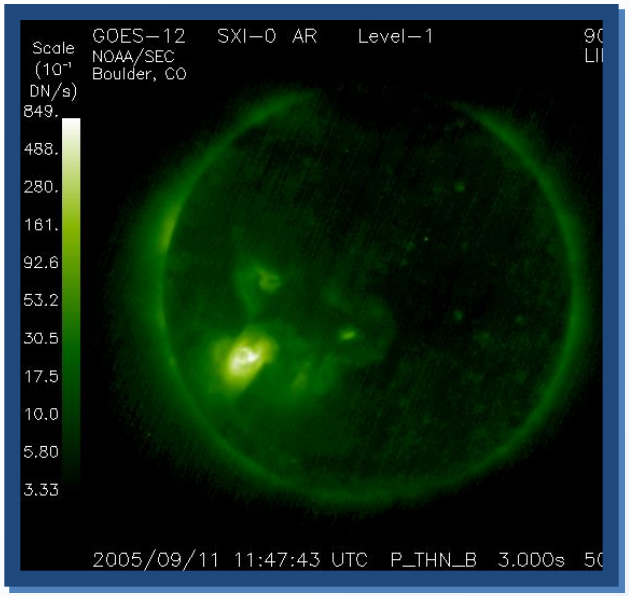
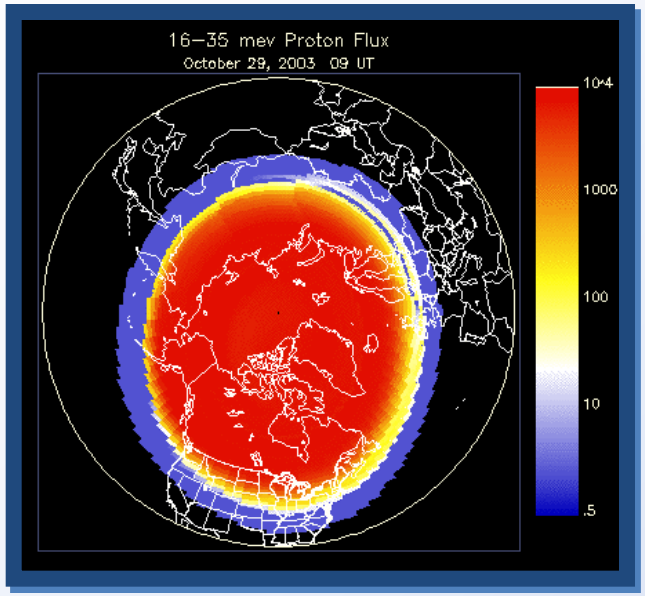
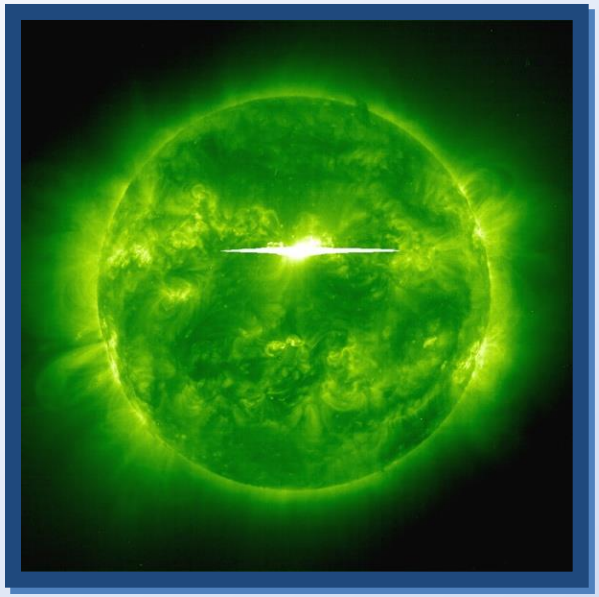






Meeting the Nation's Evolving Needs for Space Weather Services

Laura Furgione

NOAA Deputy Assistant Administrator for Weather Services

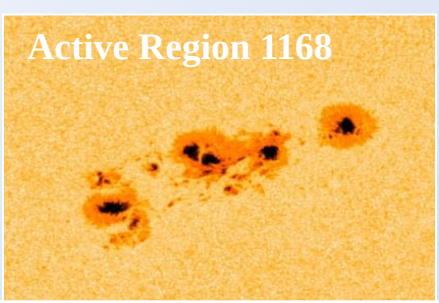
Deputy Director, National Weather Service

Boulder, CO

April 27, 2011

The Sun Awakes!
Feb. 15-17, 2011

- First X-class flare of Solar Cycle 24
- Largest flare since Dec 2006
- Huge jump in monthly sunspot number in Feb-Mar
- Space weather on mainstream media



The Washington Post

AT A GLANCE

Fri Sat Sun

Posted at 9:40 AM ET, 02/17/2011

Solar Flare 2011: Aurora alert

By Steve Tracton

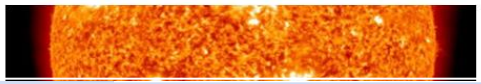
BBC Mobile News | Sport | Weather

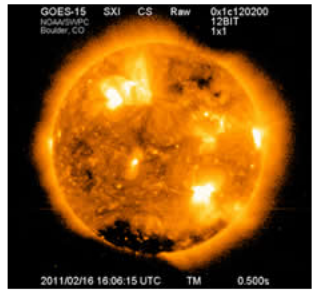
NEWS SCIENCE & ENVIRONMENT

16 February 2011 Last updated at 10:36 ET

Sun unleashes huge solar flare towards Earth

By Paul Rincon
Science reporter, BBC News

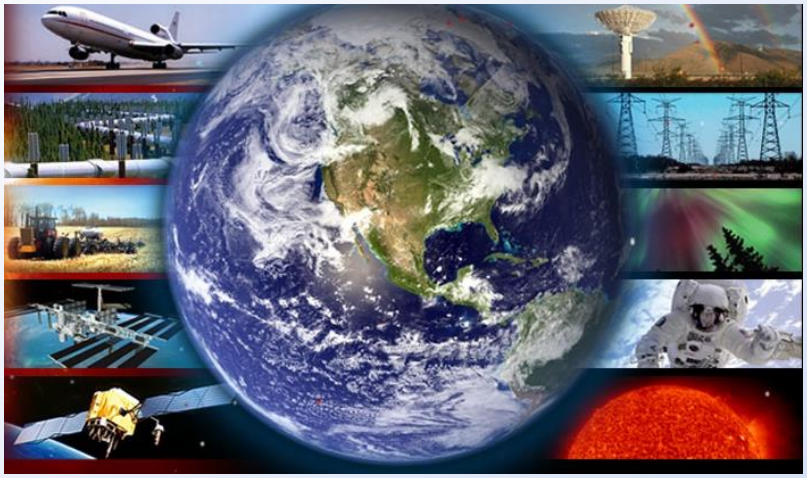




From NOAA: "Bright and dark regions of the Sun in this solar X-ray image help researchers

A Weather-Ready Nation

GOAL – Society that is prepared for and responds to space weather-related events



Customer growth

Critical observations

Partnerships

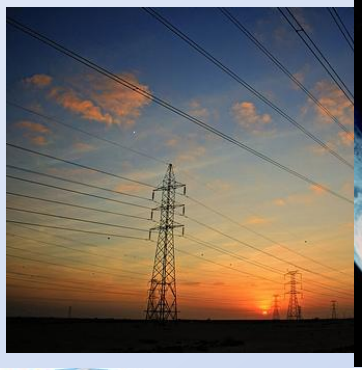
Drivers for Space Weather Services

Evolving customers and industries:

- *Arctic economic development*
- *Airspace management needs*
- *Emergency Management*
- *Commercial space enterprise*

Evolving technologies:

- *Civil precision Global Navigation Satellite Systems*
- *Power Grids*
- *Satellites (private and government)*



Drivers for Space Weather Services

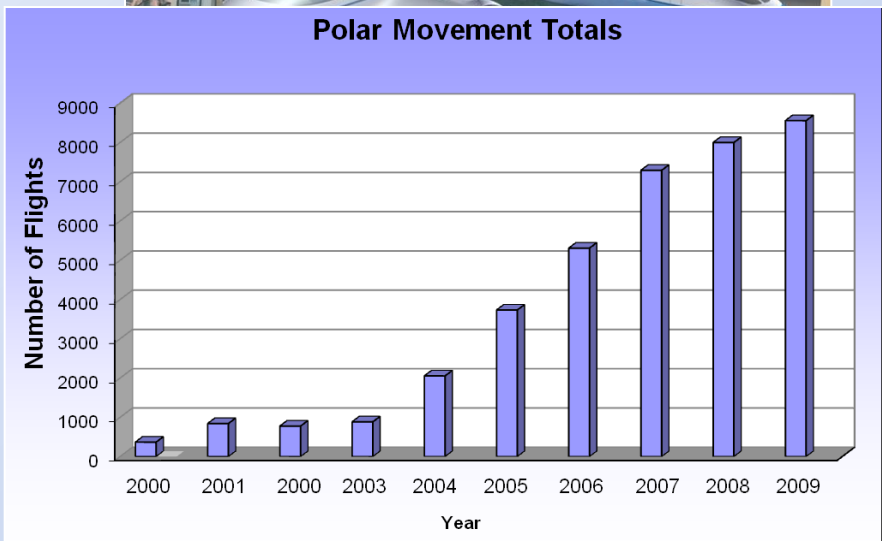
The Arctic

- Aviation polar operations
- Drilling
- Sea Navigation
- Communications
- Search and Rescue
- Pipelines

Drivers for Space Weather Services

Future Demands for Airspace Management

- **Communications**
  - *Radio blackouts*
- **GPS**
  - *Degraded navigation capability*
- **Radiation**
  - *Increased radiation exposure*
- **Avionics**
  - *Impacts on semi conductors, power transistors and other sensitive electronics*

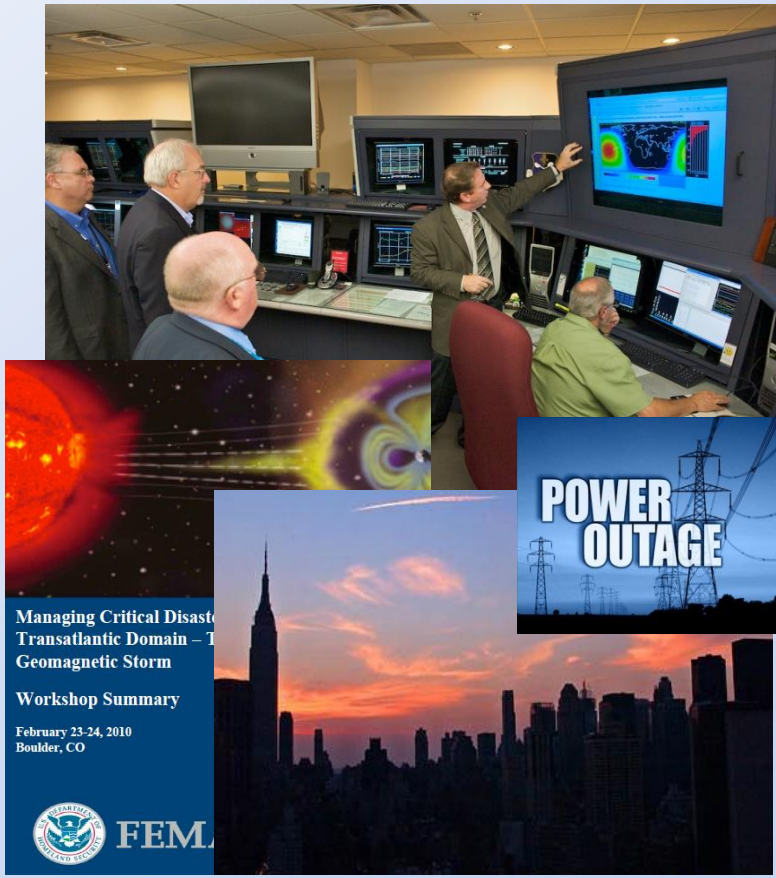


Drivers for Space Weather Services

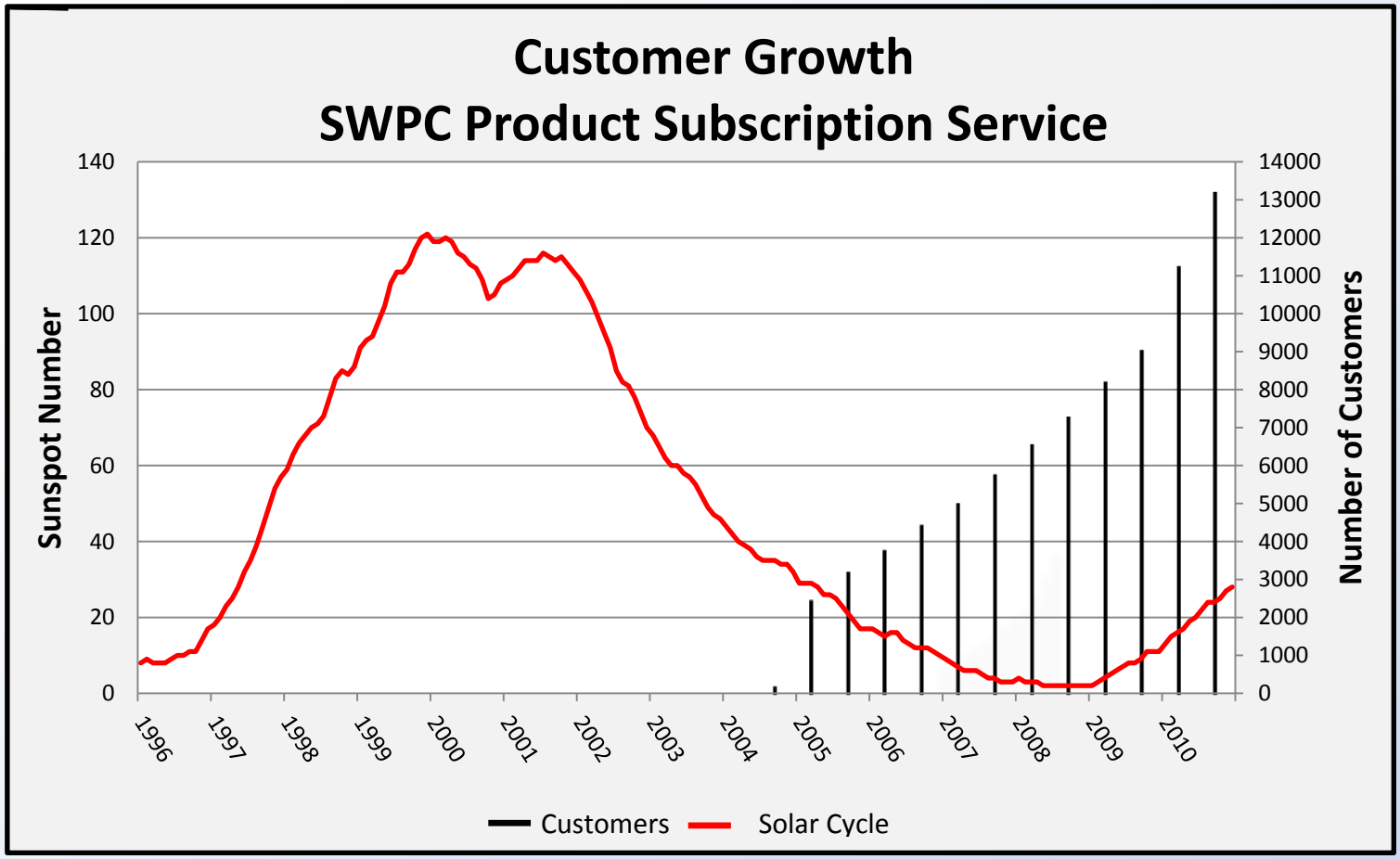
Space Weather and Emergency Response

SWPC is working with FEMA and other emergency organizations

- *SWPC providing warnings to FEMA, the National Communications System, and State Emergency Management*
- *Space weather being incorporated into Federal and State exercises*
- *SWPC assisting with planning and mitigation efforts underway*



Fast Growing Demand for Space Weather Products



Sample Recent Registrants

SES Satellite	Inmarsat	FEMA	Boeing	FAA
Alaska DOT	Chrysler	Motorola	British Petroleum America	Bonneville Power Administration
Washington St. Dept of Transportation	John Deere & Caterpillar, Inc.	Major Airlines – UAL, AA, CO, Delta	United Launch Alliance	Salem and Hope Creek Nuclear Stations

Multiple critical infrastructures impacted

NOAA's Commitment to Improved Operations

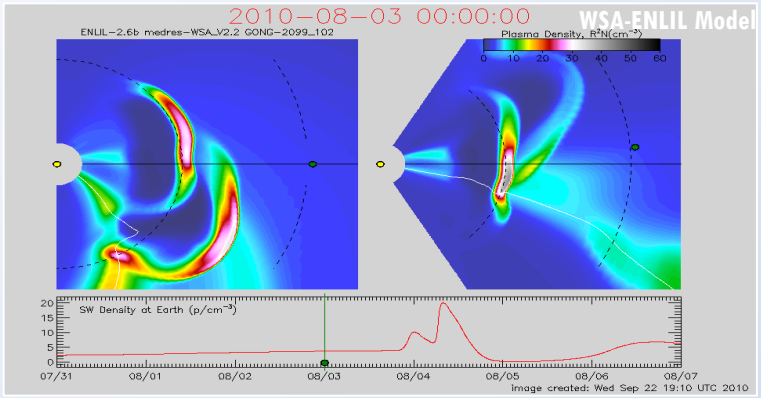
Continue and Expand Coverage of Critical Observations

- **L1 Mission – Deep Space Climate Observatory (DSCOVR)**
  - *In President's FY2011 and FY2012 Budget*
  - *Request NASA/NOAA/DoD Tri-agency partnership*

- **COSMIC II – President's budget supports initial launch in 2014. Proposed partnership with Taiwan –**
  - *Taiwan to provide: 12 spacecraft and integration of payloads onto spacecraft, ground system command & control*
  - *NOAA to provide: 12 payloads (receivers), 2 launches, ground system data processing*
- **GOES R – Continue critical measurements and introdu improved sensors and capabilities ~2015**

NOAA's Commitment to Improved Operations

New Models and Products



- **Model transition**
  - *WSA-Enlil*
- **Space Weather Prediction Testbed**
  - *Geospace Model - The Whole Atmosphere Model*
- **Upgrade operational product suite – critical new data sets**
  - *Geomagnetic Storm Products*
  - *USGS and INTERMAGNETIC data*

Meeting Our Nation's Needs

Space weather being addressed at all level of government. Government working on ways forward to develop and implement mitigation strategies to safeguard critical infrastructure from the impacts of severe space weather.

- *Secure High-voltage Infrastructure for Electricity from Lethal Damage Act (SHIELD Act) (11 Feb, 2011)*
- *Meeting at White House with National Security Staff and OSTP (18 Feb, 2011)*
- *OpEd on space weather by Chief Science*
- *Advisors - John Holdren (OSTP) and Sir John Beddington (UK Government) (10 Mar,2011)*
- *Electric Infrastructure Security Summit (EISS) in Capitol building (11 Apr, 2011)*


The New York Times
The Opinion Pages
WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH
I.H.T. OP-ED CONTRIBUTOR
Celestial Storm Warnings
By JOHN P. HOLDREN and JOHN
Published: March 10, 2011
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The New York Times
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OP-ED CONTRIBUTOR
The Sun Also Surprises
By LAWRENCE E. JOSEPH
Published: August 15, 2010
Los Angeles
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International Developments
Global Threat – Global Response

Space Weather Now Part of UN

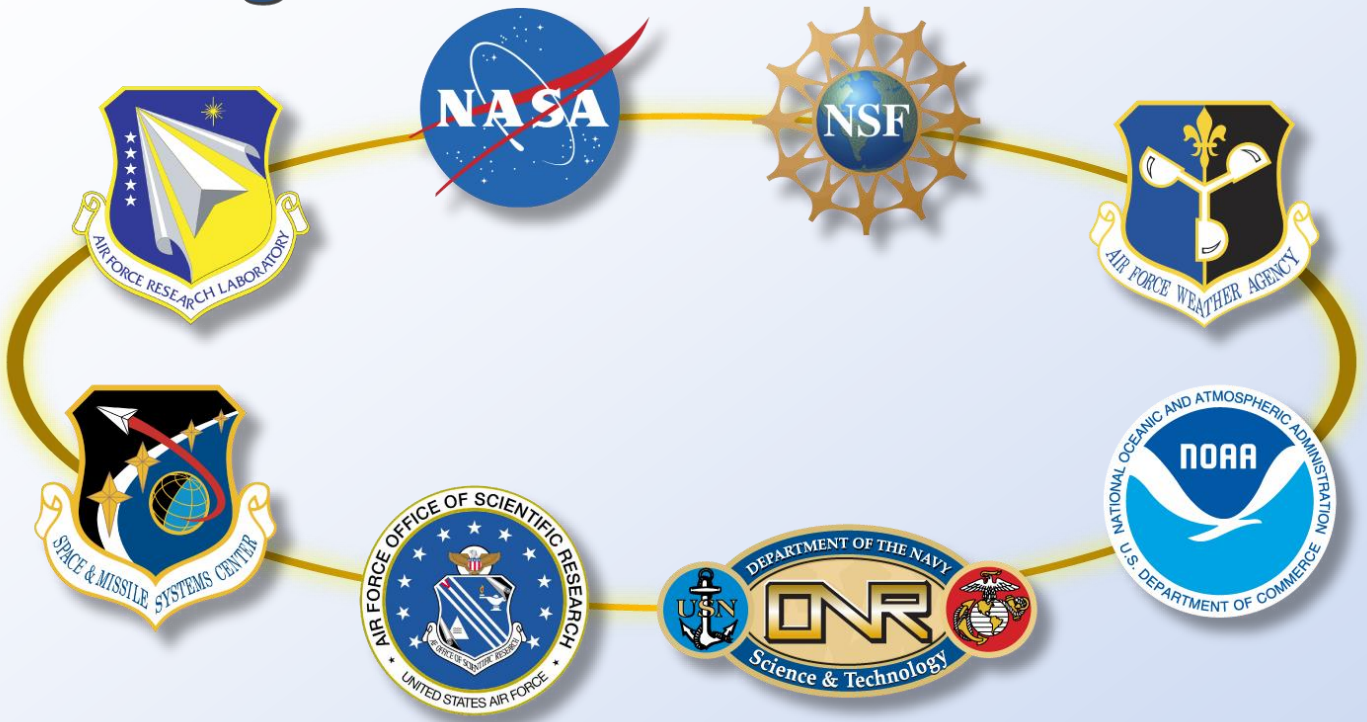
- *World Meteorological Organization*
- *International Civil Aviation Organization*

International Space Weather Operations

- *UK Met Office*
- *Korean Radio Research Agency*
- *European Space Agency*

NWS assisting and partnering in global efforts

Partnerships: A Critical Element for Meeting National and Global Needs



Other Partners

ICAO · OACI · ИКАО

ISES

USGS
science for a changing world

Private Sector

Academia

Interagency Collaboration is critical to achieve goals


NATIONAL WEATHER SERVICE