



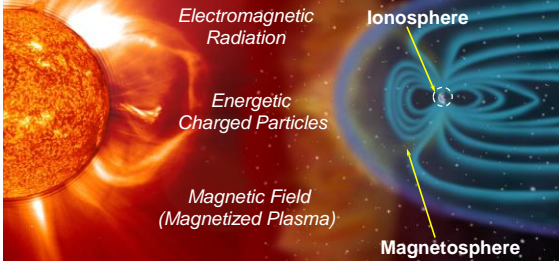
Risks of Space Weather

The National Space Weather Strategy

AMS Washington Forum
April 12, 2016


What is space Weather

Space weather refers to the variable conditions on the Sun and in space that can influence performance and reliability of space and ground-based technological systems, and endanger life or health.



Geomagnetic Storms

Coronal Mass Ejections (CMEs) create geomagnetic storms



Severe Space Weather – Societal and Economic Impacts




Impacts occur even with relatively minor activity...



Lloyds Report (21 May 2013): Solar Storm Risk to the North American Electric Grid

- US population at risk of extended power outage: **20-40 mil**
- Duration: **16 days to 1-2 years**
- Economic cost: **\$0.6-2.6 trillion USD**
- Highest Risk: **DC-NYC corridor**
- Gulf Coast states, including **Florida**, identified as a **"high risk" area**.



www.lloyds.com/news-and-insight/risk-insight

National Space Weather Strategy

A cohesive all-of-government strategy was necessary to ensure the federal government was positioned to mitigate, respond to and recover from a major space weather storm

Nov 2014 – Space Weather Operations, Research, and Mitigation (SWORM) Task Force is established

Tasked to develop:

- National Space Weather Strategy (NSWS)
- Space Weather Action Plan



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National Space Weather Strategy and Action Plan (Oct 2015)



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



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Risks of Space Weather

- **Mark MacAlester**, FEMA, Washington, DC - *Preparing the Nation for the Risks of Extreme Space Weather*
- **Thomas H. Fahey III**, Delta Airlines, Atlanta, GA - *Risks of Space Weather: A Commercial Aviation Perspective*
- **Sten Odenwald**, NASA Goddard Spaceflight Center - *Severe Space Weather and Satellite Vulnerability*
- **Frank Koza**, PJM, PA - *Space Weather Power System Impacts and PJM Response*

