

NOAA Agency Report Highlights of Activities

Howard J. Singer

NOAA Space Weather Prediction Center

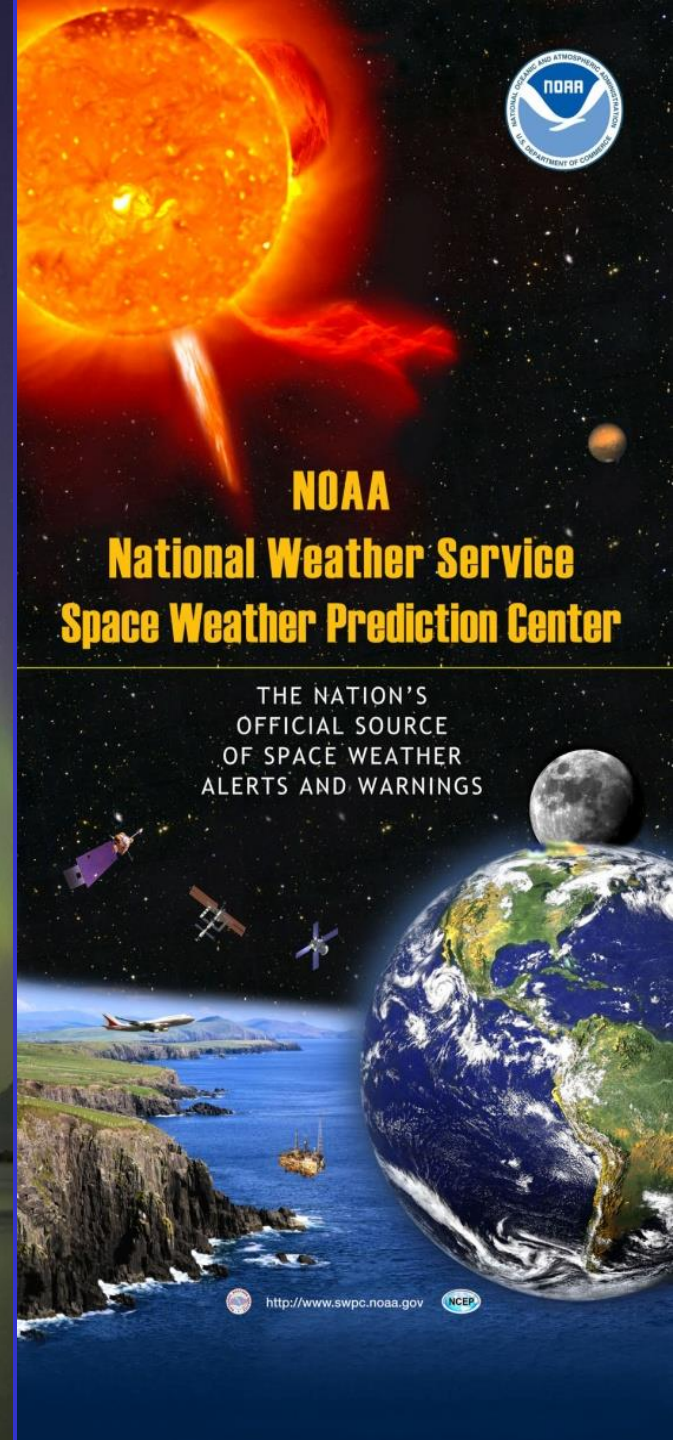
With contributions from

Janet Green and Rob Redmon

National Geophysical Data Center

GEM Workshop
June 19, 2013

Acknowledgments: Biesecker, Gordon,
Kunches, Murtagh, Onsager, Viereck



NOAA
National Weather Service
Space Weather Prediction Center

THE NATION'S
OFFICIAL SOURCE
OF SPACE WEATHER
ALERTS AND WARNINGS

<http://www.swpc.noaa.gov> NCEP

Executive Office of the President



Geomagnetically Induced Currents Interagency Working Group

- Formed by Office of Science and Technology Policy to address space weather threat.
- Membership includes NOAA, USGS, NASA, NSF, DoD, DOE, DHS, NRC, FERC
- White House wants action....gets updates during space weather outbreaks.



Strategic National Risk Assessment

Executed in support of Presidential Policy Directive 8 (PPD-8): Identifies incidents that pose greatest threat to the Nation's security

Threat/ Hazard Group	Threat/Hazard Type	National-level Event Description
Natural	Animal Disease Outbreak	An unintentional introduction of the foot-and-mouth disease virus into the domestic livestock population in a U.S. state
	Earthquake	An earthquake occurs within the U.S. resulting in direct economic losses greater than \$100 Million
	Flood	A flood occurs within the U.S. resulting in direct economic losses greater than \$100 Million
	Human Pandemic Outbreak	A severe outbreak of pandemic influenza with a 25% gross clinical attack rate spreads across the U.S. populace
	Hurricane	A tropical storm or hurricane impacts the U.S. resulting in direct economic losses of greater than \$100 Million
	Space Weather	The sun emits bursts of electromagnetic radiation and energetic particles causing utility outages and damage to infrastructure
	Tsunami	A tsunami with a wave of approximately 50 feet impacts the Pacific Coast of the U.S.
	Volcanic Eruption	A volcano in the Pacific Northwest erupts impacting the surrounding areas with lava flows and ash and areas east with smoke and ash
	Wildfire	A wildfire occurs within the U.S. resulting in direct economic losses greater than \$100 Million

Precision Farming - optimize returns on inputs and preserve resources while reducing environmental risks

“I work with a John Deere Dealer group in North Dakota. We encounter many problems with our GPS Auto Steer etc. when K-Indexes are high and I have signed up for alerts from you. We are working to set up a mass text message system that will go out to all our customers warning them of when problems will arise. This would save us many problems, headaches, and probably 1000+ phone calls per day companywide with our GPS technicians.”

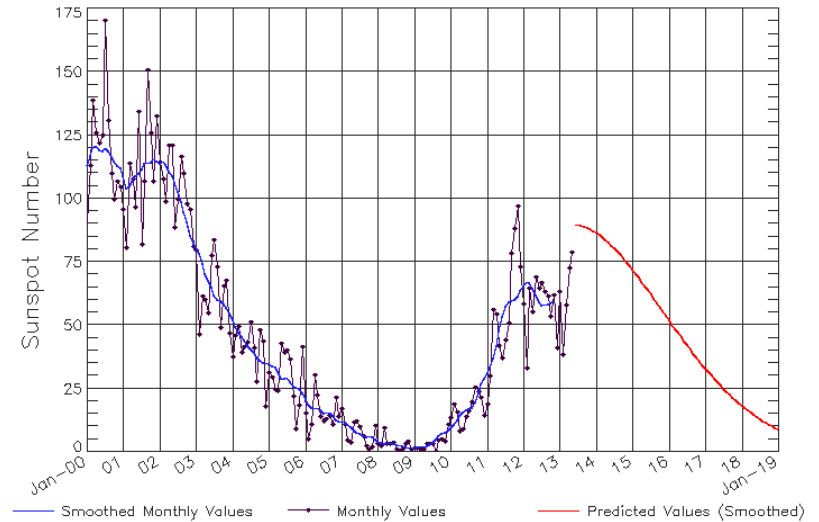
- Apr 2012



Solar Cycle Prediction

May 8, 2009 -- The Solar Cycle 24 Prediction Panel has reached a consensus decision on the prediction of the next solar cycle (Cycle 24). First, the panel has agreed that **solar minimum occurred in December 2008**. This still qualifies as a prediction since the smoothed sunspot number is only valid through September, 2008. The panel has decided that the **next solar cycle will be below average in intensity, with a maximum sunspot number of 90**. Given the predicted date of solar minimum and the predicted maximum intensity, solar maximum is now expected to occur in **May 2013**. Note, this is a consensus opinion, not a unanimous decision. A supermajority of the panel did agree to this prediction.

ISES Solar Cycle Sunspot Number Progression
Observed data through May 2013

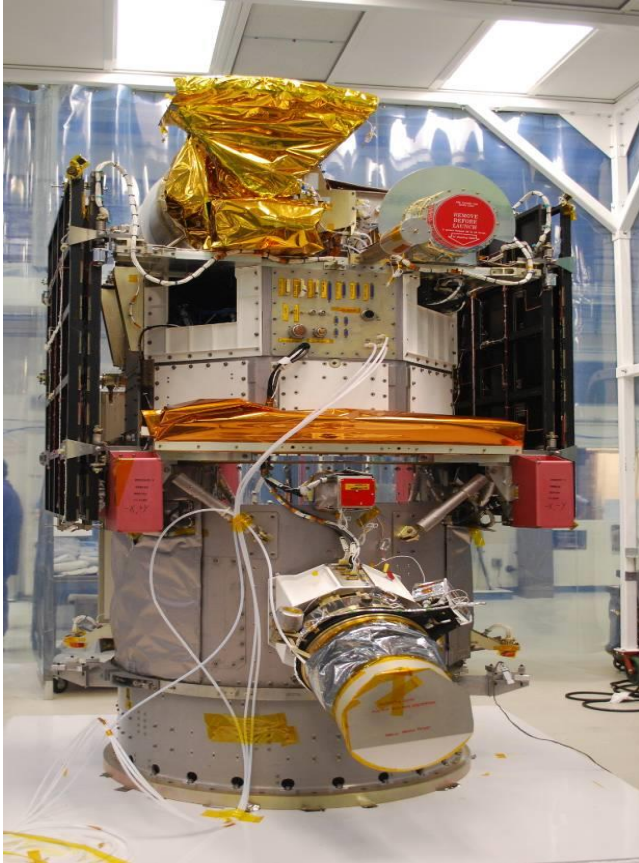


Updated 2013 Jun 3

NOAA/SWPC Boulder, CO USA



Deep Space Climate Observatory (DSCOVR) Solar Wind Mission Operational Space Weather Data from L1

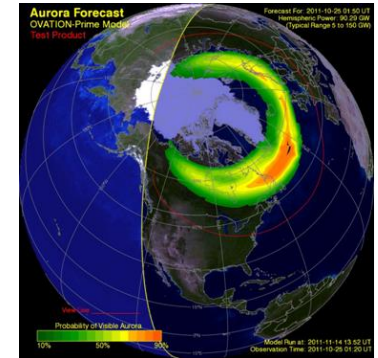
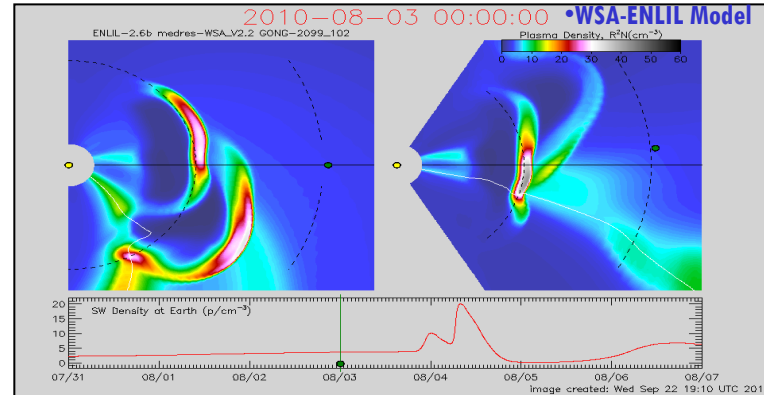


- The DSCOVR spacecraft is being refurbished and readied for launch Nov 2014
- Satellite and sensors transferred to NOAA from NASA
- Refurbishment of satellite and Plasma-Mag sensors was completed at NASA/GSFC under reimbursement by NOAA
- USAF will launch on a Space-X Falcon 9 launch (co-manifested with Sunjammer)
- All data will be downlinked to the Real Time Solar Wind Network (RTSWnet)
- Activities for ground-based validation of instrument performance have been completed
- NOAA has been investigating long-term commercial solutions for future solar wind observations

NOAA's commitment to improved operations

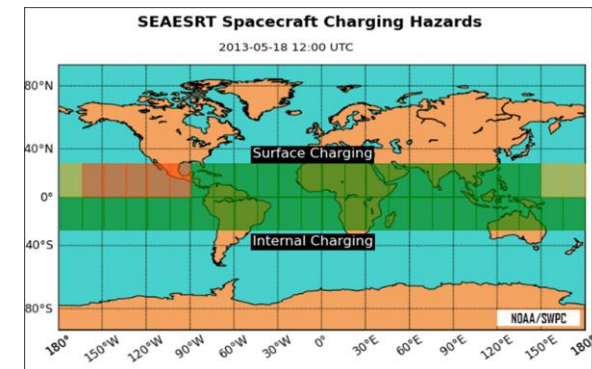
New Models and Products

- **Model transition**
- WSA-Enlil
- OVATION (2012)
- SEAESRT (2013)

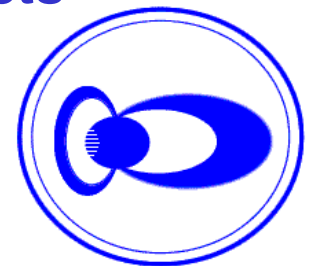


OVATION

- **Space Weather Prediction Testbed**
- Geospace Model (selection 2013)
- The Whole Atmosphere Model (ops 2017)



- **Upgrade operational product suite – critical new data sets**
- Geomagnetic Storm Products
- USGS and INTERMAGNET data
- International Partners – magnetometer data





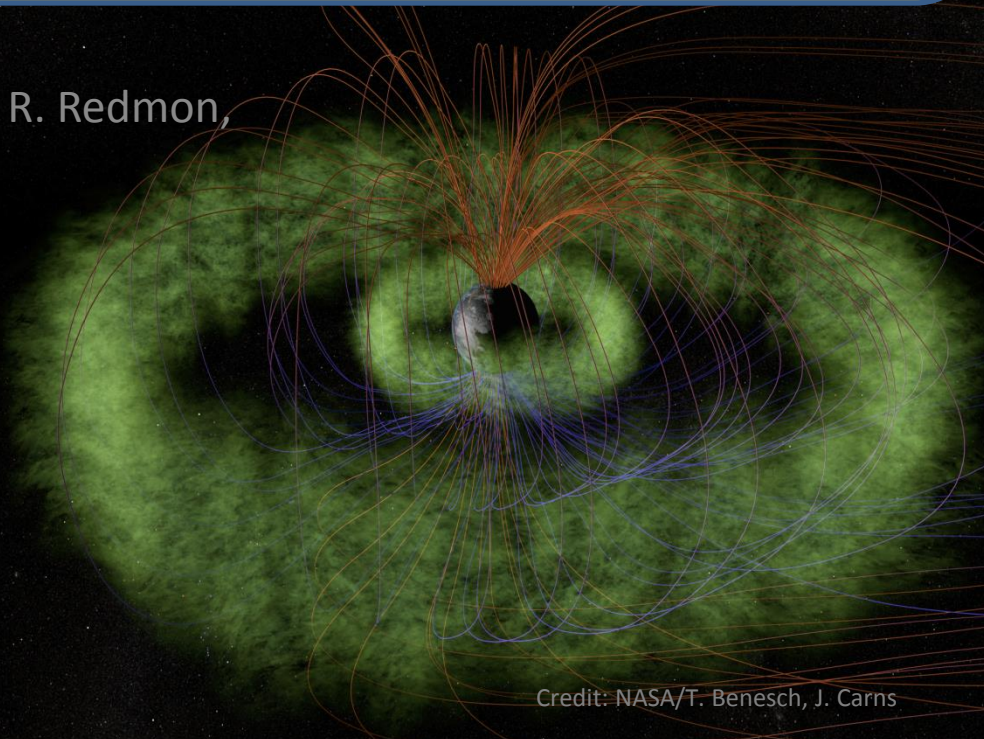
Additional NOAA Highlights



- **Partnerships** - Interagency, International, Commercial, Universities...
- **Space Weather Workshop** – 2012: 233 registered attendees, 19 nations; next year 4/16 to 4/19 2013; NASA and NSF partners
- **GOES Status** – -13 and -15 operational, -14 in storage; Planned: GOES-R 2015
- **POES** - NOAA 15,16,18,19 operational; METOP- A and B in operations; METOP C planned; NPOESS – becomes Joint Polar Satellite System (JPSS) for NOAA – No Space Environment Monitor
- **NRC Associateship:** no funding, will announce in newsletters when available
- **NOAA GOES and POES Instruments:** transition many SpWx functions to NGDC in NOAA NESDIS
- **Strategic National Risk Assessment:** Dept. Homeland Security includes Space Wx in Strategic National Risk Assessment
- **SWPC Director:** Brent Gordon appointed Acting Director

NEW NOAA data products and resources from the National Geophysical Data Center

Green, J.C., W. Denig, J. Rodriguez, R. Redmon,
S. Codrescu, D. Wilkinson





Outline

- New Data Products
 - POES status and improvements
 - DMSP improvements
 - GOES-R (launch 2015)
- New NOAA Resources under development
 - People Empowered Products (PeEPs)
 - SAIS (Satellite Anomaly Information Services)
 - NOAA SAIS data portal
 - Anomaly data base

POES Updates and Improvements

- Currently 6 satellites in orbit (NOAA 15,17,18,19, MetOp-A,B) carrying SEM-2 particle detector
 - NOAA 17 decommissioned March 2013
 - MetOp-B launched Sep 2012
 - MetOp-C expected launch 2016

- **New data processing provides**

- Real time access to data

(<http://satdat.ngdc.noaa.gov/sem/poes/data/processed/ngdc/uncorrected/full/>)

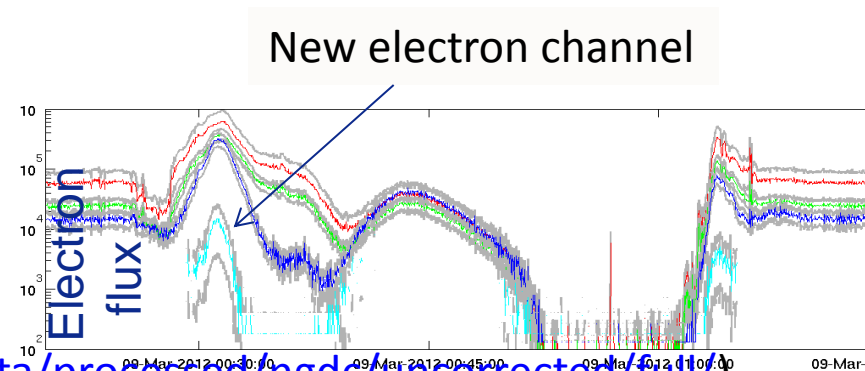
- Fluxes instead of counts using new techniques and reanalysis of responses

- Differential proton flux for high energy protons from omni detectors
- Electron flux for additional >800 KeV channel from 2 telescope detectors

- Error bars for all flux outputs

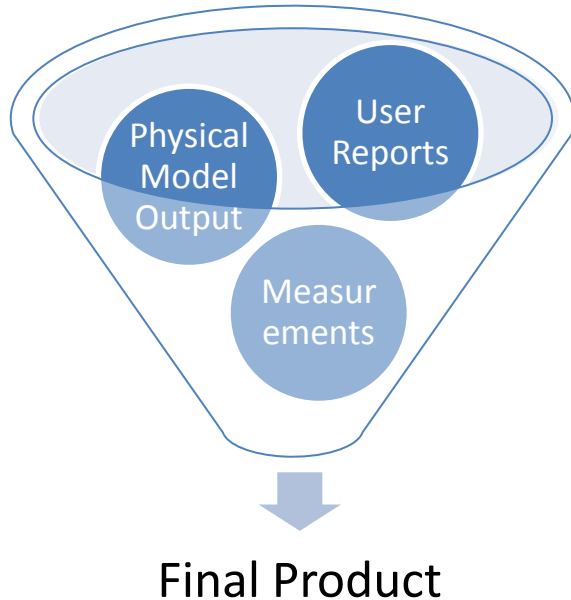
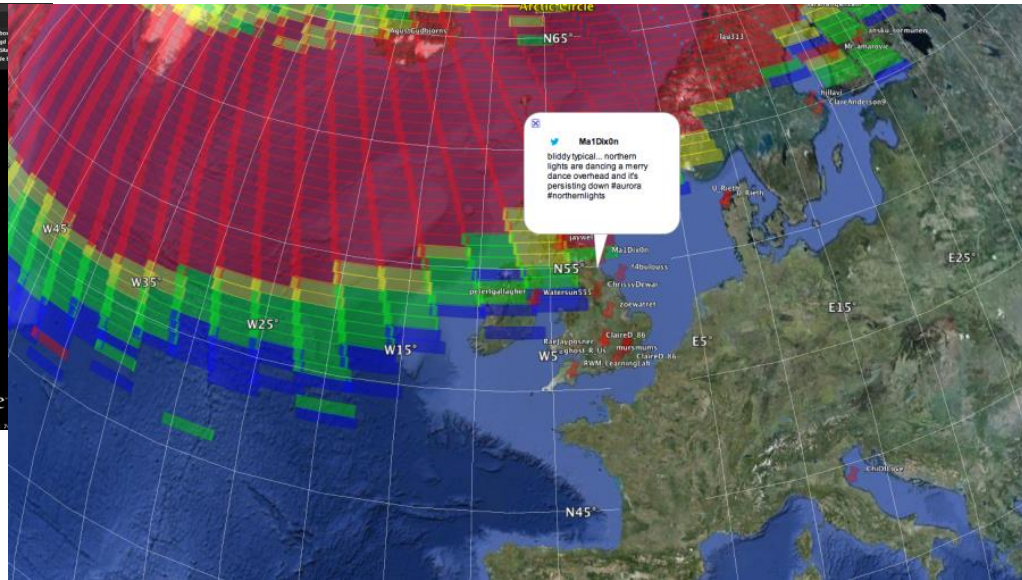
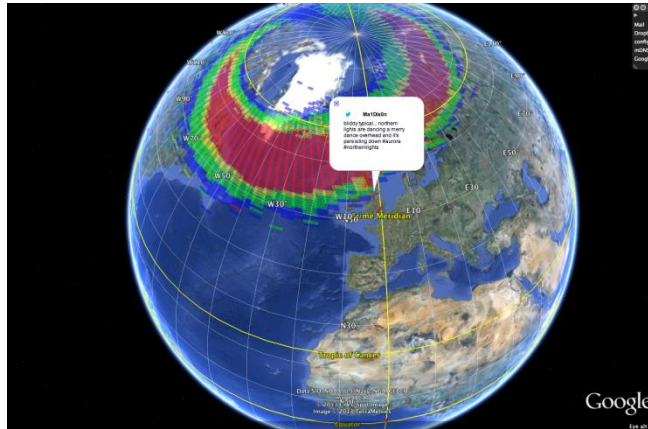
- More detailed documentation

<https://www.ngdc.noaa.gov/stp/satellite/poes/documentation.html>



People Empowered Products (PeEP)

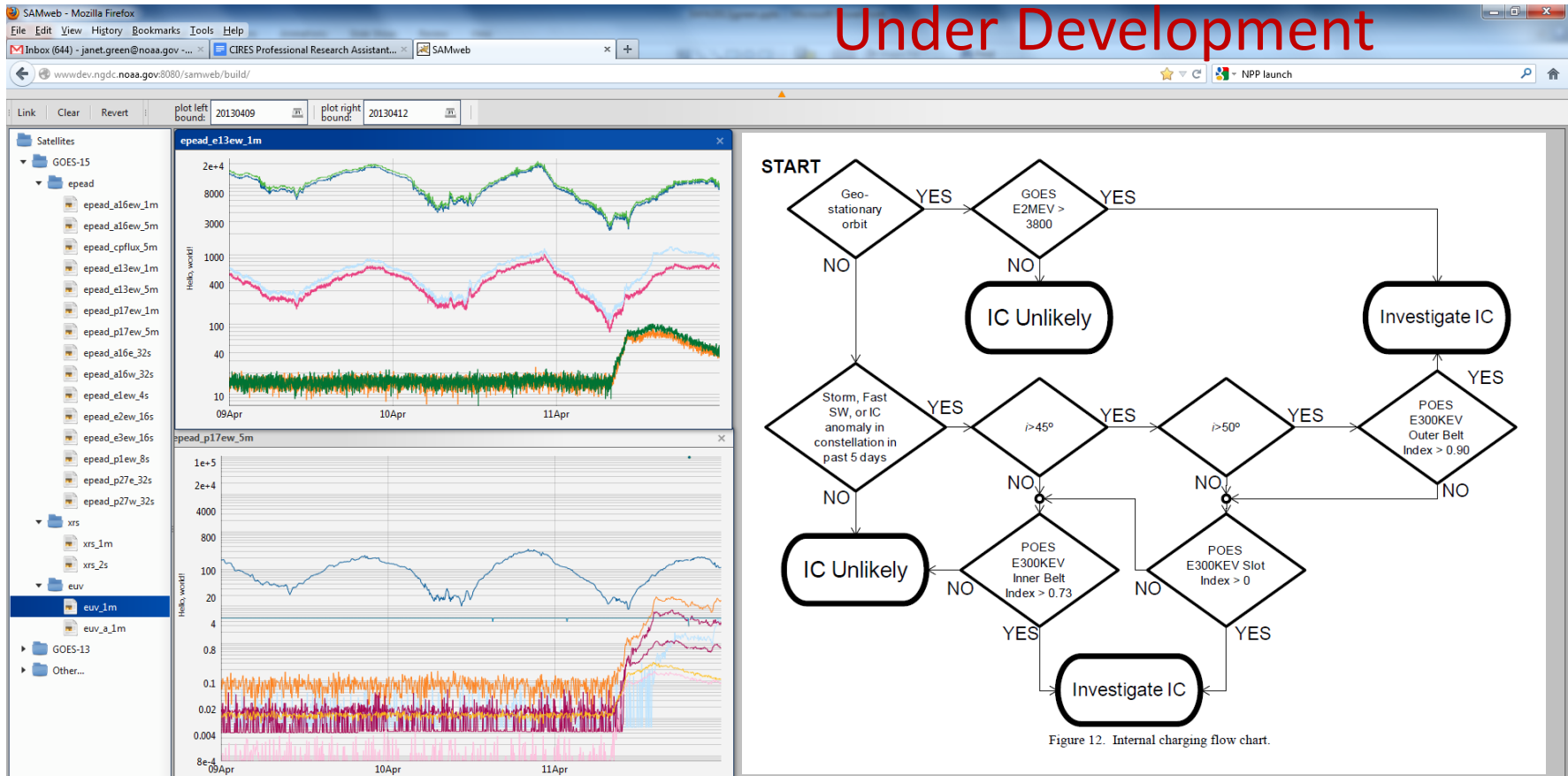
Incorporates user reports into NOAA real time and retrospective weather products



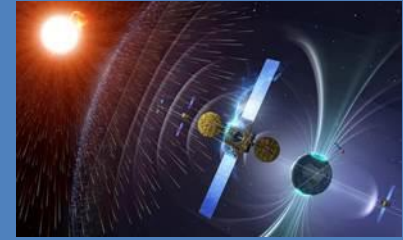
- New PeEP combines twitter auroral sightings with Ovation auroral model
- **Poster – “Using crowd sourced auroral observations to validate OVATION”, Codrescu et al. on Thursday #63**

NOAA SAIS: Satellite Anomaly Information Services Data Portal

- A one stop shop for data to quickly determine if an anomaly is related to the space environment
- The portal provides a standard palette that can be customized by the user and gives links to the data



Anomaly Database



- Community requests for an anomaly database
 - To develop models to predict when anomalies are likely
 - For designers to identify and correct space weather vulnerabilities
 - NOAA NGDC previously maintained a database
- NOAA SAIS will provide mechanism for reporting anomalies and accessing anomaly database
- Anomaly reports could be included with data and models using the PeEPS framework

Other Activities

- Magnetometer Scientist Position at NGDC
 - <http://www.jobsatcu.com/postings/63316>
 - <http://www.jobsatcu.com/postings/63275>
 - Contact Rob.Redmon@noaa.gov
- NGDC and NASA SPDF collaborating to increase availability of NOAA datasets (e.g. POES, GOES) to community through CDAWeb.