COMMITTEE ON
SCIENCE, SPACE AND TECHNOLOGY
CHAIRMAN BRIAN BABIN

FULL COMMITTEE

HEARING CHARTER

"Weathering the Solar Storm: Advancing America's Space Weather Capabilities"

Thursday, November 19, 2026
10:00 AM
2318 Rayburn House Office Building

Purpose

The purpose of this hearing is to examine space weather and its impacts on technology, infrastructure, and human activities both on Earth and in space. The hearing will evaluate current efforts to research, forecast, and mitigate the effects of space weather events, as well as ways to improve the nation's space weather prediction capabilities. It will also explore the roles of Federal agencies involved in space weather research, forecasting, and response; the interagency partnerships that support these efforts; and potential avenues to strengthen collaboration among the federal, academic, and commercial sectors to advance space weather research, forecasting, and preparedness.

Witnesses

- **Dr. Joseph Westlake,** Heliophysics Division Director, Science Mission Directorate, National Aeronautics and Space Administration
- **Mr. Ken Graham,** National Weather Service Director, National Oceanic and Atmospheric Administration

Background

Solar activity can cause variations in space conditions between the Sun and Earth that can impact systems and infrastructure in both space and on Earth.[1]

The Sun continuously emits electromagnetic radiation as well as streams of charged particles in the form of plasma, frequently described as solar wind.[2] The Sun's activity is driven by its magnetic field, which reverses polarity approximately every 11 years in a pattern known as the solar cycle.[3] Each solar cycle begins and ends at "solar minimum," when the magnetic field is clearly separated between the north and south poles, and the Sun is the least active. "Solar maximum" occurs in the middle of the solar cycle and is marked by a peak in solar activity caused by the Sun's "magnetic field winding up into its most disordered state."[4] The current solar cycle, Solar Cycle 25, began in December 2019 and reached solar maximum around July 2025.[5]

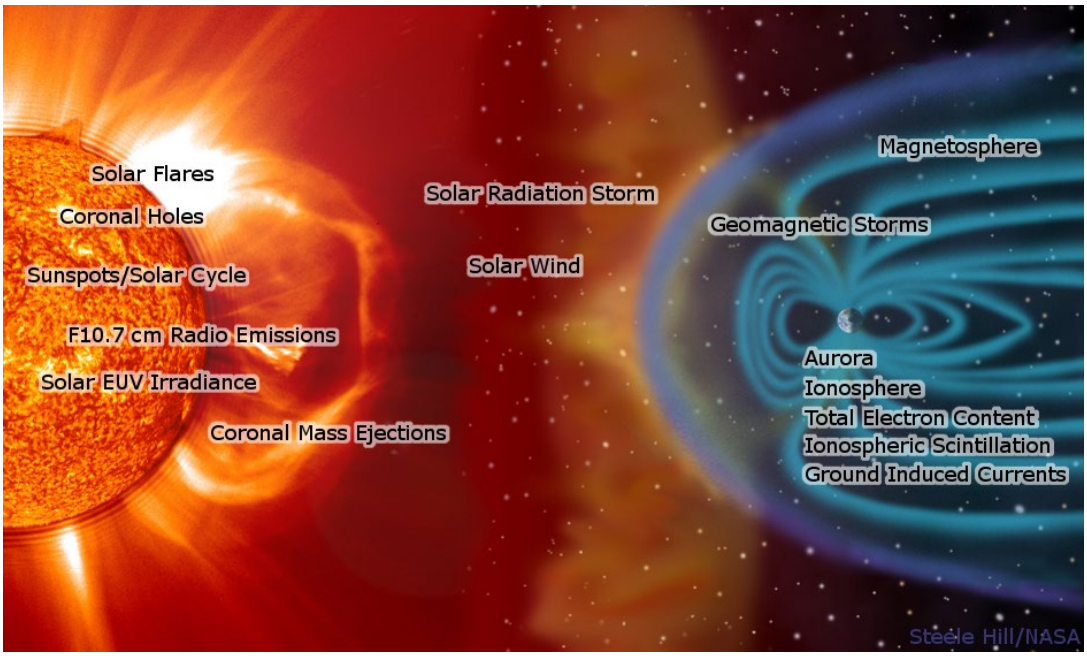

Figure 1: Space Weather Phenomena[6] [Source: NOAA]

[1] NOAA, *Space Weather Phenomena*, https://www.spaceweather.gov/phenomena.
[2] Mark Moldwin, *An Introduction to Space Weather,* (2008), https://ia800708.us.archive.org/16/items/anintroductiontospaceweather_201907/An%20Introduction%20to%20Space%20Weather.pdf.
[3] ESA, *The solar cycle, a heartbeat of stellar energy*, https://www.esa.int/Science_Exploration/Space_Science/The_solar_cycle_a_heartbeat_of_stellar_energy.
[4] eoPortal, *Solar Activity*, (Sep. 27, 2024), https://www.eoportal.org/other-space-activities/solar-activity#solarauxiliary.
[5] NOAA, *Hello Solar Cycle 25*, National Weather Service, (Sep. 15, 2020), https://www.weather.gov/news/201509-solar-cycle.
[6] See supra note 1.

There are three main types of space weather events: solar flares, coronal mass ejections (CMEs), and solar particle events.[7] Solar flares are large eruptions of electromagnetic radiation from the Sun that travel at the speed of light and typically last between minutes and hours.[8] CMEs, which often occur in tandem with solar flares, are large explosions of plasma and charged particles from the Sun's corona that travel more slowly than solar flares and can take between 15 hours and several days to reach Earth.[9] Solar particle events, which are the release of high-energy protons and heavy ions that sometimes occur along with solar flares and CMEs and cause solar radiation storms, occur less frequently.[10] Each of these phenomena can have an impact on human activity.

Space Weather Impacts

The geomagnetic disturbances (GMDs) caused by space weather events can affect both space and Earth infrastructure and systems that are vulnerable to geomagnetically induced currents, electromagnetic interference, or radiation exposure.[11] A powerful space weather event could impact infrastructure, operations, and human health by disrupting the electrical power grid, communication and navigation systems, satellite operations, and aviation. Space weather can also have significant financial impacts. A 2025 study analyzed moderate to severe space weather events and their impact on a county's financial well-being. The study found that the expected five-year global economic losses could range between $1.2 trillion and $9.1 trillion. These losses are equivalent to a 0.2% to 1.4% reduction in global GDP. The assessment additionally found that North America had the highest risk of financial impact, due to its highly interconnected economy and reliance on electricity-dependent sectors.[12]

[7] NOAA, *Space Weather 101*, https://www.swpc.noaa.gov/sites/default/files/images/Space%20Weather%20101%20Factsheet%20Final.pdf.
[8] NOAA, *Solar Flares (Radio Blackouts)*, https://www.swpc.noaa.gov/phenomena/solar-flares-radio-blackouts.
[9] NOAA, *Coronal Mass Ejections*, https://www.swpc.noaa.gov/phenomena/coronal-mass-ejections.
[10] See supra note 8.
[11] NASA, *Health, Safety, and Commercial Needs*, https://www.jpl.nasa.gov/nmp/st5/SCIENCE/effects2.html.
[12] Lloyd's, *Lloyd's highlights risk of extreme space weather as latest scenario reveals potential global economic loss of $2.4trn*, (Mar. 4, 2025), https://www.lloyds.com/insights/media-centre/press-releases/extreme-space-weather-scenario.

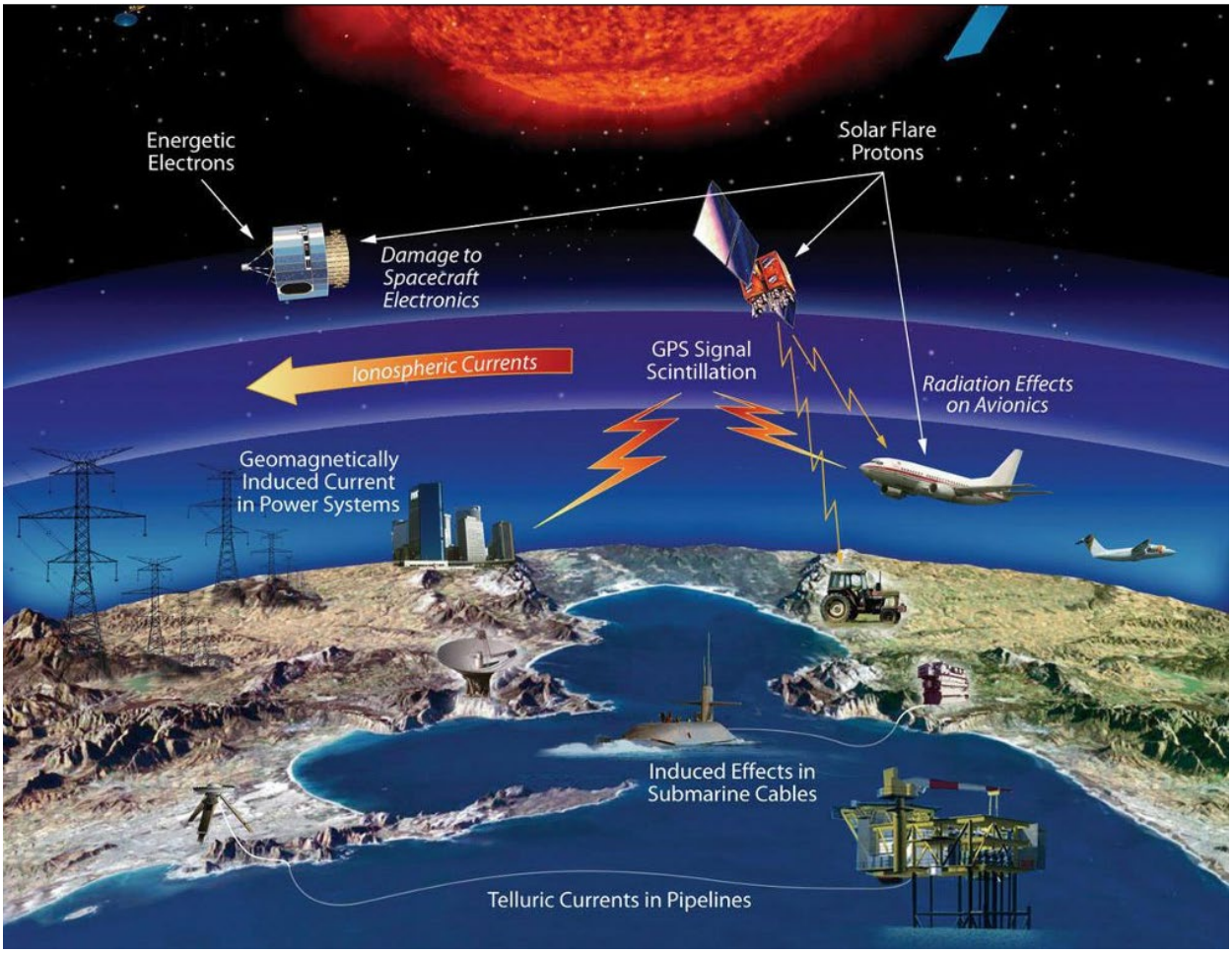

Figure 2: Potential Effects of Space Weather [13][Source: NASA]

Solar phenomena can also impact the natural electric current systems found inside the upper atmosphere of the Earth. Geomagnetic storms can produce geomagnetically induced currents (GICs) capable of impacting the function and performance of transformers, potentially causing damage to power grid infrastructure, degrading power quality, and disrupting power transmission.[14] There have been several instances of space weather impacts on the power grid.[15]

Solar phenomena can also have serious impacts on navigation systems**,** such as the Global Positioning System (GPS), which have become essential for modern life. GPS systems send radio signals through the Earth's ionosphere to receivers on Earth's surface. Space weather events increase the number of charged particles in the ionosphere, which can cause ranging errors, degrade the accuracy of GPS systems, and prevent GPS receivers from locking onto

[13] NASA, *Why Teach Heliophysics?,* Framework for Heliophysics Education, https://science.nasa.gov/science-nasa-gov-431638/
[14] Abt Associates, *Social and Economic Impacts of Space Weather in the United States*, (Sep. 2017), https://www.weather.gov/media/news/SpaceWeatherEconomicImpactsReportOct-2017.pdf.
[15] Power outages in 1958, equipment issues in 1972, the 9-hour blackout in Canada in 1989, and the blackout in Sweden in 2003.

satellites transmitting signals, ultimately resulting in service outages.[16] In May 2024, the Gannon Solar Storm caused significant degradation in GPS accuracy during the peak of planting season, resulting in over $500 million in losses for the farming sector alone.[17]

Communications systems**,** including both high-frequency (HF) radio and satellite communications, also send radio signals through Earth's ionosphere. Solar storm-related changes can cause the signals to weaken, flicker, or disappear completely.[18]

Space weather can also create challenges for in-space satellite operations**.** Space weather events can heat and expand Earth's upper atmosphere, increasing atmospheric density primarily at low Earth orbit (LEO) altitudes and causing satellites to experience greater drag and accelerated orbital decay.[19] After SpaceX launched 49 Starlink satellites on February 3, 2022, an extreme geomagnetic storm increased Earth's atmospheric temperature, leading to a 50% increase in atmospheric density. This caused the premature reentry of 38 of the 49 Starlink satellites, an estimated loss of at least $50 million.[20]

Space weather events also present a hazard to human spaceflight operations. Even during periods of normal solar activity, astronauts operating outside the protection of Earth's atmosphere are exposed to more radiation than on Earth's surface.[21] Increased radiation levels caused by a space weather event can place astronauts at an even greater risk of exposure, increasing their risk of developing cancer, degenerative disorders, and cognitive conditions.[22]

Finally, space weather can impact the navigation and communication capabilities, as well as the radiation exposure, associated with aviation operations.[23] The same service degradation issues affecting communications and navigation can have serious consequences for aviation, which relies on tools such as HF radio systems to fly safely.[24] As part of preflight procedures, pilots are required to inspect and confirm that the GPS systems are performing properly and have not been damaged by space weather storms.[25] Thirty-three airports in the National Airspace System (NAS) do not have instrument landing systems to support aircraft operations during low-visibility landings in the event of a GPS blackout.[26] During space weather events, airlines also

---

[16] See supra note 13.
[17] Tereza Poltarova, *May 2024 solar storm cost $500 million in damages to farmers, new study reveals*, Space.com, (June 22, 2025), https://www.space.com/astronomy/sun/may-2024-solar-storm-cost-usd500-million-in-damages-to-farmers-new-study-reveals.
[18] NOAA, *Satellite Communications*, https://www.swpc.noaa.gov/index.php/impacts/satellite-communications.
[19] See supra note 13.
[20] Michael Sheetz, *SpaceX to lose as many as 40 Starlink satellites due to space storm*, (Feb. 9, 2022), https://www.cnbc.com/2022/02/09/spacex-losing-starlink-satellites-due-to-geomagnetic-space-storm.html.
[21] NASA, *Space Radiation Element*, https://www.nasa.gov/hrp/radiation/space-radiation-risks/.
[22] NASA, *Space Radiation, Risk of Radiation-Induced Cancers*, https://www.nasa.gov/reference/risk-of-radiation-induced-cancers/.
[23] Federal Aviation Administration, *Space Weather*, Aviation Weather Research Program, Space Weather | Federal Aviation Administration
[24] See supra note 21.
[25] See supra note 21.
[26] See supra note 21.

must reroute flights or operate at lower altitudes in polar regions in order to mitigate radiation exposure to both pilots and passengers, and to maintain reliable communications.[27] This, in turn, results in longer flight times and higher fuel consumption, increasing the costs for the airline.[28] During these polar routes, pilots and crew can experience increased radiation exposure because Earth's magnetic field provides less shielding near the poles, allowing more energetic particles from space weather events to reach aircraft.[29]

Department and Agency Roles and Responsibilities

The Federal government carries out a range of activities to monitor, research, and manage space weather events.[30] Federal agencies' roles and responsibilities fall into five key areas: early warning and forecasting, research and development (R&D), fundamental scientific research, risk assessment and mitigation (including modeling and information sharing), and response and recovery efforts. Many agencies contribute to multiple areas rather than operating within one category.

The National Oceanic and Atmospheric Administration (NOAA) serves as the primary civil agency responsible for conducting space weather forecasting and operational warning services, including the continuous monitoring of solar activity and issuance of alerts.[31] In 1988, Congress directed the Secretary of Commerce to "prepare and issue predictions of electromagnetic wave propagation conditions and warnings of disturbances in such conditions,"[32] a function which the Secretary delegated to NOAA. Executive Orders 13744, issued by President Obama in October of 2016 [33] and 13865, issued by President Trump in March of 2019 [34], assigned the Department of Commerce and NOAA responsibilities for improving space weather services and stakeholder coordination, which NOAA implemented under the direction of the Secretary of Commerce.

Within NOAA, the National Weather Service (NWS), proposed to be funded at $1,456,905,000 by the FY27 Commerce, Justice, Science, and Related Agencies Appropriations Act (HCJS),[35] and the National Environmental Satellite, Data, and Information Service (NESDIS), proposed to

---

[27] W. K. Tobiska, et al., *Frontiers in Astronomy and Space Sciences*, (Oct. 22, 2025), https://www.frontiersin.org/journals/astronomy-and-space-sciences/articles/10.3389/fspas.2025.1657731/full.
[28] See supra note 25.
[29] Solomon Self, *FAA Urged to Revise its Approach to Radiation Exposure for Flight Crewmembers; Current Approaches Are Insufficient, Says New Report,* National Academies of Sciences, Engineering, and Medicine, (June 12, 2026), https://www.nationalacademies.org/news/faa-urged-to-revise-its-approach-to-radiation-exposure-for-flight-crewmembers-current-approaches-are-insufficient-says-new-report.
[30] Eva Lipiec & Brian E. Humphreys, *Space Weather: An Overview of Policy and Select U.S. Government Roles and Responsibilities*, Congressional Research Service, (Mar. 29, 2022), https://www.congress.gov/crs_external_products/R/PDF/R46049/R46049.6.pdf.
[31] NOAA, *About Space Weather*, https://www.spaceweather.gov/about-space-weather.
[32] 15 U.S.C. § 1532(2) (2024).
[33] Exec. Order No. 13744, 81 Fed. Reg. 71573 (Oct. 13, 2016).
[34] Exec. Order No. 13865, 84 Fed. Reg. 12041 (Mar. 26, 2019).
[35] H.R. Rep. No. 199-XXX, *Commerce, Justice, Science, and Related Agencies Appropriations Bill, 2027.*

be funded at $344,500,00 by HCJS,[36] carry out space weather responsibilities.[37] NWS operates and maintains observation systems to support forecasting of space weather.[38] NESDIS provides access to and archives NOAA's space weather data through the National Centers for Environmental Information.[39] This data is acquired through the Space Weather Follow-On (SWFO) program. SWFO was designed to ensure the continuity of critical space-based measurements and currently has instruments onboard two satellites. The Geostationary Operational Environmental Satellite (GOES-19) carries an instrument that monitors for CMEs.[40] NOAA's newest solar observatory, Space Weather Observations at L1 to Advance Readiness (SOLAR-1), recently entered operational service carrying four instruments that enhance NOAA's ability to monitor solar activity, improve space weather forecasts, and provide earlier warnings of potentially disruptive solar events.[41]

NOAA also operates the Space Weather Prediction Center (SWPC), established in 1965, which provides forecasting and monitoring of solar events and disturbances used to improve the understanding and prediction of future events.[42] Geomagnetic storms are classified on a G1-G5 scale (see Figure 3 below). SWPC recently established the Space Weather Prediction Testbed. This testbed is a critical Research-to-Operations-to-Research (R2O2R) partnership led by the SWPC that allows numerous interagency partners to collaborate on improvements to observations, models, and forecast products.[43] SWPC hosts yearly testbed exercises which bring together forecasters, customers, regulators, internal and external research and development staff, and federal partners to explore the current capabilities, needs, and gaps in NOAA weather services.

One of the main goals of the Space Weather Prediction Testbed exercise program is to accelerate emerging concepts and new technologies for improving space weather prediction and informing Operations-to-Research (O2R) activities.

---

[36] See supra note 33.
[37] See supra note 33.
[38] NOAA, *Office of Observations*, National Weather Service, https://www.weather.gov/organization/obs.
[39] NOAA, *NESDIS*, https://www.nesdis.noaa.gov/.
[40] NOAA, *Space Weather Follow On Program*, https://www.ncei.noaa.gov/cloud-access/space-weather-portal.
[41] NOAA, *Space weather Observations at L1 to Advance Readiness (SOLAR)-1*, Our Satellites, https://www.nesdis.noaa.gov/our-satellites/future-programs/swfo/space-weather-follow-lagrange-1-swfo-l1.
[42] NOAA, *Space Weather Prediction Center*, https://www.spaceweather.gov/.
[43] NOAA, *Welcome to the space weather prediction testbed (SWPT)*, https://testbed.spaceweather.gov/?_gl=1%2A18oprkk%2A_ga%2AMTM0MzU5MDIwMi4xNzgxNzEwMTg3%2A_ga_HG3R64H44F%2AczE3ODE3MTU1NjckbzIkZzAkdDE3ODE3MTU1NjckajYwJGwwJGgw.

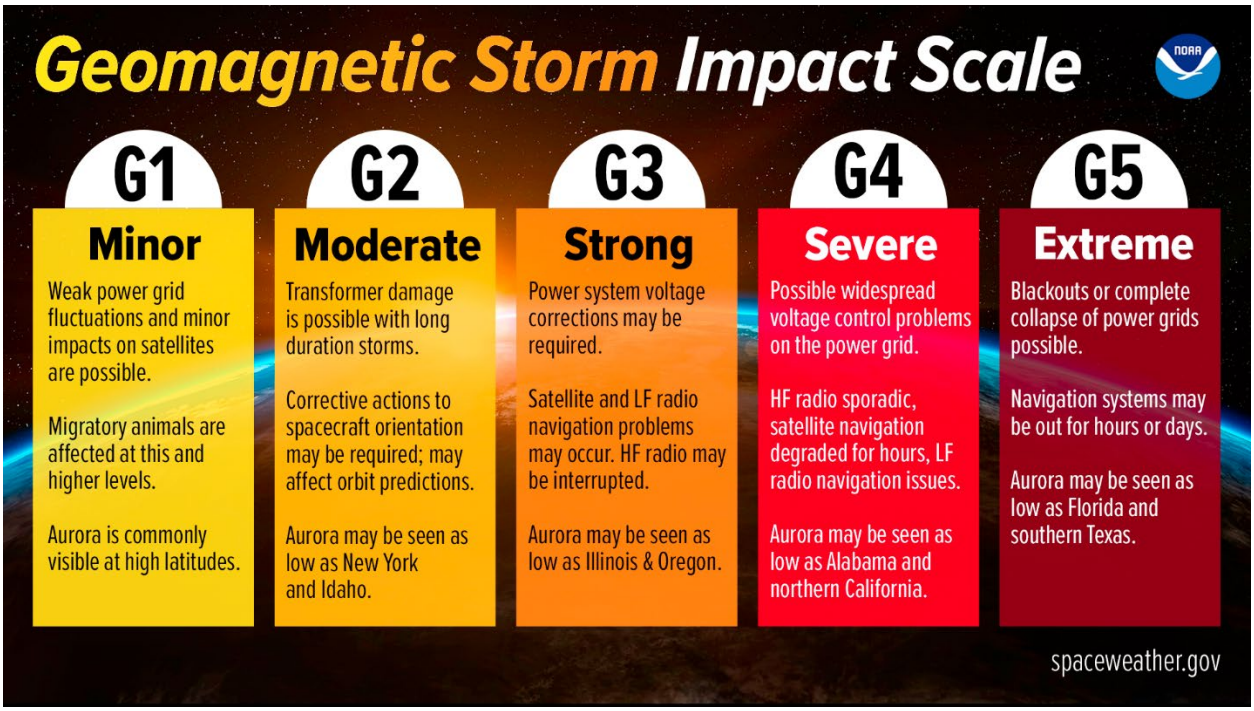

Figure 3: NOAA Geomagnetic Impact Scale [44][Source: NOAA]

The National Aeronautics and Space Administration (NASA) serves as the primary research agency for space weather.[45] NASA is responsible for research involving the "Sun-Earth connection through the development and operation of research satellites and other means."[46] The Heliophysics Division of NASA's Science Mission Directorate, proposed to be funded at $625,000,000 by HCJS[47], supports fundamental research on the Sun through a fleet of research spacecraft and programs, including Heliophysics Research, Solar Terrestrial Probes, Explorers, Sounding Rockets, the Living With a Star program, Citizen Science, and the Heliophysics Technology Program. Key NASA Space Weather Program missions include the Heliophysics Environmental and Radiation Measurement Experiment Suite (HERMES), Vigil, and space weather CubeSats.[48] NASA is also responsible for protecting astronauts from the harsh conditions of space weather, especially as the agency seeks to expand human presence beyond LEO.[49]

NASA's heliophysics research is informed by the National Academies decadal survey. The most recent heliophysics decadal, titled "The Next Decade of Discovery in Solar and Space Physics,"

[44] NOAA, *Social Media: Space Weather*, (2024), https://www.weather.gov/wrn/winter-space-sm.
[45] NASA, *Space Weather*, https://science.nasa.gov/heliophysics/focus-areas/space-weather/.
[46] See supra note 43.
[47] See supra note 33.
[48] NASA, Missions Exploring Our Sun, https://science.nasa.gov/sun/exploration/.
[49] See supra note 43.

was released in December 2024[50] and identified three major themes for space weather research: System of Systems: Drivers of Space Weather; Space Weather Responses of the Physical System; and Space Weather Impacts on Infrastructure and Human Health.

The Department of Defense (DoD), through the Department of the Air Force and the U.S. Space Force, is responsible for operational space weather observations, analyses, forecasts, and other products to support national security.[51] The 557th Weather Wing, based at Offutt Air Force Base, Nebraska, conducts the majority of the DoD's space weather-related activities.[52] The 45th Weather Squadron, part of the U.S. Space Force Space Launch Delta 45 at Patrick Space Force Base in Florida, plays a critical role in ensuring safe space operations through observations, advisories, and warnings, specifically tailored for space launches.[53] DoD also shares observational data and collaborates with civil agencies, including NASA and NOAA, to support national space weather forecasting and warning capabilities.[54]

The National Science Foundation (NSF), proposed to be funded at $7,000,000,000 by HCJS[55], plays a key role in space weather by funding basic scientific research, primarily conducted by universities and research institutions, on solar activity, Earth's space environment, and the processes that drive space weather events.[56] NSF supports major observational facilities and research networks, including the NSF-NOAA Global Oscillation Network Group (GONG),[57] the ground-based radar Super Dual Auroral Radar Network (SuperDARN),[58] and the Daniel K. Inouye Solar Telescope,[59] the world's most powerful solar telescope, which improves scientific understanding and forecasting of space weather.

The Federal Aviation Administration (FAA) Space Weather Aviation (SWxA) Research Program gains valuable insights into space weather through research and develops ways to mitigate its impacts on aviation.[60] In FY23 and FY24, FAA's SWxA Research Program focused

---

[50] National Academies, *The Next Decade of Discovery in Solar and Space Physics*, (Dec. 2024), https://nap.nationalacademies.org/resource/27938/interactive/#overview.
[51] See supra note 39.
[52] U.S. Air Force, *557th Weather Wing*, https://www.offutt.af.mil/Units/557th-Weather-Wing/.
[53] U.S. Space Force, *45th Weather Squadron*, https://45thweathersquadron.nebula.spaceforce.mil/.
[54] Space Weather Operations, Research, and Mitigation Subcommittee & Committee on Homeland & National Security, (Dec. 2023), https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/12/Implementation-Plan-for-National-Space-Weather-Strategy-12212023.pdf.
[55] See supra note 30.
[56] U.S. National Science Foundation, *Science Matters, Space weather: Protecting the planet*, (Apr. 27, 2026), https://www.nsf.gov/science-matters/space-weather-protecting-planet.
[57] U.S. National Science Foundation, *Global Oscillations Network Group*, Telescopes, https://nso.edu/telescopes/nisp/gong/.
[58] Thayer School of Engineering at Dartmouth, *Dartmouth College SuperDARN Group*, https://superdarn.thayer.dartmouth.edu/.
[59] U.S. National Science Foundation, *Inouye Solar Telescope*, Telescopes, https://nso.edu/telescopes/inouye-solar-telescope/.
[60] See supra note 37.

on how space weather affects aviation safety, including radiation exposure risks to crews and passengers and vulnerabilities in current operational procedures.[61]

The U.S. Geological Survey (USGS) supports space weather preparedness by operating geomagnetic observatories, monitoring Earth's magnetic field, and assessing the risk of geomagnetically induced currents that can disrupt electric power infrastructure.[62]

The Department of Energy (DOE) plays a key role in supporting the nation's space weather program by focusing on grid resilience and recovery in the event of space-weather-induced damage.[63] Its Office of Cybersecurity, Energy Security, and Emergency Response (CESER) recognizes geomagnetic disturbances as a natural hazard to equipment.[64] Additionally, its national laboratories conduct critical research on space weather impacts, modeling of geomagnetically induced currents, and mitigation technologies.[65]

Federal Interagency Coordination

The White House Office of Science and Technology Policy (OSTP) was directed by Congress in the 2010 NASA Authorization Act to improve national preparedness for space weather events and to coordinate related federal space weather efforts.[66] OSTP created the Space Weather Operations, Research, and Mitigation (SWORM) Working Group in 2014 to develop strategic and implementation plans.[67] In 2019, the SWORM Interagency Working Group released its updated strategy titled "The National Space Weather Strategy and Action Plan."[68] The most recent strategic and implementation plan was released by SWORM in December 2023, and the last published meeting held by SWORM was on April 15, 2024.[69]

In 2019, President Trump released Executive Order 13865, titled "Coordinating National Resilience to Electromagnetic Pulses," which directed the government to create and maintain efficient approaches to national resilience to the effects of electromagnetic pulses (EMPs).[70] A year later, in 2020, President Trump released "The National Space Policy," which expanded the collaboration and responsibilities of space weather for NASA and NOAA and reiterated OSTP's

---

[61] See supra note 37.
[62] USGS, *Geomagnetism Program*, Programs, https://www.usgs.gov/programs/geomagnetism.
[63] DOE, *Office of Cybersecurity, Energy Security, and Emergency Response*, https://www.energy.gov/ceser/office-cybersecurity-energy-security-and-emergency-response.
[64] See supra note 54.
[65] See supra note 25.
[66] National Aeronautics and Space Administration Authorization Act of 2010, Pub. L. No. 111-267, 124 Stat. 2805, (2010).
[67] Space Weather Operations, Research and Mitigation Subcommittee, https://www.sworm.gov/.
[68] Trump White House, *National Space Weather Strategy and Action Plan*, (March 2019), https://trumpwhitehouse.archives.gov/wp-content/uploads/2019/03/National-Space-Weather-Strategy-and-Action-Plan-2019.pdf.
[69] Space Weather Operations, Research and Mitigation Subcommittee, *Relevant Space Weather Meetings*, https://www.sworm.gov/meetings.htm.
[70] See supra note 42.

role in implementing the 2019 strategy.[71] Additionally, the policy defined geomagnetic disturbances (GMDs) as a subset of EMPs.[72]

Legislative Activities

The Promoting Research and Observations of Space Weather to Improve the Forecasting of Tomorrow (PROSWIFT) Act, signed into law in October 2020,[73] sought to improve U.S. capabilities to forecast and mitigate the effects of space weather.[74] PROSWIFT formally authorized both SWORM and SWAG to continue advising executive branch efforts regarding space weather.[75] The statute directed SWORM to periodically review and update the benchmarks outlined in the National Science and Technology Council (NSTC) report titled "Space Weather Phase 1 Benchmarks" from June 2018.[76] Additionally, the language directed the OSTP, NOAA, NSF, Air Force, Navy, NASA, and U.S. Geological Survey to carry out specific activities on space weather.[77] The Act gave NOAA the authority to establish a pilot program to enter into contracts in the commercial sector to provide NOAA with space weather data.[78] NOAA successfully carried out this pilot program, finding that commercially derived data products show promise for creating operational forecasting, while noting that government-owned and operated observational systems remain more capable and more reliable.[79]

The Space Weather Advisory Group (SWAG) was established in 2021 under the Promoting Research and Observations of Space Weather to Improve the Forecasting of Tomorrow (PROSWIFT) Act.[80] SWAG's main responsibility is to advise the Space Weather Interagency Working Group on advancing the Nation's space weather capabilities.[81] Additionally, the SWAG is directed to 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," and report its findings to the Committee

---

[71] Trump White House, *National Space Policy of the United States of America*, (Dec. 9, 2020), https://trumpwhitehouse.archives.gov/wp-content/uploads/2020/12/National-Space-Policy.pdf.
[72] See supra note 69.
[73] Promoting Research and Observations of Space Weather to Improve the Forecasting of Tomorrow Act, Pub. L. No. 116-181, 134 Stat. 882, (2020).
[74] See supra note 39.
[75] See supra note 71.
[76] Space Weather Operations, Research, and Mitigation Subcommittee, *Space Weather Phase 1 Benchmarks*, (June 2018), https://www.sworm.gov/publications/2018/Space-Weather-Phase-1-Benchmarks-Report.pdf.
[77] See supra note 71.
[78] NOAA & NESDIS, *Commercial Data Program Space Weather Data Pilot Report Executive Summary*, (Aug. 2024), https://www.nesdis.noaa.gov/s3/2024-09/NESDIS-RPT-8001.1-Commercial-Data-Program-Space-Weather-Data-Pilot-Report-Executive-Summary.pdf.
[79] NOAA, *NOAA Releases Space Weather Data Pilot Results*, News, Commercial Data Program, (May 7, 2025), https://www.nesdis.noaa.gov/news/noaa-releases-space-weather-data-pilot-results.
[80] NOAA, *Space Weather Advisory Group*, https://www.weather.gov/swag/.
[81] See supra note 78.

on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.[82]

Several of the major provisions of the PROSWIFT Act were implemented, while others are still ongoing. While the SWORM was created by the OSTP and the NSTC, as stated by the PROSWIFT Act, its last published activity was in April 2024.[83] SWAG was also established by the Act, with its last published meeting on September 26, 2024.[84] In 2023, SWORM and OSTP released the Implementation Plan for the National Space Weather Strategy and Action Plan, filling a major requirement of the PROSWIFT Act.[85]

On December 7, 2023, NASA, NOAA, NSF, and the U.S. Air Force signed a formal Memorandum of Agreement for Space Weather Research-to-Operations-to-Research Collaboration.[86] The memorandum outlined the responsibilities for collaboration between the four agencies to enhance U.S. preparedness for space weather impacts.[87]

The creation of a collaborative mechanism among government, academia, and industry was required by the PROSWIFT Act, which led to the Space Weather Government-Academic-Commercial Roundtable, led by the National Academies. The Space Weather Roundtable consists of senior leaders, decision makers, and scientists from across government, the commercial sector, and academic institutions who work to advance the understanding of space weather phenomena, impacts, and events.[88]

Several operational provisions of the PROSWIFT Act remain incomplete or have yet to be fully enacted, including commercial data integration, and maintenance of preparedness activities.[89] While the PROSWIFT Act does not contain a sunset provision requiring reauthorization, several statutory objectives remain incomplete, suggesting Congress may wish to revisit the language to assess implementation progress and address emerging space weather challenges.

---

[82] Space Weather Advisory Group, *Results of the First National Survey of User Needs for Space Weather*, (Sep. 26, 2024), https://www.weather.gov/media/nws/Results-of-the-First-National-Survey-of-User-Needs-for-Space-Weather-2024.pdf.
[83] See supra note 76.
[84] NOAA, *SWAG Meetings*, https://www.weather.gov/swag-meetings.
[85] See supra note 46.
[86] NASA Communications, *NASA Signs Memorandum of Agreement for Space Weather*, (Dec. 8, 2023), https://www.nasa.gov/image-article/nasa-signs-memorandum-of-agreement-for-space-weather/.
[87] See supra note 84.
[88] National Academies, *Space Weather Roundtable*, Program Centers, https://www.nationalacademies.org/units/DEPS-SSB-21-02.
[89] National Academies, *Office of Congressional and Government Affairs*, Program Centers, https://www.nationalacademies.org/units/NRCEO-NRC EO-23-P-592.