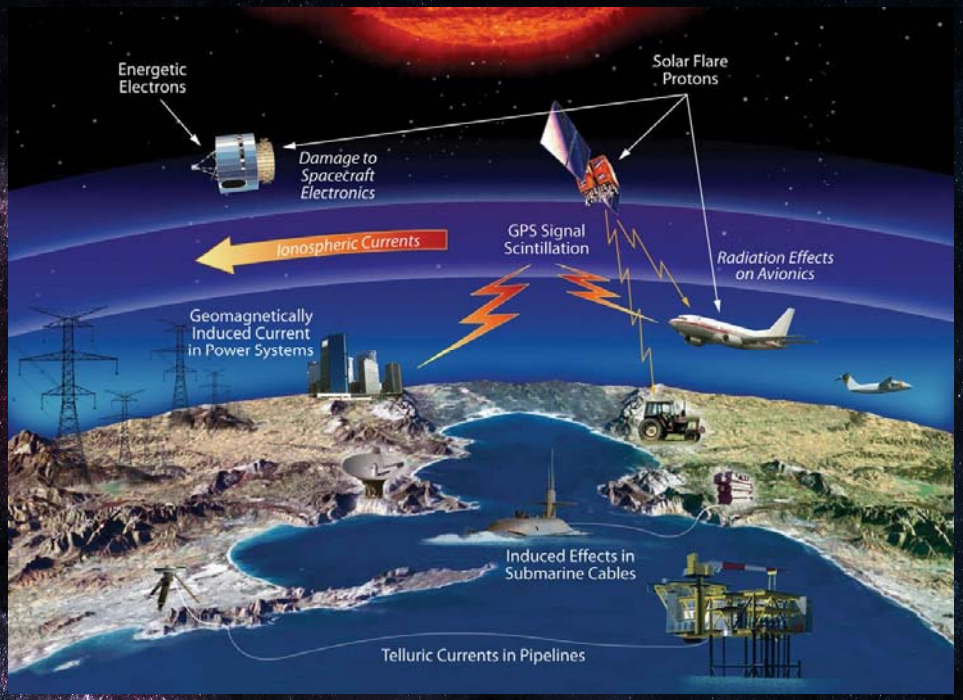
Space Weather Public Awareness and Response: Possible Ways Forward



Space Weather Enterprise Forum

Silver Spring, MD
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Outline of Remarks

- Why Space Weather Matters
- Public Perception of Space Weather
- Efforts to Raise Public Awareness and Readiness
- Suggested Strategies and Implementation Measures

Why Space Weather Matters

National infrastructure and services are complex and interdependent; a major outage in any one area has a widespread impact.

"Potential damage resulting from these critical dependencies can be minimized by having a robust capability to monitor, model, and predict what is happening in the space environment."

Ref: National Research Council (NRC) report, "Severe Space Weather Events" (2008)

Examples of dependencies and impacts

Global Satellite Communications: Widespread service disruptions impact everything from National-level decisions to financial, telemedicine, and internet services.

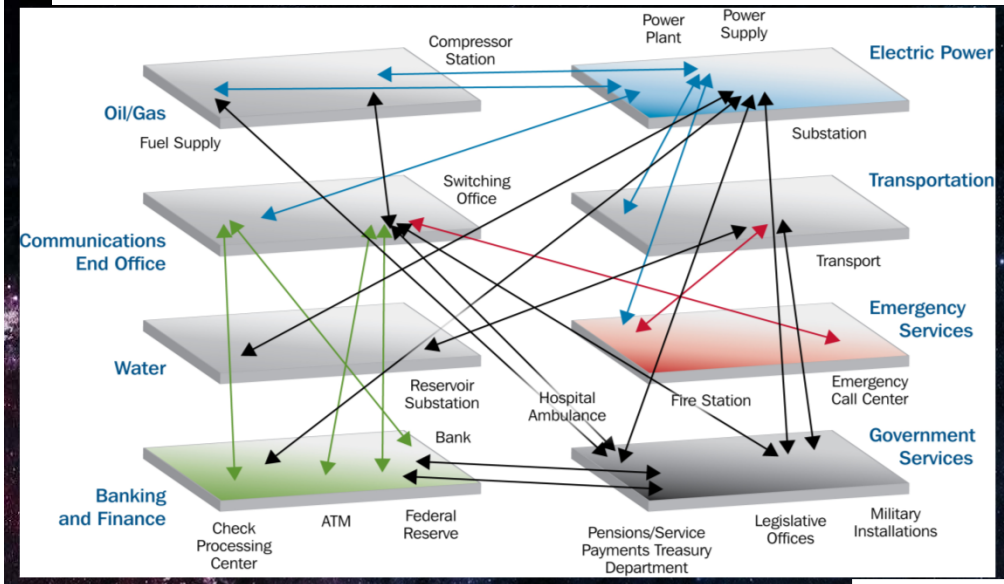
GPS Positioning: Degraded military weapons accuracy, increased collateral damage, degraded air traffic management, transportation, precision survey/construction, ship navigation/commerce, etc.

Satellites & Spacecraft: Loss of satellites and capabilities, loss of space situ awareness (detection of hostile actions), increased probability of satellite-debris collisions, degraded communication, navigation, astronaut safety, etc.

Air and Missile Defense: Accuracy and reliability of radars to identify threats.

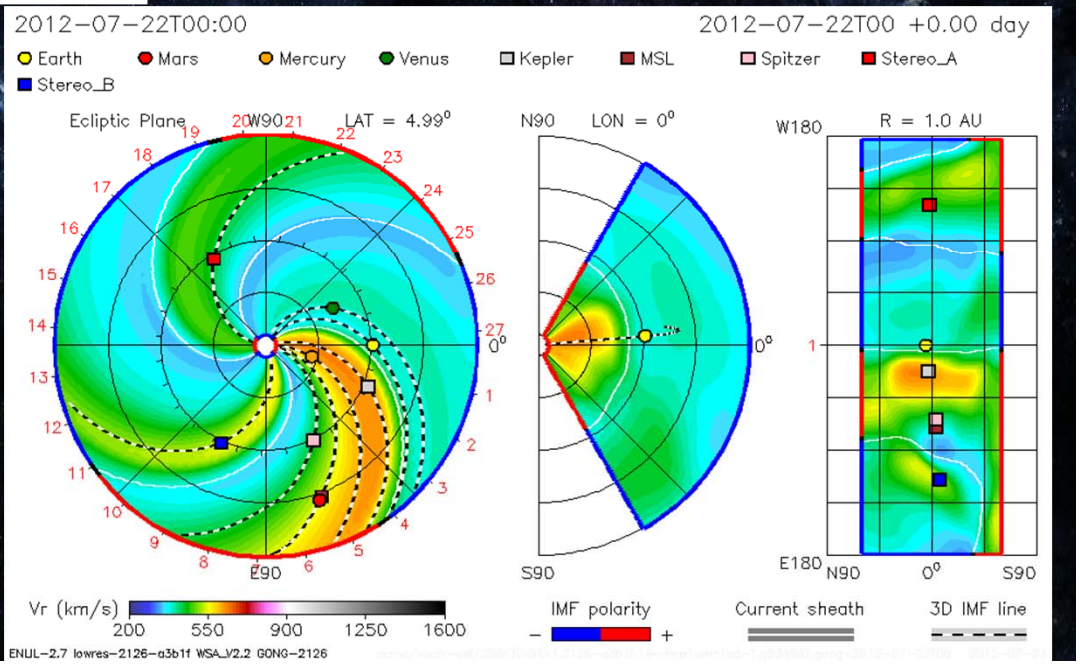
Space environmental monitoring provides actionable information to operators and decision makers that can mitigate these risks and impacts.

Why Space Weather Matters



Our modern societal infrastructure shows an incredible set of interdependencies (NRC, 2008)

Even in this recent moderate sunspot activity period, there still have been hugely powerful solar disturbances that could have damaged technical systems.

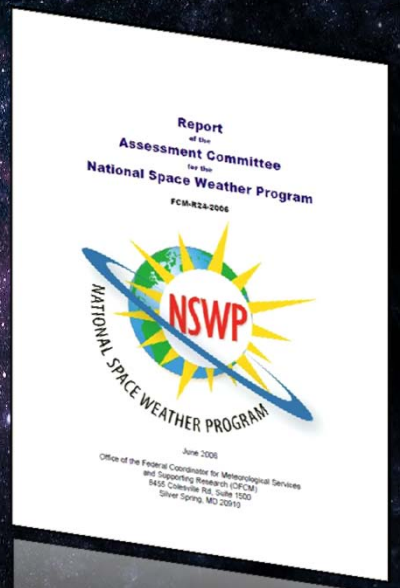


Statement of the Issue

Although the public is becoming aware of space weather, people can be quite confused and have limited understanding of the relevance in their daily lives.

2006 Assessment of the NSWP Public Awareness Recommendations

- **Independent Assessment of the NSWP provided 23 recommendations overall in four key areas:**
  - **Increasing program effectiveness through centralize program management, funding priorities, and collaboration**
  - **Maintain continuity of critical data sources**
  - **Strengthen the science-to-user chain**
  - **Emphasize public and user awareness**



R3.7.1. The NSWP must enhance its efforts to educate the U.S. Government and wider technical communities and the public on the importance of strategic research and space situational awareness to national interests, and particularly the possible consequences of space weather events to those interests.

R3.11.2. The NSWP should work with the private sector to ascertain better than currently is understood the economic and social values of space weather knowledge and the resulting products and services.

R3.10.1. The NSWP agencies should make a more unified and concerted effort to educate a new generation of professionals who have the systems view of space weather.

NSWP Strategic Goals

- Discover and understand the physical conditions and processes that produce space weather and its effects.
- Develop and sustain necessary observational capabilities.
- Provide tailored and accurate space weather information where and when it's needed.
- Raise national awareness of the impacts of space weather.
- Foster communications among government, commercial, and academic organizations.

Available at http://www.ofcm.gov/nswp-sp/fcm-p30.htm

NSWP and US Government Actions

The member agencies, particularly NASA, NSF, and NOAA, engage in activities to raise public awareness of space weather impacts and improve readiness.

- Annual Space Weather Workshop (SWW)
- Annual Space Weather Enterprise Forum (SWEF)
- NASA TV and public education
- National Space Weather Portal website

  (http://www.swpc.noaa.gov/portal/)

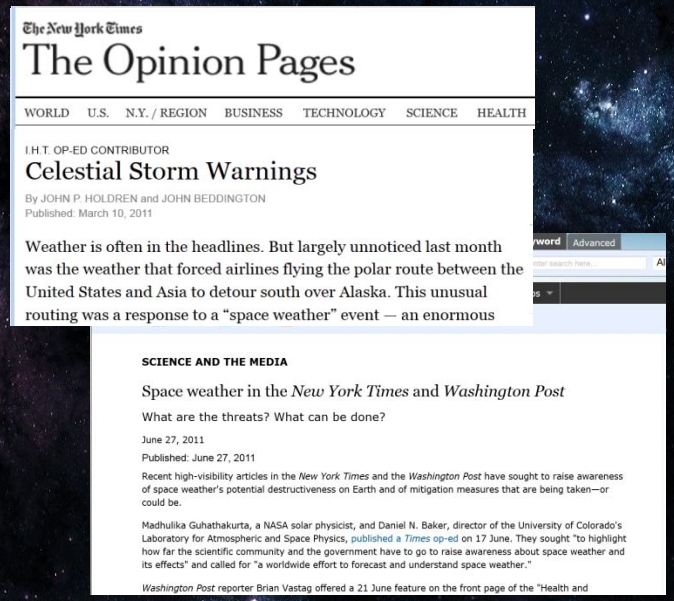
Private / Public Actions

- American Geophysical Union (AGU) Conferences
- AGU ***Space Weather*** Journal

  http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1542-7390
- American Meteorological Society (AMS) Conf.
- National Research Council (NRC) studies

Other Actions

- Media coverage (good and bad)
- High profile OpEds published
- Numerous news and feature articles

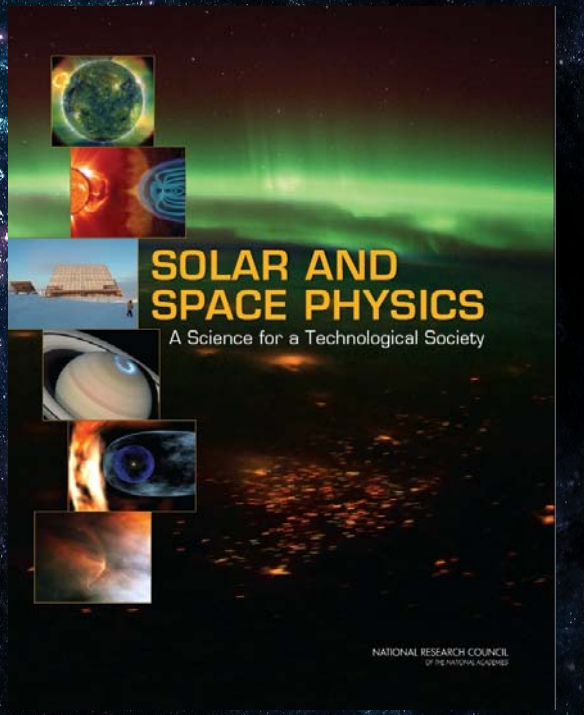


Assessment of Actions

The public is still confused, often inappropriately worried, and insufficiently prepared regarding space weather and its potential impacts.

Decadal Survey Findings

- The NRC Decadal Survey DRIVE initiative offers important, affordable guidance
- In order to develop and sustain interest in solar and space physics and ensure nurturing of the next generation of Solar and Space Physics professionals, investment must be made in education and public awareness activities.



Workshop Proposal

- A coordinated national approach and effort is needed
- The NSWP agencies should conduct or sponsor a focused (2-day) Space Weather Public Awareness and Response Workshop to address the following PAR questions:
  - What is each agency/industry now doing?
  - What does each group regard as its desired "state"?
  - What can/should be done to fill identified gaps?
  - How can all NSWP partners work (together) toward better PAR efforts?
- The Workshop objectives would be to:
  - Define immediate near-term steps
  - Define longer term vision
- Such a workshop could be conducted by the National Research Council at a minimal cost to government

NSWP Planning for Public Awareness and Response

- Results of space weather PAR workshop could be used to develop an NSWP PAR strategy and the NSWP Implementation Plan.
- Development of an NSWP PAR plan should also include media relations, a review of formal space weather educational efforts and recommendations for improvement.

Summary

- Although the public, industry, and policy makers are becoming aware of space weather, they often can be confused and have limited understanding of the relevance in their daily lives and affairs.
- NSWP agencies should work in a more cohesive manner to ensure that consistent and effective PAR activities are planned and executed.
- The NSWP should not wait to update its Implementation Plan to develop a space weather PAR strategy, plan, and procedures to help the public prepare for potential space weather impacts.