

**DEPARTMENT OF THE INTERIOR, ENVIRONMENT,
AND RELATED AGENCIES APPROPRIATIONS
FOR FISCAL YEAR 2021**

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

UNITED STATES SENATE

ONE HUNDRED SIXTEENTH CONGRESS

SECOND SESSION

ON

H.R. 7612

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF THE IN-
TERIOR, ENVIRONMENT, AND RELATED AGENCIES FOR THE FISCAL
YEAR ENDING SEPTEMBER 30, 2021, AND FOR OTHER PURPOSES

Department of the Interior

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DEPARTMENT OF THE INTERIOR, ENVIRONMENT, AND RELATED AGENCIES APPROPRIATIONS FOR FISCAL YEAR 2021

WEDNESDAY, MARCH 4, 2020

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:00 a.m., in room SD-124, Dirksen Senate Office Building, Hon. Lisa A. Murkowski (Chairman) presiding.

Present: Senators Murkowski, Alexander, Blunt, Capito, Hyde-Smith, Daines, Rubio, Udall, Leahy, Tester, and Van Hollen.

DEPARTMENT OF THE INTERIOR

OPENING STATEMENT OF SENATOR LISA MURKOWSKI

Senator MURKOWSKI. Good morning, everyone.

The subcommittee will come to order.

We are here this morning to review the fiscal year 2021 budget request for the Department of the Interior. Secretary Bernhardt, welcome. This is your second appearance before the subcommittee. I appreciate the work that we have done together on a host of issues important to my State and to the country during your tenure as secretary.

Today is the subcommittee's first hearing of this budget cycle. We look forward to working with you and your team. And Senator Udall, you and your team have been very helpful as always. We want to build on the successes that we saw on our fiscal year 2020 bill which included more than \$13 billion for the Department's critical functions.

We know that the Department administers many programs that impact and improve the lives of Alaskans. And Secretary Bernhardt, I want to thank you for being a reliable partner there. We know that there is always more to be done in Alaska. Federal land makes up over 60 percent of the State. The Department oversees the majority of those lands and is responsible for developing our abundant natural resources, providing assistance to our Tribal communities by addressing climate change impacts, and much, much more.

The Department's budget request addressed many of these responsibilities which we appreciate, but there are some areas where we believe you have fallen short in addressing. The fiscal year 2020 budget request for Interior is \$11.7 billion for programs within the

jurisdiction of the Interior subcommittee. That is almost \$2 billion below the enacted level, a reduction of 14 percent.

Again, while I support many components in this budget request, I am concerned by others. But like every president's budget request, this is just that; it's a request, it's a proposal. Congress will work together to enact the final budget for the Department.

I do support the Department's focus on expanding energy and mineral security through the development of our Nation's natural resources both onshore and offshore. Particularly, I appreciate the Department's work on unlocking our onshore arctic resources within ANWR and the NPRA. I do want to note that the request assumes the Obama era 5-year plan for offshore leasing continues, which restricts the significant potential of the Arctic OCS in both the Beaufort and Chukchi Sea, so I would hope that the Department finds a path forward for a new 5-year plan that enables safe Arctic development.

I have worked for many years on the issue of the need for greater domestic critical mineral production, and I applaud the Department for the work to develop an OCS critical minerals inventory and all the work that it's doing to reduce our reliance on foreign sources of these minerals. Energy and critical mineral production is not just an economic issue but a national security one, as well.

I would like to thank you and your team for maintaining funding in the budget request for the Alaska Conveyance Program which is charged with transferring the title to millions of acres of land owed to both the State of Alaska and Alaska Natives. The request also acknowledges the need to implement the Alaska Native Vietnam Era Veterans Land Allotment section that was passed recently in the Dingell Act. Proper and expedient implementation this program, of course, is very, very important to our Alaska Native Veterans. I am going to be following up with you on this issue in the months ahead.

As you know, Alaska is home to one half of all federally recognized Tribes. The Bureaus of Indian Affairs and Education provide essential programs for Alaska Natives that are fundamental to the Federal Government's legal obligations to our first peoples.

And while I am concerned by some of the proposed reductions to critical human services, natural resources, and education programs, I am pleased to see your proposal maintains Tribal court funding for the Public Law 280 States and requests \$3 million to support activities related to Operation Lady Justice.

For the first time in our final fiscal year 2020 bill, this subcommittee was successful in providing \$6.5 million for activities concerning Missing and Murdered Indigenous Women. You know that I have worked on this issue for some time, and I greatly appreciate your efforts on this and the leadership laid down by the President and certainly that of Tara Sweeney at Bureau of Indian Affairs, as we work to develop a long-term plan to address the high rates of violence, abuse, murder, and trafficking that we see unfortunately in many of our rural communities and our urban centers when it comes to our indigenous peoples.

We cannot talk about funding needs for public lands without discussing deferred maintenance across our national parks. We all have our parks that are our favorites, but I think Alaska hosts

some of the best when you think about Denali, Glacier Bay, Gates of the Arctic, Katmai. But we also recognize that not only Alaska's national parks but parks across the country are struggling to address deferred maintenance challenges.

In some cases, like with Denali National Park, critical deferred maintenance needs must be met in order to mitigate and prevent negative economic consequences from impacting our entire State, so I am going to bring up the situation with the road there in my questions.

I think we have done our best as a subcommittee to address backlog maintenance issues, but really there is not enough discretionary funding to meet those needs. You and I have had several discussions about the necessity of tackling the deferred maintenance backlog at our Nation's park and other public lands.

The principles behind the Public Lands Infrastructure proposal contained in the request as well as the Restore Our Parks Act which has been championed by my colleague Senator Alexander, could certainly help to address the difficulties that we face in finding those resources, so we have got some work to be doing together there.

I am looking forward to learning more about how this budget proposal fulfills our commitment to science, better prepares us for natural hazards, including wildfires, and accomplishes our goal of greater stewardship on public lands. I am also eager to hear what the Department is doing to ensure funding for international wildlife trafficking and conservation issues is successfully executed.

I know we have got a lot of ground to cover and limited time this morning. We have got a vote at 10:30, and I know Members have many competing committee requirements here this morning.

So Mr. Secretary, I thank you for being here today. Thank you for your leadership at the Department. And we look forward to the opportunity to discuss the President's budget with you.

And with that I turn to my colleague and the Ranking Member, Senator Udall.

OPENING STATEMENT OF SENATOR TOM UDALL

Senator UDALL. Thank you very much, Chairman Murkowski.

And I would like to begin this morning by thanking you for your leadership and for working with me so closely on fiscal year 2020 appropriations bill. I am very proud of the work we accomplished to fund many of the programs we will discuss this morning.

I would also like to welcome Secretary Bernhardt to the subcommittee. Good to have you here today. Mr. Secretary, I know you are here to discuss the administration's fiscal year 2021 budget request, but I also want to thank you for visiting with me this week and taking time to sit down with the leaders of this subcommittee from both chambers to talk about the relocation of the Bureau of Land Management.

Now, it's no secret that I opposed the move, and I still have questions and concerns about whether the move will actually improve the agency's effectiveness. But the reorganization is moving forward, and I am going to do what I can to support the Bureau employees during this process.

One thing I do support is investing more resources on the ground in western States, so I was glad to hear that you still intend to have more positions on the ground in New Mexico to address energy and land management needs. I was also very glad to hear that you do not intend to follow through on the threat that one of your subordinates made last year to pull resources out of my State simply because we had a policy disagreement. I appreciate that commitment very much, and so thank you very much for that.

And I want to work with you and with Members of the subcommittee to ensure that the BLM has the resources and the people it needs to take care of its public lands and to serve the public.

Returning to the budget request, I will say up front that I do not plan to focus too much time on the details this morning. As you know, and as the Chairman has said, "President proposes, Congress disposes." And while I expect that we will restore many of these cuts in a bipartisan way, there is no way this subcommittee will agree to cut the Land and Water Conservation Fund by 97 percent or reduce payments in lieu of taxes or cut operating funds for national parks. But this budget is a very accurate portrayal of the administration's priorities.

From my perspective, when I look across the landscape, here is what I see: In 3 years this administration has actively worked to dismantle 50 years' worth of protections from bedrock environmental laws, decimated Bears Ears and Grand Staircase-Escalante National Monuments, ignoring the voices of Native communities; weakened protections for endangered species and dismantled migratory bird protections; put an anti-public land zealot in charge of managing public lands; adopted a drill-at-all-cost approach for managing our public lands; and abandoned any and all efforts to fight climate change.

These policy choices are wrong for the environment and wrong for the people of our Nation. Simply put, the President's vision is moving us backward at a time when we can least afford it.

When the need for us to tackle crises like climate and mass extinction have never been more urgent humans are destroying nature at a devastating rate, and in the United States we are losing a football field of natural area every 30 seconds. Our wetlands, forests, and coasts are being destroyed. States have identified more than 12,000 wildlife species that need better protection. Climate change is threatening every corner of our earth. Worldwide, 1 million species risk extinction in the coming decades.

That is why I have called for protecting and restoring 30 percent of the Nation's lands and waters by 2030. My Thirty by Thirty to Save Nature Resolution calls for saving enough of our ecosystems before it's too late, and Congress needs to do more right now to permanently fund the Land and Water Conservation Fund. It sounds like the President now agrees. We talked about this momentarily before we came in. And that stands there, and it's very good news, I think, for all of us.

We need to give State, Tribal, and local governments tools to address these issues at their level, and we need to invest in science programs and then actually listen to what the scientists tell us.

Our country also needs to face down climate change as the existential threat to humanity that it is. We must address the fact that

emissions from fossil fuels extracted on public lands account for nearly one quarter of the Nation's greenhouse gas emissions. Unfortunately, the Trump administration ripped up the 2016 rules to limit methane pollution.

And we must protect environmentally and culturally sensitive public lands from development like the legislation I have introduced to protect Chaco in New Mexico developed in partnership with New Mexico Tribes who consider this area sacred.

As we transition away from fossil fuels, we must also support and protect communities, Tribes, and States that have relied on fossil fuels in the process. Transitioning to a clean energy economy is for everyone, and no one can be left out.

Finally, we need to undertake all these actions with equity and inclusion as our north star. We cannot ignore the legacy of toxic pollution that has harmed so many low income communities and communities of color. In particular, we cannot ignore the centuries of desecration of Native American sacred sites and cultural resources.

I wish I could say that these practices are in the past, but our government literally and tragically desecrated human remains by blasting holes in burial grounds and other culturally significant sites to construct the President's foolish border wall near the Tohono O'odham Nation in Arizona. Injustices like these must not be allowed to continue and must be addressed through sound policy and out of respect for the Federal trust responsibility and the bedrock principle of Federal Indian law that have anchored the government-to-government relationship for more than a century.

We also need to give Tribes the resources they need to protect and conserve their lands and build strong economies for their communities, not slash funding from their programs as this budget request proposes to do.

So we have a lot to talk about. So I look forward to hearing from you, Secretary Bernhardt, and I hope myself and all the Members have an opportunity to ask a number of questions here this morning. Thank you, Madam Chair.

Senator MURKOWSKI. Thank you, Senator Udall. With that, Secretary Bernhardt, let's turn to you for your presentation of the President's budget request, and then we will have an opportunity for the back-and-forth that we look forward to. Again, thank you for being here.

STATEMENT OF HON. DAVID BERNHARDT, SECRETARY, DEPARTMENT OF THE INTERIOR

Secretary BERNHARDT. Thank you very much Chairman Murkowski, Ranking Member Udall, Members of the subcommittee.

I am here today to discuss the fiscal year 2021 budget request for the Department of the Interior. I request that my written statement be incorporated into the record at the appropriate place. Thank you.

Before I turn to the budget proposal, I want to note that 171 years ago and one day, on what was the final day of the 30th Congress, the United States passed the legislation establishing the Department of the Interior.

Therefore, it is notable that yesterday, precisely 171 years later, President Trump called upon this Congress to send him, and I quote, “a bill that fully and permanently funds the Land and Water Conservation Fund and restores our national parks.” I believe President Trump is the first president to seek mandatory funding for these items from Congress in that 171-year history.

The enactment of such legislation would be historic for the cause of conservation. His support for this major initiative is extremely significant. And with all due respect, Senator Udall, the President’s vision is moving us forward, not backward.

In the year and 3 months that I have led Interior, it has become clear to me that the President takes in a lot of information when making a decision. And once he makes that decision, he wants to see it through. He is willing to lean in when facing headwinds. I would also be willing to bet that there were some bean counters in the Old Executive Office Building last night that were having heart palpitations after the President’s statement.

There will be folks who have long-held concerns regarding the Land and Water Conservation Fund (LWCF), and they will express those concerns going forward. Therefore, I think everyone who has expressed support for addressing our deferred maintenance backlog and fully funding the LWCF with mandatory funding should grab an oar and start rowing together.

Turning to the matter of today’s hearing, I would like to begin by thanking the subcommittee and its staff for working with the Department last year on a number of key issues. With your support we have successfully engaged in a process of modernizing how we administer the Freedom of Information Act, and we have dramatically restructured the Department’s ethics program. We have more work to do to be firing on all cylinders, but I want to publicly thank you for that effort.

As this subcommittee knows well, the Department’s mission directly affects Americans across the country, and its mission delivery creates economic benefits through direct investment and facilitating private sector activities and contributions. The President has been clear in his direction and priorities, and he set ambitious goals challenging Federal agencies to deliver better results. The fiscal year 2021 budget will allow us to continue advancing key presidential priorities.

We estimate that the Department totals about \$12.8 billion in current authority, and we will continue to have access to an additional \$310 million in the event of a severe wildfire season. In addition to that, we have roughly \$7.5 billion in permanent authority available.

In 2021 we are proposing several targeted investments to advance specific objectives and deliver tangible results, and I would like to highlight a couple of those.

First, we propose to strengthen the Department’s wildland fire and active management capacity. We propose a plan to transform the firefighting workforce in order to build a more stable and permanent workforce to address threats associated with wildfire, and I look forward to talking to you about that.

We are continuing to expand recreation and access on our public lands, and we are requesting additional funding to support the Missing and Murdered in Indian Country Taskforce.

Let me close by saying, Chairman, as you stated in your opening statement, the President proposes, and you dispose. I learned that reality last year here, and I do appreciate that there is a \$2.4 billion difference between your 302(b) allocation and our budgetary parameters.

The President has to look at the Department's budget in one context, and we have to fit within those parameters. And if you were to look at it from that perspective, what you'd see is a number of things, and our requests are actually up significantly from last year's request.

That concludes my statement, and I would be happy to answer your questions.

[The statement follows:]

PREPARED STATEMENT OF HON. DAVID BERNHARDT

Chairman Murkowski, Ranking Member Udall, and Members of the subcommittee, I am here today to discuss the President's Fiscal Year 2021 Budget Request for the Department of the Interior.

Let me begin by thanking the Committee for working with me last year on a number of key issues. I appreciate the fact that respectful disagreements of policy have not gotten in the way of our efforts to put in place successful reform of the Department's Freedom of Information Act program; a strengthened and expanded Ethics Program to guide employees and promote a culture of ethical compliance and a workplace free from harassment; and the relocation of the Bureau of Land Management's Headquarters to Grand Junction, Colorado, a reform that will better align BLM's functions with available resources.

THE FISCAL YEAR 2021 BUDGET

The Department of the Interior's mission directly affects Americans across the country. Delivering the Department's mission creates economic benefits for the Nation through both direct investment and facilitating private-sector activities and contributions. According to the Department's current Economic Report, in 2018, lands under the Department's jurisdiction generated roughly \$315 billion in total economic output across the country. The Department also grants access to public lands and offshore areas for conventional and renewable energy development. In fiscal year 2018, Departmental lands and waters produced nearly one-fifth of the Nation's energy, generating roughly \$150 billion in economic output, which included \$7.9 billion in direct energy revenue disbursements to States and the Treasury.

President Trump has been clear in his direction and priorities, setting ambitious goals challenging Federal agencies—through governmentwide Executive Orders (EOs) and Presidential memoranda—to deliver better results. The Department has worked consistently to implement the President's agenda for the Department. Investments outlined in the President's 2021 budget will allow the Department to advance the objectives articulated in Presidential directives.

The 2021 budget advances key Presidential priorities, including the Department's new Plan to Transform the Firefighting Workforce, investments in active forest and rangeland management to better protect communities from fire, increased access to broadband in rural areas, advancement of critical minerals exploration and development, and provision of law enforcement needs in Tribal communities. While investing in key areas, this budget also supports the administration's broader fiscal objectives through targeted reforms and program reductions.

In 2021, the Department will continue to make important operational reforms—revisiting outdated and redundant processes and regulations, strengthening the Department's ethical culture, and transforming internal administrative operations to deliver better service to customers and employees.

The 2021 budget for the Department totals \$12.8 billion in current authority. The Department continues to have access to additional emergency suppression resources via the wildfire cap adjustment in the event of a severe wildland fire season. The Department estimates there will be an additional \$7.5 billion in permanent author-

ity available—including grants and payments—for specific activities that do not require annual appropriation.

The 2021 budget continues to prioritize taking care of the lands and resources we oversee, expanding access to those areas for public recreation and enjoyment, and investing to improve the visitor experience at our sites. Funding focuses on delivering our direct mission activities. In 2021, we are proposing several targeted investments to advance specific objectives and deliver tangible results, which include the following:

- Bolstering the Department’s capability to address the wildfire seasons.
- Investing in proactive forest and fuels management activities to reduce wildfire risk.
- Supporting a broadband access initiative to expand coverage in rural and Tribal areas.
- Proposing a more sustainable Wild Horse and Burro management strategy.
- Investing in U.S. energy security and ensuring a reliable supply of critical minerals.
- Expanding public access to the Department’s lands for hunting, fishing, and other outdoor recreation.
- Addressing the problem of missing and murdered indigenous people in Indian Country.
- Promoting conservation stewardship focused on recovery and promoting collaborative partnerships.
- Being a good neighbor by continuing support for Payments in Lieu of Taxes, which are relied upon by communities across the country.
- Implementing important internal reforms in regulation and processes, ethics, workplace culture, Freedom of Information Act programs, and innovation through administrative shared services.

The President’s 2021 budget carries forward two significant legislative proposals related to the Department: a package of legislative reforms to improve forest management and reduce wildfire risk and legislation to establish a Public Lands Infrastructure Fund. Detailed descriptions of these legislative proposals and additional proposals for new appropriations language that address other Department priorities, can be found at: <https://www.doi.gov/budget/appropriations/2021/highlights>.

CONCLUSION

The priorities we have addressed in our request reflect a balanced and responsible approach to ensure continued economic prosperity and resource management. We are focused on taking care of the resources and infrastructure that we have. We are also continuing to make important reforms that will allow the Department and its programs to deliver better service to stakeholders, our customers, and employees.

Chairman Murkowski, Ranking Member Udall, this concludes my statement and I am happy to answer any questions you may have.

Senator MURKOWSKI. Thank you, Mr. Secretary. I appreciate that overview, and I am sure that colleagues heard your request for everyone picking up an oar on Restore our Parks and the Land and Water Conservation Fund. These are issues I think that we as a subcommittee understand and appreciate. As Chairman of the Energy Committee, believe me, I understand and appreciate it. But we do, of course, need to be conscious of what we are putting on the mandatory side. So these are big issues and important considerations.

MISSING AND MURDERED INDIGENOUS PEOPLE

I want to start my questions off. First I want to acknowledge what you have included in the budget as it relates to Murdered and Missing Indigenous Women, the effort there with Operation Lady Justice, and what we can be doing moving forward on this. So know that I intend to be working with you, with Assistant Secretary Sweeney on this, along with our U.S. Attorney in the State and so, so many others on this. So thank you for that commitment there.

105(L) LEASE AGREEMENTS

I wanted to talk about an issue that from a budget perspective has become more complicated over these past few years. We routinely discuss the estimates for these 105(l) Tribal lease agreements with Indian Health Service, but this is really our first foray into this with the Department of the Interior. We knew that we were going to be dealing with this; we just were not sure when.

So the budget proposal includes a request for \$21.6 million and legislative language for new indefinite appropriations accounts similar to what we have done with contract support cost.

But what I am trying to get a handle on is the numbers that we are talking about. How many lease agreements that DOI has entered into, what the agreements are for, whether they're for schools, detention facilities, what's the type of facility. And then this estimate that you have arrived at, the \$21.6 million, can you give me some sense—is this a guesstimate; how did we arrive at this number—and really trying to understand going forward are we anticipating fairly what the budgetary impact of these 105(l) leases will mean to us?

Secretary BERNHARDT. So our budget estimate, the \$21.6 million that we have in there, really is simply a reflection of our current engagement and what we estimate to be potential interest in projects. And so it's a very short horizon, is maybe the best way to say it.

You know, we signed our first 105(l) agreement in 2019, so we are still learning a little bit. The Tribes that we have entered into these agreements with have been great Tribes to work with, and so I think it's a very good start, honestly. And obviously we have proposed legislation to try and address that through what we have submitted to you in terms of a cap in a way.

But my view is that we are a long ways from being able to tell you with any clear definity, like, 5 years or 10 years out, what these could look like because it could be quite significant. But I also think we are going to be cautious as we move forward with them even though they're mandatory.

Senator MURKOWSKI. Well, and on that point, I think we know where we ended up with the obligation for contract support costs. They were required to be paid, and so at some point in time you're going to have to even up on it. What we are trying to do is really understand what we are dealing with. So if you can work with us to help better define this, I would appreciate it.

Secretary BERNHARDT. We are happy to try and do that.

DENALI PARK ROAD

Senator MURKOWSKI. I mentioned in my opening the Denali National Park road. For those who have not been, you've got one road in, and it's the same road out. Its 92 miles, incredibly scenic. It is the place that—every tourist who comes to Alaska, they want to see Denali, they want to get in on the road. It's not an open-access road. You go in by bus so that we limit the impact there.

But what we are seeing, in addition to extraordinary visitor participation—600,000 visitors into Denali Park—but we have got a situation where that road is experiencing slippage. And it's one

thing if it's a road on a flat surface; it's another thing when it's a road on the top of the side of a mountain, and it's quite dramatic.

So we recognize that this is something that is going to have to be addressed in the short term in order to have it open for the season coming up in just a couple months; but that long term, we have got to have some sustainable options.

Rerouting is one of the options being evaluated. I know the specific route has yet to be clearly determined. My understanding is that we have got general contours of the possible corridor, but I am hoping that we can, again, figure out a way to prioritize this. I know that the President has included language within the budget which we greatly appreciate, but I need to know that we will be working together to ensure that the Parks Service at every level is doing what is necessary to ensure that this road remains safe and accessible for both the short and the long term.

Secretary BERNHARDT. So I know you had folks up there I think last week.

Senator MURKOWSKI. Yes.

Secretary BERNHARDT. And I have seen some of the contour maps. We will absolutely work with you. We have this road and we have the road in Theodore Roosevelt, two very similar situations where it's the only way in and out. Denali Road, I have been up on it on the bus, and I want to make sure that we have something that is workable.

My biggest concern with some of these alternative routes is just what is that experience like versus not, and how does that relate to the infrastructure that we have at the base. But we will absolutely work with you on it.

Senator MURKOWSKI. Well, thank you. We need to ensure the safety of all that are coming into the park there.

Senator Udall has gone to vote, so I will turn to Senator Van Hollen.

MIGRATORY BIRD TREATY ACT

Senator VAN HOLLEN. Thank you, Madam Chairman. Welcome, Mr. Secretary. In the past we have talked about the proposed changes the Department's making to the Migratory Bird Treaty Act. And just to get on the record here, the proposed changes you're making would make it impossible for us to have collected the \$100 million in damages from the *Deepwater Horizon* spill under the Migratory Bird Treaty Act. Isn't that true?

Secretary BERNHARDT. I would have to go back and look at that particular settlement agreement. I was not here when it was done. I assume that—

Senator VAN HOLLEN. So you do not—just—just a second—so you do not know the answers to whether or not the changes you're—

Secretary BERNHARDT. I know full well—

Senator VAN HOLLEN [continuing]. Suggesting would be—

Secretary BERNHARDT. With all due respect.

Senator VAN HOLLEN. With respect, just answer the question.

Secretary BERNHARDT. I am sorry.

Senator VAN HOLLEN. We have gone back and forth on this.

Secretary BERNHARDT. With respect, last year you came here—

Senator VAN HOLLEN. Yes.

Secretary BERNHARDT. And I told you very clearly I would love to work with you on legislation if you wanted to go that route.

Senator VAN HOLLEN. Yes.

Secretary BERNHARDT. I have waited a year and not received a single phone call. House Members have proposed legislation, and we are——

Senator VAN HOLLEN. Mr. Secretary, I thought you were going to reach—I thought we were going to hear from you. I have raised this repeatedly not just with you——

Secretary BERNHARDT. Well, I would be happy to meet with your staff.

Senator VAN HOLLEN [continuing]. But with Assistant Secretary Wallace. Okay.

Secretary BERNHARDT. I am happy to meet with you at any moment.

Senator VAN HOLLEN. Right, right.

Secretary BERNHARDT. Three circuit courts have taken a position that mirrors our position, okay? So at the end of the day we are doing this regulation. I would love to work with you on this.

Senator VAN HOLLEN. Okay, Mr. Secretary, I can tell you, BP has some really good lawyers.

Secretary BERNHARDT. That's great.

Senator VAN HOLLEN. And they would—I can assure that——

Secretary BERNHARDT. I am not BP's lawyer.

Senator VAN HOLLEN. Yes, but you're—well, sometimes you are acting like BP's lawyer, and that is the problem here because the reality is that BP was fined and then other folks \$100 million under the Migratory Bird Treaty Act because of the massive loss in bird life.

Secretary BERNHARDT. I actually really question——

Senator VAN HOLLEN. You——

Secretary BERNHARDT. I would have to go——

Senator VAN HOLLEN. Mr. Secretary——

Secretary BERNHARDT. I'll go back and look——

Senator VAN HOLLEN. I am asking the questions.

Secretary BERNHARDT [continuing]. But I think it's a settlement agreement, with all due respect.

Senator VAN HOLLEN. Okay. Yes. And how many companies do you know——

Secretary BERNHARDT. I do not know.

Senator VAN HOLLEN [continuing]. Settle if there is no legal basis for the argument? So you have essentially eliminated—you're eliminating the legal basis that was used for getting this fine. I mean, that's a reality. So I am happy to work with you.

Secretary BERNHARDT. It's a position taken by multiple circuit courts.

Senator VAN HOLLEN. No, no.

Secretary BERNHARDT. With all due respect——

Senator VAN HOLLEN. Mr. Secretary, that is not true.

Secretary BERNHARDT. It's absolutely true.

Senator VAN HOLLEN. No. All right. We will pursue this further. Okay? Let me turn to another issue.

Let me just say on this, Madam Chairman, because we have been going back and forth. Your predecessor also sort of dodged this question.

Secretary BERNHARDT. I am not dodging. I would love to——

Senator VAN HOLLEN. Well, you——

Secretary BERNHARDT. I do not believe we have legal authority to do it. I am happy to work with you to create that authority.

Senator VAN HOLLEN. Okay. Okay. The reality is \$100 million was collected under the Migratory Bird Treaty Act in the *Deep-water Horizon* case, and I can assure you that if there had not been a legal basis for that collection, those who were sued under the Migratory Bird Treaty Act——

Secretary BERNHARDT. There was a strict liability, which——

Senator VAN HOLLEN. No, and there are issues. That's absolutely—but you've taken it to a whole different place where you——

Secretary BERNHARDT. The area where the law requires us to go rationally.

Senator VAN HOLLEN. It does not.

Secretary BERNHARDT. Why are you proposing a new rule if the existing rules—well, actually you're incorrect further in that we discussed a legal opinion last year, not a ruling.

Senator VAN HOLLEN. Yes. No, no.

Secretary BERNHARDT. And so we have proposed rulemaking to——

Senator VAN HOLLEN. Mr. Secretary, I'm——

Secretary BERNHARDT [continuing]. To codify that legal opinion.

Senator VAN HOLLEN. Mr. Secretary, we talked about the M-Opinion.

Secretary BERNHARDT. Right.

Senator VAN HOLLEN. That was the first step you took.

Secretary BERNHARDT. That was the legal authority.

Senator VAN HOLLEN. Yes, it is. Exactly. Obviously——

Secretary BERNHARDT. What we are talking about now is a rule.

Senator VAN HOLLEN. Madam Chairman—Mr. Secretary, look. That is a legal opinion.

Secretary BERNHARDT. Correct.

Senator VAN HOLLEN. Okay. Obviously the Department does not think that's sufficient, right?

Secretary BERNHARDT. Obviously the Department thinks it would be a good practice to codify that legal interpretation and rule. And the reason we do what we do——

Senator VAN HOLLEN. No, the reason, Mr. Secretary, is you know that that reinterpretation, the M-Opinion, is on very thin legal ground which is——

Secretary BERNHARDT. I actually—I think that's completely wrong.

INTERNATIONAL CONSERVATION GRANTS

Senator VAN HOLLEN. But let me ask you about some of your programs in Central Africa.

Secretary BERNHARDT. Sure.

Senator VAN HOLLEN. Maybe we can have some common——

Secretary BERNHARDT. Absolutely.

Senator VAN HOLLEN [continuing]. Understanding here because the Department took the right action, I think, last year. Around September there were some reports of some of your important antipoaching efforts. Some of the folks who were getting contracts were engaged in wrongdoing, and I salute the Department for stopping the funding at that point. That was last September.

I guess my question is that there is still \$12.3 million from fiscal year 2018, and there is also the fiscal year 2019 and fiscal year 2020 funding. I asked Assistant Secretary Wallace about this issue when he was in front of the Environment and Public Works (EPW) Committee. We plan to get together. Do you have a sense of what the plan is to renew those?

Secretary BERNHARDT. Yes. Let me be very clear with this for you since we had a little dispute on the last one. 43 U.S.C. 1457 says that I supervise all public business at the Department of the Interior, number one.

Number two, your concept of wrongdoing is really a synonym for rapists and murders. Okay? That's where the money went.

Senator VAN HOLLEN. Mr. Secretary—and it was a good thing you stopped it.

Secretary BERNHARDT. So——

Senator VAN HOLLEN. It was the House of Representatives that reached out to——

Secretary BERNHARDT. Absolutely.

Senator VAN HOLLEN. Which was the right thing to do.

Secretary BERNHARDT. And here's what we're doing.

Senator MURKOWSKI. Gentlemen——

Secretary BERNHARDT. We are doing a programmatic review——

Senator VAN HOLLEN. Yes.

Secretary BERNHARDT. And when I get that review done, either we will have the ability to prevent that from happening or not. I am not sending money where I think it's going to go for those types of things.

Senator VAN HOLLEN. Mr. Secretary, nobody is suggesting that.

Secretary BERNHARDT. Actually——

Senator VAN HOLLEN. And the fact that you would jump to that——

Senator MURKOWSKI. Gentlemen——

Secretary BERNHARDT [continuing]. Is just an example of the fact——

Senator MURKOWSKI. Time is expired.

Secretary BERNHARDT [continuing]. In the heat of your—in a confrontational mode I understood you took the same tenor with respect to the Ranking Member. If we are going to ever make progress on these issues, then we need to be able to have a civil conversation.

I have been back and forth with you and the Department has on the Migratory Bird Treaty Act for a long time. I look forward to talking with Assistant Secretary Wallace. I am happy to talk with you about any legislation.

Senator VAN HOLLEN. But at least we should be getting straight answers with respect to the legal impact of your opinions.

Thank you, Madam Chairman.

Senator MURKOWSKI. Thank you.

Let's go to Senator Hyde-Smith.

VICKSBURG NATIONAL MILITARY PARK

Senator HYDE-SMITH. Thank you, Madam Chairman. And Mr. Secretary, first let me thank you for the work you've done for the past year at the Department of the Interior.

I today would like to focus my time on a very significant historical site in Mississippi that I am very attached to. The Vicksburg National Military Park in Vicksburg National Cemetery is located in west central Mississippi within sight of the Mississippi. This national park is Mississippi's most visited tourist attraction with more than 500,000 visitors a year. But more importantly, it is the burial site of more than 17,000 soldiers from the Civil War Era.

Over the past 28 months, 28 inches of rain has fallen there. The National Park of the Soldiers of the Civil Rights Era is suffering tremendous damage from that. The 28 inches of rain has caused significant erosion, road damage, and road collapses in various sections of the park. This unprecedented rainfall has forced park officials to close about 30 percent of the park. But even more disturbing to me is the damage that has occurred in the Vicksburg National Cemetery.

Currently there are 64 gravesites of the United States African American Troops and other unknown burials that have been compromised due to soil erosion from the excessive rainfall. I visited the park personally on February the 21st and was astonished by the magnitude of damage and the way those graves have just slid into piles of mud.

Since my visit you have dispatched personal resources to begin assessment of the damage of the park, and I sincerely thank you for the attention to this issue. But more work has to be done, and the Vicksburg Military Park and National Cemetery are vital parts of American history. And, of course, the local economy has been affected; but more so, those graves have been disturbed.

And I am just asking for your commitment. Will you commit to me that you will explore all available resources within your Department to address the damages at the Vicksburg National Military Park and Cemetery as soon as possible?

Secretary BERNHARDT. So as you said, we have a team there. Resources are focused on it. It's obviously a very dynamic situation right now, but we are 100 percent there, and we will be there, and I will personally work on it. We have a big interest in making this right too.

Senator HYDE-SMITH. Thank you very much.

Secretary BERNHARDT. You bet.

STE. GENEVIEVE NATIONAL HISTORIC PARK

Senator BLUNT. Well, Secretary, thank you for being here.

I am glad we continue to talk about the park that's getting put in place at Ste. Genevieve. I think Mike Ward, who is the superintendent at the Gateway Arch Project has been great at keeping an eye on that. There is a new superintendent that's designated and onsite now. I think the legislature is moving forward with what they need to do to really get that park in place.

I look forward to you having an opportunity to visit. Sometimes we get a little more of that put together. I think it's going to be one of the great walking historic parks in the whole park system and look forward to that.

MISSOURI RIVER MANAGEMENT PLAN

On a topic that's not developed quite as well is our Missouri River flooding challenges. About this time last year, almost exactly—I think it was around the 12th to the 14th of March—we had flooding start earlier than it normally does in the very northern corner of the State that affected Kansas and Nebraska as well. A lot of what happened then has not been remediated because of high water during most of the summer.

We are talking to the Corps on this, but one of the projects that I continue to be concerned about is the Corps' focus on some of the fish issues, the pallid sturgeon issue, frankly before the Corps knows what would work. Already a number of breeding chutes were put in. It turned out they did not work. Now the proposal is maybe we do 12 intercepting rearing complexes along the course of the river. I think there is no particular reason to believe they would work either.

And what I am wondering is, what can we do to better monitor whether something would work before we go full-fledged into a dozen locations? And believe me, every minute that's spent on that is a minute that's not spent on getting ready for what would be this year's flooding challenges.

Secretary BERNHARDT. So one of the things that we are doing with the Endangered Species Act implementation is to better inform our folks of what our regulations require in terms of reasonable certainty and likelihood so that we can be working with proposing agencies like the Corps in a way that offers them more flexibility.

I would be happy to have the Service make sure that they are communicating with the Corps to ensure that they are thinking about these items and with our entire toolkit because we really have made some changes to improve that process.

Senator BLUNT. Well, one of the things I would like you to for sure communicate is to be sure that you're also talking about the impact on flood control and navigation issues as part of the discussion as to how to move forward here. Those are still priority issues in the whole management plan, but they never seem to get the priority considerations over the last few years.

Another thing I would like you to look at is what kind of metrics would Fish and Wildlife use to determine, one, if this is really a workable plan; and two, if any part of the plan is put into place, how do you measure the success?

So far, again let me repeat, it's taken a lot of time, a lot of effort, a lot of Federal money to put things in place that then we found out did not work. If you know something's going to hurt people and property and you do not know that it's going to produce the result, I think there should be more of an effort to be sure that you've really tested this in a way that the results would be at least positive on the wildlife side if you know it's going to be negative on the

people and property side. And of course all the people involved would believe that this should not be a choice that's being made.

Also, the fish hatcheries, Neosho, I think there is one other one on the Missouri River—seem to do a fine job of repopulating pallid sturgeon, but I would like a commitment from you that we are going to look carefully at the metrics of how we measure whether this might work or not and then if you try it somewhere, whether it really does work or not.

Secretary BERNHARDT. So I will give you that commitment. I will also tell you that the President has expressed that view to me multiple times in a broader setting. And we are very interested in utilizing human interactions with proposals of hatcheries and other things in a number of places.

Senator BLUNT. Good.

Secretary BERNHARDT. So I'll get back to you on it, sir.

Senator BLUNT. All right. Thank you, Secretary.

Senator UDALL [presiding]: Senator Tester.

LAND AND WATER CONSERVATION FUND

Senator TESTER. Thank you for being here, Secretary Bernhardt. I appreciate your representation here for the Department of the Interior.

For four consecutive years this subcommittee has either met with you or someone in this position to review President Trump's budget and more specifically previous budgets, including this one, to get LWCF. And I am pleased that the administration has reversed course and is now backing permanent, full funding for the best conservation tool we have at the Federal level, Land and Water Conservation Fund.

As you well, know, I have been a supporter of this fund since I joined the U.S. Senate, and I am encouraged where we are today, very encouraged. I am pleased that some of my colleagues who in the past blocked strengthening LWCF are now on board. It's a good day, no doubt about that.

I was curious to know if you were aware of the President's change in point of view on fully funding the Land and Water Conservation Fund. He originally presented it at \$14 million. Yesterday he tweeted out that he wants to fully fund it permanently at \$900 million. That's a really good thing. Just curious if you know about it.

Secretary BERNHARDT. Well, I would say this. You were not here for the opening, but we discussed that a little bit in my opening. I will tell you this. I do think that there probably were a few folks in the Old Executive Office Building that had heart palpitations yesterday afternoon. But look, the President makes a decision, and this is one that he felt was very important, and he did it.

Senator TESTER. Yes. That's good. So it indicates to me by that answer that you really did not know anything about it.

Secretary BERNHARDT. I am not going to discuss my conversations with the President.

Senator TESTER. Okay. You answered the question. So the question I have next is, will you and President Trump do everything that you can—you cannot speak for the President. Let me specify "you." Will you do everything you can to assure clean passage of

bipartisan legislation that is about to be introduced to fully fund the Land and Water Conservation Fund and to address the Nation's national park maintenance backlog?

Secretary BERNHARDT. Yes. So I actually, earlier today in this committee, encouraged us all who have an interest in this to get together and start rowing because I think it's a tremendous opportunity for conservation in America. I think it's unprecedented that a president has asked for mandatory funding for these things, and we should seize the day, sir.

Senator TESTER. I am with you 100 percent. It's almost too good to be true, but we will take it for what it is.

Secretary BERNHARDT. That depends on Congress acting.

Senator TESTER. Yes. Well, Congress is going to act. One way or the other, we will act; or if it's held up, not act. But fortunately I think we will act.

BUREAU OF LAND MANAGEMENT LEADERSHIP

I am going to talk about your Acting Director of the Bureau of Land Management (BLM) who is not just bad but horrible on public lands. I think you know it, I know it, the papers show where he has proposed selling off public lands. And maybe that's the goal behind——

Secretary BERNHARDT. Actually he's not. I mean, let's be very clear, Senator. Perry Pendley is a former U.S. Marine——

Senator TESTER. I——

Secretary BERNHARDT [continuing]. A former lawyer——

Senator TESTER. Mr. Secretary, I think he is a great human being and served this country, but do not deny—do not deny the fact that he has been front and center on selling our public lands.

Secretary BERNHARDT. He has not.

Senator TESTER. That is revision history.

Secretary BERNHARDT. Listen to me. Let me be very clear with you. The day he walked into the Department one of his first acts was to add land to BLM, and he will not—he will not support large-scale sales of Federal land or transfer. He will not, under my watch at all. He will not.

Senator TESTER. Okay. So the question is, is why would you put somebody in that position if you're going to tell him this dog does not hunt?

Secretary BERNHARDT. I have complete faith that Perry understands the policies of our President and of me and will implement them to a tee. If I did not have faith in that, he would not be there. I am very confident of that, and nothing he's done since he arrived in August would lead me to believe there is anything to the contrary to that. I have a lot of faith in Perry, and I also have a lot faith in my willingness, if I see a deviation, to deal with it. And it has not happened, and I do not expect it to happen.

Senator TESTER. It better not happen.

Secretary BERNHARDT. It will not happen.

RURAL WATER PROJECT FUNDING

Senator TESTER. The budget for this year cuts funding for rural water projects by 79 percent. This is a budget, by the way, that

adds \$1 trillion to our national debt, and we are not investing in critical water projects in rural America.

Could you address that at all other than saying “you know what, Congress, tack on some more money to the debt and pay for this program.”

Secretary BERNHARDT. So I think through the budget of the Bureau of Reclamation, which is not before us in this subcommittee, does what it can with the parameters that it has. And we have been very consistent in maintaining our support for projects, and we will continue to do so, and we are trying to be thoughtful about it. We are also trying to be innovative when it comes to partnering and working with project proponents. So that is the reality on water.

Senator TESTER. I can also tell you one other reality, it does not get built with my good looks; it gets built with money. And I think that if we are going to do things like put proposals forward—maybe not from your office but from other people—to sell our public lands to pay for infrastructure, we have got a big problem.

Secretary BERNHARDT. That has not happened in the Department of the Interior.

Senator UDALL. Thank you, Senator.

Senator Rubio.

EVERGLADES RESTORATION

Senator RUBIO. Thank you. First, let me thank you and the President for historic funding for Everglades Restoration, \$250 million. I hope we continue to sustain that. It's an enormous project, an important one.

INVASIVE SPECIES

I want to thank you for working with us on Invasive Species which is a growing problem.

WILDFIRE PREVENTION

And I want to also just point to something you talked about, wildfire prevention in Florida. We are very proud of how we manage our forests. Every year we are going to burn about over 2.1 million acres, and we are going to do it responsibly. So thank you for all that.

DRILLING MORATORIUM OFF FLORIDA AND EASTERN GULF OF MEXICO COAST

We have a very big issue in Florida we have discussed in the past, and that is the existing but soon-to-expire moratorium on oil and gas drilling off of Florida and eastern Gulf of Mexico. Opposition to drilling and exploration, extending and/or making permanent this moratorium has unanimous support among all Floridians, both political parties at the State level, at the Federal level. And the reason is really not because of energy per se; it's because of the circumstances in Florida that are very unique.

We have a very important military testing and training complex, the Joint Gulf Range Complex, out in the Gulf. And by all accounts, without dispute, having exploration out there would abso-

lutely undermine this critical resource of the country but also important to Florida.

The House has passed a permanent extension. I think only one Member of the delegation voted against it, and it was because it was permanent. I, on the other hand, have offered or suggested a 10-year extension of the moratorium as a sort of compromise approach that provides more certainty for the next decade.

And the Chairwoman, Chairwoman Murkowski, last year, I believe, at this very hearing committed to working with us on this, and I thanked her for that. I look forward to working with her on it. It's really important.

And as a side note, my colleague from Florida, Senator Scott, and I filed a 10-year moratorium as an amendment to the energy bill that's on the floor now. We are hoping we can get some action on that.

What I wanted to ask you is, as you formulate the 5-year plan for oil and gas lease and sales in the United States, the law will require you to consult with State and local leaders of the affected areas.

So I wanted to once again get the commitment that I believe I have gotten from you publicly and in our conversations in the past, reaffirming that you're going to talk to our local delegation, your Department is going to talk to our local and State leaders to see what they have to say about oil and gas exploration—which I know what it will be—and that those concerns are going to be taken into account as those decisions are made.

Secretary BERNHARDT. First off, the simple answer is “absolutely.” But as you know and as you said, Senator, the law requires us to do that. We absolutely will do it. And it's also my personal experience that in the entire life of the Outer Continental Shelf program that the ultimate plan always has deferred to those views.

So they will be considered. I will reach out when we get to that point, absolutely.

Senator RUBIO. And I thank you again. The point I always make to my colleagues is this is for Florida, not really about energy independence which I support and most of us in the delegation support. It has to do with obviously some concern about what impact an accident would have on our beaches and on our tourism.

But I think the overriding concern that everyone shares is the impact it would have on our Department of Defense operations and a very unique testing range which we, frankly, cannot replace. I mean, we just do not have anything else like it in the continental United States that we could use for very important functions.

So your commitment is important. I look forward to working with your Department and ensuring that all the proper input is received. And I hope that we can get action on it here in Congress because it would provide a level of certainty that I think would be welcome in Florida and be important for Floridians.

I guess the Ranking Member. The Chairman is not back yet. She should be on her way. I am done with my question. Thank you.

Senator UDALL. Thank you very much, Senator Rubio, for your participation and being here today. My understanding is she's managing the energy bill, so she may or may not be back. But we are happy to have you here.

We have other Republican Members, I think Senator Daines, Senator Alexander, and Senator Capito that will be here and maybe a few more Democrats. Anyway, thank you, Senator Rubio, for your participation today.

LAND AND WATER CONSERVATION FUND

I am heartened by the President's newfound support for the Land and Water Conservation Fund. I have been a champion for this program my entire career, and I am proud to join Senators Manchin, Daines, and Gardner in this combined bill, and I know that Chairwoman is very, very interested in seeing us do things on conservation.

I would like to note that this is something President Obama supported in his budget request, both permanent and mandatory. And I hope the President is sincere in abandoning this administration's previous attempts to gut the LWCF. I would be more than eager to work across party lines with him to get this done for the American people and for future generations.

Secretary Bernhardt, there is tremendous excitement in the conservation community today. Can you assure us that the whole administration is now supporting the President's call for permanent, mandatory LWCF funding? And will you work with us in a bipartisan way to get this done as soon as possible?

Secretary BERNHARDT. So it's not my recollection that President Obama's proposal contained the parks proposal, number one.

Number two, the President made his comment, and I am 100 percent confident everybody's getting in line.

Senator UDALL. Great. That's great. And my understanding, you know, originally the sad thing in looking at commissions with vision, Laurance Rockefeller, as you know before we had the Land and Water Conservation Fund, chaired an outdoor commission, and the recommendation of that commission, I believe, was spend \$1 billion a year because the needs are there and it's going to make us a better country. And now in recent times we have had several presidents say we are going to do that. So if both of are smiling, then that's a good deal.

Secretary BERNHARDT. Yesterday I was looking through some old LWCF material, and there was a photo of you, your dad, and I assume your brother on a raft at the bottom of the Grand Canyon as your dad's talking about it, so I thought that was kind of neat.

Senator UDALL. Yes. He had to end up combining business trips and family trips together because as you know—

Secretary BERNHARDT. Yes, that would result in a major Inspector General investigation today.

CLIMATE CHANGE

Senator UDALL. Yes. In those days you could do them both together. And the secretary—we had six children, and so we ended up doing that. I would like to ask a couple of questions about what some scientists are calling our climate emergency.

I am extremely troubled by the report in Monday's New York Times that at least one Department official tried to insert inaccurate language in the studies and reports at the Bureau of Reclamation and language that denies the scientific consensus regard-

ing climate change including the debunked claim that increasing carbon dioxide in the atmosphere is beneficial.

In fact, that Times report says that by 2018 the Bureau had, quote, “adopted a de facto requirement that studies reference climate uncertainty,” end quote, in contravention of established science.

And this story comes on the heels of other reports that officials attempted to censor, a National Parks Service report on climate, and retaliated against senior employees for their climate work.

Mr. Secretary, you yourself have testified that the climate is changing and that humans are a contributing factor. But unfortunately you have denied that your Department has any real responsibility for doing anything about it. And now this new report raises alarms about what the Department is really doing behind the scenes with respect to climate science.

So let me ask a yes-or-no question. Does the Department or any of your bureaus have a position, either officially or unofficially, to question the scientific consensus that climate change is occurring and is human-caused as part of its decision documents?

Secretary BERNHARDT. Coming up here today I pulled——

Senator UDALL. Will you give me the yes-or-no before you go into the detail there?

Secretary BERNHARDT. I believe fundamentally that the Department regularly, in publications, and here’s just a few—we regularly comment on climate. We regularly comment on the fact that the climate is changing. And we try and have the best information and the best science to do that. And I am happy to insert this into the record as just one quick example of hundreds of reports that we do.

[CLERK’S NOTE: See the list of USGS publications in the appendix at the end of the hearing.]

Virtually every EIS that we put out has a discussion specifically on climate. And so that is the reality, and we follow the best science wherever it leads us.

Senator UDALL. Yes. Were you aware that this Interior official attempted to insert language in reports that ignores well-established climate science? Do you agree with this so-called uncertainty language that was inserted into multiple Department documents and reports? And were any policy decisions reached as a result of these faulty assumptions?

Secretary BERNHARDT. Well, let me say a couple things first to clarify the record.

The employee is a long-term career employee who has these views as a career employee. I have asked to see what’s been edited and what’s not. But the reality is in reading the article there are some things that more scientists than others might disagree with or agree with in that article itself. So I’ll get to the bottom of that.

But the reality is that the employee is a long-term career employee, he has these views just like other experts within their fields tend to have views. And those views are regularly debated within the scientific community and the Department.

Senator UDALL. And I know I am up, but just let me follow up here just a second. I am very happy you’re looking at it. I hope you will release something so we can settle this, that climate change

is an existential threat and is human-caused, and we ought to be proactive on it.

The other thing I would note, though, during this administration this career employee had a much more low-level position and during your tenure and the previous tenure was moved into the Deputy Secretary's office to do this.

Secretary BERNHARDT. That's actually not quite true, and I want to be careful about that.

Senator UDALL. Okay. Well, tell me what the truth is.

Secretary BERNHARDT. So it's my understanding that he was, at some point early in the administration, was detailed to the Deputy Secretary's office. I can tell you this: the day I found out about that, I undetailed him. So now he's a career person in policy management and budget, and that's where he's been.

Senator UDALL. Thank you for your courtesy, Madam Chair.

Senator MURKOWSKI. Thank you. We are now going to turn to Senator Alexander, and Senator Capito will be the last one here. Mr. Secretary, I am going to have to excuse myself. We have got the energy bill on the floor—

Secretary BERNHARDT. I know.

Senator MURKOWSKI [continuing]. And I have got to close out this vote. Know that I will have included as questions for the record some specifics as they relate to the USGS budget which you know is very, very important to us up north. Tribal court funding I mentioned as well, something on the invasive species, and then where we are with hazards: volcanoes, earthquakes, and landslides. We have been seeing more than our fair share. We just had a pretty significant landslide in Ketchikan just a couple weeks ago—along with the wildfire issues which I appreciate your initiative on that.

To my colleague, thank you for helping to wrap up, and to Senator Capito.

But Mr. Secretary, we look forward to spending a little more time with you on some of the specifics—

Secretary BERNHARDT. Absolutely.

Senator MURKOWSKI [continuing]. Of these with you and your good team. And with that, I'll turn to Senator Alexander.

LAND AND WATER CONSERVATION FUND AND RESTORE OUR PARKS ACT

Senator ALEXANDER. Thank you, Madam Chairman. Mr. Secretary, welcome.

Let me say first how pleased I was to hear comments at the opening of your statement about the President's support for the Restore Our Parks Act and the Land and Water Conservation Fund. I agree that if we are able to pass those two bills and turn them into law that it will surely be the most important conservation legislation of the last half century, at least since the 1960s.

And one reason for that is we have been trying to do it for that long. The Land and Water Conservation Fund was recommended by President Johnson's commission, the Rockefeller commission, on which I imagine a Udall served. Is that right?

Senator UDALL. That's correct.

Senator ALEXANDER. Was that your uncle or your father?

Senator UDALL. It was my father.

Senator ALEXANDER. It was your father. And that was first recommended then, and that commission recommended a number of provisions that became law. Wild and Scenic Rivers Bill, it was very important.

And at the time it made a lot of sense to say that we are going to take an environmental burden and turn it into an environmental benefit. We are going to take drilling offshore and take some of that money—\$900 million a year—and use it to buy conservation land. That made a lot of sense.

The problem was Congress has never done it. They've done some of it. Senator Udall and Senator Murkowski fund it every year, but we have never funded the full \$900 million a year regularly as Congress intended in 1964 or 1965.

That was not the only presidential commission that recommended that. In 1985 and 1986 President Reagan appointed the President's Commission on Americans Outdoors. That included Mo Udall, and I was chairman of it; Pat Noonan, Gilbert, Grover, and a number of others. And we recommended at that time that the Land and Water Conservation Fund be fully funded.

The problem has been the Office of Management and Budget, and presidents up to date had not been willing to support that. So I congratulate President Trump for his decision to do this. I think it'd be greatly appreciated by millions of American. It's in a long tradition of conservation, not only the Udalls and the Rockefellers but Republicans and Democrats for many years have supported. And I am hopeful that we can enact it while Senator Udall is still a Member of the United States Senate and while I am still a Member of the United States Senate.

Now, on the Restore Our Parks Act I heard what you said when you were here before, and I assume you have not changed your mind. I asked you could you think of any way to deal with the deferred maintenance backlog in the national parks other than something like the Restore Our Parks Act, and you said no, you could not. Is that correct?

Secretary BERNHARDT. That's still my answer, sir.

Senator ALEXANDER. Yes, I think of the Great Smoky Mountains where we have an annual appropriation of about \$20 million but we have a deferred maintenance backlog of \$230 or -40 million dollars. We will never be able to deal with the trails, the toilets that do not work, the campgrounds that are closed because there is not enough money for that.

And again, the President—Secretary Zinke, he came to see me a couple years ago and asked me to help with this. Senator Warner and Senator Portman already were working hard on it. Senator King got involved. And so again, we have a bipartisan effort, and we have 52 or 53 senators who cosponsor it.

About that same number cosponsor the Land and Water Conservation Fund. And in the House of Representatives we have more than 300 on the Restore Our Parks Act and significant support for the Land and Water Conservation Fund.

So my hope is that with the President's clear support and your support that Senator McConnell will put this bill on the floor with all these Democratic and Republican Senators singing in chorus and harmony for a little while, and we will pass it and send it to

the House and hopefully send it to the President, and he will turn it into law. And so I want to congratulate you for that.

ASIAN CARP

Now may I ask you one quick question about Asian carp? Some people say, "Why do you worry about fish?" I say, "Well, we have more people with fishing licenses in Tennessee than we do who vote in the Republican primary, so I can count." That's one reason I worry about them.

The Asian carp are destroying our recreational fishing areas. Senators Udall and Murkowski and others put significant money into the budget. How soon are you going to get that money out to the State agencies?

Secretary BERNHARDT. Well, we are really working on it, and it's going to go out as fast as we can get it out. We are also looking at using contractors to reduce priority population, so we are on top of it.

Look, other than the national parks I interact with more Members of the Senate and the U.S. House on the Asian carp than anything. So clearly we need to be on top of it, and we will get that money out. Fish and Wildlife Service has actually gotten much better over the last year and a half about getting dollars out the door.

Senator ALEXANDER. Well, our anglers count on us to deal with that. We have good State agencies——

Secretary BERNHARDT. Absolutely.

Senator ALEXANDER [continuing]. And it's a priority of Congress, and I am glad it's a priority of the administration. We need to deal with it, and I'll continue to be interested in your support for it.

Secretary BERNHARDT. Absolutely, sir.

Senator ALEXANDER. Thank you very much.

Senator UDALL. Senator Leahy, I think you're next in line here.

Senator LEAHY. Thank you.

Senator UDALL. And then Senator Capito, we will come to you.

FREEDOM OF INFORMATION ACT REGULATIONS

Senator LEAHY. Thank you both. I was listening to your comments, and you could probably know I was in agreement.

A lot of the questions that come from here are of a bipartisan nature, as you know. And one of the ones we did, a group of us Republicans and Democrats joined together to address your Department's draft rule and updating its Freedom of Information Act regulations.

As a result, I believe the FOIA rule which was issued in October of last year was significantly improved to comply with FOIA. Now, a lot of us across the political spectrum believe strongly in FOIA, whether it's a Republican or a Democratic administration. I thought this was a chance to show what happens when you have interbranch consultations.

Can you assure me that you will consult with this subcommittee and other appropriate congressional committees with jurisdiction over FOIA before any future proposed rules, guidance, or memoranda impacting FOIA compliance are finalized?

Secretary BERNHARDT. So, Senator, I actually brought my letter—your letter—to this hearing because I wanted to thank you for working with us on it.

[The letter follows:]

United States Senate
WASHINGTON, DC 20510

October 25, 2019

The Honorable David Bernhardt
Secretary
U.S. Department of the Interior
1849 C Street, NW
Washington, DC 20240

Dear Secretary Bernhardt,

In March of this year, we sent your Department a bipartisan, bicameral letter to express significant concerns with the Department of Interior's proposed update to its Freedom of Information Act (FOIA) Act regulations.¹ We write today to express appreciation for the changes reflected in the Department's finalized rule,² as well as for the constructive dialogue that occurred between the Department and our offices since our initial letter.

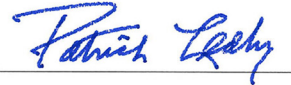
The final rule appears to more faithfully align with FOIA's twin goals of transparency and openness. While our offices will remain vigilant in our oversight—of all agencies' FOIA policies under any administration—we sincerely appreciate the efforts your Department took to keep Congress informed of the final rule's development. Moreover, we were pleased that the Department heard our concerns with the proposed rule and issued a final rule that seeks to directly address those concerns.

Lastly, we note that our March letter, and the inter-branch dialogue that followed, was initiated by the late Chairman of the House Committee on Oversight and Reform, Representative Elijah Cummings, whose legacy in improving government transparency is widely respected. It's in his spirit and dedication to accountability that we hope other agencies, going forward, will provide the same level of dialogue and responsiveness as your Department has in this process. The American people, after all, are best served when Congress and the Executive Branch work together and across party lines to protect their interests.

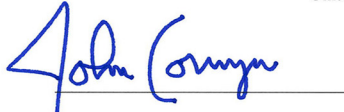
Respectfully,



Charles E. Grassley
United States Senator



Patrick Leahy
United States Senator



John Cornyn
United States Senator

¹ Department of the Interior, *Freedom of Information Act Regulations*, 83 Fed. Reg. 67175 (Dec. 28, 2018) (proposed rule) available at <https://www.govinfo.gov/content/pkg/FR-2018-12-28/pdf/2018-27561.pdf>.

² Department of the Interior, *Freedom of Information Act Regulations*, Docket No. DOI-2018-0017 (Oct. 25, 2019) (final rule) available at <https://www.doi.gov/sites/doi.gov/files/uploads/signed-foia-finalrule102419.pdf>.

I do not know if we would have been able to finalize that rule without your help, and I just want you to know, first off, thank you for that. And absolutely, I do not contemplate us having a proposed

rule; but if we do, we will absolutely come up here and talk to you about it.

Senator LEAHY. I thank you for that, and I appreciate it. Obviously you knew I would raise this issue because FOIA is very important to all of us, openness in any administration. And the people I worked with in FOIA on the other side of the aisle would have taken exactly the same position whether it's been a Democratic administration or a Republican administration because the American people should know what any administration is doing.

Now, fiscal year 2020 we appropriated \$1 million to expand the Department's FOIA staff because there are chronic backlogs and delays. How many additional FOIA-related staff has been hired with the \$1 million we gave your Department, and what's the current backlog?

Secretary BERNHARDT. Well, the current backlog remains significant. I can get you those numbers specifically. I actually met with the FOIA team last week, but I do not have the numbers we have hired; but I know we had many new hires in there, and I am happy to provide that to you.

Senator LEAHY. Could you provide that, say, within the next week?

Secretary BERNHARDT. Well, it's a factual question. I should be able to provide it pretty quickly.

Senator LEAHY. And what the backlog is.

Secretary BERNHARDT. Oh, well, that we can give you at the same time. Let me tell you, though, the backlog is very, very significant. And about five requesters make up, I think, almost 20 percent of our requests. So we have people that are just filing non-stop. But it's also a significant issue for us in the field. I mean, we have been inundated in the field. But I am happy to get you the numbers.

Senator LEAHY. Thank you.

INVASIVE SPECIES ADVISORY COMMITTEE

And we have talked about invasive species, and you say you get a lot of calls on that. In my State of Vermont we believe in environmental stewardship. Again, something that's not a Republican or Democrat; we all believe it. Outdoor recreation, billions of dollars to our State annually. Lake Champlain, a major economic driver. But I see the erosion of environmental laws and protections. I see a number of unqualified science deniers in your Department.

The Department announced the discontinuation of the Invasive Species Advisory Committee, which worked for 20 years. Now, I believed that saved about \$30 thousand. Invasives have created more than \$120 billion of damage to our economy annually. What did we save by getting rid of that?

Secretary BERNHARDT. So from my perspective, Senator, it's really not a question of savings. When the task force was originally set up, invasives were sort of a novel concept. And since then our thinking on invasives has changed dramatically over the last 20 years. And so we have very robust programs and very robust partnerships within each of our bureaus as they relate to invasives. And so it's really a question of need and what you get for that expenditure of time.

Look, we are very committed to work on invasives, whether it's in Florida, whether it's in your State, whether it's in my home State of Colorado. We face real threats on these, and we are making real investments in it, and we have a lot of partnerships on it.

Senator LEAHY. Okay. Could you do this: It seems to be a catchword ever since the time, unfortunately, many administrations ago when the secretary, everything he gave an answer to had to use the word "robust" in it, the most overused word.

Secretary BERNHARDT. Well, I may have done that. I apologize. I do not use it very often.

Senator LEAHY. No, but the thing is, "robust" does not explain what you have. So would you let me know what these—

Secretary BERNHARDT. Like, the total for invasives?

Senator LEAHY. Yes, and let me know what the groups are in your Department that are actually working on invasives.

Secretary BERNHARDT. I can absolutely do that. I am certain it's well over \$100 million. Well over.

Senator LEAHY. Okay. Because we have 50 invasive species in Lake Champlain alone, and there has to be some coordination.

Secretary BERNHARDT. I absolutely will get it to you.

Senator LEAHY. Yes, 175 entities working on it. Okay. I would like to know that. Thank you very much.

Senator UDALL. Thank you, Senator Leahy.

Senator CAPITO.

Senator CAPITO. Thank you, Senator. Welcome. And it's great to see you again.

CANAAN VALLEY NATIONAL WILDLIFE REFUGE

I think you know what a high priority that visitors' center that we visited together with Senator Manchin at the Canaan Valley National Wildlife Refuge. And we are going to be together again, I think, in early June to see the completion of that \$7 million facility.

You know, when you look at the estimation of the economic benefit to this facility and also other such facilities in the Wildlife Refuge system. It's millions of visitors and has an impact of billions of dollars.

And also, I think as you noticed when we were there together, it's a great partnership with the State because of the coordinating of resources there.

So I know that it has slipped a little bit in terms of the target date for opening the new visitors' center, and I wanted to ask you a status update. Is everything on cue to begin in June?

And also, along with that, I know the Elkins field office of Fish and Wildlife is going to be moving there, which will be the centralized area. How is that going—do you need to hire new people into that, because I know our main person recently retired—and the status of the move of Fish and Wildlife to that facility.

Secretary BERNHARDT. So you're spot on. I mean, the reality is construction is essentially done, and refuge staff will be moving in this week. We expect the folks in the Elkins field office to relocate to the building over the next two weeks, and we will have, basically, a real opening of the office portion on or around March 18.

And then the visitors' center, as you said, will follow along. It just needs some internal stuff done to it. So I think early summer is right on. But we are on target. In terms of hiring—

Senator CAPITO. So I would remind you to remember to bring your fishing gear.

Secretary BERNHARDT. Absolutely. I am. Or actually we have a bigger problem in that I went home and talked to my boy about it, and he was, like, well, I need to bring him.

Senator CAPITO. Good.

Secretary BERNHARDT. So he will probably be with me that day.

Senator CAPITO. Great. Great. Well, we look forward to that, and that will be a great enhancement to really the entire area of the State, and thanks for your commitment to that.

Secretary BERNHARDT. You bet.

WHITE-NOSE SYNDROME

Senator CAPITO. We are talking about species. The bat species is one that West Virginians wrestle with, whether it's the little brown bat, the Indiana bat, the northern long-eared bat; and the white-nose syndrome has been part of this.

What are you seeing there? Are you seeing the bat population declining? Because the problem is, any time we want to do any timbering or anything else, we have to set up habitats, and it just prolongs the ability to move forward.

Secretary BERNHARDT. Well, I do think our scientists are making strides. The Geological Survey and the Fish and Wildlife Service have developed a vaccine that might provide immunity against the fungus causing white-nose syndrome.

USGS is working on some tools to monitor bats and control the spread, and we are continuing to research changes to hibernation sites, microbes that bats are carrying on their skin.

The budget that we put forward has about \$6 million, and frankly the 2020 enacted has 12, and we have not spent through that. So we have the resources, and I think we are making progress on that. I am sorry to get you all choked up.

Senator CAPITO. I am going to stop there. Thank you.

Secretary BERNHARDT. I am sorry.

Senator UDALL. Take some water with you, Senator Capito. Thank you so much.

Senator Daines, please?

Senator DAINES. Thank you, Ranking Member Udall.

CHRONIC WASTING DISEASE

Secretary Bernhardt, it's good to have you here today on the Hill.

I want to talk about a couple issue that are important back home in Montana. The first is chronic wasting disease. We are seeing this emerging across our State. In fact, we call it, of course, CWD, a fatal disease. It affects deer, elk, moose across the west; and unfortunately Montana is no exception. In fact, last year 13 percent of our hunter-harvested or trapped deer tested positive for CWD in Libby last year up in the northwest corner of our State. CWD threatens the viability, the health of the species, the future of hunting, and the hunting economies that thrive and drive our conservation programs.

It's clear from the data the risk now is only spreading. I know you are another western guy from Rifle, Colorado. You get it. You've had a rifle over your shoulders much of your life like I have. I appreciate the attention of the U.S. Geological Survey to CWD and am pleased to know they're working with the Boone and Crockett Club through its research endowment at the University of Montana where my father attended, in fact, many years ago.

My question for you, Mr. Secretary, is this issue also falls under the scrutiny and the authority of the USDA and States. Could you describe the activities being coordinated between these entities to address chronic wasting disease.

Secretary BERNHARDT. Absolutely. Like you, when I got to the Department I was stunned at what we were investing in chronic wasting disease because I had been there 8 years earlier and we had much more resources invested. And the truth is, it's spread to many more States than it was then.

I have tasked my career science advisor, Bill Werkheiser, really in the first weeks that I became Secretary, to reach out to the State wildlife association, the Association of State Fish and Wildlife Agencies. We want to coordinate with them.

We have also brought the USDA along. And I think that with the additional resources you all gave us last year, I think we are beginning to turn the page on having a Federal plan that coordinates with the various States.

You're absolutely right that there is, at times, a disconnect between State wildlife agencies and State agriculture agencies; and sometimes that disconnect exists at Ag. But I feel very comfortable that we have Secretary Perdue's support. He is a hunter. He gets this issue. He has a beautiful, absolutely phenomenal elk in his office. Not quite as big as my moose, but it's beautiful.

And so I think we are on the same page. We are working with the States. We want to work with them to the extent that they identify best practices. We want to make sure that we are applying them on our land. But look, this is a very important issue.

COTTONWOOD DECISION

Senator DAINES. Speaking of important issues—and thank you for continuing to work with Secretary Perdue and the coordinated effort here to help us in Montana.

I want to talk about the Cottonwood decision, the issue. While both the Department of the Interior and Forest Service have made strides to better manage our forests, the reality is, Mr. Secretary, the litigation from these fringe groups is what has continued to delay these critical projects.

One lawsuit is jeopardizing over 130 projects in Montana. This particular case is one of many copycat lawsuits that follow the 9th Circuit's Cottonwood decision. The Forest Service is telling me to clean fix this disastrous—it's disastrous. We just lost a mill outside of Townsend, Montana, the RY mill. Sixty jobs gone. Surrounded by national forests, and we cannot get enough logs into our mills.

We have had multiple requests for information. I have yet to hear the views of the Fish and Wildlife Service as it relates to this Cottonwood decision.

My question for you is, do you believe the Cottonwood decision hinders proper Forest and Wildlife Management, and would you support a legislative fix?

Secretary BERNHARDT. So we worked on our regulations earlier this year to address the decision, I thought, in a way that would work. I was recently contacted by the Secretary who has some additional concerns with that. But we want to make it very clear that way the issue is addressed is through legislation. There is no question about that. And so we recognize that and certainly would be happy to work with you on that.

Senator DAINES. Thank you.

Could I ask one more question?

Senator UDALL. Go ahead, Senator Daines.

ENDANGERED SPECIES ACT REGULATIONS

Senator DAINES. Thank you, because I cannot help but to talk about grizzly bears and the Endangered Species Act while I have got you here, having spent a good part of Friday up along the Rocky Mountain front.

My grandfather was born in Conrad in 1918. My great-great-grandma homesteaded 23 miles east of Conrad. And I see grizzly bears all over the Plains like they were when Lewis and Clark came through as a Plains animal.

Keeping with this theme of the Endangered Species Act—and of course that was tied with Cottonwood—I want to turn to your recently published rulemaking.

Currently less than 2 percent of species listed in the ESA have been recovered. And even if a species is recovered, as we saw with both the grizzly bear and the gray wolf in Montana, it will most assuredly be tied up in litigation for years, effectively replacing the expertise wildlife biologists, with that, politically appointed judges; and even worse, at the mercies of the 9th Circuit Court.

You've been criticized as gutting the Endangered Species Act (ESA) and eliminating protections of the endangered species. Could you respond to why that's not the case and how your recent regulations actually incentivize conservation and will strengthen ESA protections.

Secretary BERNHARDT. Yes. So, you know, the reality is both the gray wolf recovery and the conservation situation of the grizzly bears are great conservation successes. And I'll be talking to you probably early next week about some additional ideas we have for problem bears.

But our regulations maintain in their entirety the requirement that we list species and make determinations and delisting species based on the best commercial and scientific data available. And it requires that we look at the five-statutory factors and nothing else. So we maintain the integrity of the law, unquestionably.

What we have done is suggest that when we do a threatened listing we will tear at each rule to the specifics of that species. And I fundamentally believe that enhances conservation opportunities because for a particular species, if we can target conservation efforts up front, I think we really can minimize the hostility and concern that folks have on the application of the Act.

We have also worked very hard to change the regulations we have where Federal agencies consult with us to ensure that they have a little more flexibility, but the standards of avoiding jeopardy, avoiding the destruction of critical habitat or the adverse modification of it, do not change. And we will be relentless in effectuating that.

But there are things that were not thought about when the regulations were written in 1986 that we learned in implementing these regulations, and so we have modernized them.

And I will tell you this: I spend a lot of time with the folks in the Fish and Wildlife Service, and the more they've been able to work with these new rules, the more enthusiastic they are about them. That maybe does not take care of everybody in the peanut gallery, but the reality is the people that implement these are seeing the benefits to the species and to our program from it.

You know, grizzly bears are a great example of a great conservation success. But you know how it could go south is if the problem bears have problems with people and we have a really bad interaction. And we want to do everything we can to avoid that as these successes are occurring.

Senator DAINES. Mr. Secretary, I spend a lot of time in the back country. And in fact, when we are backpacking my wife and I take our two mini Australian shepherds. They're part of our deterrent. I carry my bear spray.

Secretary BERNHARDT. They're a really good deterrent.

Senator DAINES. They are. They are, so we do not surprise a bear. And it is a great success story of what's happened with the grizzly bear. And it is time to delist the bear based on the science and the quantifiable data—

Secretary BERNHARDT. Undoubtedly.

Senator DAINES [continuing]. And return that authority back to the States to manage the species as we have done successfully with other predators; for example, the gray wolf.

If we look at the livestock losses in Montana year after year now, I'll tell you that mountain lions are staying relative static. Wolves now are not the big-dollar issue. The grizzly bears are skyrocketing off the chart.

This is an issue for our Ag industry. It's an issue for parents who early morning they want to walk their kids to the bus stop. They're having to carry a sidearm and a flashlight as they walk their kids up because we have got so many grizzly bears.

So we should celebrate the success, return the authority back to the State of Montana to manage the species as we have done successfully with the gray wolf.

Secretary BERNHARDT. We recognize that. We are going to work with you. The Service is prepared to put out some guidance, and I'll talk to you about that.

LAND AND WATER CONSERVATION AND RESTORE OUR PARKS ACT

Senator DAINES. Great. And let me just close with a statement.

I want to thank you for your earlier statement about your support with this initiative on the Land and Water Conservation Fund and Restore Our Parks Act. This is a great moment for Congress. It goes back to 1965 with Land and Water Conservation Fund. And

looking at the last 10 years, the oil and gas offshore revenue has been between \$3- and nearly \$9 billion a year; and by statute is says we should fund it up to \$900 million. It's time to do that with full mandatory funding.

I thank you for your comments. We have an opportunity. The President's fully onboard. Senator Gardner, I met with him on Thursday. We showed him wonderful pictures and maps of what's going on in places like Montana and Colorado, using land and water conservation with these bottom-up driven projects supported by our local communities. And I am really pleased to see this for the President, the Majority Leader, and it is time now for Congress to Act.

So we will be sharing more today at a news conference in a bipartisan way. There are few issues that unite Congress anymore. Our public lands still remains one of them.

Secretary BERNHARDT. Clearly you and Senator Gardner were very persuasive.

Senator DAINES. Well, thank you. And thanks for being here, Secretary Bernhardt.

Senator UDALL. Thank you so much, Senator Daines, and we look forward to working with you on the permanent mandatory funding on land and water conservation.

Congratulations on all your good work there, and let's get it across the finish line.

Senator DAINES. Ranking Member, did you ever think we would ever be having this conversation? We have been pushing and pushing, and we have a moment here. And thank you for your support, by the way, too, Tom.

ENDANGERED SPECIES

Senator UDALL. Thank you. Thank you. Thank you for your questions today.

And thank you, Secretary Bernhardt, for making the point about our successes on endangered species. I mean, I would add the bald eagle.

Secretary BERNHARDT. Absolutely.

Senator UDALL. And there are many others where we have had really, really great successes. And I think people understand and know that as we talk about these keystone species, really what we are talking about is ecosystems that are being endangered. And everybody knows, you know, that human beings get enormous ecosystem services from having healthy ecosystems, and it's your Department that oversees and tries to do everything it can with you and the career people to push that.

And the bottom line is, our healthy ecosystems are our life support system, and I really think that's very, very true.

CHACO CULTURE NATIONAL HISTORIC PARK

I want to thank you for your willingness to work with me—I am talking about Chaco now, changing the subject.

I just have two final questions, and I think we will have you out of here pretty quickly.

I want to thank you and the Department for your willingness to work with me, our New Mexico delegation, the Tribes on protecting the area around Chaco Culture National Historic Park.

As you know, this area is a complicated mix of BIA-managed land, Indian allotted land, and BLM-managed public land.

And it's right on the doorstep of a wild and irreplaceable landscape that has huge cultural significance to the Tribes. It's my understanding that much of the Federal land surrounding the park has already been leased, and the development on Tribal allotment lands continues to this day.

But given pressures on the remaining resource values, which the Department itself has recognized through an informal leasing moratorium and a more recent secretarial order, there is a real need for further protections.

And that's why I was very proud to include language in the fiscal year 2020 Interior bill that blocks new oil and gas leasing within the 10-mile buffer zone surrounding the Park while the Department works with Tribes to prepare a cultural resources study guide for future development and to provide \$1 million to the Department to fund the study once the Tribal consultation was completed.

Now, first question: The informal moratorium on the new oil and gas leasing in a 10-mile area around Chaco Canyon has been in effect since 2014. Is that correct?

Secretary BERNHARDT. That is not my understanding, Senator. The reason no leasing occurred over the last year is because I went to Chaco with Senator Heinrich and a number of the Tribes, and I made that commitment for a year. And we are keeping that commitment. So that's why nothing has happened.

Senator UDALL. I think there is been an informal moratorium since 2014, and I think you've continued that, which I think is—

Secretary BERNHARDT. I honestly do not. I am happy to look at that.

Senator UDALL. And this moratorium has not applied. The informal one I am talking about has not applied to allotted lands, just to Federal lands. Is that right?

Secretary BERNHARDT. So I think you're highlighting an issue that has a little subtlety, and I do not want to leave you with a misimpression.

Legislative proposals have tried to make clear that the moratorium would not affect allotted land. I think—and this is something you can talk to the allottees about because I do not want to misrepresent their position—but I think here is their concern, is that if operators are able to access certain public lands, they will not actually develop their allotted lands. And I am not asking you to make a judgment call on it; I am just telling you that is my understanding of the concern.

And so you would see in our proposed plan we have a whole series of alternatives, and some of those alternatives—you know, at one time I thought there would be a consensus Tribal alternative, but it turned out that there are a few views in there. I am not trying to weigh in with you one way or another on these, but that is the ultimate issue, I think, and that is something that people need to weigh in whatever way you weigh it.

Senator UDALL. Yes, yes. Well, the allotted lands—my point was, is there is nothing that has been done that has prevented the allotted lands from continuing to receive their resources.

Secretary BERNHARDT. Well, that would be true with the exception that—and I am, again, not making this argument—but there are some allottees I know, because I have met with them, that fundamentally believe that development is unlikely to take place and they essentially will have a stranded asset. I am not asking you to agree with that, but that is their heartfelt concern.

Senator UDALL. Yes, but all the allottees who were producing subsurface rights have received royalty payments throughout this time, have they not?

Secretary BERNHARDT. I would have to look at that, but I—

Senator UDALL. Well, that's my understanding.

Secretary BERNHARDT. It would not be impacted by the BLM leasing.

Senator UDALL. Yes. Yes.

Now, moving to the relationship between the mandated cultural resource study and the current Regional Management Plan process. What is the status of the Cultural Resource Study? When should we expect the Department to conduct its required Tribal consultation? And how soon will work actually begin?

Secretary BERNHARDT. So I can get back to you with the specific dates, but there is no holdup on our end. We understand you provided the money. We want to do the work. So there is nothing to my knowledge, and there is certainly no direction that's been given that's holding it up in any way, shape, or form. I'll get to the bottom of that for you.

Senator UDALL. Okay. Well, we'd be happy to have an answer for the record on the timing and everything I asked about.

Secretary BERNHARDT. Okay. Absolutely.

Senator UDALL. The Department just released a proposed Resource Management Plan for the Farmington region, including the area around Chaco which includes alternatives that would limit development within 5-, 10-, and 15-mile zones around the park. It appears that this planning is proceeding without any direct connection to the cultural resources study that was just funded, which does not make much sense to me.

What's the schedule for finalizing the RMP? If you fit those two together—

Secretary BERNHARDT. I do not think they're in conflict at all. This is a proposed plan. It's also a plan that's proposed by both BLM and BIA, so I think they should fit together just fine. And even if the plan were finalized, there is nothing that would prevent us from using the work of the study. So I just do not see that as items that are on inconsistent pathways at all.

Senator UDALL. Yes. I am not arguing with inconsistent pathways. I hope the Department waits to finalize the plan until the Tribal study is complete so that Tribes can have substantial input into the agency's final action.

Secretary BERNHARDT. Well, the Tribes are having input in addition to the study by communicating about the plan, which they're a cooperating agency on, I believe. But I will go back and make sure that those are lined up for you.

BLM REORGANIZATION

Senator UDALL. Okay. Just a couple of questions on the BLM reorganization. And thank you for getting back to us on that and putting that answer in the record.

Mr. Secretary, we had a good meeting on Monday to discuss the Department's decision to move BLM headquarters out of Washington, DC. I appreciate your commitment to expanding resources in the field in New Mexico.

I think it would be helpful for you to discuss the status of relocation. We have heard that many senior Bureau employees retired or left the Bureau in the last 6 months due to the uncertainty this decision has caused and that these staff losses will make it difficult for BLM to manage its programs like the Wild Horse and Burro Program which received a 20 percent funding increase this fiscal year, and you single out for another significant increase in the 2020–2021 budget request.

Please walk us through some of the numbers. How many positions are moving out of Washington, DC? How many of those are filled? And how many are vacant?

Secretary BERNHARDT. First off, I appreciate the question. I am not at all concerned about our ability to implement the Wild Horse and Burro Program. Not only the \$21 million but the additional \$14 million on top of that 21 that we have asked you for.

I would be happy to provide the subcommittee with the numbers that I provided you with earlier in the week. I do not have them with me, and I do not want to misstate a number publicly. I will say this, that since Monday I received feedback on a number of panels that are doing interviews, and the caliber of people and the number of people we have applying for these jobs is off the roof and phenomenal. But I will get the numbers to you. I just do not want to misstate a number.

Senator UDALL. Okay.

Secretary BERNHARDT. And I do not want to leave people with a misimpression in any way, shape, or form.

Senator UDALL. Okay. We'd be happy to get those for the record.

Secretary BERNHARDT. Sure.

Senator UDALL. Thank you very much.

Maybe these are for the record too, but how many staff were given directed reassignments, and how many people accepted those reassignments and plan to relocate? Is that part of what you're going to send?

Secretary BERNHARDT. I can give you the exact numbers, but it's roughly—and I can provide those—but it's roughly 173, and I think 80 accepted. Some had retired earlier or left earlier, and whatever the remainder would be. But I am happy to get you those numbers.

Senator UDALL. Okay. And how many senior BLM positions are vacant or temporarily filled in an acting capacity?

Secretary BERNHARDT. Well, a lot of those positions were filled with acting people well before we began the relocation. So I'll go back and get those for you too.

Senator UDALL. Okay. And what is the Department's plan to ensure that BLM is fully functional during this transition and that

its programs have sufficient staffing and oversight despite the current level of staffing?

Secretary BERNHARDT. So I feel very confident about that. We have already began maintaining an office in Grand Junction. We are rotating folks through it to beta test it. I want it battle-tested and hardened by the end of the year when the lease for M Street expires. And I feel very confident that we are headed along a course that we are going to be very successful with this.

We have also ensured that we have backups for our ADAs and our divisional chiefs, so I feel like we are in pretty good shape right now, honestly.

Senator UDALL. Great. Thank you very much for the answers, and we look forward to getting the answers on the positions that you did not have off the top of your head, which is fully understandable.

Secretary BERNHARDT. Sure.

Senator UDALL. This concludes today's hearing.

Secretary Bernhardt, we appreciate you appearing before our subcommittee today. The hearing record will remain open for 1 week from today. Senators may submit written questions for the record. We ask the Department to respond to them within a reasonable amount of time.

SUBCOMMITTEE RECESS

The subcommittee stands in recess.

Secretary BERNHARDT. Thank you.

[Whereupon, at 12:00 p.m., Wednesday, March 4, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

APPENDIX

LIST OF USGS PUBLICATIONS

Publication type	Title	Year	Publisher	Contributing office(s)	Description	Author(s)
Article	100-kyr paced climate change in the Pliocene warm period, Southwest Pacific	2019	American Geophysical Union	Eastern Geology and Paleoclimate Science Center	22 p.	Caballero-Gill, Rocio; Herbert, Timothy D.; Dowsett, Harry
Article	1200 years of Upper Missouri River streamflow reconstructed from tree rings	2019	Elsevier	Alaska Climate Science Center, Fort Collins Science Center, Northern Rocky Mountain Science Center	105971, 14 p.	Martin, Justin; Pederson, Gregory T.; Pederson@usgs.gov; Woodhouse, Connie A.; Cook, Edward R.; McCabe, Gregory J.; gmcabec@usgs.gov; Wise, Erika K.; Egger, Patrick; Dolan, Larry; McGuire, Marketa; Gangopadhyay, Subhrendu; Chase, Katherine J.; Ichase@usgs.gov; Littell, Jeremy S.; Gray, Stephen; St. George, Scott; Friedman, Jonathan M.; Friedmanj@usgs.gov; Sauchyn, David J.; St. Jacques, Jannine; King, John W.
Article	A 50-year Sr/Ca time series from an enclosed, shallow-water Guam coral: In situ monitoring and extraction of a temperature trend, annual cycle, and ENSO and PDO signals	2019	Coastal Education and Research Foundation	Pacific Coastal and Marine Science Center	18 p.	Bell, Tomoko; Lander, Mark; Jenson, John; Randall, Richard; Partin, Judson W.; Prouty, Nancy G. nprouty@usgs.gov
Article	A General Lake Model (GLM 3.0) for linking with high-frequency sensor data from the Global Lake Ecological Observatory Network (GLEON)	2019	European Geosciences Union	WMA - Integrated Information and Dissemination Division	51 p.	Hipsey, Matthew R.; Bruce, Louise C.; Boon, Casper; Busch, Brendan; Carey, Cayelan C.; Hamilton, David P.; Hanson, Paul C.; Read, Jordan S. jread@usgs.gov; de Sousa, Eduardo; Weber, Michael; Winslow, Luke A.
Article	A high-resolution 1983-2016 Tmax climate data record based on InfraRed Temperatures and Stations by the Climate Hazard Center	2019	AMS	Earth Resources Observation and Science (EROS) Center	20 p.	Funk, Chris cfunk@usgs.gov; Peterson, Pete; Peterson, Seth H.; Shukla, Shraddhanand; Davenport, Frank; Michaelsen, Joel; Landsfeld, Martin; Husak, Gregory; Harrison, Laura; Rowland, James; Buddie, Michael; Knapp, Kenneth
Article	A landscape model of variable social-ecological fire regimes	2019	Elsevier	Geosciences and Environmental Change Science Center	9 p.	Scheller, Robert M.; Kretschun, Alec; Hawbaker, Todd; Hennie, Paul D. phennie@usgs.gov
Article	A multidisciplinary coastal vulnerability assessment for local government focused on ecosystems, Santa Barbara area, California	2019	Elsevier	Pacific Coastal and Marine Science Center	104921	Myers, Monique; Barnard, Patrick L. pbarnard@usgs.gov; Belghley, Edward; Cayan, Daniel R.; Dugan, Jennifer E.; Fong, Dongmei; Iacobellis, Samuel F.; Melack, John M.; Page, Henry M.

Article	A multidisciplinary framework to derive global river reach classifications at high spatial resolution	2019	IOP Science	Land Change Science	12 p.	Ouellet Dallaire, Camille; Lehner, Bernhard; Sayre, Roger rsayre@usgs.gov; Thieme, Michele
Article	A multi-scale soil moisture monitoring strategy for California: Design and validation	2019	American Water Resources Association	California Water Science Center	19 p.	Curtis, Jennifer; Flint, Lorraine E. flint@usgs.gov; Stern, Michelle A. mstern@usgs.gov
Article	A review of coastal management approaches to support the integration of ecological and human community planning for climate change	2019	Springer	Northeast Climate Science Center	18 p.	Powell, Emily J.; Tyrrell, Megan C.; Milliken, Andrew; Tirpak, John M.; Staudinger, Michelle D.
Article	A strategy for defining the reference for land health and degradation assessments	2019	Elsevier	Forest and Rangeland Ecosystem Science Center	6 p.	Herrick, Jeffrey E.; Shaver, Patrick; Pyke, David A. david_a_pyke@usgs.gov; Pellant, Mike; Toledo, David; Lepak, Nika
Article	Adaptive variation, including local adaptation, requires decades to become evident in common gardens	2019	Ecological Society of America	Forest and Rangeland Ecosystem Science Center	Article e01842; 7 p.	Germino, Matthew J. mgermino@usgs.gov; Moer, Ann M.; Sands, Alan R.
Book	Alaska Shorebird Conservation Plan, Version III	2019	Alaska Shorebird Group	Alaska Science Center Biology WTEB	vii, 138 p.	Ruthrauff, Daniel R. druthrauff@usgs.gov
Article	An assessment of plant species differences on cellulose oxygen isotopes from two Kenai Peninsula, Alaska peatlands: Implications for hydroclimatic reconstructions	2019	Frontiers Media	Eastern Geology and Paleoclimate Science Center	25, 16 p.	Jones, Miriam; Anderson, Leslie land@usgs.gov; Keller, Katherine; Nash, Bailey; Littell, Virginia; Wooler, Matthew J.; Jolley, Chelsea
Article	An integrated framework for ecological drought across riverscapes of North America	2019	Oxford Academic	Northern Rocky Mountain Science Center	14 p.	Kovach, Ryan rkovach@usgs.gov; Dunham, Jason B. jdunham@usgs.gov; Al-Chokhachy, Robert; Snyder, Craig; Beaver, Erik A. ebeaver@usgs.gov; Pederson, Gregory T. gpederson@usgs.gov; Lynch, Abigail; Hitt, Nathaniel P. nhitt@usgs.gov; Konrad, Christopher P.; Jaeger, Kristin; Rea, Alan H.; Sepulveda, Adam J. asepulveda@usgs.gov; Lambert, Patrick M. plambert@usgs.gov; Stoker, Jason M. jstoker@usgs.gov; Giersch, J. Joseph jgiersch@usgs.gov; Muhlfeld, Clint C. cmuhlfeld@usgs.gov

Article	An introduced breeding population of <i>Chrysemys picta marginata</i> in the Kaibab National Forest, northern Arizona	2019	The Herpetological Society of Japan	Southwest Biological Science Center	8 p.	Lovich, Jeffrey E. jeffrey_lovich@usgs.gov ; Christman, Bruce L.; Norris, Jenna; Cummings, Kristy L.; Puffer, Shellie R.; Jones, Christina
Report	Anderson Ranch wetlands hydrologic characterization in Taos County, New Mexico	2019	U.S. Geological Survey	New Mexico Water Science Center	iii, 42 p.	Galanter, Amy E.; Shephard, Zachary M.; Pamela Herrera-Olivas
Article	Applying the Community Ice Sheet Model to evaluate PMIP3 LGM climatologies over the North American ice sheets	2019	Springer	Geosciences and Environmental Change Science Center		Alder, Jay R. j.alder@usgs.gov ; Hostettler, Steven W. swhostet@usgs.gov
Article	Applying the ecology of aquatic-terrestrial linkages to freshwater and riparian management	2019	University of Chicago Press Journals	Columbia Environmental Research Center	2 p.	Kraus, Johanna M. j.kraus@usgs.gov
Article	Aquatic macroinvertebrate community responses to wetland mitigation in the Greater Yellowstone Ecosystem	2019	Wiley	Fort Collins Science Center; Northern Rocky Mountain Science Center	12 p.	LEAH K. SWARTZ; Hosack, Blake R. blake_hosack@usgs.gov ; Muhs, Erin L. muhs@usgs.gov ; Robert L. Newell; Winsor H. Lowe
Article	Arctic vegetation, temperature, and hydrology during Early Eocene transient global warming events	2019	Elsevier	Climate Research and Development	14 p.	Willard, Debra A. dwillard@usgs.gov ; Donders, Timme H.; Reichgelt, Tammo; Greenwood, David R.; Petersen, Francien; Sangiorgi, Francesca; Sluijs, Appy; Schouten, Stefan
Article	Are polar bear habitat resource selection functions developed from 1985-1996 data still useful? Assessing beach and island habitat loss in the Chesapeake Bay and Delmarva coastal bay region, USA, through processing of Landsat TM and OLI imagery: A case study	2019	Wiley	Alaska Science Center Biology MFEB	14 p.	Durner, George M. gdurner@usgs.gov ; Douglas, David C. ddouglas@usgs.gov ; Atwood, Todd C. tatwood@usgs.gov
Article	Assessing effects of nonnative crayfish on mosquito survival	2019	Elsevier	Patuxent Wildlife Research Center	100265, 10 p.	Marban, Paul R.; Mullinax, Jennifer M.; Resop, Jonathan P.; Prosser, Diann
Article	Assessing plant production responses to climate across water-limited regions using Google Earth Engine	2019	Wiley	Western Ecological Research Center	10 p.	Bucciarelli, Gary M.; Suh, Daniel; Davis Lamb, Avery; Roberts, Dave; Sharpston, Debra; Shaffer, H. Bradley; Fisher, Robert N. rfisher@usgs.gov ; Kats, Lee B.
Article	Assessing plant production responses to climate across water-limited regions using Google Earth Engine	2019	Elsevier	Southwest Biological Science Center	1113792, 15p.	Bunting, Erin L.; Munson, Seth M. smunson@usgs.gov ; Bradford, John
Book chapter	Assessing rangeland health under climate variability and change	2019	Cambridge University Press	National Climate Change and Wildlife Science Center, Southwest Biological Science Center	17 p.	Bradford, John B. jbradford@usgs.gov ; Duniway, Michael C. mduniway@usgs.gov ; Munson, Seth M. smunson@usgs.gov

Report	Assessment of Columbia and Willamette River flood stage on the Columbia Corridor Levee System at Portland, Oregon, in a future climate	2019	U.S. Geological Survey	Oregon Water Science Center	vii, 44 p.	Wherry, Susan A. swherry@usgs.gov ; Wood, Tamara M. tmwood@usgs.gov ; Moritz, Hans R., Duffy, Keith B.
Article	Beneath the arctic greening: Will soils lose or gain carbon or perhaps a little of both?	2019	European Geosciences Union (EGU)	Geology, Minerals, Energy, and Geophysics Science Center	22 p.	Harden, Jennifer W. jharden@usgs.gov ; O'Donnell, J.A.; Heckman, K.A.; Sulman, B.N.; Koven, C.D.; Ping, C.L.; Michaelson, G.J.
Article	Bioclimatic envelopes for individual demographic events driven by extremes: Plant mortality from drought and warming	2019	University of Chicago Press	Southwest Biological Science Center	10 p.	Law, Darin J.; Adams, Henry D.; Breshears, David D.; Cobb, Neil S.; Bradford, John B. jbradford@usgs.gov ; Zou, Chris B.; Field, Jason P.; Gardea, Alfonso A.; Williams, A. Park; Huxman, Travis E.
Article	Biocrust science and global change	2019	Wiley, New Phytologist Trust	Southwest Biological Science Center	5 p.	Reed, Sasha C. screed@usgs.gov ; Delgado-Baquerizo, Manuel; Ferrenberg, Scott
Article	Biogeographical patterns of tunicates utilizing eelgrass as substrate in the western North Atlantic between 39° and 47° north latitude (New Jersey to Newfoundland)	2019	REABIC	Patuxent Wildlife Research Center	15 p.	Carman, Mary R.; Colarusso, Philip D.; Neckles, Hilary A. hneckles@usgs.gov ; Bologna, Paul; Caines, Scott; Davidson, John D. P.; Evans, N. Tay; Fox, Sophia; Grunden, David W.; Hoffman, Sarah; Ma, Kevin C. K.; Matheson, Kyle; McKenzie, Cynthia; Nelson, Eric P.; Plaisted, Holly; Reddington, Emily; Schott, Stephen; Wong, Melissa C.
Report	Calibration of Precipitation-Runoff Modeling System (PRMS) to simulate prefire and postfire hydrologic response in the upper Rio Hondo Basin, New Mexico	2019	U.S. Geological Survey	New Mexico Water Science Center	Report: vi, 25 p.; Data Release	Douglas-Mankin, Kyle R.; Moeser, C. David
Report	Catchment-level estimates of nitrogen and phosphorus agricultural use from commercial fertilizer sales for the conterminous United States, 2012	2019	U.S. Geological Survey	Upper Midwest Water Science Center	Report: x, 52 p.; Data releases	Stewart, Jana S. jstewart@usgs.gov ; Schwarz, Gregory E. ggschwarz@usgs.gov ; Brakebill, John W. jwbrakeb@usgs.gov ; Preston, Stephen D. spreston@usgs.gov
Book chapter	Changing climates and challenges to Charadrius plover success throughout the annual cycle	2019	CRC Press	Forest and Rangeland Ecosystem Science Center	18 p.	Halg, Susan M. susan_halg@usgs.gov
Article	Changing station coverage impacts temperature trends in the Upper Colorado River Basin	2019	Royal Meteorological Society	Alaska Climate Science Center; Northern Rocky Mountain Science Center	22 p.	McAfee, Stephanie A.; McCabe, Gregory J. gmcabe@usgs.gov ; Gray, Stephen; Pederson, Gregory T. gpederson@usgs.gov

Article	Characterization and evaluation of controls on post-fire streamflow response across western U.S.	2019	Copernicus Publications	WMA - Integrated Modeling and Prediction Division	17 p.	Save, Samuel; Hogue, Terri S.; Hay, Lauren E. Langlin, Kathryn; Aldridge, Cameron L.; aldrigec@usgs.gov; Fike, Jennifer A.; Cornman, Robert S. rcornman@usgs.gov; Martin, Kathy M; Wann, Greg T; Seglund, Amy E; Schroeder, Michael A; Benson, David P; Fedy, Brad C.; Young, Jessica R.; Wilson, Scott D.; Wolfe, Don H; Braun, Clait E.; Oyler-McCance, Sara J. sara_oyler-mccance@usgs.gov Laske, Sarah M. slaske@usgs.gov; Amundsen, Per-Arne; Christoffersen, Kirsten; Erkinaro, Jaakko; Gudbergsson, Gudni; Hayden, Brian; Heino, Jani; Holmgren, Kerstin; Kahilainen, Kimmo K.; Lento, Jennifer; Orell, Panu; Östergren, Johan; Power, Michael; Rafikov, Ruslan; Romakkaniemi, Atso; Svenning, Martin-A.; Swanson, Heidi K.; Whitman, Matthew; Zimmerman, Christian E. czimmerman@usgs.gov
Article	Characterizing range-wide population divergence in an alpine-endemic bird: A comparison of genetic and genomic approaches	2019	Springer	Fort Collins Science Center	15 p.	
Article	Circumpolar patterns of Arctic freshwater fish biodiversity: A baseline for monitoring	2019	Wiley	Alaska Science Center Biology MFEB		
Article	Clarifying regional hydrologic controls of the Marañón River, Peru through rapid assessment to inform system-wide basin planning approaches	2019	University of California Press	WMA - Earth System Processes Division	22 p.	Hill, Alice F.; Stallard, Robert; Rittger, Karl
Report	Climate adaptation Science Centers—Annual report for 2018	2019	U.S. Geological Survey	National Climate Change and Wildlife Science Center	14 p.	Varela Minder, Eida
Article	Climate and disturbance influence self-sustaining stand dynamics of aspen (<i>Populus tremuloides</i>) near its range margin	2019	Wiley	Forest and Rangeland Ecosystem Science Center	e01948, 15 p.	Shinneman, Douglas dshinneman@usgs.gov; McIlroy, Susan smcilroy@usgs.gov
Article	Climate change effects on deer and moose in the midwest	2019	The Wildlife Society	National Climate Change and Wildlife Science Center	13 p.	Weiskopf, Sarah R.; LeDee, Olivia E.; Thompson, Laura M. lthompson@usgs.gov
Article	Climate change implications for irrigation and groundwater in the Republican River Basin, U.S.A.	2019	Springer	Coop Res Unit Atlanta	14 p.	Ou, Gengxin; Munoz-Arriola, F.; Uden, D.R.; Martin, D. R.; Allen, Craig R. allencr@usgs.gov; Shank, N.

Article	Climate change, coral loss, and the curious case of the parrotfish paradigm: Why don't marine protected areas improve reef resilience?	2019	Annual Reviews	St. Petersburg Coastal and Marine Science Center	28 p.	Bruno, John F.; Cote, Isabelle M.; Toth, Lauren T. lttoth@usgs.gov
Article	Climate vulnerability assessment for Pacific salmon and steelhead in the California Current Large Marine Ecosystem	2019	PLOS ONE	Forest and Rangeland Ecosystem Science Center	e0217711, 49 p.	Grozler, Lisa G; McClure, Michelle M; Beechie, Tim J.; Bograd, Steven J.; Boughton, David A.; Carr, Mark H.; Cooney, Thomas D.; Dunham, Jason B. jdunham@usgs.gov ; Greene, Corneil M.; Hultsch, Melissa A.; Hazen, Elliott L.; Holzer, Damon M.; Huff, David D.; Johnson, Rachel C.; Jordan, Chris E.; Kaplan, Isaac C.; Lindley, Steven T.; Mantua, Nathan J.; Moyle, Peter B.; Myers, James M.; Nelson, Mark W.; Spence, Brian C.; Weitkamp, Laurie A.; Williams, Thomas H.; Willis-Norton, Ellen
Article	Climate, snow, and soil moisture data set for the Tuolumne and Merced river watersheds, California, USA	2019	Copernicus Publications	National Research Program - Western Branch	10 p.	Roche, James W.; Rice, Robert; Meng, Xiande; Cayan, Daniel R. dracayan@usgs.gov ; Dettinger, Michael D. mddettin@usgs.gov ; Alden, Douglas; Patel, Sarina C.; Mason, Megan A.; Conklin, Martha H.; Bales, Roger C.
Report	Climate, streamflow, and lake-level trends in the Great Lakes Basin of the United States and Canada, water years 1960–2015	2019	U.S. Geological Survey	Midwest Regional Director's Office	Report: vi, 47 p.; Appendix Figures; Appendix Tables: 5	Norton, Parker A. pnorton@usgs.gov ; Driscoll, Daniel G.; Carter, Janet M.
Article	Climate-driven shifts in soil temperature and moisture regimes suggest opportunities to enhance assessments of dryland resilience and resistance	2019	Frontiers Media, Inc.	Southwest Biological Science Center	358, 16 p.	Bradford, John; Schlaepfer, Daniel R.; Lauenroth, William K.; Palmquist, Kyle A.; Chambers, Jeanne C.; Maestas, Jeremy D.; Campbell, Steven B.
Article	Climatic controls on the distribution of foundation plant species in coastal wetlands of the conterminous United States: Knowledge gaps and emerging research needs	2019	Springer	Patuxent Wildlife Research Center; Wetland and Aquatic Research Center	13 p.	Osland, Michael; Grace, James; Guntenspergen, Glenn; Thorne, Karen; Carr, Joel; Feher, Laura
Article	Climatic correlates of white pine blister rust infection in whitebark pine in the Greater Yellowstone Ecosystem	2019	MDPI	Northern Rocky Mountain Science Center	16 p.	Thoma, David; Shanahan, Erin K.; Irvine, Kathryn

Article	Climatic sensitivity of dryland soil CO ₂ fluxes differs dramatically with biological soil crust successional state	2019	Springer	Southwest Biological Science Center	18 p.	Tucker, Colin ctucker@usgs.gov; Ferrenberg, Scott sferrenberg@usgs.gov; Reed, Sasha C. screed@usgs.gov
Article	Cloud cover and delayed herbivory relative to timing of spring onset interact to dampen climate change impacts on net ecosystem exchange in a coastal Alaskan wetland	2019	IOpScience	Alaska Science Center Biology WTEB	084030, 11 p.	Leffler, Josh; Beard, Karen H.; Kelsey, Katharine C.; Choi, Ryan T.; Schmutz, Joel A. jschmutz@usgs.gov; Welker, Jeffrey
Report	Communicating hazards—A social science review to meet U.S. Geological Survey needs	2019	U.S. Geological Survey	Office of the AD Hazards	vi, 67 p.	Milch, Kerry F.; Perry, Suzanne C. sperry@usgs.gov; Bruce, Jennifer L. jbruce@usgs.gov
Article	Compounding effects of climate change reduce population viability of a montane amphibian	2019	Ecological Society of America	Forest and Rangeland Ecosystem Science Center	e01832; 12 p.	Kissel, Amanda M.; Palen, Wendy J.; Ryan, Maureen E.; Adams, Michael J.
Book chapter	Conservation of temporary wetlands	2019	Elsevier	Northern Prairie Wildlife Research Center		Boix, Dani; Calhoun, Aram J.K.; Mushet, David M. dmushet@usgs.gov; Bell, Kathleen P.; Fitzsimons, James A.; Isselin-Nondedeu, Francis
Book chapter	Contemporary human impacts on alpine ecosystems: the direct and indirect effects of human-induced climate change and land use	2019	Elsevier	Southwest Biological Science Center		Winkler, Daniel E.
Article	Controls on organic matter distributions in Eocene Lake Uinta, Utah and Colorado	2019	Elsevier	WMA - Earth System Processes Division	16 p.	Korol, Alicia R.; Noe, Gregory B. gnoe@usgs.gov; Ahn, Changwoo
Article	Controls on organic matter deposition in eastern North America: Predicted responses of forest ecosystems	2019	Rocky Mountain Association of Geologists	Central Energy Resources Science Center; Energy Resources Program; Southwest Climate Science Center	40 p.	Johnson, Ronald C. rcjohnson@usgs.gov; Mercier, Tracey J. tmercier@usgs.gov; Birdwell, Justin E. jbirdwell@usgs.gov
Article	Decreased atmospheric nitrogen deposition in eastern North America: Predicted responses of forest ecosystems	2019	Elsevier	WMA - Integrated Modeling and Prediction Division	15 p.	Gilliam, Frank S.; Burns, Douglas A.; Driscoll, Charles T.; Frey, Serita D.; Lovett, Gary M.; Watmough, Shaun A.
Article	Delayed herbivory by migratory geese increases summer-long CO ₂ uptake in coastal western Alaska	2019	Wiley	Alaska Science Center Biology WTEB	13 p.	Leffler, A. Joshua; Beard, Karen H.; Kelsey, Katharine C.; Choi, Ryan T.; Schmutz, Joel A. jschmutz@usgs.gov; Welker, Jeffrey M.
Article	Demographic consequences of conservation reserve program grasslands for lesser prairie-chickens	2019	Wiley	Coop Res Unit Seattle	16 p.	Haukoos, David A. dhaukoos@usgs.gov

Article	Designing multi-scale hierarchical monitoring frameworks for wildlife to support management: A sage-grouse case study	2019	Wiley	Forest and Rangeland Ecosystems Science Center; Fort Collins Science Center; Western Ecological Research Center	e02872, 34 p.	O'Donnell, Michael S. odonnellm@usgs.gov ; Edmunds, David R. dedmunds@usgs.gov ; Aldridge, Cameron L. aldridgec@usgs.gov ; Heinrichs, Julie jheintrichs@usgs.gov ; Coates, Peter S. pcoates@usgs.gov ; Prochazka, Brian G. bprochazka@usgs.gov ; Hanser, Steven E. shanser@usgs.gov
Article	Detecting signals of large-scale climate phenomena in discharge and nutrient loads in the Mississippi-Atchafalaya River Basin	2019	Wiley	WMA - Integrated Information and Dissemination Division	11 p.	Smits, Adrienne P.; Ruffing, Claire M.; Royer, Todd V.; Appling, Alison P. aappling@usgs.gov ; Griffiths, Natalie A.; Bellmore, Rebecca; Scheuerell, Mark D.; Harms, Tamara K.; Jones, J.B.
Report	Developing a decision-support process for landscape conservation design	2019	U.S. Forest Service, General Technical Report	Columbia Environmental Research Center	66 p.	Bonnot, Thomas W.; Jones-Farrand, D. Todd; Thompson III, Frank R.; Millsbaugh, Joshua J.; Fitzgerald, Jane A.; Muenks, Nate; Hanberry, Phillip; Stroh, Esther; Heggemann, Larry; Fowler, Allison; Howery, Mark; Hammond, Shea; Evans, Kristine
Conference Paper	Developing a precision irrigation framework to facilitate smallholder dry-season farming in developing countries: A case study in northern Ghana	2019	Society of Exploration Geophysicists	WMA - Earth System Processes Division	5 p.	Fontaine, Jeremy M.; Fentzke, Joseph; Oware, Erasmus K.; Doe, Eric; Guug, Samuel; Lane, Jr., John W.
Article	Developing and optimizing shrub parameters representing sagebrush (<i>Artemisia</i> spp.) ecosystems in the Northern Great Basin using the Ecosystem Demography (EDv2.2) model	2019	European Geosciences Union	Forest and Rangeland Ecosystem Science Center	17 p.	Pandit, Karun; Daathi, Hamid; Glenn, Nancy; Flores, Alejandro; Maguire, Kaitlin C.; Shinneman, Douglas dshinneman@usgs.gov ; Flerchinger, Gerald; Fellow, Aaron
Article	Development of on-shore behavior among polar bears (<i>Ursus maritimus</i>) in the southern Beaufort Sea: Inherited or learned?	2019	Wiley	Alaska Science Center; Alaska Science Center Biology MFEB	10 p.	Lillie, K. M.; Gese, E. M.; Atwood, Todd C. tatwood@usgs.gov ; Sonsthagen, Sarah A. ssonsthagen@usgs.gov
Article	Digital mapping of ecological land units using a nationally scalable modeling framework	2019	Alliance of Crop, Soil, and Environmental Science Societies (ACSESS)	Southwest Biological Science Center	21 p.	Maynard, Jonathan J.; Nauman, Travis W. tnauman@usgs.gov ; Salley, Shawn W.; Bestelmeyer, Brandon T.; Duniway, Michael C. mduniway@usgs.gov ; Talbot, Curtis J.; Brown, Joel R.

Article	Dissolved organic carbon turnover in permafrost-influenced watersheds of interior Alaska: Molecular insights and the priming effect	2019	Frontiers Media	WMA - Earth System Processes Division	275, 17 p.	Textor, Sadie R.; Wickland, Kimberly P. kpwick@usgs.gov ; Podgorski, David C.; Johnston, Sarah Ellen; Spencer, Robert G.M.
Article	Downstream-propagating channel responses to decadal-scale climate variability in a glaciated river basin	2019	AGU	Washington Water Science Center	18 p.	Anderson, Scott W. swanderson@usgs.gov ; Konrad, Christopher P. cpkonrad@usgs.gov
Article	Drivers and impacts of water level fluctuations in the Mississippi River delta: Implications for delta restoration	2019	Elsevier	Wetland and Aquatic Research Center	21 p.	Hiatt, Matthew R.; Snedden, Gregg; Day, John W.; Rohli, Robert V.; Nyman, John A.; Lane, Robert R.; Sharp, Leigh A.
Article	Drivers and uncertainties of forecasted range shifts for warm-water fishes under climate and land cover change	2019	Canadian Science Publishing	Upper Midwest Environmental Sciences Center	11 p.	Bouska, Kristen L. kbouska@usgs.gov ; Whitledge, Gregory W.; Lant, Christopher; Schoof, Justin
Conference Paper	Drought in the U.S. Caribbean: Impacts to freshwater ecosystems	2019	U.S. Geological Survey	National Climate Change and Wildlife Science Center	2 p.	Myers, Bonnie
Conference Paper	Drought in the U.S. Caribbean: Impacts to Coastal Estuary Ecosystems	2019		National Climate Change and Wildlife Science Center	2 p.	Brent Murry; Miguel Garcia-Bermudez; Shelley Crausbay; Malpeli, Kate
Article	Drought-mediated extinction of an arid-land amphibian: Insights from a spatially explicit dynamic occupancy model	2019	Wiley	Fort Collins Science Center; Northern Rocky Mountain Science Center	e01859, 15 p.	Zylstra, Erin R; Swann, Don E; Hossack, Blake R. blake_hossack@usgs.gov ; Steidl, Robert J
Article	Dynamic flood modeling essential to assess the coastal impacts of climate change	2019	Nature	Pacific Coastal and Marine Science Center	Article number: 4309, 13 p.	Barnard, Patrick L. pbarnard@usgs.gov ; Erikson, Li H. lerikson@usgs.gov ; Foxgrover, Amy C. afoxgrover@usgs.gov ; Finzi Hart, Juliette A.; Limber, Patrick W. plimber@usgs.gov ; O'Neill, Andrea C. aoneill@usgs.gov ; van Ormondt, Maarten; Vitousek, Sean; Wood, Nathan J. nwood@usgs.gov ; Hayden, Maya K.; Jones, Jeanne M. jmjoness@usgs.gov
Conference Paper	Early career climate communications and networking	2019		Northeast Climate Science Center	19 p.	Ezra Markowitz; Staudinger, Michelle D.

Article	Early-warming signals of individual tree mortality based on annual radial growth	2019	Frontiers Media	Western Ecological Research Center	Article 1964; 14 p.	Cailleret, Maxime; Dakos, Vasilis; Jansen, Steven; Robert, Elisabeth M. R.; Aakala, Tuomas; Amoroso, Mariano M.; Antos, Joe A.; Bigler, Christof; Bugmann, Harald; Caccianaga, Marco; Camarero, Jesus-Julio; Cherubini, Paolo; Coyea, Marie R.; Cufar, Katarina; Das, Adrian J. adas@usgs.gov; Davi, Hendrik; Gea-Izquierdo, Guillermo; Gillner, Sten; Haavik, Laurel J.; Hartmann, Henrik; Heres, Ana-Maria; Hultine, Kevin R.; Janda, Pavel; Kane, Jeffrey M.; Kharuk, Viatcheslav I.; Kitzberger, Thomas; Klein, Tamir; Levanić, Tom; Linares, Juan-Carlos; Lombardi, Fabio; Mäkinen, Harri; Mészáros, Ilona; Metsaranta, Juha M.; Oberhuber, Walter; Papadopoulos, Andreas; Petritan, Any Mary; Röhner, Brigitte; Sangüesa-Barreda, Gabriel; Smith, Jeremy M.; Stan, Amanda B.; Stojanović, Dejan B.; Suarez, Maria-Laura; Svoboda, Miroslav; Trotsiuk, Volodymyr; Villalba, Ricardo; Westwood, Alana R.; Wyckoff, Peter H.; Martinez-Vilalta, Jordi
Article	Earth history and the passerine superradiation	2019	National Academy of Sciences	Patuxent Wildlife Research Center	12 p.	Oliveros, Carl H.; Field, Daniel J.; Ksepka, Daniel T.; Barker, F. Keith; Aleixo, Alexandre; Andersen, Michael J.; Alstrom, Per; Benz, Brett W.; Braun, Edward I.; Braun, Michael J.; Bravo, Gustavo A.; Brunfield, Robb T.; Chesser, Terry T.; Chesser@usgs.gov; Santiago Claramunt, Joel Cracraft; Andrés M. Cuervo; Elizabeth P. Derryberry; Travis C. Glenn; Michael G. Harvey; Peter A. Hosner; Leo Joseph; Rebecca Kimball; Andrew L. Mack; Colin M. Miskelly; A. Townsend Peterson; Mark B. Robbins; Frederick H. Sheldon; Luis Fábio Silveira; Brian T. Smith; Noor D. White; Robert G. Moyle; Brant C. Faircloth
Conference Paper	Ecological and management implications of climate change induced shifts in phenology of coastal fish and wildlife species in the Northeast CASC region	2019	Northwest Climate Adaptation Science Center	Northeast Climate Science Center	12 p.	Staudinger, Michelle D.; Jordaan, Adrian

Article	Ecological consequences of anomalies in atmospheric moisture and snowpack	2019	Wiley	Northern Rocky Mountain Science Center	Article e02638	Johnston, Aaron; Bruggeman, Jason E.; Christophersen, Roger; Beers, Aidan; Beaver, Erik A. ebeaver@usgs.gov ; Ransom, Jason I.
Article	Ecological effects of establishing a 40-year oasis protection system in a Northwestern China Desert	2019	Elsevier	Southwest Biological Science Center	104374, 13 p.	Wang, Guohua; Munson, Seth M. smunson@usgs.gov ; Yu, Kailiang; Chen, Ning; Gou, Qianqian
Article	Ecological islands: Conserving biodiversity hotspots in a changing climate	2019	Wiley	Lower Mississippi-Gulf Water Science Center	10 p.	Cartwright, Jennifer M. jmcart@usgs.gov
Article	Ecosystem function and services of aquatic predators in the Anthropocene	2019	Elsevier	Western Ecological Research Center	15 p.	Hammerschlag, Neil; Schmitz, Oswald J.; Flecker, Alexander S.; Lafferty, Kevin D. klafferty@usgs.gov ; Sih, Andrew; Atwood, Trisha B.; Gallagher, Austin J.; Irschick, Duncan J.; Skubel, Rachel; Cooke, Steven J.
Article	Effects of 21st century climate, land use, and disturbances on ecosystem carbon balance in California	2019	Wiley	Western Fisheries Research Center; Western Geographic Science Center	22 p.	Sleeter, Benjamin M. bsleeter@usgs.gov ; David Marvin; D. Richard Cameron; Selman, Paul pselman@usgs.gov ; LeRoy Westerling; Kretzler, Jason R. jkreiter@usgs.gov ; Colin Daniel; Liu, Jinxun jxliu@usgs.gov ; Wilson, Tamara twilson@usgs.gov
Article	Effects of a changing climate on the hydrological cycle in cold desert ecosystems of the Great Basin and Columbia Plateau	2019	BioOne	Forest and Rangeland Ecosystem Science Center; Southwest Biological Science Center	12 p.	Snyder, Keirith A.; Evers, Louisa B.; Chambers, Jeanne C.; Dunham, Jason B. jdunham@usgs.gov ; Bradford, John B. jbradford@usgs.gov ; Loik, Michael E.
Article	Effects of age and environment on stable carbon isotope ratios in tree rings of riparian Populus	2019	Elsevier	Fort Collins Science Center	8 p.	Friedman, Jonathan M. jfriedman@usgs.gov ; Stricker, Craig A. cstricker@usgs.gov ; Adam Z Csank; Honghua Zhou
Article	Effects of climate change on habitat and connectivity for populations of a vulnerable, endemic salamander in Iran	2019	Elsevier	Forest and Rangeland Ecosystem Science Center; Forest and Rangeland Ecosystem Science Center	e00637, 13 p.	Ashrafzadeh, Mohammad Reza; Naghipour, Ali Asghar; Haidarian, Maryam; Kusza, Szilvia; Pilliod, David S. dpilliod@usgs.gov
Article	Effects of climate, regulation, and urbanization on historical flood trends in the United States	2019	Elsevier	WMA - Integrated Modeling and Prediction Division	13 p.	Hodgkins, Glenn; Dudley, Robert; Archfield, Stacey; Renard, Benjamin
Article	Effects of land use on greenhouse gas flux in playa wetlands and associated watersheds in the High Plains, USA	2019	Scientific Research	Northern Prairie Wildlife Research Center	21 p.	Daniel, Dale W.; Smith, Loren M.; McMurry, Scott T.; Tange, Brian btange@usgs.gov ; Dahl, Charles F. cdahl@usgs.gov ; Euliss, Ned ceuliss@usgs.gov ; LaGrange, Ted

Article	Effects of nest exposure and spring temperatures on golden eagle brood survival: An opportunity for mitigation	2019	The Raptor Research Foundation	Forest and Rangeland Ecosystem Science Center	7 p.	Kochert, Michael N. mkochert@usgs.gov; Steenhof, Karen; Brown, Jessi L.
Article	Effects of ocean climate on the length and condition of forage fish in the Gulf of Alaska	2019	Wiley	Alaska Science Center Biology MIEB	14 p.	Sarah Ann Thompson; Marisol Garcia-Reyes; William Sydeman; Arimitsu, Mayumi L. marimitsu@usgs.gov; Scott Hatch; Platt, John F. jplatt@usgs.gov
Article	El Niño increases high-tide flooding in tidal wetlands along the U.S. Pacific coast.	2019	American Geophysical Union	Western Ecological Research Center	16 p.	Goodman, Arianna; Thorne, Karen M.; Buffington, Kevin J. kbuffington@usgs.gov; Freeman, Chase cfreeman@usgs.gov; Janousek, Christopher N.
Book chapter	Encyclopedia of Caves	2019	Elsevier	Lower Mississippi-Gulf Water Science Center	9 p.	Knierim, Katherine J. knierim@usgs.gov; Hays, Phillip D. pdhays@usgs.gov
Article	Endless forams: >34,000 modern planktonic foraminiferal images for taxonomic training and automated species recognition using convolutional neural networks	2019	American Geophysical Union	Eastern Geology and Paleoclimate Science Center	21 p.	Hsiang, Allison Y.; Brombacher, Anieke; Costa Rillo, Marina; Mleneck-Vautravers, Maryline J.; Connett, Stephen; Lordsmith, Sian; Jentzen, Anna; Henahan, Michael J.; Metcalfe, Brett; Fenton, Isabel; Wade, Bridget; Fox, Lyndsey; Meiland, Julie; Davis, Catherine V.; Baranowski, Ulrike; Groeneveld, Jeroen; Edgar, Kirsty M.; Movellan, Aurore; Aze, Tracy; Dowsett, Harry J. hdowsett@usgs.gov; Miller, Giles; Rios, Nelson; Hull, Pincelli M.
Article	Energy intake rate influences survival of Black Oystercatcher Haematopus bachmani broods	2019	Marine Ornithology	Coop Res Unit Atlanta	7 p.	Robinson, B.H.; Phillips, L.M.; Powell, Abby abby_powell@usgs.gov
Report	Estimated groundwater recharge from a water-budget model incorporating selected climate projections, Island of Maui, Hawai'i	2019	U.S. Geological Survey	Pacific Islands Water Science Center	Report: vi, 46 p., 3 data releases	Mair, Alan dmair@usgs.gov; Johnson, Adam G. ajohnson@usgs.gov; Rotzoll, Kolja; Oki, Delwyn S.
Article	Estimating spatially and temporally complex range dynamics when detection is imperfect	2019	Nature	Patuxent Wildlife Research Center	Article 12805	Rushing, Clark S.; Royle, J. Andrew aroyle@usgs.gov; Ziolkowski, David Jr. dziolkowski@usgs.gov; Pardieck, Keith L. kpardieck@usgs.gov
Article	Evaluating community-level response to management actions across a diverse Hawaiian forest bird community	2019	Ecological Society of America	Pacific Island Ecosystems Research Center	11 p.	Guillaumet, Alban; Paxton, Eben H. epaxton@usgs.gov

Article	Evaluating consumptive and nonconsumptive predator effects on prey density using field times series data	2019	ESA	Great Lakes Science Center	Article e02583, 14 p.	Marino Jr., John A.; Peacor, Scott D.; Bunnell, David; Vanderploeg, Henry A.; Pothoven, Steven A.; Elgin, Ashley K.; Bence, James R.; Jiao, J.; Ionides, Edward L.
Article	Evaluating k-nearest neighbor (kNN) imputation models for species-level aboveground forest biomass mapping in northeast China	2019	MDPI	Geosciences and Environmental Change Science Center; Office of the AD Climate and Land-Use Change; Land Change Science	20 p.	Fu, Yuanyuan; He, Hong S.; Hawbaker, Todd J.; thawbaker@usgs.gov; Henne, Paul D. phenne@usgs.gov; Zhu, Zhiliang zzhu@usgs.gov; Larsen, David R.
Article	Evaluating potential distribution of high-risk aquatic invasive species in the water garden and aquarium trade at a global scale based on current established populations	2019	Wiley	Fort Collins Science Center; Wetland and Aquatic Research Center	23 p.	West, Amanda M.; Jarnevich, Catherine S. Jarnevich@usgs.gov; Fuller, Pam L. pfuller@usgs.gov; Young, Nicholas E.
Article	Evaluating the relationship among wetland vertical development, elevation capital, sea-level rise and tidal marsh sustainability	2019	Springer	Patuxent Wildlife Research Center	15 p.	Cahoon, Donald R. dcahoon@usgs.gov; Lynch, James C.; Roman, Charles T.; Schmitz, John Paul; Skidds, Dennis E.
Article	Evidence for interactions among environmental stressors in the Laurentian Great Lakes	2019	Elsevier	Great Lakes Science Center	9 p.	Smith, Sigrid D. P.; Bunnell, David B. dbunnell@usgs.gov; Burton, G.A. Jr.; Ciborowski, Jan J. H.; Davidson, Alisha D.; Dickinson, Caitlin E.; Eaton, Lauren A.; Esselman, Peter C. pesselman@usgs.gov; Evans, Mary Anne maevans@usgs.gov; Kashian, Donna R.; Manning, Nathan F.; McIntyre, Peter B.; Nalepa, Thomas F.; Perez-Fuentetaja, Alicia; Steinman, Alan D.; Uzarski, Donald G.; Allan, J. David
Article	Evidence of Culiseta mosquitoes as vectors for Plasmodium parasites in Alaska	2019	Wiley	Alaska Science Center	8 p.	Smith, Matthew M. msmith@usgs.gov; Van Hemert, Caroline R. cvanhemert@usgs.gov; Handel, Colleen M. cmhandel@usgs.gov
Report	Extreme coastal water level in Washington state: Guidance to support sea level rise planning	2019	Washington Coastal Resilience Project	Pacific Coastal and Marine Science Center	24 p.	Miller, I.M.; vanArendonk, N.R.; Grossman, Eric egrossman@usgs.gov
Article	Facilitating adaptation to climate change while restoring a montane plant community Fena Valley Reservoir watershed and water-balance model updates and expansion of watershed modeling to southern Guam	2019	Public Library of Science	Pacific Island Ecosystems Research Center	e0218516; 17 p.	Leopold, Christina; Hess, Steve C. shess@usgs.gov
Report		2019	U.S. Geological Survey	Pacific Islands Water Science Center	Report: viii, 64 p.	Rosa, Sarah N. snrosa@usgs.gov; Hay, Lauren E. lhay@usgs.gov

Article	Financing agricultural drought risk through ex-ante cash transfers	2019	Elsevier	Earth Resources Observation and Science (EROS) Center	13 p.	Nobre, Gabriela Guimarães; Davenport, Frank; Bischiniotis, Konstantinos; Veldcamp, Ted; Jongman, Brenden; Funk, Chris cfunk@usgs.gov; Husak, Gregory; Ward, Philip J.; Aerts, Jeroen C.J.H.
Article	Fishing for conservation of freshwater tropical fish in the Anthropocene	2019	Wiley	National Climate Change and Wildlife Science Center	13 p.	Phang, Sul Chian; Cooperman, Michael S.; Lynch, Abigail; Steel, Ashley; Elliott, Vittoria; Murchie, Karen J.; Cooke, Steven J.; Dowd, Scott; Cowx, Ian G.
Report	Flow modification in the Nation's streams and rivers	2019	U.S. Geological Survey	WMA - Earth System Processes Division	ix, 75 p.	Carlisle, Daren M. dcarlisle@usgs.gov; Wolock, David M.; Konrad, Christopher P.; McCabe, Gregory J. gmcabeb@usgs.gov; Eng, Ken keng@usgs.gov; Theodore E. Grantham; Mahler, Barbara bjmahler@usgs.gov
Article	Fluvial sedimentary history of Arlington Canyon, Channel Islands National Park, California	2019	Wiley	Geosciences and Environmental Change Science Center	10 p.	Schumann, R. Randall rschumann@usgs.gov; Pigati, Jeffrey S. jpigati@usgs.gov
Article	Freezing resistance, safety margins, and survival vary among big sagebrush populations across the western United States	2019	Botanical Society of America	Forest and Rangeland Ecosystem Science Center	13 p.	Lazarus, Brynne; Germino, Matthew J. mgermino@usgs.gov; Richardson, Bryce A.
Article	Functional and geographic components of risk for climate sensitive vertebrates in the Pacific Northwest, USA	2019	Elsevier	Forest and Rangeland Ecosystem Science Center	12 p.	Meryl Mims; Deanna H. Olson; Pilliod, David S. dpilliod@usgs.gov; Dunham, Jason B. jdunham@usgs.gov
Article	Gene flow connects coastal populations of a habitat specialist, the Clapper Rail <i>Rallus crepitans</i>	2019	Wiley	Forest and Rangeland Ecosystem Science Center	13 p.	Coster, Stephanie S.; Welsh, Amy B.; Costanzo, Gary R.; Harding, Sergio R.; Anderson, James T.; Katzner, Todd E. tkatzner@usgs.gov
Report	Genetically-informed seed transfer zones for <i>Pleurophis jamesii</i> , <i>Sphaeralcea parvifolia</i> , and <i>Sporobolus cryptandrus</i> across the Colorado Plateau and adjacent regions	2019	Bureau of Land Management	Southwest Biological Science Center	11 p.	Massatti, Robert
Article	Geochemically distinct oil families in the onshore and offshore Santa Maria basins, California	2019	American Association of Petroleum Geology	Pacific Coastal and Marine Science Center	28 p.	Peters, Kenneth E.; Lillis, Paul G. plillis@usgs.gov; Lorensen, Thomas tllorenson@usgs.gov; Zumberge, J. E.

Article	Geographic variation in the intensity of warming and phenological mismatch between Arctic shorebirds and invertebrates	2019	Ecological Society of America	Alaska Science Center Biology WTEB; Upper Midwest Environmental Sciences Center	e01383	Kwon, Enubi; Weiser, Emily L.; Lanctot, Richard B.; Brown, Stephen C.; Gates, H. River; Gilchrist, H. Grant; Kendall, Steve J.; David B. Lank; Joseph R. Liebezeit; McKinnon, Laura; Erica Nol; Payer, David C.; Jennie Rausch; Saafield, Sarah T.; Rinella, Daniel J.; Sennel, Nathan R.; Smith, Paul A.; Ward, David; Wissman, Robert C.; Sandercock, Brett K.
Article	Giving ecological meaning to satellite-derived fire severity metrics across North American forests	2019	MDPI	Alaska Science Center Geography	1735, 19 p.	Parks, Sean; Holsinger, Lisa M.; Koontz, Michael J.; Collins, Luke S.; Whitman, Ellen; Parisien, Marc-André; Loehman, Rachel A. floehman@usgs.gov; Barnes, Jennifer L.; Bourdon, Jean-François; Boucher, Jonathan; Boucher, Yan; Caprio, Anthony C.; Collingwood, Adam; Hall, Ron; Park, Jane; Saperstein, Lisa; Smetanka, Charlotte; Smith, Rebecca; Soverel, Nick
Article	Glacier recession since the Little Ice Age: Implications for water storage in a Rocky Mountain landscape	2019	Taylor & Francis	Northern Rocky Mountain Science Center	10 p.	Mikle, Chelsea; Fagre, Daniel B. dan_fagre@usgs.gov
Article	Global observational needs and resources for marine biodiversity	2019	Frontiers in Marine Science	Core Science Analytics and Synthesis	367, 20 p.	Canonico, Gabrielle; Buttigieg, Pier Luigi; Montes, Enrique; Muller-Karger, Frank E.; Stepien, Carol; Wright, Dawn J.; Benson, Abigail; Helmuth, Brian; Costello, Mark John; Sousa-Pinto, Isabel; Saeedi, Hanieh; Newton, Jan; Appeltans, Ward; Bednaršek, Nina; Bodrossy, Levente; Best, Benjamin D.; Brandt, Angelika; Goodwin, Kelly D.; Iken, Katrin; Marquez, Antonio C.; Miloslavich, Patricia; Ostrowski, Martin; Turner, Woody; Achterberg, Eric P.; Barry, Tom; DeFeo, Omar; Bigatti, Gregorio; Henry, Lea-Anne; Ramiro-Sánchez, Berta; Durán, Pablo; Morato, Telmo; Roberts, J. Murray; Garcia-Alegre, Ana; Sacau Cuadrado, Mar; Murtón, Bramley
Article	Global patterns of tree stem growth and stand aboveground wood production in mangrove forests	2019	Elsevier	Wetland and Aquatic Research Center	11 p.	Xiong, Yanmei; Cakir, Roxelane; Phan, Sang Minh; Ola, Anne; Krauss, Ken; Lovelock, Catherine E.

Article	Global sea-level contribution from Arctic land ice: 1971 to 2017	2019	IOP publishing	Alaska Science Center Water	125012, 11 p.	Box, Jason E.; Colgan, William T.; Wouters, Bert; Burgess, David O; O'Neel, Shad sonel@usgs.gov; Thomson, Laura; Mernild, Sebastian H
Article	GRACE storage change characteristics (2003–2016) over major surface basins and principal aquifers in the Conterminous United States	2019	MDPI	Earth Resources Observation and Science (EROS) Center	22 p.	Velpuri, Naga Manohar nvelpuri@usgs.gov; Senay, Gabriel senay@usgs.gov; Driscoll, Jessica M. jdriscoll@usgs.gov; Saxe, Samuel; Hay, Lauren E.; Farmer, William H. wfarmer@usgs.gov; Kiang, Julie E. jkiang@usgs.gov
Article	Grounding simulation models with qualitative case studies: Toward a holistic framework to make climate science usable for US public land management	2019	Elsevier	North Central Climate Science Center	17 p.	Beeton, Tyler A.; McNeeley, Shannon M.; Miller, Brian W. bwmillier@usgs.gov; Ojima, Dennis S.
Report	Groundwater availability in the Ozark Plateaus aquifer system	2019	U.S. Geological Survey	Arkansas Water Science Center; Lower Mississippi-Gulf Water Science Center	Report: x, 82 p.; Data Release	Clark, Brian R. brclark@usgs.gov; Duncan, Leslie L.; Knierim, Katherine J. knierim@usgs.gov
Report	Hawai'i Groundwater Recharge Tool	2019	University of Hawaii	Pacific Islands Water Science Center	HTML Document	McLean, Jared H.; Rotzoll, Kolja kolja@usgs.gov; Cleaveland, Sean B.; Izuka, Scot K. skizuka@usgs.gov
Article	Heightened immune system function in polar bears using terrestrial habitats	2019	University of Chicago Press	Alaska Science Center Biology MIEB	11 p.	Whiteman, John P.; Harlow, Henry J.; Durner, George M. gdurner@usgs.gov; Regehr, Eric V.; Amstrup, Steven C.; Ben-David, Merav
Article	Historical background and current developments for mapping burned area from satellite Earth observation	2019	Elsevier	Geosciences and Environmental Change Science Center	20 p.	Chuvieco, Emilio; Mouillot, Florent; van der Werf, Guido R.; San Miguel, Jesús; Tanasse, Mihai; Koutsias, Nikos; Garcia, Mariano; Yebra, Marta; Padilla, Marc; Heil, Angelika; Hawbaker, Todd J. tjhawbaker@usgs.gov; Giglio, Louis
Article	Historical changes in New York State streamflow: Attribution of temporal shifts and spatial patterns from 1961 to 2016	2019	Elsevier	New York Water Science Center	16 p.	Glas, Robin; Burns, Douglas A.; Lautz, Laura K.
Book chapter	Historical range and variation (HRV)	2019	Springer	Alaska Science Center Geography		Keane, Robert; Loehman, Rachel A. rloehman@usgs.gov
Article	Holocene thermokarst lake dynamics in northern Interior Alaska: The interplay of climate, fire, and subsurface hydrology	2019	Frontiers	Geosciences and Environmental Change Science Center	53, 22 p.	Anderson, Leslie; Mary E. Edwards; Mark D. Shapley; Bruce P. Finney; Catherine Langdon

Report	Hurricane Sandy impacts on coastal wetland resilience	2019	U.S. Geological Survey	Patuxent Wildlife Research Center	xii, 117 p.	Cahoon, Donald R.; Olker, Jennifer H.; Yeates, Alice G.; Guntenspergen, Glenn R. glenn.guntenspergen@usgs.gov; Grace, James B. gracej@usgs.gov; Adamowicz, Susan C.; Anisfeld, Shimon C.; Baldwin, Andrew H.; Barrett, Neil; Beckett, Leah; Benzecry, Alice; Blum, Linda K.; Burdick, David M.; Crouch, William; Ekberg, Marci Cole; Fernald, Sarah; Grimes, Kristin Wilson; Grzyb, Joseph; Hartig, Ellen Kracauer; Kreeger, Danielle A.; Larson, Marit; Lerberg, Scott; Lynch, James C.; Maher, Nicole; Maxwell-Doyle, Martha; Mitchell, Laura R.; Mora, Jordan; O'Neill, Victoria; Padeletti, Angela; Prosser, Diann J. dprosser@usgs.gov; Quirk, Tracy; Raposa, Kenneth B.; Reay, William G.; Siok, Drexel; Snow, Christopher; Starke, Adam; Stevenson, J. Court; Staver, Lorie; Turner, Vincent
Book chapter	Hypotheses from recent assessments of climate impacts to biodiversity and ecosystems in the United States	2019	Springer	National Climate Change and Wildlife Science Center	21 p.	Carter, Shawn L. scarter@usgs.gov; Lynch, Abigail J. ajlynch@usgs.gov; Myers, Bonnie bimyers@usgs.gov; Rubenstein, Madeleine A. mrubenstein@usgs.gov; Thompson, Laura M. lthompson@usgs.gov
Article	Identifying changing precipitation extremes in Sub-Saharan Africa with gauge and satellite products	2019	IOP Science	Earth Resources Observation and Science (EROS) Center	13 p.	Harrison, Laura; Funk, Chris cfunk@usgs.gov; Peterson, Pete
Article	Impacts to wildlife of wind energy siting and operation in the United States	2019	Ecological Society of America	Geosciences and Environmental Change Science Center	24 p.	Taber Allison; Diffendorfer, James E. jediffendorfer@usgs.gov; Erin Baerwald; Julie Beston; David Drake; Amanda Hale; Cris Hein; Huso, Manuela M. mhuso@usgs.gov; Scott Loss; Lovich, Jeffrey E. jeffrey_lovich@usgs.gov; Dale Strickland; Kate Williams; Virginia Winder
Article	Implementation of an occupancy-based monitoring protocol for a wide-spread and cryptic species, the New England cottontail <i>Sylvilagus transitionalis</i>	2019	CSIRO	Southeast Climate Science Center		Shea, Colin P.; Eaton, Mitchell; MacKenzie, Darryl I.
Report	Implications of climate scenarios for Badlands National Park resource management	2019		North Central Climate Science Center	5 p.	Miller, Brian W. bwmiller@usgs.gov; Symstad, Amy asymstad@usgs.gov; Schuurman, Gregor

Article	Incorporating social-ecological considerations into basin-wide responses to climate change in the Colorado River Basin Individual behaviour and resource use of thermally stressed brook trout <i>Salvelinus fontinalis</i> portend the conservation potential of thermal refugia	2019	Elsevier	Southwest Biological Science Center	6 p.	Bair, Lucas; Yackulic, Charles B. cyackulic@usgs.gov ; Schmidt, John C.; Perry, Danielle M.; Kirchhoff, Christine J.; Chief, Karletta; Colombi, Benedict J.
Article		2019	Wiley	Coop Res Unit Leetown; Leetown Science Center	11 p.	White, Shannon L.; Kline, B.C.; Hitt, Nathaniel; Wagner, Tyler
Article	Influence of climate, posttreatment weather extremes, and soil factors on vegetation recovery after restoration treatments in the southwestern US	2019	Wiley	Southwest Biological Science Center	11 p.	Copeland, Stella M. scopeland@usgs.gov ; Munson, Seth M. smunson@usgs.gov ; Bradford, John B. jbradford@usgs.gov ; Butterfield, Bradley J.
Article	Influence of multi-decadal land use, irrigation practices and climate on riparian corridors across the Upper Missouri River Headwaters Basin, Montana	2019	Copernicus Publications	Geosciences and Environmental Change Science Center	24 p.	Vanderhoof, Melanie K. mvanderhoof@usgs.gov ; Christensen, J.R.; Alexander, Laurie C.
Article	Influence of surrounding land-use on mussel growth and glycogen levels in the St. Croix and Minnesota River basins	2019	Springer	Upper Midwest Environmental Sciences Center		Hornbach, Daniel J.; Stutzman, Hayley; Hove, Mark C.; Kozarek, Jessica; MacGregor, Kelly; Newton, Teresa tnewton@usgs.gov ; Ries, Patricia
Article	Influences of spawning timing, water temperature, and climatic warming on early life history phenology in western Alaska sockeye salmon	2019	Canadian Science Publishing	Coop Res Unit Seattle	13 p.	Sparks, Morgan M.; Falke, Jeffrey A. jfalke@usgs.gov ; Quinn, Thomas P.; Adkison, Milo D.; Schindler, Daniel E.; Bartz, Krista K.; Young, Daniel B.; Westley, Peter A. H.
Article	Insect herbivores on urban native oak trees	2019	International Oak Society Federal	Fort Collins Science Center	8 p.	Pearse, Ian
Conference Paper	Integrated hydrologic modeling of the Salinas River, California, for sustainable water management	2019	Interagency Subcommittee on Sedimentation (SOS)	California Water Science Center	13 p.	Hevesi, Joseph A. jhevesi@usgs.gov ; Henson, Wesley R. whenson@usgs.gov ; Henson, Randall T. rthanson@usgs.gov ; Boyce, Scott E. seboyce@usgs.gov
Article	Integrated modeling reveals shifts in waterfowl population dynamics under climate change	2019	Wiley	Patuxent Wildlife Research Center	12 p.	Qing Zhao; Scott Boomer; Royle, Andy aroyle@usgs.gov
Article	Integrating anthropogenic factors into regional-scale species distribution models — A novel application in the imperiled sagebrush biome	2019	Wiley	Forest and Rangeland Ecosystem Science Center	15 p.	Requena-Mullor, Juan M.; Maguire, Kaitlin C.; Shinneman, Douglas dshinneman@usgs.gov ; Caughlin, T. Trevor

Article	Integrating behavior and physiology into strategies for amphibian conservation	2019	Frontiers Media	Wetland and Aquatic Research Center	234, 13 p.	Walls, Susan; Gabor, Caitlin R.
Article	Intensive sampling reveals underreported use of great-river tributaries by large-river fishes in Missouri	2019	BioOne	Coop Res Unit Atlanta; National Climate Change and Wildlife Science Center	9 p.	Dunn, Corey G.; Brooke, Brandon L.; Hrabik, Robert A.; Paukert, Craig P. cpaukert@usgs.gov
Article	Invertebrate communities of Prairie-Pothole wetlands in the age of the aquatic Homogenocene	2019	Springer International Publishing	Northern Prairie Wildlife Research Center		McLean, Kyle I. kmclean@usgs.gov ; Mushet, David M. dmushet@usgs.gov ; Jon N. Sweetman; Anteau, Michael J. manteau@usgs.gov ; Wiltermuth, Mark T. mwiltermuth@usgs.gov Staudinger, Michelle; Mills, Katherine E.; Starnieszkin, Karen; Record, Nicholas R.; Hudak, Christine A.; Allyn, Andrew; Diamond, Antony; Friedland, Kevin; Golet, Walt; Henderson, Elisabeth; Hernandez, Christina M.; Huntington, Thomas G. thunting@usgs.gov ; Ji, Rubao; Johnson, Catherine L.; Johnson, David Samuel; Jordaan, Adrian; Kocik, John; Li, Yun; Liebman, Matthew; Nichols, Owen C.; Pendleton, Daniel; Richards, R. Anne; Robben, Thomas; Thomas, Andrew C.; Walsh, Harvey J.; Yakola, Keenan
Article	It's about time: A synthesis of changing phenology in the Gulf of Maine ecosystem	2019	Wiley	Northeast Climate Science Center	35 p.	Yando, Erik S.; Osland, Michael; Jones, Scott; Hester, Mark W.
Article	Jump-starting coastal wetland restoration: A comparison of marsh and mangrove foundation species	2019	Wiley	Wetland and Aquatic Research Center	36 p.	Amburgey, S. M.; Miller, D. A. W.; Brand, Adrienne B. abrand@usgs.gov ; Dietrich, Andrea M.; Campbell Grant, Evan H. ehgrant@usgs.gov
Article	Knowing your limits: Estimating range boundaries and co-occurrence zones for two competing plethodontid salamanders	2019	Wiley	Patuxent Wildlife Research Center	19 p.	Rodysill, Jessica; Russell, James M.; Vuille, Mathias; Dee, Sylvia; Lughino, Brent D.; Bijaksana, Satria
Article	La Niña-driven flooding in the Indo-Pacific warm pool during the past millennium	2019	Elsevier	Eastern Geology and Paleoclimate Science Center	106020, 11 p.	Jeffrey R. Knott; Wan, Elmira ewan@usgs.gov ; Alan L. Daino; Mitch Casteel; Rehels, Marith C. mrehels@usgs.gov ; Fred Phillips; Walkup, Laura; Kyle McCarty; David N. Manoukian; Ernest Nuñez
Book chapter	Lake Andrei: A pliocene pluvial lake in Eureka Valley, Eastern California	2019	Geological Society of America	Geology, Minerals, Energy, and Geophysics Science Center	18 p.	Costanza, Jennifer K.; Terando, Adam J. aterando@usgs.gov
Article	Landscape connectivity planning for adaptation to future climate and land-use change	2019	Springer	Southeast Climate Science Center	13 p.	

Article	Landscape controls on the distribution and ecohydrology of central Oregon springs	2019	Wiley	Oregon Water Science Center	e2065; 16 p.	Freed, Zach; Aldous, Allison; Gannett, Marshall W. mgannett@usgs.gov
Article	Landscape evolution of a fluvial sediment-rich Avicennia marina mangrove forest: Insights from seasonal and inter-annual surface-elevation dynamics	2019	Springer	Patuxent Wildlife Research Center	14 p.	Andrew Swales; Glen Reeve; Cahoon, Donald R.; Catherine Lovelock
Article	Landscape genetics reveal broad and fine-scale population structure due to landscape features and climate history in the northern leopard frog (<i>Rana pipiens</i>) in North Dakota	2019	Wiley	Northern Prairie Wildlife Research Center	20 p.	Waraniak, Justin M.; Fisher, Justin D. L.; Purcell, Kevin; Mushet, David M. dmushet@usgs.gov; Stockwell, Craig A.
Article	Landscape pivot points and responses to water balance in national parks of the southwest US	2019	British Ecological Society	Southwest Biological Science Center	11 p.	Thoma, David P.; Munson, Seth M. smunson@usgs.gov; Witwicki, Dana L.
Article	Late Quaternary paleohydrology of desert wetlands and pluvial lakes in the Soda Lake basin, central Mojave Desert, California (USA)	2019	Elsevier	Geosciences and Environmental Change Science Center	18 p.	Honke, Jeffrey S. jhonke@usgs.gov; Pigati, Jeffrey S. jpigati@usgs.gov; Wilson, J.; Bright, J.; Goldstein, H.L.; Skipp, Gary L. gskipp@usgs.gov; Rehels, M.C.; Havens, J. C.
Article	Late-Quaternary vegetation, climate, and fire history of the Southeast Atlantic Coastal Plain based on a 30,000-yr multiple-proxy record from White Pond, South Carolina (USA)	2019	Cambridge University Press	Southwest Climate Science Center	20 p.	Teresa R. Krause; James M. Russell; Rui Zhang; John W. Williams; Jackson, Stephen
Article	Linking fire and the United Nations Sustainable Development Goals	2019	Elsevier	WMA - Earth System Processes Division	12 p.	Martin, Deborah A. damartin@usgs.gov
Article	Linking landscapes and people—Projecting the future of the Great Plains	2019	Elsevier	Earth Resources Observation and Science (EROS) Center	9 p.	Sohl, Terry L. sohl@usgs.gov; Dornbierer, Jordan; Wika, Steve
Article	Linking management planning for coastal wetlands to potential future wave attenuation under a range of relative sea-level rise scenarios	2019	PLoS ONE	Wetland and Aquatic Research Center	19 p.	Hijuelos, Ann; Dijkstra, Jasper; Carruthers, Tim J.B.; Heynert, Karel; Reed, Denise; van Wesenbeeck, Bregje
Article	Linking variability in climate to wetland habitat suitability: Is it possible to forecast regional responses from simple climate measures?	2019	Springer	Patuxent Wildlife Research Center; Western Ecological Research Center	15 p.	Davis C; Miller D; Campbell Grant, Evan H. ehgrant@usgs.gov; Halstead, Brian; Kleeman, Patrick M. pkleeman@usgs.gov; Walls, Susan; Barichivich, William

Article	Local, temporal trajectories explain population-level responses to climate change in saguaro (<i>Carnegiea gigantea</i>)	2019	Wiley	Southwest Biological Science Center	e02844, 17 p.	Rodríguez-Buritica, Susana; Winkler, Daniel E.; Webb, Robert H. rhwebb@usgs.gov; Venable, Lawrence
Article	Long-term plant community trajectories suggest divergent responses of native and non-native perennials and annuals to vegetation removal and seeding treatments	2019	Wiley	Southwest Biological Science Center	11 p.	Copeland, Stella M.; Munson, Seth M. smunson@usgs.gov; Bradford, John B. jbradford@usgs.gov; Butterfield, Bradley J.; Gunnell, Kevin L.
Article	Long-term streamflow trends in Hawai'i and implications for native stream fauna	2019	Wiley	National Climate Change and Wildlife Science Center; National Climate Adaptation Science Center	21 p.	Clilverd, H. M.; Tsang, Y.-P.; Infante, D. M.; Lynch, Abigail alynch@usgs.gov; Strauch, A. M.
Article	Looking to the Future: Key points for sustainable management of Northern Great Plains grasslands	2019	Wiley	Northern Prairie Wildlife Research Center	8 p.	Lora Perkins; Marissa Ahlering; Larson, Diane L. dlarson@usgs.gov
Report	Management opportunities and research priorities for Great Plains grasslands	2019	USDA Forest Service	Northern Prairie Wildlife Research Center	vi, 56 p.	Finch, Deborah M; Baldwin, Carolyn; Brown, David P; Driscoll, Katelyn P.; Fleishman, Erica; Ford, Paulette L.; Hanberry, Brice; Symstad, Amy asymstad@usgs.gov; Van Pelt, Bill; Zabel, Richard
Report	Managing effects of drought in Hawai'i and U.S.-affiliated Pacific Islands	2019	USDA	National Climate Change and Wildlife Science Center	27 p.	Frazier, Abby G.; Deenik, Jonathan; Fujii, Neal; Funderburk, Greg; Giambelluca, Thomas; Giardina, Christian; Helweg, David; Keener, Victoria; Mair, Donald; Marra, John; McDaniel, Sierra; Ohye, Lenore; Oki, Delwyn S.; Parsons, Elliott; Strauch, Ayrton; Trauernicht, Clay
Article	Managing the trifecta of disease, climate, and contaminants: Searching for robust choices under multiple sources of uncertainty	2019	Elsevier	New Jersey Water Science Center	9 p.	Smalling, Kelly; Eagles-Smith, Collin; Katz, Rachel A.; Grant, Evan
Article	Mechanisms of methane hydrate formation in geological systems	2019	AGU	Central Energy Resources Science Center	51 p.	Kehua You; Peter B. Flemings; Alberto Malinverno; Collett, Timothy; Kristopher Darnell
Article	Methane and nitrous oxide temporal and spatial variability in two midwestern USA streams containing high nitrate concentrations	2019	Elsevier	National Research Program - Eastern Branch; National Research Program - Central Branch; WMA - Earth System Processes Division	15 p.	Smith, Richard L. rsmith@usgs.gov; Böhlke, John K. jkbohlke@usgs.gov

Article	Methane emissions from artificial waterbodies dominate the carbon footprint of irrigation: A study of transitions in the food-energy-water-climate nexus (Spain, 1900-2014)	2019	American Chemical Society	Southwest Biological Science Center	11 p.	Aguilera, Eduardo; Vila-Traver, Jaime; Demer, Bridget; Infante-Amate, Juan; Guzmán, Gloria I.; González de Molina, Manuel
Article	Methane emissions from groundwater pumping in the USA	2019	Nature	California Water Science Center	11, 8 p.	Kulongoski, Justin T. kulongos@usgs.gov; McMahon, Peter B. pmcmahon@usgs.gov
Report	Methods for estimating the magnitude and frequency of peak streamflows for unregulated streams in Oklahoma developed by using streamflow data through 2017	2019	U.S. Geological Survey	Oklahoma Water Science Center	Report: v. 39 p.; Data Release	Lewis, Jason M. jmlewis@usgs.gov; Hunter, Shelby L. shhunter@usgs.gov; Labriola, Laura G.
Article	Microclimate influences mangrove freeze damage: Implications for range expansion in response to changing macroclimate	2019	Springer	Wetland and Aquatic Research Center	13 p.	Osland, Michael J. mosland@usgs.gov; Hartmann, Arik M.; Day, Richard H. dayr@usgs.gov; Ross, Michael S.; Hall, Courtney T.; Feher, Laura C. lhundy@usgs.gov; Vervaeke, William vervaeke@usgs.gov
Article	Mid-latitude net precipitation decreased with Arctic warming during the Holocene	2019	Nature	Eastern Geology and Paleoclimate Science Center	5 p.	Cody Routson; Nicholas McKay; Darrell Kaufman; Hugues Goose; Bryan Shuman; Rodysill, Jessica; Toby Ault
Article	Mid-placenzian of the north Atlantic Ocean	2019	Micropress	Eastern Geology and Paleoclimate Science Center	26 p.	Dowsett, Harry J. hdowsett@usgs.gov; Robinson, Marci M. mrobinson@usgs.gov; Foley, Kevin M. kfoley@usgs.gov; Herbert, Timothy D.; Otto-Blesner, Bette L.; Spivey, Whitney
Article	Modeling sediment bypassing around idealized rocky headlands	2019	MDPI	Pacific Coastal and Marine Science Center	40; 37 p.	Douglas A. George; John L. Largier; Greg B. Pasternack; Barnard, Patrick L. pbarnard@usgs.gov; Storlazzi, Curt D. cstorlazzi@usgs.gov; Erikson, Li H. lerikson@usgs.gov
Article	Modeling $\delta^{18}O$ as an early indicator of regime shift arising from salinity stress in coastal vegetation	2019	Springer	Wetland and Aquatic Research Center	10 p.	Teh, Su Yean; Koh, Hock Lye; DeAngelis, Donald L. don_deangelis@usgs.gov; Voss, Clifford I. cvoss@usgs.gov; da Silveira Lobo Sternberg, Leonel
Article	Modern pollen-assemblages data from small lakes paired with local forest-composition data in northeastern United States	2019	Wiley	Southwest Climate Science Center	e02784	Jackson, Stephen
Conference Paper	Monitoring and conservation of Japanese Murrelets and related seabirds in Japan	2019	Marine Bird Restoration Group	Alaska Science Center Biology MIFB		Platt, John F. jplatt@usgs.gov; Nelson, S Kim; Carter, Harry R

Report	Monitoring plans for Louisiana's system-wide assessment and monitoring program (SWAMP). Version IV	2019	Water Institute of the Gulf	National Wetlands Research Center	xiii, 235 p.	<p>Henmerling, Scott; Baustian, Melissa M.; Bienn, Harris; Dausman, Alyssa adausman@usgs.gov; Grace, Alaina; Grimley, Lauren; McInnis, Adrian; Vingello, Michael; Vu, Huy; Sable, Shayee; Gentile, Britt; Lafargue, Phillip; Hjuelos, Ann; Piazza, Sara; plazzas@usgs.gov; Stagg, Camille; Raynie, Richard C; Haywood, Edward; Khalid, Syed</p> <p>Burns, Douglas A.; Pellerin, Brian A.; Miller, Matthew P. mamiller@usgs.gov; Capel, Paul; Tesoriero, Anthony J. tesorier@usgs.gov; Duncan, Jonathan M.</p> <p>Rosenberger, Kurt J. krosenberger@usgs.gov; Storlazzi, Curt D. cstorlazzi@usgs.gov; Dartnell, Peter pdartnell@usgs.gov</p> <p>Jones, Timothy; Divine, Laura M.; Renner, Heather; Knowles, Susan sknowles@usgs.gov; Lefebvre, Kathi A.; Burgess, Hillary K.; Wright, Charlie; Parrish, Julia K.</p> <p>Katherine Markovich; Manning, Andrew H. amanning@usgs.gov; Laura Condon; Jennifer McIntosh</p> <p>Sinnesael, Matthias; Montanari, Alessandro; Frontalini, Fabrizio; Cocconi, Rodolfo; Gattaceca, Jerome; Snoeck, Christophe; Wegner, Wencke; Koerber, Christian; Morgan, Leah E. lemorgan@usgs.gov; de Winter, Niels; DePaolo, Donald J.; Claeys, Philippe</p> <p>Moran, Emily V; Das, Adrian J. adas@usgs.gov; Keeley, Jon; Stephenson, Nathan L. nstephenson@usgs.gov</p> <p>Contosta, Alexandra R; Casson, Nora J.; Garlick, Sarah; Nelson, Sarah J.; Ayers, Matthew P; Buralowski, Elizabeth A; Campbell, John ; Creed, Ilean, Elmers, Catharine; Evans, Celia; Fernandez, Ivan; Fuss, Collin; Huntington, Thomas; Pate, Kaizad; Sanders-DeMott, Rebecca; Son, Kyongo; Templer, Pamela H.; Thornbrugh, Darren</p>
Article	Monitoring the Riverine Pulse: Applying high-frequency nitrate data to advance integrative understanding of biogeochemical and hydrological processes	2019	Wiley	WMA - Integrated Modeling and Prediction Division	24 p.	
Article	Morphodynamics of a field of crescent-shaped rippled scour depressions: Northern Monterey Bay, CA	2019	Elsevier	Pacific Coastal and Marine Science Center	16 p.	
Article	Mortality of Tufted puffins (<i>Fratercula cirrhata</i>) and other alcids during an unusual mortality event in the eastern Bering Sea	2019	PLOS ONE	National Wildlife Health Center	e0216532, 23 p.	
Article	Mountain-block recharge: A review of current understanding	2019	Wiley	Central Mineral and Environmental Resources Science Center	27 p.	
Book chapter	Multiproxy Cretaceous-Paleogene boundary event stratigraphy: An Umbria-Marche basin-wide perspective	2019	The Geological Society of America	Central Mineral and Environmental Resources Science Center	542, 26 p.	
Article	Negative impacts of summer heat on Sierra Nevada tree seedlings	2019	Wiley	Western Ecological Research Center	e02776, 22 p.	
Article	Northern forest winters have lost cold, snowy conditions that are important for ecosystems and human communities	2019	Wiley	New England Water Science Center	e01974, 24 p.	

Article	North-south dipole in winter hydroclimate in the western United States during the last deglaciation	2019	Nature	Geosciences and Environmental Change Science Center	Article number: 4826, 12 p.	Hudson, Adam M. ahudson@usgs.gov ; Hatchett, Benjamin J.; Quade, Jay; Boyle, Douglas P.; Bassett, Scott D.; Ali, Guleed; De los Santos, Marie G.
Article	Not so normal normals: Species distribution model results are sensitive to choice of climate normals and model type	2019	MDPI	Fort Collins Science Center	Article 37; 15 p.	Jarnevich, Catherine S. jarnevich@usgs.gov ; Young, Nicholas E.
Article	Nutrients mediate the effects of temperature on methylmercury concentrations in freshwater zooplankton	2019	Elsevier	Forest and Rangeland Ecosystem Science Center	12 p.	Jordan, Meredith P.; Stewart, Robin arstewar@usgs.gov ; Eagles-Smith, Collin A. ceagles-smith@usgs.gov ; Stracker, Angela L.
Article	Occupancy models for citizen-science data	2019	British Ecological Society	Patuxent Wildlife Research Center	14 p.	Altwegg, Res; Nichols, James D. jnichols@usgs.gov
Article	On the contribution of waves to total coastal water level changes in the context of sea level rise: a response to Melet, et al. (2018)	2019	Nature	Pacific Coastal and Marine Science Center	1 p.	Aucan, Jerome; Hoeke, Ron; Storlazzi, Curt D. cstorlazzi@usgs.gov ; Stopa, Justin; Wandress, Moritz; Lowe, Ryan J.
Article	Optimizing historic preservation under climate change: Decision support for cultural resource adaptation planning in national parks	2019	Elsevier	Southeast Climate Science Center	11 p.	Xiao, Xiao; Seekamp, Erin; Post van der Burg, Max maxpostvanderburg@usgs.gov ; Eaton, Mitchell; Fatorić, Sandra; McCreary, Allie
Report	Optimizing historical preservation under climate change—An overview of the optimal preservation model and pilot testing at Cape Lookout National Seashore	2019	U.S. Geological Survey	Southeast Climate Science Center	vii, 46 p.	Seekamp, Erin; Post van der Burg, Max maxpostvanderburg@usgs.gov ; Fatorić, Sandra; Eaton, Mitchell J. meaton@usgs.gov ; Xiao, Xiao; McCreary, Allie
Article	Pacific sea surface temperature linkages with Tanzania's multi-season drying trends	2019	Wiley	Earth Resources Observation and Science (EROS) Center	19 p.	Harrison, Laura; Funk, Chris cfunk@usgs.gov ; McNally, Amy; Shukla, Shraddhanand; Husak, Gregory

Article	PACTS 1.0: A crowdsourced reporting standard for paleoclimate data	2019	Wiley	Geosciences and Environmental Change Science Center	27 p.	<p>Kehnvald, Natalie M. n.kehvald@usgs.gov;</p> <p>Khider, Deborah; Emile-Geay, Julien; McKay, Nicholas P.; Gili, Yolanda; Garjo, Daniel; Ratnakar, Varun; Brewer, Peter; Csanik, Adam; Dassie, Emilie; Delong, Kristine; Felix, Thomas; Gray, William; Jonkers, Lucas; Kahle, Michael; Kaufman, Darrell S.; Richey, Julie N. jrichey@usgs.gov; Schmittner, Andreas; Sutherland, Elaine Kennedy; Alonso-Garcia, Montserrat; Sebastian, Bertrand; Bothe, Oliver; Bunn, Andrew; Chevalier, Manuel; Francus, Pierre; Frappier, Amy; Goring, Simon; Martrat, Belen; McGregor, Helen V.; Allen, Kathryn J.; Arnaud, Fabien; Axford, Yarrow L.; Barrows, Timothy T.; Bazin, Lucie; Pilaar Birch, S.E.; Bradley, Elizabeth; Bregy, Joshua; Capron, Emilie; Cartapanis, Olivier; Chiang, Hong-Wei; Cobb, Kim; Debrat, Maxime; Donmain, Rene; Du, Jianghui; Dyez, Kelsey; Emerick, Suellen; Erb, Michael; Falster, Georgina; Finsinger, Walter; Fortier, Daniel; Gauthier, Nicolas; George, Steven; Grimm, Eric; Hertzberg, Jennifer; Hibbert, Fiona; Hillman, Aubrey; Hobbs, William; Huber, Matthew; Hughes, Anna L. C.; Jaccard, Samuel; Jiayang, Ruan; Kienast, Markus; Konecky, Bronwen; Le Roux, Gael; Lyubchich, Vassilios; Novella, Valeria; Olaf, Lydia; Lyons, Shelby L.; Baczynski, Allison A.; Babila, Tali L.; Bralower, Timothy J.; Hajek, Elizabeth A.; Kump, Lee R.; Polites, Ellen G.; Self-Trail, Jean M. jstrail@usgs.gov; Trampush, Sheila M.; Vornlocher, Jamie R.; Zachos, James C.; Freeman, Katherine H.</p> <p>Pennington, Victoria E.; Bradford, John B. jbradford@usgs.gov; Palmquist, Kyle A.; Renne, Rachel R.; Lauenroth, William K.</p> <p>Thomas, David P.; Munson, Seth; Rodman, Ann W.; Renkin, Roy; Anderson, Heidi M.; Wacker, Stephanie D.</p>
	Paleocene-Eocene Thermal Maximum prolonged by fossil carbon oxidation	2019	Nature	Eastern Geology and Paleoclimate Science Center	7 p.	
	Patterns of big sagebrush plant community composition and stand structure in the western United States	2019	Elsevier	Southwest Biological Science Center	10 p.	
	Patterns of primary production and ecological drought in Yellowstone	2019	National Park Service	Southwest Biological Science Center	6 p.	

Article	Permafrost collapse is accelerating carbon release	2019	Nature	Eastern Geology and Paleoclimate Science Center	3 p.	Turetsky, Merritt R.; Abbott, Benjamin W.; Jones, Miriam; Walter Anthony, Katey; Olefeldt, David; Schuur, Edward A.G.; Koven, Charles; McGuire, A.D.; Grosse, Guido; Kuhry, Peter; Gustaf Hugelius; Lawrence, David M.; Gibson, Carolyn; Sannel, A.B.K.
Article	Persistence of intense, climate-driven runoff late in Mars history	2019	AAAS	Astrogeology Science Center	eaav77110, 8 p.	Kite, Edwin S.; Mayer, David; Wilson, Sharon A.; Davis, Joel M.; Lucas, Antoine S.; Stucky de Quay, Gaia
Article	Perspective: Developing flow policies to balance the water needs of humans and wetlands requires a landscape scale approach inclusive of future scenarios and multiple timescales	2019	Society of Wetland Scientists	Southeast Climate Science Center; Wetland and Aquatic Research Center	13 p.	Murry, Brent; Bowden, Jared; Branoff, Benjamin; Garcia-Bermudez, Miguel; Middleton, Beth; Ortiz-Zayas, Jorge; Restrepo, Carla; Terando, Adam
Article	Phenological mismatch between season advancement and migration timing alters Arctic plant traits	2019	British Ecological Society	Alaska Science Center Biology WTEB	16 p.	Choi, Ryan T.; Beard, Karen H.; Leffler, A. Joshua; Kelsey, Katharine C.; Schmutz, Joel A. jschmutz@usgs.gov; Welker, Jeffrey
Article	Phenotypic plasticity and climate change: Can polar bears respond to longer Arctic summers with an adaptive fast?	2019	Springer	Alaska Science Center Biology MIEB	13 p.	Whiteman, John P.; Harlow, Henry J.; Durner, George M. gdurner@usgs.gov; Regher, Eric V.; Amstrup, Steven C.; Ben-David, Merav
Article	Planning for ecological drought: Integrating ecosystem services and vulnerability assessment	2019	Wiley	Fort Collins Science Center; National Climate Change and Wildlife Science Center; Northern Rocky Mountain Science Center	e1352; 12 p.	Raheem, Nejem; Cavens, Amanda E. aecravens@usgs.gov; Cross, Molly S.; Crausbay, Shelley D.; Ramirez, Aaron R.; McEvoy, Jamie; Zoanni, Dionne; Bathke, Deborah J.; Hayes, Michael; Carter, Shawn; Rubenstein, Madeleine; Schwend, Ann; Hall, Kimberly R.; Paul Suberu
Report	Pleistocene and Holocene landscape development of the South Platte River Corridor, Northeastern Colorado	2019	U.S. Geological Survey	Geosciences and Environmental Change Science Center; Office of Science Quality and Integrity	Report: vi, 32 p.; Data Release	Berry, Margaret E. meberry@usgs.gov; Slate, Janet L. jslate@usgs.gov; Taylor, Emily M. emtaylor@usgs.gov
Report	Population and habitat analyses for greater sage-grouse (<i>Centrocercus urophasianus</i>) in the bi-state distinct population segment—2018 update	2019	U.S. Geological Survey	Western Ecological Research Center	x, 122 p.	Coates, Peter S. pcoates@usgs.gov; Ricca, Mark A. mark_ricca@usgs.gov; Prochazka, Brian G. bprochazka@usgs.gov; O'Neil, Shawn T.; Severson, John P.; Mathews, Steven R. smathews@usgs.gov; Espinosa, Shawn; Gardner, Scott; Lisius, Sherri; Delehanty, David J.

Article	Postfire population dynamics of a fire-dependent cypress	2019	Springer Netherlands	Western Ecological Research Center	13 p.	Brennan, Teresa J. tjbrennan@usgs.gov ; Keeley, Jon
Conference Paper	Post-fire rockfall and debris-flow hazard zonation in the Eagle Creek Fire burn area, Columbia River Gorge, Oregon: a tool for emergency managers and first responders	2019	Association of Environmental & Engineering Geologists	Geologic Hazards Science Center	8 p.	Calhoun, Nancy C.; Burns, William J.; Hayduk, S.H.; Staley, Dennis M. dstaley@usgs.gov ; Kean, Jason W. jwkean@usgs.gov
Report	Potential for increased inundation in flood-prone regions of southeast Florida in response to climate and sea-level changes in Broward County, Florida, 2060–69	2019	U.S. Geological Survey	Caribbean-Florida Water Science Center	Report: viii, 106 p.; Data Release	Decker, Jeremy D.; Hughes, Joseph D. jdhughes@usgs.gov ; Swain, Eric D. edswain@usgs.gov
Report	Potential sea level rise for the Chitimacha Tribe of Louisiana	2019	U.S. Geological Survey	Wetland and Aquatic Research Center	1 Sheet: 24.0 x 36.0 inches	Spear, Kathryn A.; Jones, William; Griffith, Keren; Tirpak, Blair E.; Walden, Kimberly
Article	Practical tips to establish an actionable science portfolio for climate adaptation	2019	Oxford Academic	National Climate Change and Wildlife Science Center	6 p.	Bisbal, Gustavo A.
Article	Precipitation regime change in Western North America: The role of atmospheric rivers	2019	Nature	WMA - Earth System Processes Division	Article 9944	Gerhunov, Alexander; Shulgina, Tamara; Clemesha, Rachel; Guirguis, Kristen; Pierce, David; Dettinger, Michael D. mddettin@usgs.gov ; Lavers, David A.; Cayan, Daniel; Polade, Suraj; Kalansky, Julie; Ralph, Martin
Article	Prediction of ice-free conditions for a perennially ice-covered Antarctic lake	2019	American Geophysical Union	Volcano Science Center	9 p.	Obryk, Maciej; Doran, P. T.; Priscu, J. C.
Article	Prediction of unprecedented biological shifts in the global ocean	2019	Nature	National Research Program - Western Branch	7 p.	Beaugrand, G.; Conversi, A.; Atkinson, A.; Cloern, James; Chiba, S.; Fonda-Umani, S.; Kirby, R.R.; Greene, C.H.; Goberville, E.; Otto, S.A.; Reid, P.C.; Stemmann, L.; Edwards, M.
Article	Preface to historic and paleoflood analyses: New perspectives on climate, extreme flood risk, and the geomorphic effects of large floods	2019	Elsevier	Oregon Water Science Center	3 p.	Davis, Lisa; Harden, Tessa M. tharden@usgs.gov ; Muñoz, Samuel E.; Godaire, Jeanne E.; O'Connor, Jim E. occonnor@usgs.gov
Article	Prevalence and diversity of avian blood parasites in a resident northern passerine	2019	Springer	Alaska Science Center Biology WTEB	292	Van Hemert, Caroline R. cvanhemert@usgs.gov ; Meixell, Brandt W. bmeixell@usgs.gov ; Smith, Matthew M. mmsmith@usgs.gov ; Handel, Colleen M. cmhandel@usgs.gov

Article	Prominence of the tropics in the recent rise of global nitrogen pollution	2019	Nature Publishing Group	WMA - Integrated Modeling and Prediction Division	1437, 11 p.	Lee, Minjin; Shevliakova, Elena; Stock, Charles A.; Malyshev, Sergey; Milly, Paul C. D. cmilly@usgs.gov
Article	Quantifying trends and uncertainty in prehistoric forest composition	2019	Wiley	Southwest Climate Science Center	e02856	Andria Dawson; Christopher J. Paciorek; Simon Goring; Jackson, Stephen; Jason S. McLachlan; John W. Williams
Conference Paper	Quaternary eolian sediments and Carolina Bays of the U.S. Atlantic Coastal Plain province	2019	Minnesota Geological Survey	Eastern Geology and Paleoclimate Science Center	2 p.	Swezey, Christopher S. cswezey@usgs.gov
Article	Radiocarbon and geologic evidence reveal Ilopango volcano as source of the colossal 'mystery' eruption of 539/40 CE	2019	Elsevier	Geology, Minerals, Energy, and Geophysics Science Center	105855, 17 p.	Dull, Robert A.; Southon, John R.; Kutterolf, Steffen; Anchukatis, Kevin J.; Freundt, Armin; Wahl, David; Sheets, Payson; Amaroli, Paul; Hernandez, Walter; Weimann, Micheal C.; Oppenheimer, Clive
Book chapter	Rapid broad-scale ecosystem changes and their consequences for biodiversity	2019	Yale University Press	Forest and Rangeland Ecosystems Science Center, Southwest Biological Science Center	11 p.	Breshears, David D.; Field, Jason P.; Law, Darin J.; Villegas, Juan C.; Allen, Craig D. craig_allen@usgs.gov ; Cobb, Neil S.; Bradford, John B. jbradford@usgs.gov
Article	Rapid inundation of the southern Florida coastline despite low relative sea-level rise rates during the late-Holocene	2019	Nature	Coastal and Marine Geology Program, Eastern Geology and Paleoclimate Science Center, National Climate Change and Wildlife Science Center, St. Petersburg	3231, 13 p.	Jones, Miriam; Wingard, G. Lynn lwingard@usgs.gov ; Stackhouse, Bethany; Keller, Katherine; Willard, Debra A. dwillard@usgs.gov ; Marot, Marci E. mmarot@usgs.gov ; Landacre, Bryan D. blandacre@usgs.gov ; Bernhardt, Christopher E. cbernhardt@usgs.gov
Article	Reanalysis of the U.S. Geological Survey Benchmark Glaciers: Long-term insight into climate forcing of glacier mass balance	2019	Cambridge University Press	Alaska Science Center Water	17 p.	O'Neil, Shad soneel@usgs.gov ; McNeill, Christopher J. cmcneil@usgs.gov ; Sass, Louis C. lsass@usgs.gov ; Florentine, Caitlyn; Baker, Emily ehbaker@usgs.gov ; Peitzsch, Erich; McGrath, Daniel J.; Fountain, Andrew G.; Fagre, Daniel B. dan_fagre@usgs.gov
Article	Recent advances in environmental flows science and water management—Innovation in the Anthropocene	2019	Wiley	New Jersey Water Science Center	13 p.	Angela H Arthington; Kennen, Jonathan; Eric D. Stein; J. Angus Webb
Article	Recognizing the Famine Early Warning Systems Network: Over 30 years of drought early warning science advances and partnerships promoting global food security	2019	AMS	Earth Resources Observation and Science (EROS) Center	17 p.	Funk, Chris; Shraddhanand Shukla; Wassila Mamadou Thiaw; Rowland, James rowland@usgs.gov ; Andrew Hoell; Husak, Gregory; Novella, Nicholas

Article	Remote sensing as the foundation for high-resolution United States landscape projections – The Land Change Monitoring, assessment, and projection (LCMAP) initiative	2019	Elsevier	Earth Resources Observation and Science (EROS) Center	104495, 17 p.	Sohl, Terry L. sohl@usgs.gov ; Dornbierer, Jordan; Wika, Steve; Robison, Charles
Report	Report from the Ice and Climate Evolution Science Analysis group (ICE-SAG)	2019	JPL	Astrogeology Science Center	157 p.	Putzig, Than; Diniaga, Serina; Dundas, Colin M. cdundas@usgs.gov ; Titus, Timothy N. ttitus@usgs.gov
Report	Report on the workshop 'Global modelling of biodiversity and ecosystem services'	2019	Netherlands Environmental Assessment Agency	North Central Climate Science Center	58 p.	Sana Okayasu; Machteld Schoonenberg; Eefje den Belder; Ghassen Halouani; Hyelin Kim; Miller, Brian W. bwmliller@usgs.gov
Article	Responses of Native American cultural heritage to changes in environmental setting	2019	SAGE	National Climate Change and Wildlife Science Center	9 p.	Bisbal, Gustavo A.; Jones Jr., Chas E
Article	Ross Ice Shelf response to climate driven by the tectonic imprint on seafloor bathymetry	2019	Springer Nature Publishing AG	Crustal Geophysics and Geochemistry Science Center	9 p.	Tinto, K.J.; Padman, L.; Siddoway, C.S.; Springer, M.R.; Fricker, H.A.; Das, I.; Caratori Tontini, F.; Porter, D.F.; Frearson, N.P.; Howard, S.J.; Siegfried, M.R.; Mosbeux, C.; Becker, M.K.; Bertinato, C.; Boghosian, A.; Brady, N.; Burton, Bethany L. blburton@usgs.gov ; Chu, W.; Cordero, S.I.; Dhakal, T.; Dong, L.; Gustafson, C.D.; Keeshin, S.; Locke, C.; Lockett, A.; O'Brien, G.; Spergel, J.J.; Starke, S.E.; Tankersley, M.; Wearing, M.; Bell, R.E.
Article	Salmon, forage fish, and kelp	2019	Ecological Society of America	Western Fisheries Research Center	1 p.	Shaffer, Anne; Parks, Dave; Schoen, Erik R.; Beauchamp, David
Article	Salt marsh ecosystem restructuring enhances elevation resilience and carbon storage during accelerating relative sea-level rise	2019	Elsevier	Woods Hole Coastal and Marine Science Center	13 p.	Gonneea, Meagan mgonneea@usgs.gov ; Mato, Christopher V.; Kroeger, Kevin D. kkroeger@usgs.gov ; Hawkes, Andrea D.; Mora, Jordan; Sullivan, Richard; Madsen, Stephanie; Buzard, Richard M.; Cahill, Niamh; Donnelly, Jeffrey P.
Report	Santa Barbara area coastal ecosystem vulnerability assessment	2019	California Sea Grant	Pacific Coastal and Marine Science Center	207 p.	Myers, M.R.; Cayan, D.R.; Jacobellis, S.F.; Melack, J.M.; Beighley, R.E.; Barnard, Patrick L. pbarnard@usgs.gov ; Dugan, J.E.; Page, H.M.
Article	Scale dependence of diversity in alpine tundra, Rocky Mountains, USA	2019	Springer	Northern Rocky Mountain Science Center	10 p.	Malanson, George P.; Fagre, Daniel B. dan_fagre@usgs.gov ; Zimmerman, Dale L.

Article	Scenarios of climate adaptation potential on protected working lands from management of soils	2019	IOP Science	California Water Science Center; Western Geographic Science Center	12 p.	Byrd, Kristin B. kbyrd@usgs.gov ; Alvarez, P.; Sleeter, Benjamin; Flint, Lorraine E. lflint@usgs.gov ; Cameron, D. Richard; Creque, J.
Article	Seasonal epilimnetic temperature patterns and trends in a suite of lakes from Wisconsin (USA), Germany and Finland	2019	Taylor & Francis	Upper Midwest Water Science Center	18 p.	Lathrop, Richard C.; Kasprzak, Peter; Tarvainen, Marjo; Ventela, Anne-Mari; Keskinen, Tapio; Koschel, Rainer; Robertson, Dale M.
Article	Seasonality of climatic drivers of flood variability in the conterminous United States	2019	Nature	Arizona Water Science Center; Oregon Water Science Center	15321	Dickinson, Jesse E. jdickins@usgs.gov ; Harden, Tessa M. tharden@usgs.gov ; McCabe, Gregory J. gmcabe@usgs.gov
Report	Sediment storage and transport in the Nooksack River basin, northwestern Washington, 2006–15	2019	U.S. Geological Survey	Washington Water Science Center	vii, 43 p.	Anderson, Scott W. swanderson@usgs.gov ; Konrad, Christopher P. cpkonrad@usgs.gov ; Grossman, Eric E. egrossman@usgs.gov ; Curran, Christopher A. ccurran@usgs.gov
Article	Seed bank community and soil texture relationships in a cold desert	2019	Elsevier	Southwest Biological Science Center	7 p.	Haight, Jeffrey D.; Reed, Sasha C. screed@usgs.gov ; Faist, Akasha M.
Article	Seeking shelter from the storm: Conservation and management of imperiled species in a changing climate	2019	Wiley	Wetland and Aquatic Research Center	12 p.	Walls, Susan; Barichivich, William; Chandler, Jonathan; Meade, Ashley M.; Milnichik, Marysa; O'Donnell, Katherine; Owens, Megan E.; Peacock, Terry; Reinman, Joseph; Watling, Rebecca C.; Wetsch, Olivia E.
Article	Selecting a landscape model for natural resource management applications	2019	Springer International Publishing	Alaska Science Center Geography	10 p.	Keane, Robert E.; Loehman, Rachel A. rloehman@usgs.gov ; Holsinger, Lisa M.
Report	Severity and extent of alterations to natural streamflow regimes based on hydrologic metrics in the conterminous United States, 1980–2014	2019	U.S. Geological Survey	WMA - Integrated Modeling and Prediction Division	Report: iv, 25 p.; Data Release	Eng, Ken keng@usgs.gov ; Carlisle, Daren M. dcarlisle@usgs.gov ; Grantham, Theodore E.; Wolock, David M. dwolock@usgs.gov ; Eng, Rosaly L.
Article	Sharp savanna-forest transitions in the Midwest followed environmental gradients but are absent from the modern landscape	2019	BioOne	Great Lakes Science Center	17	Broderick, Caitlin M.; Heilman, Kelly A.; Patterson, Tamatha tpatterson@usgs.gov ; Peters, Jody A.; McLachlan, Jason S.
Article	Shrub persistence and increased grass mortality in response to drought in dryland systems	2019	Wiley	Southwest Biological Science Center	15 p.	Winkler, Daniel E.; Belnap, Jayne jayne_belnap@usgs.gov ; Hoover, David L. dhoover@usgs.gov ; Reed, Sasha C. screed@usgs.gov ; Duniway, Michael C. mduniway@usgs.gov

Article	Simulating the effects of climate variability on waterbodies and wetland-dependent birds in the Prairie Pothole Region	2019	Ecological Society of America	Patuxent Wildlife Research Center	e02711, 18 p.	McIntyre, N.E.; Liu, G.; Gorzo, J.; Wright, C.K.; Guntenspergen, Glenn R. glenn_guntenspergen@usgs.gov; Schwartz, F.
Report	Simulation of water availability in the Southeastern United States for historical and potential future climate and land-cover conditions	2019	U.S. Geological Survey	Arkansas Water Science Center; Colorado Water Science Center; Georgia Water Science Center; New Mexico Water Science Center; National Research Program - Central Branch; South Atlantic Water Science Center; Lower Mississippi-Gulf Water Science Center; WMA - Integrated Modeling and Prediction Division	Report: x, 83 p.; Data release	LaFontaine, Jacob H. jlafonta@usgs.gov; Hart, Rheannon M. rmhart@usgs.gov; Hay, Lauren E.; Farmer, William H. wfarmer@usgs.gov; Bock, Andy R.; Viger, Roland J. rviger@usgs.gov; Markstrom, Steven L. markstro@usgs.gov; Regan, R. Steven rsregan@usgs.gov; Driscoll, Jessica M. jdriscoll@usgs.gov
Article	Size, growth, and density data for shallow-water sea urchins from Mexico to the Aleutian Islands, Alaska, 1956–2016	2019	Ecological Society of America	Alaska Science Center Biology MFEB	1 p.	Ebert, Thomas A; Barr, Louis; Bodkin, James L. jbodkin@usgs.gov; Burcham, Dirk; Bureau, Dominique; Carson, Henry; Caruso, Nancy; Caselle, Jennifer E.; Claisse, Jeremy; Clemente, Sabrina; Davis, Kathryn; Detwiler, Paul; Dixon, John; Duggins, David; Engle, John; Estes, James; Groth, Scott; Grupe, Benjamin; Halimay, Peter; Hebert, Kyle; Hernandez, Jose Carlos; Jurgens, Laura J.; Kalvass, Peter; Kenner, Michael C.; Konar, Brenda; Kushner, David; Lee, Lynn; Leighton, David; Montano-Moctezuma, Gabriela; Munk, Eric; Olguin Espinoza, Irma; Weitzman, Ben
Article	Soil characteristics are associated with gradients of big sagebrush canopy structure after disturbance	2019	Ecological Society of America	Forest and Rangeland Ecosystem Science Center	e02780, 12 p.	Barnard, David; Germino, Matthew J. mgermino@usgs.gov; Arkle, Robert; Bradford, John; Duniway, Michael; Pilliod, David; Pyke, David; Shriver, Robert; Welty, Justin
Article	Soil physical, hydraulic, and thermal properties in interior Alaska, USA: Implications for hydrologic response to thawing permafrost conditions	2019	American Geophysical Union	WMA - Earth System Processes Division	21 p.	Ebel, Brian A.; Koch, Joshua C. jkoch@usgs.gov; Walvoord, Michelle A.

Article	Spatial conservation planning under uncertainty. Adapting to climate change risks using modern portfolio theory	2019	Ecological Society of America	Wetland and Aquatic Research Center	e01962, 19 p.	Eaton, Mitchell; Yurek, Simeon; Haider, Zulqarnain; Martin, Julien julienmartin@usgs.gov; Johnson, Fred; Udell, Bradley J; Charkhgard, Hadi; Kwon, Changhyun Christine M. Albano; Meredith L. McClure; Shana E. Gross; Kitlsten, Wesley; Souland, Christopher; Charles Morton; Justin Huntington
Article	Spatial patterns of meadow sensitivities to interannual climate variability in the Sierra Nevada	2019	Wiley	Nevada Water Science Center, Western Geographic Science Center	e2128, 20 p.	Shana E. Gross; Kitlsten, Wesley; Souland, Christopher; Charles Morton; Justin Huntington
Report	Spatially referenced models of streamflow and nitrogen, phosphorus, and suspended-sediment loads in the southeastern United States	2019	U.S. Geological Survey	Lower Mississippi-Gulf Water Science Center	Report: xi, 87 p.; Data Release; HTML	Hoos, Anne B.; Roland II, Victor L.
Report	Spatially referenced models of streamflow and nitrogen, phosphorus, and suspended-sediment transport in streams of the southwestern United States	2019	U.S. Geological Survey	Oregon Water Science Center, Utah Water Science Center	Report: viii, 66 p.; Data Release	Wise, Daniel R.; Anning, David W.; Miller, Olivia L.
Article	Spatiotemporal remote sensing of ecosystem change and causation across Alaska	2019	Wiley	Earth Resources Observation and Science (EROS) Center	18 p.	Pastick, Neal J. njpastick@usgs.gov; Jorgenson, M. Torre; Goetz, Scott J.; Jones, Benjamin M. bjones@usgs.gov; Wylie, Bruce K. wylie@usgs.gov; Minsley, Burke J. bminsley@usgs.gov; Genet, Hélène; Knight, Joseph F.; Swanson, David K.; Jorgenson, Janet C.
Article	Spatio-temporal variability of human-fire interactions on the Navajo Nation	2019	Wiley	Fort Collins Science Center	e02932, 23 p.	Guterman, Christopher H.; Margolis, Ellis emargolis@usgs.gov; Baisan, Christopher H.; Falk, Donald A.; Allen, Craig D. craig_allen@usgs.gov; Swetnam, Thomas W.
Article	Speaking the same language: Can the Sustainable Development Goals translate the needs of inland fisheries into irrigation decisions?	2019	CSIRO Publishing	National Climate Change and Wildlife Science Center	18 p.	Lynch, Abigail; Baumgartner, Lee J.; Boys, Craig A.; Conallin, John; Cowx, Ian, G.; Finlayson, C. Max; Franklin, Paul A.; Hogan, Zeb; Koehn, John D.; McCartney, Matthew P.; O'Brien, Gordon C.; Phouthavong, Kaviphone; Silva, Luiz G. M.; Tob, Chann Aun; Valbo-Jorgensen, John; Vu, An Vi; Whiting, Louise; Wibowo, Arif; Duncan, Phil

Article	State of knowledge on current exposure, fate and potential health effects of contaminants in polar bears from the circumpolar Arctic	2019	Elsevier	Alaska Science Center Biology MFEB	21 p.	Routti, Heli; Atwood, Todd C. tatwood@usgs.gov; Bechshoft, Thea; Boltunov, Andrei N.; Ciesielski, Tomasz M.; Desforges, Jean-Pierre; Dietz, Rune; Gabrielsen, Geir W.; Jenssen, Bjørn Munro; Letcher, Robert J.; McKinney, Melissa A.; Morris, A.; Riget, F.; Sonne, Christian; Styrishave, Bjarne; Tartu, Sabrina
Article	Subhourly mesoscale analysis of the 2011-2017 North American monsoon near its northwest boundary	2019	Royal Meteorological Society	WMA - Earth System Processes Division	420	Truettner, Charles; Dettinger, Michael D. mddettin@usgs.gov; Ziaco, Emanuele; Czank, Adam; Biondi, Franco
Article	Submarine permafrost map in the arctic modelled using 1D transient heat flux (SuPerMAP)	2019	American Geophysical Union	Woods Hole Coastal and Marine Science Center	18 p.	Overduin, P.P.; Schneider von Deimling, T.; Miesner, F.; Grigoriev, M.N.; Ruppel, Carolyn D. cruppel@usgs.gov; Vasiliev, A.; Lantuit, H.; Juhls, B.; Westermann, S.
Article	Survival and recruitment dynamics of Black-legged Kittiwakes Rissa tridactyla at an Alaskan colony	2019	Marine Ornithology	Coop Res Unit Leetown	13 p.	Loftin, Cyndy cyndy_loftin@usgs.gov; McKnight, Aly; Blomberg, Erik J.; Irons, David B.; McKinney, Shawn T.
Article	Synergistic interaction of climate and land-use drivers alter the function of North American, Prairie-pothole Wetlands	2019	MDPI	Northern Prairie Wildlife Research Center	6581	McKenna, Owen P. omckenna@usgs.gov; Kucia, Samuel Richard; Mushet, David M. dmushet@usgs.gov; Anteau, Michael J. manteau@usgs.gov; Wiltermuth, Mark T. mwiltermuth@usgs.gov

Article	Technical comment on "Global pattern of nest predation is disrupted by climate change in shorebirds"	2019	American Association for the Advancement of Science (AAA Science)	Alaska Science Center, Alaska Science Center Biology MIEB; Upper Midwest Environmental Sciences Center; Upper Midwest Water Science Center	eaaw8529, 6 p.	<p>Bulla, Martin; Reneerikens, Jeroen; Weiser, Emily L.; Sokolov, Aleksandr; Taylor, Audrey R.; Sittler, Benoit; McCaffery, Brian J.; Ruthrauff, Daniel R. druthrauff@usgs.gov; Catlin, Daniel H.; Payer, David C.; Ward, David H. dward@usgs.gov; Solovyeva, Diana V.; Santos, Eduardo SA; Rakhimberdiev, Eldar; Nol, Erica; Kwon, Eunbi; Brown, Glen S; Hevia, Glenda D; Gates, H. River; Johnson, James A.; Van Gils, Jan A.; Hansen, Jannik; Lamarre, Jean-Francois; Rausch, Jennie; Conklin, Jesse R.; Liebezeit, Joe; Bety, Joel; Lang, Johannes; Alves, Jose A; Fernandez-Ellipe, Juan; Exo, Klaus-Michael; Bollache, Loic; Bertellotti, Marcelo; Giroux, Marie-Andree; van de Pol, Martin; Johnson, Matthew D.; Boldenow, Megan L.; Valcu, Mihai; Soloviev, Mikhail; Sokolova, Natalya; Sennet, Nathan R.; Lecomte, Nicholas; Meyer, Nicolas; Schmidt, Niels Martin; Gilg, Olivier; Smith, Paul A; Machin, Paula; McGuire, Rebecca L; Cerboncini, Ricardo AS; Ottvall, Richard; van Bemmelen, Rob SA; Swift, Rose J; Saalfeld, Sara T; Jamieson, Sara E; Brown, Stephen C.; Piersma, Theunis; Albrecht, Tomas; D'Amico, Veronica L; Lanctot, Richard B.; Kempenaers, Bart</p>
Article	Temperature thresholds for black mangrove (Avicennia germinans) freeze damage, mortality, and recovery in North America: Refining tipping points for range expansion in a warming climate	2019	British Ecological Society	Wetland and Aquatic Research Center	12 p.	<p>Osland, Michael; Day, Richard; Hall, Courtney T.; Feher, Laura; Armitage, Anna R.; Cebrian, Just; Dunton, Kenneth H.; Hughes, Randall; Kaplan, David; Langston, Amy K.; Macy, Aaron; Weaver, Carolyn A.; Anderson, Gordon H. gordon_anderson@usgs.gov; Cummins, Karen; Feller, Ilka C.; Snyder, Caitlin M.</p>
Article	Temporal changes in avian community composition in lowland conifer habitats at the southern edge of the boreal zone in the Adirondack Park, NY	2019	PLOS One	National Climate Change and Wildlife Science Center	e0220927, 18 p.	<p>Glennon, Michale; Langdon, Stephen; Rubenstein, Madeleine A. mrubenstein@usgs.gov; Cross, Molly S.</p>
Conference Paper	The 'Ike Wai Hawaii'i groundwater recharge tool	2019	OSF	Pacific Islands Water Science Center	6 p.	<p>McLean, Jared H.; Cleaveland, Sean B.; Rutzoli, Kolja kolja@usgs.gov; Izuka, Scot K. skizuka@usgs.gov; Leigh, Jason; Jacobs, Gwen A.; Theriot, Ryan</p>

Article	The 4.2 ka event, ENSO, and coral reef development	2019	EGU	St. Petersburg Coastal and Marine Science Center	15 p.	Toth, Lauren T. ltoth@usgs.gov; Aronson, Richard B.
Article	The Aleutian Low – Beaufort Sea Anticyclone: A climate index for predicting the timing of springtime melt in the Pacific Arctic cryosphere	2019	AGU	Alaska Science Center Biology MTEB	10 p.	Cox, Christopher J.; Stone, Robert S.; Douglas, David C. ddouglas@usgs.gov; Stanitski, Diane; Gallagher, Michael
Article	The dependence of hydroclimate projections in snow-dominated regions of the western United States on the choice of statistically downscaled climate data	2019	American Geophysical Union	Geosciences and Environmental Change Science Center	22 p.	Alder, Jay R. jalder@usgs.gov; Hostetler, Steven W. swhostet@usgs.gov
Report	The effects of management practices on grassland birds—An introduction to North American grasslands and the practices used to manage grasslands and grassland birds	2019	U.S. Geological Survey	Northern Prairie Wildlife Research Center	V, 63 p.	Shaffer, Jill A. jshaffer@usgs.gov; DeLong, John P.
Article	The impact of late Holocene land-use change, climate variability, and sea-level rise on carbon storage in tidal freshwater wetlands on the southeastern United States Coastal Plain	2019	Wiley	Eastern Geology and Paleoclimate Science Center	16 p.	Jones, Miriam; Bernhardt, Christopher E. cbernhardt@usgs.gov; Krauss, K.W.; Noe, Gregory B. gnoe@usgs.gov
Article	The importance of natural versus human factors for ecological conditions of streams and rivers	2019	Elsevier	Wetland and Aquatic Research Center	135268, 13 p.	Tang, Tao; Stevenson, R. Jan; Grace, James
Article	The influence of shelf bathymetry and beach topography on extreme total water levels: Linking large-scale changes of the wave climate to local coastal hazards	2019	Elsevier	Pacific Coastal and Marine Science Center	17 p.	Katherine A. Serafin; Peter Ruggiero; Barnard, Patrick L. pbarnard@usgs.gov; Stockdon, Hilary F. hstockdon@usgs.gov
Article	The landscape of soil carbon data: Emerging questions, synergies and databases	2019	Sage	Geosciences and Environmental Change Science Center	13 p.	Avni Malhotra; Katherine Todd-Brown; Luke Nave; Niels Batjes; James Holmquist; Allison Hoyt; Colleen Iversen; Jackson, Robert B.; Kate Lathja; Lawrence, Corey R.; Olga Vindusková; William Wieder, Matt Williams; Gustaf Hugelias; Jennifer Harden
Article	The Laurentian Great Lakes: A case study in ecological disturbance and climate change	2019	Wiley	Great Lakes Science Center	14 p.	McKenna, James E. Jr. jemckenna@usgs.gov

Article	The long-term effects of Hurricanes Wilma and Irma on soil elevation change in Everglades mangrove forests	2019	Springer	Patuxent Wildlife Research Center; Wetland and Aquatic Research Center		Fehr, Laura; Osland, Michael; Anderson, Gordon; Vervaeke, William; Krauss, Ken; Whelan, Kevin R. T.; Balentine, Karen M.; Tilling-Range, Ginger; 3663; Cahoon, Donald
Report	The major coral reefs of Maui Nui, Hawai'i—distribution, physical characteristics, oceanographic controls, and environmental threats	2019	U.S. Geological Survey	Pacific Coastal and Marine Science Center	Report: vi, 71 p.	Field, Michael E. mfield@usgs.gov; Storzlazzi, Curt D. cstorlazzi@usgs.gov; Gibbs, Ann E. agibbs@usgs.gov; D'Antonio, Nicole L.; Cochran, Susan A. scochran@usgs.gov
Article	The plant diversity sampling design for The National Ecological Observatory Network	2019	Ecological Society of America	Wetland and Aquatic Research Center	e02603, 18 p.	Barnett, David T.; Adler, Peter B.; Chemel, Benjamin R.; Duffy, Paul A.; Enquist, Brian J.; Grace, James B. gracej@usgs.gov; Harrison, Susan P.; Peet, Robert K.; Schmel, David S.; Stohlgren, Thomas J.; Vellend, Mark
Article	The risk reduction benefits of the Mesoamerican Reef in Mexico	2019	Frontiers Media	Coastal and Marine Geology Program; Pacific Coastal and Marine Science Center	125, 21 p.	Reguero, Borja G.; Secalira, Fernando; Tolmil, Alexandra; Escudero, Mireille; Diaz-Simal, Pedro; Beck, Michael W.; Silva, Rodolfo; Storzlazzi, Curt D. cstorlazzi@usgs.gov; Losada, Iñigo
Article	The role of baseflow in dissolved solids delivery to streams in the Upper Colorado River Basin	2019	Wiley	Utah Water Science Center	14 p.	Rumsey, Christine crumsey@usgs.gov; Miller, Matthew P. mamiller@usgs.gov; Schwarz, Gregory E. gschwarz@usgs.gov; Hirsch, Robert M. rhirsch@usgs.gov; Susong, David D. ddsusong@usgs.gov
Article	The state of the world's mangrove forests: Past, present, and future	2019	Annual Reviews	Wetland and Aquatic Research Center	27 p.	Friess, Daniel A.; Rogers, Kerrylee; Lovelock, Catherine E.; Krauss, Ken; Hamilton, Stuart E.; Lee, Shing Yip; Lucas, Richard; Primavera, Jurgenne; Rajkaran, Anusha; Shi, Suhua
Article	The status of mussel health assessment and a path forward	2019	BioONE	Upper Midwest Environmental Sciences Center	17 p.	Waller, Diane L. dwaller@usgs.gov; Cope, Greg
Article	Thermal variability drives synchronicity of an aquatic insect resource pulse	2019	ESA	Columbia Environmental Research Center	e02852, 11 p.	Anderson, Heidi E.; Alberson, Lindsey K.; Walters, David
Article	Thermal variability drives synchronicity of an aquatic insect resource pulse	2019	Ecological Society of America	Columbia Environmental Research Center; Fort Collins Science Center	e02852, 11 p.	Anderson, Heidi E.; Alberson, Lindsey K.; Walters, David
Article	Tools for managing hydrologic alteration on a regional scale II: Setting targets to protect stream health	2019	Wiley	California Water Science Center	18 p.	Mazor, Raphael D.; May, Jason T. jasonmay@usgs.gov; Sengupta, Ashmita; McCune, Kenneth S.; Bledsoe, Brian P.; Skein, Eric D.

Conference Paper	Topographic change detection at Chalk Cliffs, Colorado, USA, using Airborne LIDAR and UAS-based Structure-from-Motion photogrammetry	2019	Mountain Scholar	Geologic Hazards Science Center; Geology and Geophysics Science Center	8 p.	Barnhart, Katherine R.; Rengers, Francis K. frengers@usgs.gov; Ghent Jessica N; Tucker, Gregory E.; Coe, Jeffrey A. jcoe@usgs.gov; Kean, Jason W. jwkean@usgs.gov; Smith, Joel B. jsmith@usgs.gov; Staley, Dennis M. dstaley@usgs.gov; Kleiber, William; Wiens, Ashton M
Article	Trends in landbird density at two national parks in fragmented, mixed-use landscapes of the Pacific Northwest	2019	Society for Northwestern Vertebrate Biology	Forest and Rangeland Ecosystem Science Center	25 p.	Ray, Chris; Holmgren, Mandy; Wilkerson, Robert L.; Siegel, Rodney B.; Boetsch, John R.; Jenkins, Kurt J. kurt_jenkins@usgs.gov; Ransom, Jason I.
Report	Tritium as an indicator of modern, mixed, and premodern groundwater age	2019	U.S. Geological Survey	California Water Science Center; Massachusetts Water Science Center; National Water Quality Assessment Program; New England Water Science Center; Pennsylvania Water Science Center; WMA - Earth System Processes Division	vii, 18 p.	Lindsey, Bruce D. blindsey@usgs.gov; Jurgens, Bryant C. bjurgens@usgs.gov; Beltz, Kenneth
Article	Trophic implications of a phenological paradigm shift: Bald eagles and salmon in a changing climate	2019	British Ecological Society	National Climate Change and Wildlife Science Center	10 p.	Rubenstein, Madeleine A. mrubenstein@usgs.gov; Christophersen, Roger; Ransom, Jason I.
Article	Tropical cyclone projections: Changing climate threats for Pacific Island defense installations	2019	American Meteorological Society	Coastal and Marine Geology Program; Oregon Water Science Center; Pacific Coastal and Marine Science Center; Pacific Islands Water Science Center	13 p.	Widlansky, Matthew J.; Annamalai, Hariharasubramanian; Gingerich, Stephen B. sbginger@usgs.gov; Storlazzi, Curt D. cstorlazzi@usgs.gov; Marra, John J.; Hodges, Kevin I.; Choy, Barry; Kitoh, Akio
Report	User guide to the FireCLIME Vulnerability Assessment (VA) Tool: A rapid and flexible system for assessing ecosystem vulnerability to climate-fire interactions	2019	US Forest Service	Alaska Science Center Geography	42 p.	Friggens, Megan; Loehman, Rachel A. rloehman@usgs.gov; Thode, Andri; Flatley, William T.; Evans, Alexander; Bunn, Windy; Wilcox, Craig; Mueller, Stephanie; Yocum, Larissa; Falk, Donald A.
Report	User's manual for the Draper climate-distribution software suite with data-evaluation tools	2019	U.S. Geological Survey	California Water Science Center	viii, 55 p	Donovan, John M. jmd@usgs.gov; Koczot, Kathryn M. kmkoczot@usgs.gov

Article	Using remote sensing to quantify ecosystem site potential community structure and deviation in the Great Basin, United States	2019	Elsevier	Earth Resources Observation and Science (EROS) Center	16 p.	Rigge, Matthew B. mrigge@usgs.gov ; Homer, Collin G. homer@usgs.gov ; Wylie, Bruce K. wylie@usgs.gov ; Gu, Yingxin; Shi, Hua hshi@usgs.gov ; Xian, George Z. xian@usgs.gov ; Meyer, Debra K. dkmeyer@usgs.gov ; Bunde, Brett brett.bunde.ctr@usgs.gov
Report	Using scenarios to evaluate vulnerability of grassland communities to climate change in the Southern Great Plains of the United States	2019	U.S. Geological Survey	Fort Collins Science Center	Report: vii, 48 p.	Manier, Daniel J. manierd@usgs.gov ; Carr, Natasha B. carrn@usgs.gov ; Reese, Gordon C. greese@usgs.gov ; Burris, Lucy lburris@usgs.gov
Report	Using the precipitation-runoff modeling system to predict seasonal water availability in the upper Klamath River basin, Oregon and California	2019	U.S. Geological Survey	Oregon Water Science Center	vi, 37 p.	Risley, John C. jrisley@usgs.gov
Article	UZIG research: Measurement and characterization of unsaturated zone processes under wide-ranging climates and changing conditions	2019	ACSESS	Upper Midwest Water Science Center	5 p.	Trost, Jared J. jtrost@usgs.gov ; Mirus, Benjamin B. bbmirus@usgs.gov ; Perkins, Kimberlie kperkins@usgs.gov ; Henson, Wesley R. whenson@usgs.gov ; Nimmo, John R. jnimmo@usgs.gov ; Munoz-Carpena, Rafael
Article	Validating a landsat time-series of fractional component cover across western U.S. Rangelands	2019	MPDI	Earth Resources Observation and Science (EROS) Center	3009	Rigge, Matthew B. mrigge@usgs.gov ; Homer, Collin G. homer@usgs.gov ; Shi, Hua hshi@usgs.gov ; Meyer, Debra K. dkmeyer@usgs.gov
Article	Validating a time series of annual grass percent cover in the sagebrush ecosystem	2019	Elsevier	Earth Resources Observation and Science (EROS) Center	13 p.	Boyte, Stephen P. sboyte@usgs.gov ; Wylie, Bruce K. wylie@usgs.gov ; Major, Donald J.
Article	Vegetation and precipitation shifts interact to alter organic and inorganic carbon storage in cold desert soils	2019	ESA	Forest and Rangeland Ecosystem Science Center	e02655, 17 p.	Huber, David P.; Lohse, Kathleen A.; Commendador, Amy; Joy, Stephen; Aho, Ken A.; Finney, Bruce P.; Germino, Matthew J. mgermino@usgs.gov
Article	Vertical zonation and niche breadth of tidal marsh plants along the Northeast Pacific coast	2019	Springer	Western Ecological Research Center	14 p.	Janousek, Christopher N.; Thorne, Karen M. kthorne@usgs.gov ; Takekawa, John Y. john_takekawa@usgs.gov

Report	Water resources on Guam—Potential impacts of and adaptive response to climate change	2019	U.S. Geological Survey	Pacific Islands Water Science Center	Report: viii, 55 p.; 3 Data Releases	Gingerich, Stephen B. sbginger@usgs.gov; Johnson, Adam G. ajohnson@usgs.gov; Rosa, Sarah N. snrosa@usgs.gov; Marineau, Mathieu D. mmarineau@usgs.gov; Wright, Scott A. sawright@usgs.gov; Hay, Lauren E.; Widlansky, Matthew J.; Jensen, John W.; Wong, Corinne I.; Banner, Jay L.; Finucane, Melissa L.; Keener, Victoria W.
Report	Water-balance modeling of selected lakes for evaluating viability as long-term fisheries in Kidder, Logan, and Stutsman Counties, North Dakota	2019	U.S. Geological Survey	Dakota Water Science Center	Report: v, 22 p.; Downloads	Lundgren, Robert F. rflundgr@usgs.gov; York, Benjamin C. byork@usgs.gov; Stroh, Nathan A. nstroh@usgs.gov; Vecchia, Aldo V. avecchia@usgs.gov
Article	Wetland drying linked to variations in snowmelt runoff across Grand Teton and Yellowstone national parks	2019	Elsevier	Northern Rocky Mountain Science Center	10 p.	Ray, Andrew M.; Sepulveda, Adam J. asepulveda@usgs.gov; Irvine, Kathryn M. k Irvine@usgs.gov; Wilmoth, Siri K.C.; Thoma, David P.; Patla, Debra A.
Article	Where has turtle ecology been, and where is it going?	2019	Herpetologists' League	Southwest Biological Science Center	17 p.	Gibbons, J. Whitfield; Lovich, Jeffrey E. jeffrey_lovich@usgs.gov
Article	Widespread initiation, reactivation, and acceleration of landslides in the northern California Coast Ranges due to extreme rainfall	2019	Wiley	Geologic Hazards Science Center	16 p.	Handwerker, Alexander L.; Fielding, Eric J.; Huang, Mong-Han; Bennett, Georgina L.; Liang, Cunren; Schulz, William wschulz@usgs.gov
Article	Widespread loss of lake ice around the Northern Hemisphere in a warming world	2019	Nature	Upper Midwest Water Science Center	5 p.	Sharma, Sapna; Blagrove, Kevin; Magnuson, John J.; O'Reilly, Catherine; Oliver, Samantha; Batt, Ryan D.; Magee, Madeline R.; Straile, Dietmar; Weyhenmeyer, Gesa A.; Winslow, Luke A.; Woolway, R. Iestyn
Article	Wind erosion and dust from US drylands: a review of causes, consequences, and solutions in a changing world	2019	Wiley	Southwest Biological Science Center	e02650; 28 p.	Duniway, Michael C. mduniway@usgs.gov; Pfennigwerth, Alix A.; Fick, Stephen E.; Nauman, Travis W. tnauman@usgs.gov; Belnap, Jayne jayne_belnap@usgs.gov; Barger, Nichole N.
Article	Wind sheltering impacts on land-atmosphere fluxes over fens	2019	Frontiers	WMA - Earth System Processes Division	179, 16 p.	Turner, Jessica; Desai, Ankur R.; Thom, Jonathan; Wickland, Kimberly P. kpwick@usgs.gov; Olson, Brent

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