

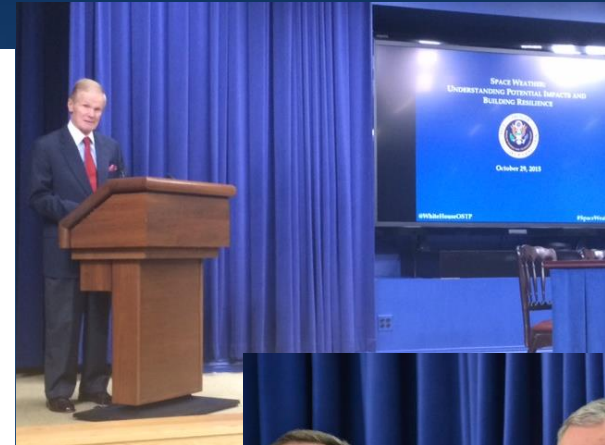
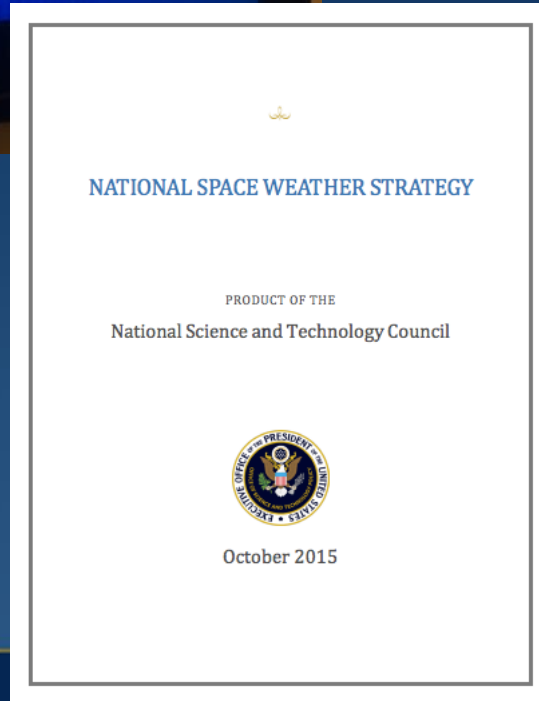
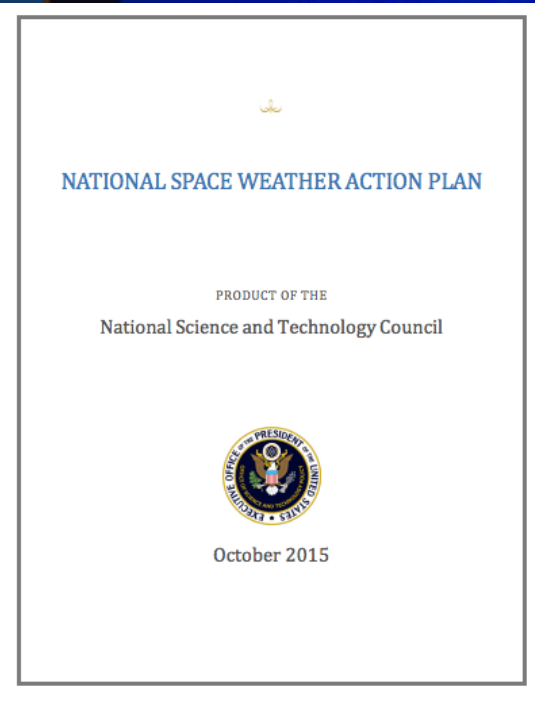
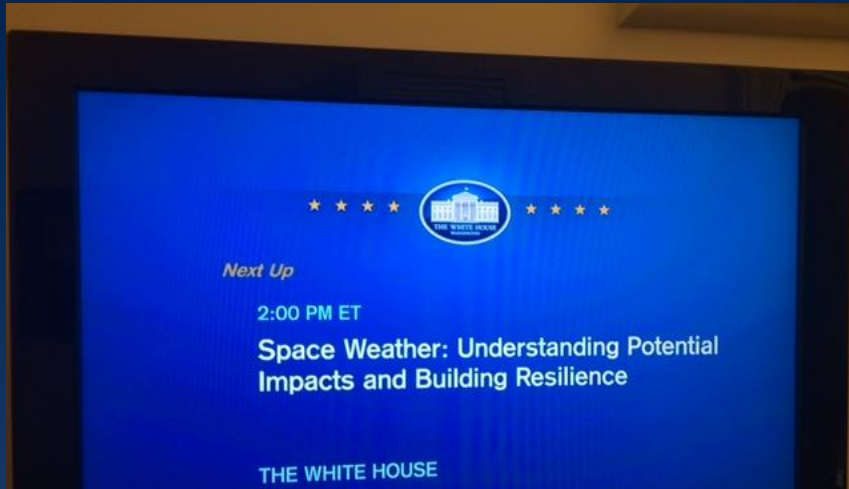


Implementation of the National Space Weather Action Plan

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Assistant Director for Space Weather
Office of Science and Technology Policy
Executive Office of the President

CSSP, Keck Center
October 5, 2016

National Space Weather Strategy and Action Plan – One year Anniversary



Space Weather Research and Forecasting Act

“Identify opportunities to address the needs identified through collaborations with academia, the private sector, and the international community”



Fixing America's Surface Transportation (FAST) Act (Dec 2015)

Calls for action to reduce the vulnerability of electric grid against physical attack, cyber attack, and geomagnetic disturbances



National Space Weather Strategy – Structure

Strategy articulates six high-level goals

1. Establish Benchmarks for Space Weather Events
2. Enhance Response and Recovery Capabilities
3. Improve Protection and Mitigation Efforts
4. Improve Assessment, Modeling, and Prediction of Impacts on Critical Infrastructure
5. Improve Space Weather Services through Advancing Understanding and Forecasting
6. Increase International Cooperation



Benchmarks

- Describe physical characteristics and conditions against which a space-weather event can be measured
- Provide a point of reference from which to improve the understanding of space-weather effects
- Provide a clear and consistent description of space-weather events based on current scientific understanding and the historical record; and
- Inform other activities within the National Space Weather Action Plan



Benchmarks

Five benchmarks are under development by multi-agency working group teams

- Induced geo-electric fields
- Ionizing radiation
- Ionospheric disturbances
- Solar radio bursts
- Upper atmospheric expansion

Teams have finished working on the first phase of benchmark

- Using the existing body of work, investigating the 1 in 100 year event and the theoretical maximum
- Document will be share with the community soon for comment

Phase 2 benchmark assessment already underway



Preparedness - Protection, Mitigation, Response and Recovery Efforts

- Space weather in the National Planning Frameworks
- Space weather included in the Power Outage Incident Annex (POIA) to the Federal Interagency Operations Plans (FIOPs) - under adjudication now
- Space weather included in the 2015 Strategic National Risk Assessment (SNRA) - under review now



Preparedness - Protection, Mitigation, Response and Recovery Efforts

- Public information templates for warning messaging
- Assessment of vulnerabilities of communications systems
- Identify which essential facilities have sufficient back-up power capability
- Incorporate exercise objectives



Preparedness - Protection, Mitigation, Response and Recovery Efforts

Many actions are dependent on completion of other actions. 2.6.2 is an example:

2.6.2 DHS will incorporate exercise objectives tailored to testing and evaluating the Nation's capabilities to respond to and recover from the potential impacts of a benchmarked space-weather event within relevant exercises.

Depends on completion of benchmarks and 2.1.1 (Power Outage Incident Annex)



Improve Assessment, Modeling, and Prediction of Impacts on Critical Infrastructure

Critical element in Goal 4, led by NOAA, will soon be underway – defining requirements including specifications for lead time, accuracy, and uncertainty of space weather products.

4.4.1 DOC and DHS, in coordination with other relevant agencies and stakeholders, will conduct a survey of commercial systems operators, government operators, and emergency managers to identify and assess the requirements for developing functional forecasting capabilities and alert products, including specifications for lead time, accuracy, and uncertainty.

This activity will be accomplished under FY17 funds.



Advancing Understanding and Forecasting

Critical element is the R2O/O2R challenges. We must have infrastructure in place to transition, maintain, and improve models.

5.6.2 DOC and DOD, in collaboration with NASA and NSF, will develop a plan (which may include a center) that will ensure the improvement, testing, and maintenance of operational forecasting models..

NOAA conducted a workshop with external stakeholders on 8/16-17 to examine the issue and complete the plan

The O2R white paper has been drafted that will provide the Federal government with options to improve the R2O/O2R process



Advancing Understanding and Forecasting

A big challenge in Goal 5 was SWAP action 5.5.5

5.5.5 DOI will identify and fill gaps in magnetotelluric (MT) surveys of the United States, beginning with the northeastern United States and concentrating on geographic regions judged to have the highest induction hazards.

NSF's Division of Atmospheric and Geospace Science (AGS) has now funded the extension of the Earthscope magnetotelluric data collection to cover New York and New England. MT data collection has already begun in western New York; it will proceed eastward for as long as the weather permits, and will then resume when the weather permits in the spring.



Space Weather – A Global Challenge

Inform policy makers and leaders of partner nations of the need for a comprehensive and coordinated approach to space weather:

- **April 4th at State Department**
 - 150 attendees from over 30 nations.
- Organize a **high-level policy meeting** on economic and societal effects of an extreme space weather event



A Global Challenge (cont'd)

Sustain U.S. participation in relevant United Nations activities and incorporation of space weather-related elements into work plans, programs, and projects:

- Developing a 4-year plan for **UN World Meteorological Organization** space weather activities;
- Continuing with space weather as a regular agenda item at the **UN Committee on the Peaceful Uses of Outer Space (COPUOS)**;
- Providing global space weather information and services for international aviation with the **UN International Civil Aviation Organization**; and
- Providing guidance on ionospheric disturbances monitoring and forecasting with the **International Telecommunications Union**.



SWORM – The Way Forward

- **Co-Chairs**
 - OSTP (policy), DHS (preparedness), and NOAA (operations)
- **Executive Secretary**
 - Administrative functions (compiles documents, scheduling, meeting minutes, etc.)
- **Subcommittee**
 - Meets quarterly to discuss progress, next steps, and to resolve issues associated with implementation
- **(sub-)Working Groups**
 - Meets monthly, or as necessary, to track progress across all actions within each of the six-goals

White House Office of Management and Budget and the National Security Council will participate.





THANK YOU!



Memo from OMB and OSTP Directors

White House Multi-Agency Science and Technology Priorities for the FY 2017 Budget



July 9, 2015

M-15-16

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Shaun Donovan
Director
Office of Management and Budget

Dr. John P. Holdren
Director
Office of Science and Technology Policy

SUBJECT: Multi-Agency Science and Technology Priorities for the FY 2017 Budget

“Space weather observations and R&D are essential to address the growing societal needs for accurate and timely space weather information. Agencies should prioritize investments in space weather science and preparedness according to the 2015 *National Space Weather Strategy and Action Plan*.



Presidents FY17 Budget

Recognizes space weather observations and R&D are essential to meet societal needs for accurate and timely space weather information.

- Next generation of NOAA space-weather satellites
- NASA \$10 mil
- USGS \$1.7 mil

