

the National Oceanic and Atmospheric Administration.

(Pub. L. 111-314, § 3, Dec. 18, 2010, 124 Stat. 3426.)

HISTORICAL AND REVISION NOTES

<i>Revised Section</i>	<i>Source (U.S. Code)</i>	<i>Source (Statutes at Large)</i>
60505	42 U.S.C. 16656.	Pub. L. 109-155, title III, § 306, Dec. 30, 2005, 119 Stat. 2919.

In subsection (b), the words “beginning with the first fiscal year after the date of enactment of this Act [December 30, 2005]” are omitted as obsolete.

In subsection (b), the words “Committee on Science and Technology” are substituted for “Committee on Science” on authority of Rule X(1)(o) of the Rules of the House of Representatives, adopted by House Resolution No. 6 (110th Congress, January 5, 2007).

Statutory Notes and Related Subsidiaries

CHANGE OF NAME

Committee on Science and Technology of House of Representatives changed to Committee on Science, Space, and Technology of House of Representatives by House Resolution No. 5, One Hundred Twelfth Congress, Jan. 5, 2011.

§ 60506. Sharing of climate related data

The Administrator shall work to ensure that the Administration’s policies on the sharing of climate related data respond to the recommendations of the Government Accountability Office’s report on climate change research and data-sharing policies and to the recommendations on the processing, distribution, and archiving of data by the National Academies Earth Science Decadal Survey, “Earth Science and Applications from Space”, and other relevant National Academies reports, to enhance and facilitate their availability and widest possible use to ensure public access to accurate and current data on global warming.

(Pub. L. 111-314, § 3, Dec. 18, 2010, 124 Stat. 3426.)

HISTORICAL AND REVISION NOTES

<i>Revised Section</i>	<i>Source (U.S. Code)</i>	<i>Source (Statutes at Large)</i>
60506	42 U.S.C. 17825(c).	Pub. L. 110-422, title XI, § 1109(c), Oct. 15, 2008, 122 Stat. 4811.

CHAPTER 606—SPACE WEATHER

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§ 60601. Space weather

(a) FINDINGS.—

(1) SPACE WEATHER.—Congress makes the following findings with respect to space weather:

(A) Space weather phenomena pose a significant threat to ground-based and space-

based critical infrastructure, modern technological systems, and humans working in space.

(B) The effects of severe space weather on the electric power grid, satellites and satellite communications and information, aviation operations, astronauts living and working in space, and space-based position, navigation, and timing systems could have significant societal, economic, national security, and health impacts.

(C) Space-based and ground-based observations provide crucial data necessary to understand, forecast, and prepare for space weather phenomena.

(D) Clear roles and accountability of Federal departments and agencies are critical for efficient and effective response to threats posed by space weather.

(E) Space weather observation and forecasting are essential for the success of human and robotic space exploration.

(F) In October 2015, the National Science and Technology Council published a National Space Weather Strategy and a National Space Weather Action Plan seeking to integrate national space weather efforts and add new capabilities to meet increasing demand for space weather information.

(G) In March 2019, the National Science and Technology Council published an updated National Space Weather Strategy and Action Plan to enhance the preparedness and resilience of the United States to space weather.

(2) ROLE OF FEDERAL AGENCIES.—Congress makes the following findings with respect to the role of Federal agencies on space weather:

(A) The National Oceanic and Atmospheric Administration provides operational space weather monitoring, forecasting, and long-term data archiving and access for civil applications, maintains ground-based and space-based assets to provide observations needed for space weather forecasting, prediction, and warnings, provides research to support operational responsibilities, and develops requirements for space weather forecasting technologies and science.

(B) The Department of Defense provides operational space weather research, monitoring, and forecasting for the Department’s unique missions and applications.

(C) The National Aeronautics and Space Administration provides increased understanding of the fundamental physics of the Sun-Earth system through basic research, space-based observations and modeling, developing new space-based technologies and missions, and monitoring of space weather for the National Aeronautics and Space Administration’s space missions.

(D) The National Science Foundation provides increased understanding of the Sun-Earth system through ground-based measurements, technologies, and modeling.

(E) The Department of the Interior collects, distributes, and archives operational ground-based magnetometer data in the United States and its territories, works with the international community to improve

global geophysical monitoring, and develops crustal conductivity models to assess and mitigate risks from space weather-induced electric ground currents.

(F) The Federal Aviation Administration provides operational requirements for space weather services in support of aviation and for coordination of these requirements with the International Civil Aviation Organization, and integrates space weather data and products into the Next Generation Air Transportation System.

(b) COORDINATION BY OFFICE OF SCIENCE AND TECHNOLOGY POLICY.—The Director of the Office of Science and Technology Policy shall—

(1) coordinate the development and implementation of Federal Government activities conducted with respect to space weather to improve the ability of the United States to prepare for, avoid, mitigate, respond to, and recover from potentially devastating impacts of space weather; and

(2) coordinate the activities of the interagency working group on space weather established under subsection (c).

(c) SPACE WEATHER INTERAGENCY WORKING GROUP.—Not later than 90 days after the date of enactment of the PROSWIFT Act, the National Science and Technology Council shall establish an interagency working group on space weather (in this chapter referred to as the “interagency working group”) to coordinate executive branch actions that improve the understanding and prediction of and preparation for space weather phenomena, and coordinate Federal space weather activities.

(1) MEMBERSHIP.—The following entities shall be members of the interagency working group:

(A) The National Oceanic and Atmospheric Administration.

(B) The National Aeronautics and Space Administration.

(C) The National Science Foundation.

(D) The Department of Defense.

(E) The Department of the Interior.

(F) Such other Federal agencies as the Director of the Office of Science and Technology Policy deems appropriate.

(2) INTERAGENCY AGREEMENTS.—

(A) The members of the interagency working group may enter into one or more interagency agreements providing for cooperation and collaboration in the development of space weather spacecraft, instruments, technologies, and research to operations and operations to research in accordance with this chapter.

(B) The Administrator of the National Aeronautics and Space Administration and the Administrator of the National Oceanic and Atmospheric Administration shall enter into one or more interagency agreements providing for cooperation and collaboration in the development of space weather spacecraft, instruments, and technologies in accordance with this chapter.

(3) INTERNATIONAL, ACADEMIC COMMUNITY, AND COMMERCIAL SECTOR COLLABORATION.—

Each Federal agency participating in the space weather interagency working group established under this subsection shall, to the extent practicable, increase engagement and cooperation with the international community, academic community, and commercial space weather sector on the observational infrastructure, data, and scientific research necessary to advance the monitoring, forecasting, and prediction of, preparation for, and protection from, space weather phenomena.

(d) SPACE WEATHER ADVISORY GROUP.—

(1) IN GENERAL.—

(A) ESTABLISHMENT.—Not later than 180 days after the date of the enactment of the PROSWIFT Act, the Administrator of the National Oceanic and Atmospheric Administration, in consultation with other relevant Federal agencies, shall establish a space weather advisory group (in this chapter referred to as the “advisory group”) for the purposes of receiving advice from the academic community, the commercial space weather sector, and space weather end users that informs the interests and work of the interagency working group.

(B) COMPOSITION.—The advisory group shall be composed of not more than 15 members appointed by the interagency working group, of whom—

(i) 5 members shall be representatives of the academic community;

(ii) 5 members shall be representatives of the commercial space weather sector; and

(iii) 5 members shall be nongovernmental representatives of the space weather end user community.

(C) CHAIR.—Not later than 30 days after the date on which the last member of the advisory group is appointed under subparagraph (B), the Administrator of the National Oceanic and Atmospheric Administration shall appoint 1 member as the Chair of the advisory group.

(D) TERMS.—The length of the term of each member of the advisory group shall be 3 years beginning on the date on which the member is appointed.

(E) TERM LIMITS.—

(i) IN GENERAL.—A member of the advisory group may not serve on the advisory group for more than 2 consecutive terms.

(ii) CHAIR.—A member of the advisory group may not serve as the Chair of the advisory group for more than 2 terms, regardless of whether the terms are consecutive.

(2) DUTIES.—The advisory group shall advise the interagency working group on the following:

(A) Facilitating advances in the space weather enterprise of the United States.

(B) Improving the ability of the United States to prepare for, mitigate, respond to, and recover from space weather phenomena.

(C) Enabling the coordination and facilitation of research to operations and operations to research, as described in section 60604(d).

(D) Developing and implementing the integrated strategy under section 60602 including subsequent updates and reevaluations.

(3) USER SURVEY.—

(A) IN GENERAL.—Not later than 180 days after the establishment of the advisory group, the advisory group shall conduct a comprehensive survey of the needs of users of space weather products to identify the space weather research, observations, forecasting, prediction, and modeling advances required to improve space weather products.

(B) SURVEY CONSIDERATIONS.—The survey conducted under subparagraph (A) shall—

(i) assess the adequacy of current Federal Government goals for lead time, accuracy, coverage, timeliness, data rate, and data quality for space weather observations and forecasting;

(ii) identify options and methods to, in consultation with the academic community and the commercial space weather sector, improve upon the advancement of the goals described in clause (i);

(iii) identify opportunities for collection of new data to address the needs of the space weather user community;

(iv) identify methods to increase coordination of space weather research to operations and operations to research;

(v) identify opportunities for new technologies, research, and instrumentation to aid in research, understanding, monitoring, modeling, prediction, forecasting, and warning of space weather; and

(vi) identify methods and technologies to improve preparedness for potential space weather phenomena.

(C) COORDINATION WITH AGENCIES.—In carrying out the requirements of this subsection, the advisory group shall communicate and coordinate with the interagency working group to ensure the needs of the governmental space weather user community are adequately and appropriately identified by the survey under subparagraph (A).

(D) BRIEFING TO CONGRESS.—Not later than 30 days after the completion of the survey under subparagraph (A), the advisory group shall provide to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a briefing on the results of the survey under subparagraph (A).

(E) PUBLICATION.—Within 30 days of the briefing to Congress, the advisory group shall make the results of the survey under subparagraph (A) publicly available.

(F) REEVALUATION.—The advisory group shall review and assess the survey under subparagraph (A) not less than every 3 years and update, resubmit, and republish the survey in accordance with the requirements of subparagraphs (D) and (E).

(4) FEDERAL ADVISORY COMMITTEE ACT.—Section 14 of the Federal Advisory Committee Act (5 U.S.C. App.)¹ shall not apply to the advisory group.

(Pub. L. 116–181, §2(b), Oct. 21, 2020, 134 Stat. 882.)

¹ See References in Text note below.

Editorial Notes

REFERENCES IN TEXT

The date of enactment of the PROSWIFT Act, referred to in subsecs. (c) and (d)(1)(A), is the date of enactment of Pub. L. 116–181, which was approved Oct. 21, 2020.

Section 14 of the Federal Advisory Committee Act, referred to in subsec. (d)(4), is section 14 of Pub. L. 92–463, which was set out in the Appendix to Title 5, Government Organization and Employees, and was repealed and restated as section 1013 of Title 5 by Pub. L. 117–286, §§3(a), 7, Dec. 27, 2022, 136 Stat. 4204, 4361.

Statutory Notes and Related Subsidiaries

SPACE WEATHER POLICY

Pub. L. 116–181, §2(a), Oct. 21, 2020, 134 Stat. 882, provided that: “It shall be the policy of the United States to prepare and protect against the social and economic impacts of space weather phenomena by supporting actions to improve space weather forecasts and predictions including: sustaining and enhancing critical observations, identifying research needs and promoting opportunities for research-to-operations and operations-to-research collaborations both within and outside of the Federal Government, advancing space weather models, engaging with all sectors of the space weather community, including academia, the commercial sector, and international partners, and understanding the needs of space weather end users.”

Executive Documents

EX. ORD. NO. 13744. COORDINATING EFFORTS TO PREPARE THE NATION FOR SPACE WEATHER EVENTS

Ex. Ord. No. 13744, Oct. 13, 2016, 81 F.R. 71573, provided:

By the authority vested in me as President by the Constitution and the laws of the United States of America, and to prepare the Nation for space weather events, it is hereby ordered as follows:

SECTION 1. *Policy.* Space weather events, in the form of solar flares, solar energetic particles, and geomagnetic disturbances, occur regularly, some with measurable effects on critical infrastructure systems and technologies, such as the Global Positioning System (GPS), satellite operations and communication, aviation, and the electrical power grid. Extreme space weather events—those that could significantly degrade critical infrastructure—could disable large portions of the electrical power grid, resulting in cascading failures that would affect key services such as water supply, healthcare, and transportation. Space weather has the potential to simultaneously affect and disrupt health and safety across entire continents. Successfully preparing for space weather events is an all-of-nation endeavor that requires partnerships across governments, emergency managers, academia, the media, the insurance industry, non-profits, and the private sector.

It is the policy of the United States to prepare for space weather events to minimize the extent of economic loss and human hardship. The Federal Government must have (1) the capability to predict and detect a space weather event, (2) the plans and programs necessary to alert the public and private sectors to enable mitigating actions for an impending space weather event, (3) the protection and mitigation plans, protocols, and standards required to reduce risks to critical infrastructure prior to and during a credible threat, and (4) the ability to respond to and recover from the effects of space weather. Executive departments and agencies (agencies) must coordinate their efforts to prepare for the effects of space weather events.

SEC. 2. *Objectives.* This order defines agency roles and responsibilities and directs agencies to take specific actions to prepare the Nation for the hazardous effects of space weather. These activities are to be implemented in conjunction with those identified in the 2015 Na-

tional Space Weather Action Plan (Action Plan) and any subsequent updates. Implementing this order and the Action Plan will require the Federal Government to work across agencies and to develop, as appropriate, enhanced and innovative partnerships with State, tribal, and local governments; academia; non-profits; the private sector; and international partners. These efforts will enhance national preparedness and speed the creation of a space-weather-ready Nation.

SEC. 3. Coordination. (a) The Director of the Office of Science and Technology Policy (OSTP), in consultation with the Assistant to the President for Homeland Security and Counterterrorism and the Director of the Office of Management and Budget (OMB), shall coordinate the development and implementation of Federal Government activities to prepare the Nation for space weather events, including the activities established in section 5 of this order and the recommendations of the National Science and Technology Council (NSTC), established by Executive Order 12881 of November 23, 1993 (Establishment of the National Science and Technology Council).

(b) To ensure accountability for and coordination of research, development, and implementation of activities identified in this order and in the Action Plan, the NSTC shall establish a Space Weather Operations, Research, and Mitigation Subcommittee (Subcommittee). The Subcommittee member agencies shall conduct activities to advance the implementation of this order, to achieve the goals identified in the 2015 National Space Weather Strategy and any subsequent updates, and to coordinate and monitor the implementation of the activities specified in the Action Plan and provide subsequent updates.

SEC. 4. Roles and Responsibilities. To the extent permitted by law, the agencies below shall adopt the following roles and responsibilities, which are key to ensuring enhanced space weather forecasting, situational awareness, space weather preparedness, and continuous Federal Government operations during and after space weather events.

(a) The Secretary of Defense shall ensure the timely provision of operational space weather observations, analyses, forecasts, and other products to support the mission of the Department of Defense and coalition partners, including the provision of alerts and warnings for space weather phenomena that may affect weapons systems, military operations, or the defense of the United States.

(b) The Secretary of the Interior shall support the research, development, deployment, and operation of capabilities that enhance the understanding of variations of the Earth's magnetic field associated with solar-terrestrial interactions.

(c) The Secretary of Commerce shall:

(i) provide timely and accurate operational space weather forecasts, watches, warnings, alerts, and real-time space weather monitoring for the government, civilian, and commercial sectors, exclusive of the responsibilities of the Secretary of Defense; and

(ii) ensure the continuous improvement of operational space weather services, utilizing partnerships, as appropriate, with the research community, including academia and the private sector, and relevant agencies to develop, validate, test, and transition space weather observation platforms and models from research to operations and from operations to research.

(d) The Secretary of Energy shall facilitate the protection and restoration of the reliability of the electrical power grid during a presidentially declared grid security emergency associated with a geomagnetic disturbance pursuant to 16 U.S.C. 824o-1.

(e) The Secretary of Homeland Security shall:

(i) ensure the timely redistribution of space weather alerts and warnings that support national preparedness, continuity of government, and continuity of operations; and

(ii) coordinate response and recovery from the effects of space weather events on critical infrastructure and the broader community.

(f) The Administrator of the National Aeronautics and Space Administration (NASA) shall:

(i) implement and support a national research program to understand the Sun and its interactions with Earth and the solar system to advance space weather modeling and prediction capabilities applicable to space weather forecasting;

(ii) develop and operate space-weather-related research missions, instrument capabilities, and models; and

(iii) support the transition of space weather models and technology from research to operations and from operations to research.

(g) The Director of the National Science Foundation (NSF) shall support fundamental research linked to societal needs for space weather information through investments and partnerships, as appropriate.

(h) The Secretary of State, in consultation with the heads of relevant agencies, shall carry out diplomatic and public diplomacy efforts to strengthen global capacity to respond to space weather events.

(i) The Secretaries of Defense, the Interior, Commerce, Transportation, Energy, and Homeland Security, along with the Administrator of NASA and the Director of NSF, shall work together, consistent with their ongoing activities, to develop models, observation systems, technologies, and approaches that inform and enhance national preparedness for the effects of space weather events, including how space weather events may affect critical infrastructure and change the threat landscape with respect to other hazards.

(j) The heads of all agencies that support National Essential Functions, defined by Presidential Policy Directive 40 (PPD-40) of July 15, 2016 (National Continuity Policy), shall ensure that space weather events are adequately addressed in their all-hazards preparedness planning, including mitigation, response, and recovery, as directed by PPD-8 of March 30, 2011 (National Preparedness).

(k) NSTC member agencies shall coordinate through the NSTC to establish roles and responsibilities beyond those identified in section 4 of this order to enhance space weather preparedness, consistent with each agency's legal authority.

SEC. 5. Implementation. (a) Within 120 days of the date of this order, the Secretary of Energy, in consultation with the Secretary of Homeland Security, shall develop a plan to test and evaluate available devices that mitigate the effects of geomagnetic disturbances on the electrical power grid through the development of a pilot program that deploys such devices, *in situ*, in the electrical power grid. After the development of the plan, the Secretary shall implement the plan in collaboration with industry. In taking action pursuant to this subsection, the Secretaries of Energy and Homeland Security shall consult with the Chairman of the Federal Energy Regulatory Commission.

(b) Within 120 days of the date of this order, the heads of the sector-specific agencies that oversee the lifeline critical infrastructure functions as defined by the National Infrastructure Protection Plan of 2013—including communications, energy, transportation, and water and wastewater systems—as well as the Nuclear Reactors, Materials, and Waste Sector, shall assess their executive and statutory authority, and limits of that authority, to direct, suspend, or control critical infrastructure operations, functions, and services before, during, and after a space weather event. The heads of each sector-specific agency shall provide a summary of these assessments to the Subcommittee.

(c) Within 90 days of receipt of the assessments ordered in section 5(b) of this order, the Subcommittee shall provide a report on the findings of these assessments with recommendations to the Director of OSTP, the Assistant to the President for Homeland Security and Counterterrorism, and the Director of OMB. The assessments may be used to inform the development and implementation of policy establishing authorities and responsibilities for agencies in response to a space weather event.

(d) Within 60 days of the date of this order, the Secretaries of Defense and Commerce, the Administrator of NASA, and the Director of NSF, in collaboration with other agencies as appropriate, shall identify mechanisms for advancing space weather observations, models, and predictions, and for sustaining and transitioning appropriate capabilities from research to operations and operations to research, collaborating with industry and academia to the extent possible.

(e) Within 120 days of the date of this order, the Secretaries of Defense and Commerce shall make historical data from the GPS constellation and other U.S. Government satellites publicly available, in accordance with Executive Order 13642 of May 9, 2013 (Making Open and Machine Readable the New Default for Government Information), to enhance model validation and improvements in space weather forecasting and situational awareness.

(f) Within 120 days of the date of this order, the Secretary of Homeland Security, through the Administrator of the Federal Emergency Management Agency and in coordination with relevant agencies, shall lead the development of a coordinated Federal operating concept and associated checklist to coordinate Federal assets and activities to respond to notification of, and protect against, impending space weather events. Within 180 days of the publication of the operating concept and checklist, agencies shall develop operational plans documenting their procedures and responsibilities to prepare for, protect against, and mitigate the effects of impending space weather events, in support of the Federal operating concept and compatible with the National Preparedness System described in PPD-8.

SEC. 6. *Stakeholder Engagement.* The agencies identified in this order shall seek public-private and international collaborations to enhance observation networks, conduct research, develop prediction models and mitigation approaches, enhance community resilience and preparedness, and supply the services necessary to protect life and property and promote economic prosperity, as consistent with law.

SEC. 7. *Definitions.* As used in this order:

(a) “Prepare” and “preparedness” have the same meaning they have in PPD-8. They refer to the actions taken to plan, organize, equip, train, and exercise to build and sustain the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from those threats that pose the greatest risk to the security of the Nation. This includes the prediction and notification of space weather events.

(b) “Space weather” means variations in the space environment between the Sun and Earth (and throughout the solar system) that can affect technologies in space and on Earth. The primary types of space weather events are solar flares, solar energetic particles, and geomagnetic disturbances.

(c) “Solar flare” means a brief eruption of intense energy on or near the Sun’s surface that is typically associated with sunspots.

(d) “Solar energetic particles” means ions and electrons ejected from the Sun that are typically associated with solar eruptions.

(e) “Geomagnetic disturbance” means a temporary disturbance of Earth’s magnetic field resulting from solar activity.

(f) “Critical infrastructure” has the meaning provided in section 1016(e) of the USA Patriot Act of 2001 (42 U.S.C. 5195c(e)), namely systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters.

(g) “Sector-Specific Agency” means the agencies designated under PPD-21 of February 12, 2013 (Critical Infrastructure Security and Resilience), or any successor directive, to be responsible for providing institutional knowledge and specialized expertise as well as leading, facilitating, or supporting the security and resilience programs and associated activities of its designated

critical infrastructure sector in the all-hazards environment.

SEC. 8. *General Provisions.* (a) Nothing in this order shall be construed to impair or otherwise affect:

(i) the authority granted by law to an agency, or the head thereof; or

(ii) the functions of the Director of OMB relating to budgetary, administrative, or legislative proposals.

(b) This order shall be implemented consistent with applicable law and subject to the availability of appropriations.

(c) This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

BARACK OBAMA.

[Reference to a Sector Specific Agency (including any permutations or conjugations thereof) deemed to be a reference to the Sector Risk Management Agency of the relevant critical infrastructure sector and have the meaning given such term in section 650 of Title 6, Domestic Security, see section 652a(c)(3) of Title 6, enacted Jan. 1, 2021.]

§ 60602. Integrated strategy

(a) IN GENERAL.—The Director of the Office of Science and Technology Policy, in collaboration with the interagency working group and upon the advice of the advisory group, shall develop a strategy for coordinated observation of space weather among members of the interagency working group (in this chapter, referred to as the “integrated strategy”). The integrated strategy shall identify—

(1) observations and measurements that must be sustained beyond the lifetime of current ground-based and space-based assets, as described under section 60603, that are essential for space weather research, models, forecasting, and prediction;

(2) new observations and measurements that may significantly improve space weather forecasting and prediction; and

(3) plans for follow-on space-based observations under section 60603.

(b) CONSIDERATIONS.—In developing the integrated strategy in subsection (a), the Director of the Office of Science and Technology Policy shall consider, as appropriate, the following:

(1) Potential contributions of commercial solutions, prize authority, academic and international partnerships, microsatellites, small satellite options, ground-based instruments, and hosted payloads for observations identified in section 60602(a)(2).

(2) Work conducted before the date of enactment of the PROSWIFT Act by the National Science and Technology Council with respect to space weather.

(3) The survey under section 60601(d).

(4) Any relevant recommendations from the most recent National Academies of Sciences, Engineering, and Medicine Decadal Survey for Solar and Space Physics (Heliophysics).

(c) REVIEW OF INTEGRATED STRATEGY.—

(1) REVIEW.—The Administrator of the National Aeronautics and Space Administration and the Administrator of the National Oceanic and Atmospheric Administration, in consultation with Federal agencies participating in the interagency working group, shall enter into an