to operate within the United States.

CFIUS. My appreciation is that the office you're currently serving in, and are nominated to head, has a role for DOT for all CFIUS cases that go through the department. When the Senate took up CFIUS reform earlier this year I worked to ensure the Committee addressed a number of areas of concern for me and my home state of Nevada, including addressing threats investments from China have posed to our military installations in Nevada and how they might have been used to undermine our democracy. I'm also concerned about other trends we're seeing from some Chinese investments, which fall under CFIUS's purview: Some investments from Chinese companies have been linked to potential technology theft and espionage/stealing our national security secrets.

Question 2. Can I get your thoughts on these issues and how you see them fitting into how you carry out your responsibility on CFIUS?

Answer. Although the Department of Transportation (DOT) is not a statutory member of the Committee on Foreign Investment in the United States (CFIUS), DOT is called upon for its transportation related technical expertise in CFIUS reviews. The Office of Aviation and International Affairs coordinates with the technical agencies within the DOT in review of relevant transactions. We provide insights on the companies being reviewed, and their technologies as they pertain to transportation, that inform the CFIUS.

With the passage of Foreign Investment Risk Review Risk Modernization Act (FIRRMA), the role of the Department of Transportation in CFIUS will increase. As the Administration has noted, FIRRMA is an important reform to CFIUS, providing it with the tools to identify, examine, and address national security concerns arising from foreign investment. The reforms will give the U.S. Government enhanced capacity to protect our critical technology and infrastructure, while also keeping America open to foreign investment. If confirmed, I will assure that the Office of Aviation and International Affairs continues to provide transportation-related technical expertise in the review of applicable transactions.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. BRIAN SCHATZ TO JOEL SZABAT

Question 1. The Department has failed to issue rules requiring air carriers to refund fees for delayed baggage, as well as to address adjoining seats for children and their parents, despite being directed to do so in the 2016 FAA reauthorization and the 2018 omnibus. Are those rules coming? Can you commit to me that as Assistant Secretary, you will respect the authority of the United States Congress and implement the statutory requirements of the Department in a timely manner?

Answer. Since I joined the Department of Transportation in 2002, I have had the utmost respect for the constitutional role and authority of the United States Congress. If confirmed, I will continue to respect the authority of the United States Congress, and will meet all statutory requirements, insofar as it is in my power to do so.

If confirmed, I will work with the Department's Aviation Consumer Protection Division, which handles these important matters, to meet the requirements of the FAA Reauthorization Act of 2016. In response to the 2016 Act, the Department issued an advance notice of proposed rulemaking soliciting public comment and feedback on requiring airlines to refund fees for delayed bags on flights within, to, and from the United States. The Department plans to issue the Notice of Proposed Rulemaking (NPRM) this year. See *https://reginfo.gov/public/do/eAgendaViewRule?pubId=201804&RIN=2105-AE53.*

The Department already requires airlines to compensate passengers for reasonable expenses that result due to a delay in baggage delivery and to refund fees for lost bags. Currently, consumers must file claims with an airline to seek reimbursement for damages caused by delay in the delivery of their baggage.

It is in the airlines' interest to ensure that parents can sit with their children. The 2016 Act required the Department to review U.S. airlines family seating policies and decide whether it is appropriate to issue a policy. The Department, led by the Aviation Consumer Protection Division, which handles these matters, completed its review and published new information for the public. To make sitting together easier when flying, the Department has now included on its website practical tips that families may use before, during, and after air travel. See *https://www.transportation.gov/individuals/aviation-consumer-protection/family-seating.* The Department website also includes links to the family seating information of the large U.S. airlines. The Department intended to provide consumers clear and accurate information to enable them to make better informed decisions when choosing among air transportation options.

Question 2. In your previous role at the Maritime Administration, you were supportive of promoting use of U.S. flag in the international shipping industry. Unfortunately, according to MARAD, American shipping companies have gone from 25 percent of global tonnage in the 1950s to just 2 percent today. As a result, we've seen our international maritime shipping industry lose 87 percent as shipping companies flag their liners outside of the US. We're now starting to see some airlines trying to import this model into the international aviation industry. If confirmed, how will you use your new authority to protect American airline workers?

Answer. I recognize the importance of the aviation industry as a key employer in the United States, the value of the more than 10 million Americans employed in commercial aviation jobs, and their impact on the economic health of the country. Congress has provided the Department with statutory authorities to prevent entry of "flag of convenience" carriers in international aviation markets. If confirmed, I will use those statutory authorities to benefit the aviation industry and those it employs. Furthermore, I will work diligently to increase opportunities in the international marketplace for U.S. airlines and U.S. labor groups. If confirmed, I will work to ensure that U.S. airlines are competing on a level playing field, that our aviation agreements are enforced, and that the aviation industry is positioned to continue as one of our country's most important employers.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. MAGGIE HASSAN TO JOEL SZABAT

Question. You mention in your testimony that, should you be confirmed, one of your goals is to work on behalf of the small, rural communities that depend on the Essential Air Service (EAS). Entire communities and local economies in our country depend on this program, which makes air travel possible where it otherwise would not be. The Lebanon Airport, in my State of New Hampshire, provides service for 10 to 11 thousand Americans, many of whom are Granite Staters, every year, and

without this critical funding source, these passengers could be left with fewer options, higher ticket prices, and lengthy commutes to other airports. How will you reconcile supporting our rural communities—which you said is a priority in your testimony—with the President's proposal, in his 2019 proposed budget, to drastically reduce resources for one of the most important aviation programs that supports rural America?

Answer. As noted in your question, without Essential Air Service, the rural travelling public would be left with fewer options, higher unsubsidized fares, or longer commutes to other airports. At the same time, the President's Budget recognized that EAS program costs continue to rise dramatically even though the number of eligible communities has been frozen since 2011, other than for Alaska and Hawaii, and proposed some ways to constrain those costs. Since I joined the Office of Aviation and International Affairs, my discussions with EAS airport directors and community leaders across the country persuade me that there may be other ways. For example, the President's Budget would eliminate waivers for communities that do not meet enplanement standards. EAS community leaders pointed out that it is the reliable service of the air carrier that most affects enplanements, and if the air carrier has poor dependability, they believe the community should have the option of trying another carrier before losing its EAS status. I believe stakeholders can work together toward common-sense management and fiscal adjustments to improve this important program for rural America, while controlling costs as stewards of the taxpayers' dollars. If confirmed, I commit to actively engaging in that conversation.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. TOM UDALL TO
JOEL SZABAT

Question. Essential Air Service is critical for many rural communities across the country, but especially for communities like Clovis and Carlsbad in New Mexico. I am concerned that the President's proposed budget slashed funding for this program. Did you support this proposed cut? If not, how will you protect the program from your position?

Answer. I was in the Maritime Administration when the President's Budget was prepared and did not review the Essential Air Service proposal. I am aware of the importance of EAS to communities such as Carlsbad and Clovis. Clovis is a case-in-point of the type of local partnership I hope can improve the effectiveness and efficiency of EAS. When the contract came up for renewal, the community favored a twin-engine option that would cost the taxpayers $900,000 more than continuation of single engine service. The Air Force also favored twin-engine service, to allow military personnel, prohibited from flying on single-engine planes, to transit through Clovis. I met with community leaders, and worked directly with an Assistant Secretary of the Air Force, who identified the potential for more than 6,000 annual additional passengers. Despite the higher cost, my office awarded an 18-month 'proof of concept' contract. We put the carrier, the Air Force, and the community on notice that they must work together to realize additional passengers if they want to assure the continuation of twin-engine service. If they succeed, then the additional paying passengers should lead to a smaller subsidy when the contract is renewed. If confirmed, I will continue to work with the community to help them succeed.

The Office of Aviation and International Affairs has a statutory obligation to advocate for the American aviation industry. If confirmed, I will ensure that the senior leadership of the Department and the Administration are aware of Essential Air Service's critical importance for rural communities, and how EAS supports President Trump's initiatives in support of rural communities.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JON TESTER TO
JOEL SZABAT

Aviation Service to Rural Communities. Rural communities—such as those in Montana—exist and operate in conditions that differ greatly from those in urban areas. One reality that we encounter every day is expansive distances. As a result, aviation-based transportation systems play a critical role in connecting people in rural communities with their families, with health services and with their jobs.

Question 1. According to your website, one of your office's goals is to develop "policies to improve air service and/or access to the commercial aviation system for small and rural communities." Would you please describe what your office is doing to achieve this goal nationwide as well as specifically in Montana?

Answer. The Office of Aviation and International Affairs has within its mission the objective of ensuring that consumers in all regions of the United States, including those in small communities and rural and remote areas, have access to affordable, regularly scheduled air service. The Office administers both the Essential Air Service (EAS) and Small Community Air Service Development (SCASD) programs. The EAS program subsidizes service to seven communities in Montana. In April, I met in Missoula with the airport directors and community leaders from all seven EAS communities. The SCASD Program has provided 15 grants to Montana communities totaling $6,405,000. There are four active SCASD grants at this time. Using the 2016 Missoula grant as an example, the Office is working with the Missoula County Airport Authority to increase available airline seats, reduce travel times, and sustain nonstop, daily service to Dallas DFW or Houston IAH. In another example, Great Falls gained seasonal, daily service on United Airlines to Chicago ORD. This gain represents 3,500 additional inbound seats to Great Falls, according to the community's final grant report.

Overall, the Office follows developments in airline scheduling, airline competition, regional air service dynamics, and the air service needs of small and rural communities. The Office uses this knowledge to assist communities seeking to attract new or additional air service by sharing best practices employed in similarly-situated communities, especially those gleaned through the SCASD Program. If confirmed, I will continue to work directly with the EAS communities and the airlines serving them with a focus on increasing reliability and flight frequency, and adding more interline agreements where practical. These are the key tools to both improve the quality of air service to EAS-dependent communities, and to reduce the subsidy per passenger by filling more seats on each flight.

Air Ambulance Services for Rural Communities. When life-threatening emergency situations arise, all of us want to be able to have access to the best medical care. In rural communities, that access can be hundreds of miles away. Air ambulances are not a luxury for rural-based citizens. They can be the difference between living and dying. Yet presently, the costs of air ambulance services are unregulated and skyrocketing, and bankruptcy-inducing fees in tens of thousands of dollars are unchecked. For one patient, Isla Rose, her family was billed $56,000. Last year, I proposed legislation that would seek to redress such circumstances so that patients can focus on recovering medically and not have to focus on figuring out how to recover financially due to being transported via an air ambulance.

Question 2. Given the unrestricted and usury fees charged to patients facing medical crises who used an air ambulance, greater accountability is needed. What steps are needed to rein in unchecked air ambulance service fees?

Answer. The Office of Aviation and International Affairs has a statutory responsibility to address small and rural community air service issues, and I can appreciate your views on the challenges of obtaining affordable air ambulance services. I am also aware of reports detailing the amounts billed to patients by air ambulance providers. Congress has provided the Department with some authority in this area. The Office of the General Counsel has authority to investigate whether an air carrier, including an air ambulance provider, has engaged in an unfair method of competition or an unfair or deceptive practice in air transportation or the sale of air transportation. The Office tracks air ambulance related consumer complaints, and the Office regularly updates its website with the names and numbers of complaints registered against air ambulances.

Under the aviation statutes, the Department is limited, and the States are preempted from regulating the price, routes, or services of an air carrier in interstate air transportation. However, the Department, through the Department of Justice, has filed briefs in a number of recent court cases addressing the scope of the Airline Deregulation Act's preemption provision. See, *e.g.,* Scarlett v. Air Methods Corp. (D. Colo. Nos. 17-cv-485 et al.); Wray v. PHI Air Medical LLC, No. 18-cv-432 (D. Ariz. July 9, 2018); and Stout v. Med-Trans Corp. (N.D. Fla. No. 17-cv-115). In addition, where patients were charged what they believe to be excessive fees for air ambulance services, some courts have recognized a legal theory—that does not run afoul of the ADA's preemption provision—that would permit patient lawsuits to proceed. For example, the United States District Court for the District of Montana recently found that a patient's lawsuit could proceed where the patient alleged that the relationship between the patient and the air ambulance was governed by an implied-in-fact contract, which, in the absence of an agreed charge, required the air ambulance provider to charge reasonable rates pursuant to Montana law. See Wagner v. Summit Air Ambulance, LLC, No. CR–17–57, 2017 WL 4855391 (D. Mont. Oct. 26, 2017); see also Wray v. PHI Air Medical LLC, No. 18-cv-432 (D. Ariz. July 9, 2018).

If confirmed, I will work with the Office of General Counsel, as well as Congress, regarding the appropriate ongoing role of the Department in addressing this important issue.

Question 2a. How would you propose that air ambulance service charges be structured so that patients are not faced with having to choose between access to lifesaving doctors and hospitals or financial ruin?

Answer. In response to a 2017 mandate from the Senate and House Appropriations Committees, the Government Accountability Office (GAO) is currently analyzing the costs and payment structures of air ambulances, including operational, medical, human capital, and business expenses. Prices and billing practices of air ambulances may be related substantially to the cost of medical services and insurance reimbursement rates, as well as the capital costs of running an air carrier. We are interested in reviewing the results of the GAO report on air ambulance costs and payment structures. If confirmed, I will work with the Office of the General Counsel, as well as Congress, regarding how the results of the GAO study may inform our regulation of air ambulances.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. TAMMY DUCKWORTH TO JOEL SZABAT

Question 1. There have been on-going controversies related to open skies agreements—more specifically, the alleged "flag of convenience" operations by Norwegian Air International and the accusation of government subsidies against several Persian Gulf carriers. Do you think these issues may warrant a review and certain revisions to the existing air service agreements?

Answer. Two fundamental principles of U.S. international aviation policy are relying on market forces rather than government regulation and ensuring a fair and equal opportunity to compete. For those instances in which the government must intercede to enforce our air service agreements and ensure a more competitive environment, Congress has provided the Department with statutory and regulatory tools to address anticompetitive behavior in international aviation markets. These matters are continuously under review. If confirmed, I will continue to consult with stakeholders with the goal of giving the U.S. industry and its employees a fair and equal opportunity to compete. I will also work to ensure our aviation partners are living up to the agreements that they have already made. This approach led to additional understandings and side-letters with Qatar and the United Arab Emirates earlier this year.

Congress has also provided the Department with statutory authorities to prevent entry of "flag of convenience" carriers in international aviation markets. Furthermore, the bilateral nature of air service agreements increases the Department's ability to ensure that foreign airlines meet the applicable ownership and control standards. If confirmed, I will work diligently to increase opportunities in the international marketplace for U.S. airlines and their workers.

Question 2. There are a number of aviation issues related to Brexit. Such issues include international air service agreements, the possible cessation of air services between the UK and the other EU countries, the prospect of maintenance operations carried out in the UK and/or aviation components made in the UK not being accepted or approved because the UL won't be covered by the European Aviation Safety Agency (EASA). In your opinion, how should DOT approach and resolve these issues?

Answer. The Department of Transportation, along with its interagency partners, is currently negotiating with the UK in an effort to provide a seamless transition to a bilateral air transport relationship upon Brexit. The FAA, in parallel, is working with the UK aviation authorities to alleviate the implications of Brexit on high-level aviation safety oversight and air traffic management between our two countries. Avoiding any significant disruption to air services between the U.S. and UK, provision of safety oversight, or certification of aviation-related products and maintenance service, is important to companies, travelers, and communities on both sides of the Atlantic, and will be a priority of mine, if confirmed.

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