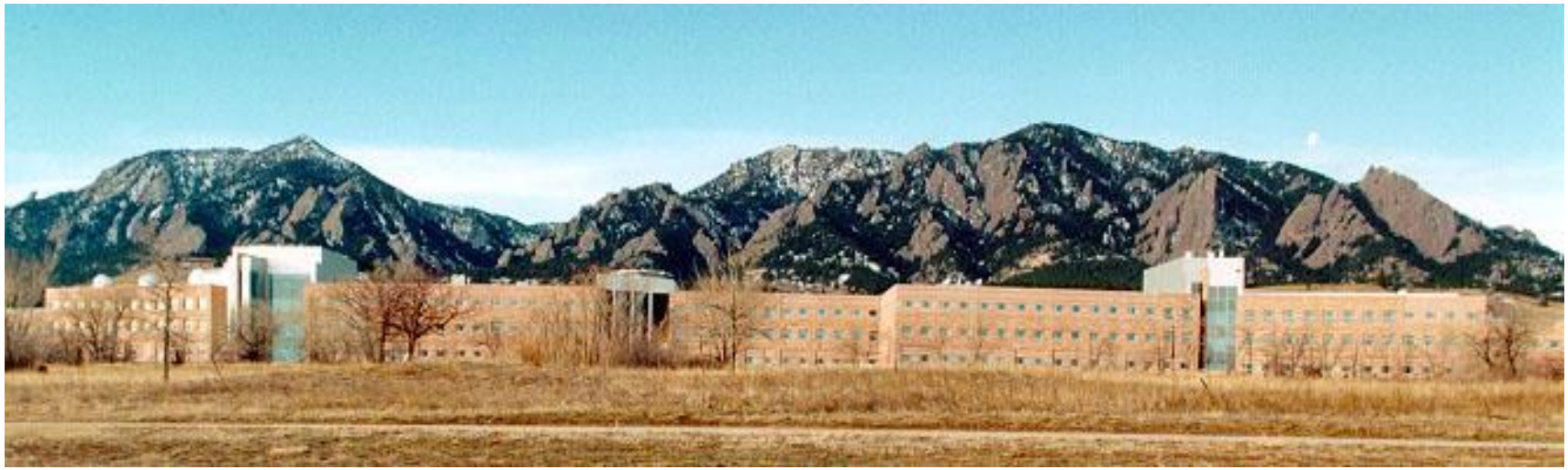


STP Quarterly Review

05 May 2010

2QFY10

Dr. William F. Denig, Chief

Solar & Terrestrial Physics Division

NOAA/NESDIS/NGDC

303 497-6323

William.Denig@noaa.gov

OUTLINE

Solar & Terrestrial Physics Division

- **STP Program Overview**
- **Milestones & Performance Measures**
- **Awards & Personal Achievements**
- **Accomplishments/Status Updates**
- **Special Interest Items**
- **Issues & Summary**

Solar & Terrestrial Physics Division
Personnel

Solar & Terrestrial Physics Division
William Denig/F, Chief
Janet Brown/F, Secretary
Karen Horan/F, Physical Science Tech
Craig Clark/F, Scientific Data Tech

Earth Observation Group (EOG)

Chris Elvidge/F, Team Lead
- Kim Baugh/C
- Ben Tuttle/C
- Tilottama Ghosh/C
- Daniel Ziskin/C

Space Environment Group (SEG)

Eric Kihn/F, Team Lead
- Terry Bullett/C
- Ray Conkright/C
- Ed Erwin/F
- Rob Redmon/F
- Dan Wilkinson/F
- Kelly Prendergast*/F
- Jim Manley/C
- Pat Purcell/C
- Paul Meade/CPI @ NGDC
- Peter Elespuru/C
- Anu Sundaravel/S
- Janet Machol/C @ SWPC
- John Schminky/S
- Preeti Bhaneja/C

Earth Geophysics Group (EGG)

Vacant/F, Team Lead
- Patrick Alken/C
- Rob Prentice/C
- Fran Coloma/C
- Justin Mabie/C
- Don Herzog/G

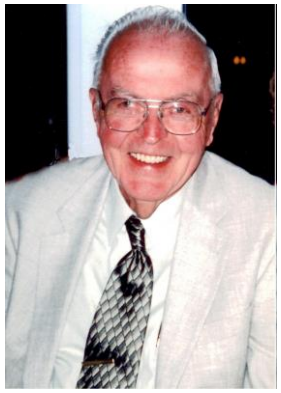
Key
F – Federal
C – CIRES/CIRA
S – Student
G – Guest Scientist

***On temporary assignment**

STP Division Overview
Personnel Changes

- **Gains**
  - Mikhail Zhizhin, Dmitry Mishin, Dmitry Medvedev – SPIDR/NEAAT
- **Losses**
  - Herb Sauer – Deceased (Guest Scientist)
  - NGS Colleagues – Moved downstairs
- **Re-Assignments**
  - Kelly Prendergast – Temporary assignment - ISD (01May10/120 days)
  - Eric Kihn – Temporary assignment - NOAA/TPIO (27May10/60 days)
- **Vacancies**
  - STP Real-time Data Manager – On hold
  - EOG Data Manager – On hold
  - SEM-N Deputy Program Manager/Systems Engineer – On Hold
- **Inbound**
  - None
- **Outbound**
  - None

STP Division Overview
NGDC Loses a Friend



Herbert H. "Herb" Sauer

December 9, 1929 - March 16, 2010

Dr Herb Sauer passed away peacefully on March 16, 2010 following a brief illness. Marion, his wife of 52 years, and children were at his side throughout his hospitalization. Born December 9, 1929 to Heinrich (Henry) and Elisabeth Amann Sauer, Herb was raised in Irvington, NJ and graduated with a BS in physics from Rutgers University in 1953.

After serving in the U.S. Army as an instructor in the Guided Missile School, Redstone Arsenal (Huntsville, AL) he worked at Project Matterhorn (renamed Princeton Plasma Physics Laboratory) on Princeton University's Forrestal Campus before heading to the University of Iowa for graduate school. While working on his doctoral thesis on "Cosmic Ray Cutoffs", he analyzed data from Explorer 1 and 3 satellites and contributed to the discovery of the Van Allen Radiation Belts.

Dr Sauer received his PhD in 1963 Herb before moving to Boulder, CO. He spent most of his professional career at the National Bureau of Standards (later incorporated into NOAA) studying space physics and the magnetosphere. Herb retired from NOAA in 1995 but continued to pursue his science as a Research Associate with the Cooperative Institute for Research in Environmental Sciences (CIRES) and, more recently, as an independent contractor doing radiation studies at aircraft altitudes with the Federal Aviation Administration.

Extracted from the Boulder Daily Camera

STP Division Overview
External Funding – FY10

STP Funding Sources

Agency	Program	Group	Amount ($K)	Status
NOAA	Climate Database Modernization Program (CDMP)	EOG	75	Received
USAF	National Air & Space Information Center (NASIC)	EOG	100	Confirmed
NOAA	Coral Reefs	EOG	45	Received
World Bank	World Bank	EOG	92	Confirmed
DOE	Department of Energy	EOG	50	Planned
JAPAN	Ministry of Agriculture, Forestry and Fisheries (MAFF)	EOG	18	Planned
KOREA	National Fisheries Research and Development Institute (NFRDI)	EOG	8	Received
CIA	Central Intelligence Agency	EOG	50	Planned
NOAA	Comprehensive Large Array-data Stewardship System (CLASS)	SEG	451	Confirmed
NOAA	NPOESS SEM-N Algorithm Development	SEG	266	Received
NOAA	NPOESS Advisory	SEG	80	Confirmed
NASA	Virtual Radiation Belt Observatory (ViRBO)	SEG	70	Planned
NOAA	NOAA Virtual Data System (NVDS)	SEG	90	Planned
NOAA	Hybrid Cloud Computing	SEG	65	Planned
NOAA	Geosynchronous Operational Environmental Satellite (GOES-R) - Risk Reduction	SEG	120	Confirmed
NOAA	Climate Database Modernization Program (CDMP)	SEG	24	Received
NOAA	Continuously Operating Reference Stations (CORS) West Operations	EOG	286	Received
NOAA	Climate Database Modernization Program (CDMP)	EOG	6	Received
			1,896	

Status Key:

Received	Monies have been received in-house
Confirmed	Funding agency has identified funds
Planned	Identified funding amounts either proposed or planned

STP Division Overview
Agreements – Status

STATUS

Scope	Team	Type	Partner	NOAA Legal	DOC Legal	NGDC Signed	Partner Signed	Start	End	Status	
CORS Support	EGG	AGR	NGS	n/a	n/a	X	X	01-Oct-03	30-Sep-09	G	In place - nothing to report
SWx Climatology	SEG	MOU	AFCCC	X	X	X	X	27-May-04	01-Oct-14	G	In place - nothing to report
GPS Data (CORS)	EGG	MOA	Multi	n/a	n/a	X	X	20-Sep-04	n/a	G	*Extension in process*
NASIC	EOG	MOU	NASIC	X	X	X	X	09-Mar-06	01-Jan-11	G	In place - nothing to report
NASIC	EOG	MOU	NASIC					*TBD*	*TBD*	G	*New MOA planned*
Ionospheric Data	SEG	MOU	AFWA	X	X	X	X	21-Aug-06	21-Aug-11	G	In place - nothing to report
DMSP Archive	SEG	MOA	DMSP	X	X	X	X	30-May-07	30-Sep-09	Y	*Expired - Renewal in process*
ViRBO	SEG	MOA	NASA	X	X	X	X	15-Apr-09	n/a	G	In place - nothing to report
Ionosonde Sites	SEG	IA	USGS	X	X	X	X	03-Apr-09	03-Apr-14	G	In place - nothing to report
SEM-N - AFRL	SEG	MOA	AFRL	X	X	X	X	11-May-09	11-May-14	G	In place - nothing to report
Nighttime Lights	EOG	MOU	DOE	X	X	X	X	12-Aug-09	12-Aug-13	G	In place - nothing to report
Gas Flaring	EOG	SA	WBank	X	X	X	X	4/6/2010	31-Dec-14	G	In place - nothing to report

As of: 05 May 10

STP Division Overview
NGDC-AFWA MOA - Status

AFWA has requested continuation of NGDC archive services for DMSP datasets and related space weather products. Recommendation (by AFWA) is to include these services as an attachment to the NESDIS-NWS-USN-USAF MOA on "Data Acquisition, Processing, and Exchange", signed 2008.

Datasets received directly from AFWA:	DMSP, including unprocessed OLS and SWx sensors (SPIDR)
Datasets received from the SEON sites:	RSTN 1-s Fixed Frequency Data (CD) RSTN Spectral Data (CD) SOON drawings (paper copies)
Datasets received from the DISS sites:	DISS Ionospheric Soundings (SPIDR)
Datasets received via NWS/SWPC:	RSTN Burst Report RSTN Spectral Reports RSTN Daily (Noontime) Flux SOON Patrol Stats SOON Optical Flare Reports SOON Solar Filaments SOON Sunspot Regions
Datasets received via AFRL/RV:	Processed SWx sensor data (SSJ, SSIES, SSM)

USAF data are combined with other datasets to produce composite lists

Comment: *It is AFWA's position that NGDC services are provided* ***free of charge*** *(precedent). Total NGDC data manager investment is ~1 FTE. Real-time access to the DMSP OLS dataset is a vital component of the Nighttime Lights program.*

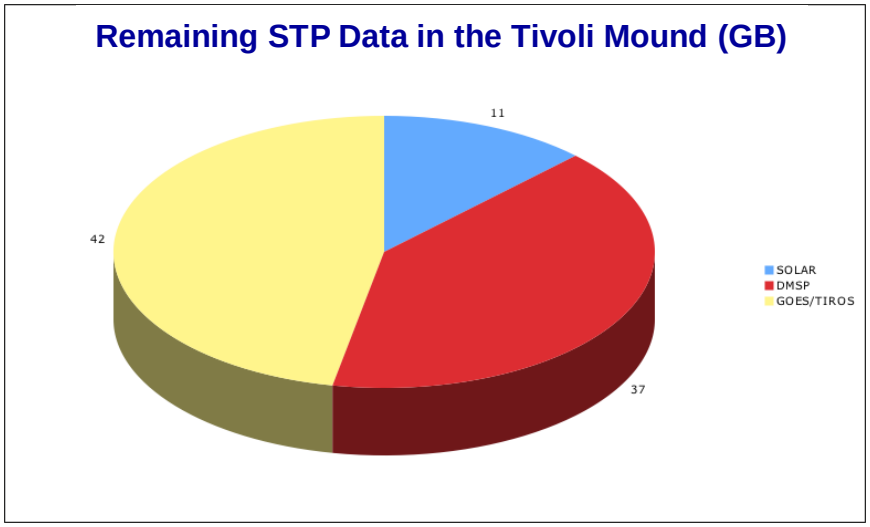
STP Division Overview
CDMP – Status

STATUS

Dataset	Funded in FY09	Proposed for FY10	POC	Contractor ($K) - FY10	Contractor ($K) - Expended YTD	NGDC - FY10 ($K)
DMSP film scanning (L3)	√	√	Elvidge	425.0	243.6	42.5
Historical ionosonde records (L7)	√	√	Redmon	90.0	6.9	9.0
Historical solar observations (L18)	√	√	Horan	30.0	22.4	3.0
Cosmic rays - Forbush archives (L42)	√	√	Denig	80.0	30.6	8.0
Heat capacity mapping mission (L44)	√	√	Elvidge	50.0	0.2	5.0
NGS Multi-Lens (L50)	√	√	Elvidge	275.0	1.0	27.5
Ionosonde Paper Record Project (L55)	–	√	Redmon	40.0	0.0	4.0
Geomagnetic Variation Digitization (L56)	–	√	Mabie	60.0	0.0	6.0

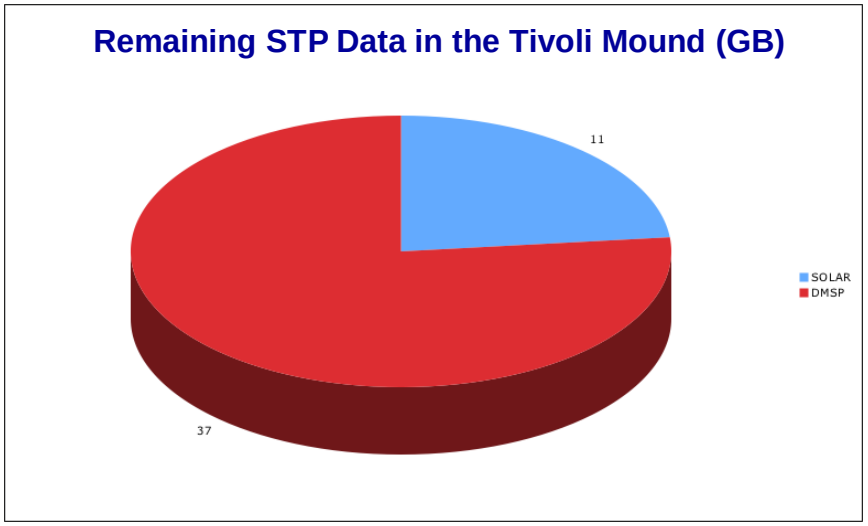
As of: 31 Mar 10

STP Division Overview
Tivoli Mound



1QFY10

Total Size: 90 GB



2QFY10

Total Size: 48 GB

	1QFY10	2QFY10
Solar	11 GB	11 GB
DMSP_SWx	37 GB	37 GB
GOES/Tiros	42 GB	
Total	90 GB	48 GB

STP Division Overview
GOES Spacecraft/Instrument Status

Spacecraft	Series	Operational Status	Status	Magnet1	Magnet2	Magnetometer 1	Magnetometer 2	MAG	XRS	XRS-EUV	EXIS	EPS	HEPAD	SEISS	XRP	SXI	SUVI
GOES 8	GOES I-M	Decommisioned															
GOES 9	GOES I-M	Decommisioned															
GOES 10	GOES I-M	Decommisioned															
GOES 11	GOES I-M	Operational West															
GOES 12	GOES I-M	Standby															
GOES 13	GOES N-O-P	Operational East															
GOES 14	GOES N-O-P	PLT				TBD	TBD			TBD		TBD	TBD			TBD	
GOES 15	GOES N-O-P	PLT	TBD			TBD	TBD			TBD		TBD	TBD			TBD	
GOES R	GOES R	Acquisition						TBD			TBD			TBD			TBD
GOES S	GOES R	Acquisition						TBD			TBD			TBD			TBD

As of: 30 Apr 10

Operational (or capable of)
Operational with limitations (or Standby)
Operational with Degraded Performance
Not Operational
Status Unknown TBD

Note: The GOES 14 XRS-EUV data are now being used operationally by NWS/SWPC.

The GOES-P (-15) spacecraft was launched on 04 Mar 10.

OUTLINE
Solar & Terrestrial Physics Division

STP Program Overview

Milestones & Performance Measures

Awards & Personal Achievements

Accomplishments/Status Updates

Special Interest Items

Issues & Summary

Milestones & Performance Measures

FY10 Milestones

	PPBES Program	STP FY10 Milestones (Proposed)	Status	Planned Completion Date	Actual Completion Date	Responsible Person
	Space Weather	Provide archive and access for the Space Weather Prediction Center (SWPC) operational D-Region Absorption Prediction (D-RAP) product	C	(Q1) 12/31/2009	(Q1) 12/8/2009	Prendergast
	Space Weather	Conduct an Algorithm Requirements Review (ARR) for the Space Environment Monitor on the National Polar-orbiting Operational Environmental Satellite System (NPOESS).	C	(Q1) 12/31/2009	(Q1) 11/17/2009	Manley
	Marine Transportation Systems	Develop a satellite-derived global map of economic activity for 2006 using nighttime earth imagery data from the Defense Meteorological Satellite Program (DMSP).	C	(Q2) 3/31/2010	(Q2) 3/31/2010	Ghosh
AOP →	Space Weather	Ingest into the official archives "out of cycle" operational X-Ray Sensor (XRS) data when available for the Geostationary Operational Environmental Satellite number 14 (GOES 14)	C	(Q2) 3/31/2010	(Q2) 3/31/2010	Wilkinson
	Geodesy	Reconcile the Global Positioning System (GPS) data holdings between the Continuously Operating Reference Stations (CORS) East and CORS West mirror sites.	G	(Q3) 6/30/2010		Coloma
	Marine Transportation Systems	Complete version 4 of the Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS) annual stable nighttime lights covering the period 1992 to 2009.	G	(Q3) 6/30/2010		Elvidge
	Space Weather	Develop a workflow client for the Space Physics Interactive Data Resource (SPIDR) to streamline user delivery of NOAA's space environmental data.	G	(Q3) 6/30/2010		Elespuru
AOP →	Space Weather	Develop a comprehensive plan for porting Space Weather Prediction Center (SWPC) data holdings to NGDC including maintaining current Frodo access capabilities.	G	(Q4) 9/30/2010		Prendergast
	Space Weather	Develop a public interface to the complete Ionosonde data catalog within the NGDC Official Archives.	G	(Q4) 9/30/2010		Redmon
	Space Weather	Develop a prototype system for the NOAA Enterprise Archive Access Tool (NEAAT) for the Comprehensive Large Array-data Stewardship System (CLASS).	G	(Q4) 9/30/2010		Kihn
AOP →	Space Weather	Complete the metadata records using available data for the solar and space environmental sensors on the Geostationary Operational Environmental Satellite (GOES) N-O-P spacecraft	G	(Q4) 9/30/2010		Wilkinson

As of 02 May 10

AOP → AOP milestone

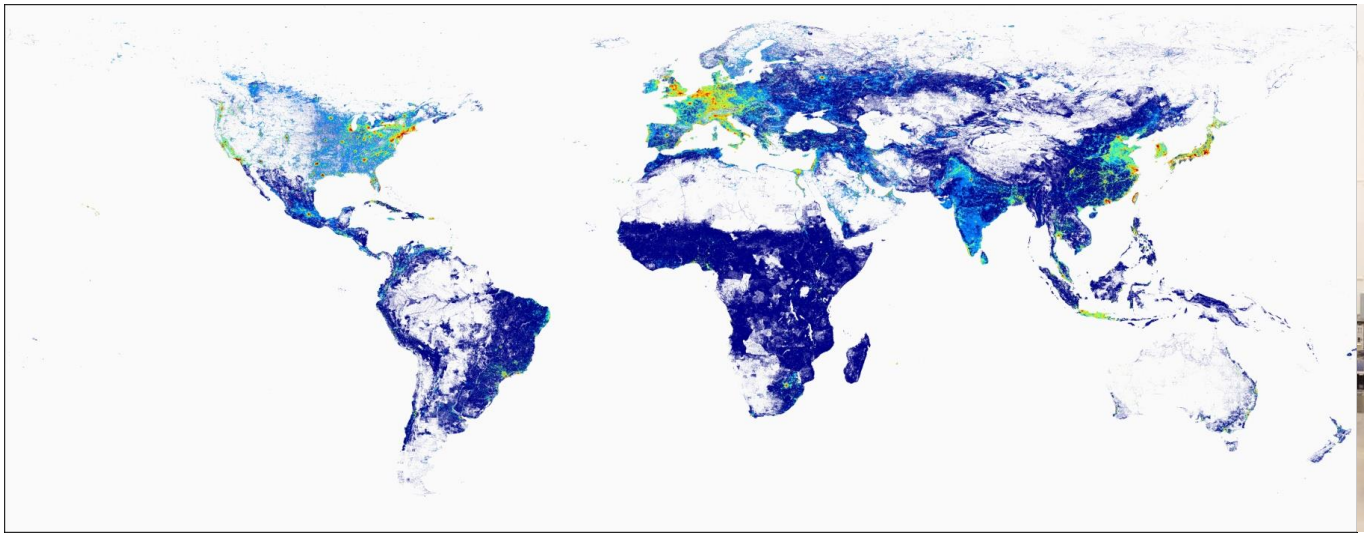
C Complete

G On-track

Y Watch Item

R Issue

Milestone (Internal)
Global Economic Activity Map



Milestone: Develop a satellite-derived global map of economic activity for 2006 using nighttime earth imagery data from the Defense Meteorological Satellite Program (DMSP).

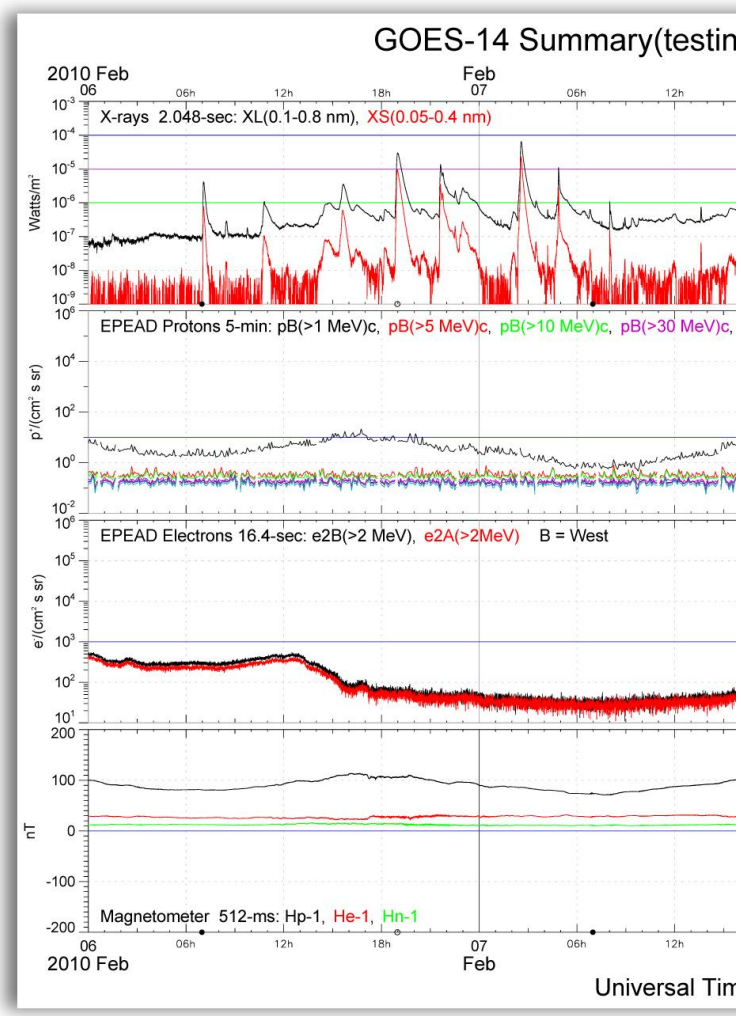
Background: Economic activity indices, such as Gross Domestic Product (GDP), are traditionally reported at the national or sub-national (state) level. DMSP nighttime lights imagery for 2006 were used to develop a proxy for domestic productivity at the regional level. The brightest regions (red) have a total GDP of $1M/km^2.

Completion Date:

Planned (FY10-2Q) 31Mar10
Actual (FY10-2Q) 31Mar10

Significance: These data can be combined with other geospatial data to provide new insights into the spatial distribution of economic activity & as a commerce planning tool.

Milestone (AOP)
GOES-14 XRS



Milestone: Ingest into the official archives "out of cycle" operational X-Ray Sensor (XRS) data when available for the Geostationary Operational Environmental Satellite number 14 (GOES 14).

Background: The “standby” GOES-14 XRS-EUV satellite data are being used for NOAA space weather operations due to hardware failures in the current GOES_West (#11) and GOES-East (#13) payloads. Continuous XRS data are also used by NASA and other external groups who monitor solar activity.

Completion Date:

Planned (FY10-2Q) 31Mar10
Actual (FY10-2Q) 31Mar10

Significance: Public availability of GOES-14 XRS data through NGDC provides a continuous /historical record of the sun. See below website for the Lockheed Martin Solar & Astrophysical Lab.

See: http://www.lmsal.com/solarsoft/latest_events_archive.html

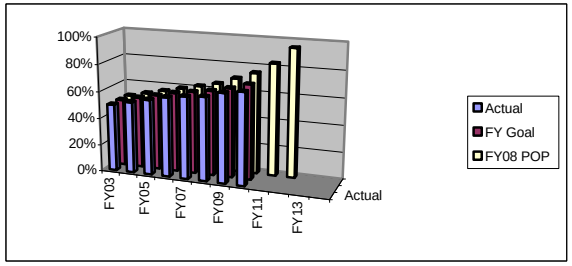
Milestones & Performance Measures

FY10 Performance Measures

Performance Measures

1 - Percentage of archived SWx data available to the public on-line

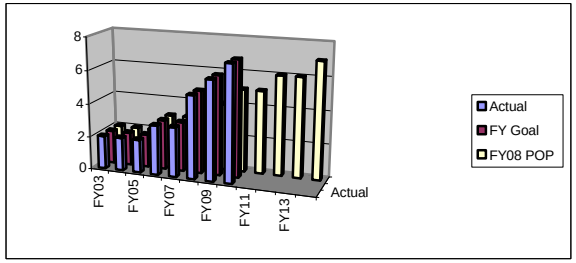
	Actual	FY Goal	FY08 POP
FY03	50%	50%	**50%**
FY04	53%	53%	53%
FY05	56%	56%	56%
FY06	59%	59%	59%
FY07	61%	61%	62%
FY08	62%	63%	**65%**
FY09	66%	66%	70%
FY10	68%	70%	75%
FY11			83%
FY12			**95%**
FY13			
FY14			



Current Month: April 2010		
This Q Planned	Actual This Q/Total	FY10 Target
68%	*68%*	70%

2 - Improved retrospective products for understanding the space environment

	Actual	FY Goal	FY08 POP
FY03	2	2	**2**
FY04	2	2	2
FY05	2	2	2
FY06	3	3	3
FY07	3	3	3
FY08	5	5	**4**
FY09	6	6	4
FY10	7	7	5
FY11			5
FY12			**6**
FY13			6
FY14			7



Current Month: April 2010		
This Q Planned	Actual This Q/Total	FY10 Target
7	*7*	7

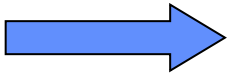
As of: 03 May 10

The FY2008 Program Baseline Assessment (FY08 PBA) was released 08 June 2005.

OUTLINE
Solar & Terrestrial Physics Division

STP Program Overview

Milestones & Performance Measures



Awards & Personal Achievements

Accomplishments/Status Updates

Special Interest Items

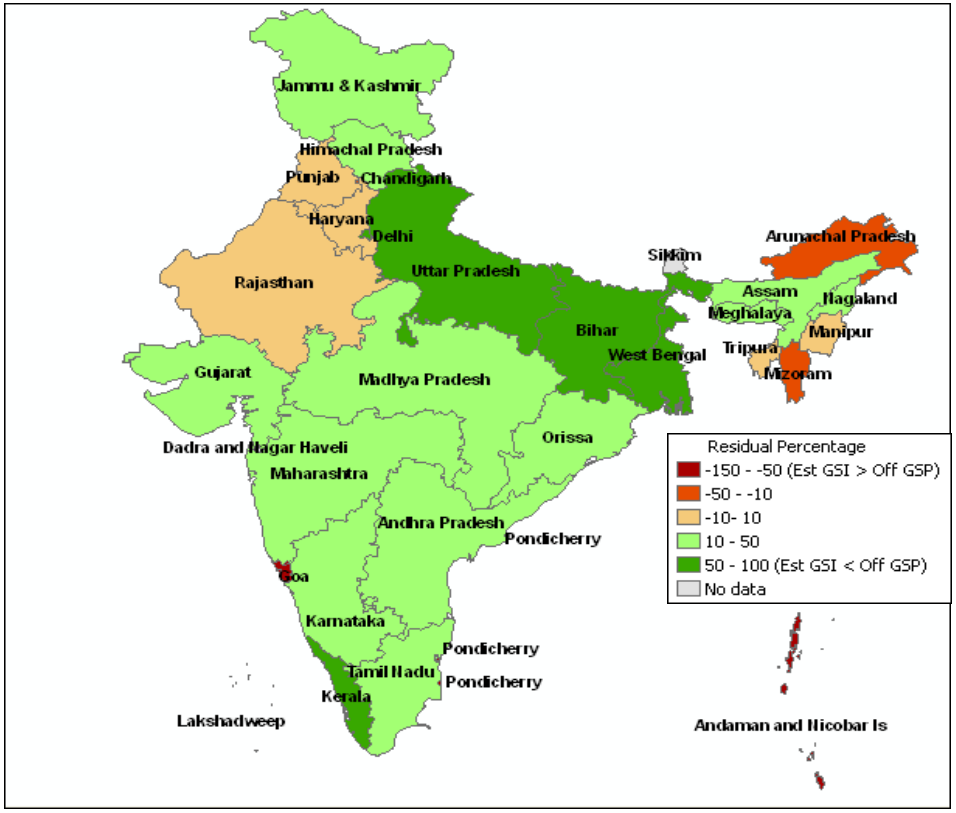
Issues & Summary

Awards & Personal Achievements

Presenting Dr. Tilottama Ghosh

Tilo Ghosh has completed all requirements for her PhD through the University of Denver and will be awarded her degree at the June 4th graduation ceremony. The title of her thesis is "Estimating Economic Activity from Space". The image on the right is from a recent publication on the "Informal Economy And Remittance Estimates of India Using Nighttime Imagery" by Ghosh et al. [*2010*] in the *International Journal of Ecological Economics & Statistics*.

Special Notice: Tilo became engaged during a recent trip back to India.



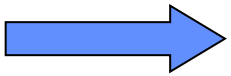
Map of Percentage Residual Gross State Product Map for the states and Union Territories of India

OUTLINE
Solar & Terrestrial Physics Division

STP Program Overview

Milestones & Performance Measures

Awards & Personal Achievements



Accomplishments/ Status Updates

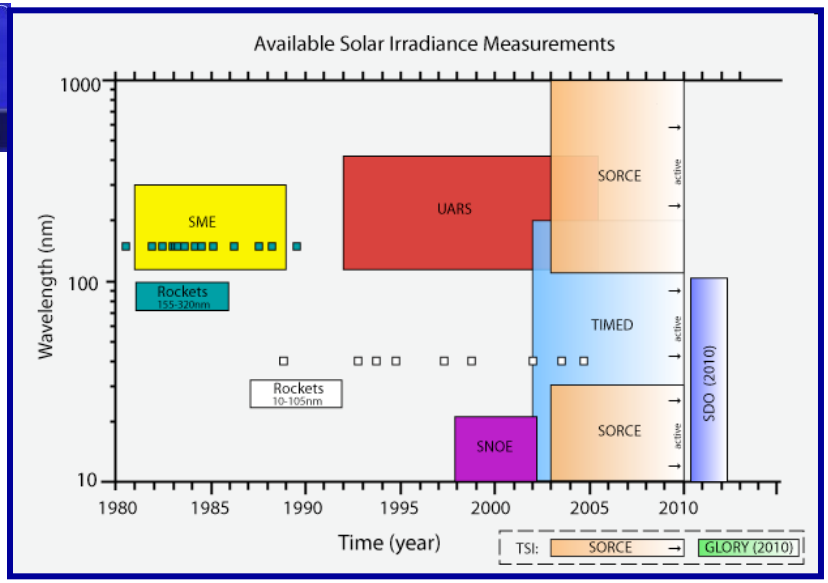
Special Interest Items

Issues & Summary

Accomplishment
Linking STP Web Services Through LISIRD

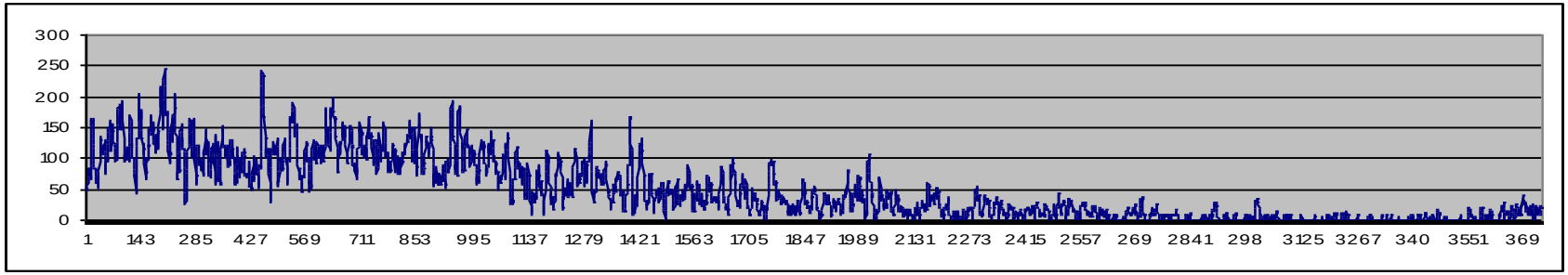
LISIRD
LASP Interactive Solar Irradiance Datacenter

NGDC has successfully established a data conduit through CU's Laboratory for Atmospheric and Space Physics (LASP) to improve the accessibility of NOAA environmental datasets. This data portal is compliant with NASA initiatives for data sharing within the Virtual Observatory construct.



The following example is a simple call to LISRD which intelligently proxies a data request to SPIDR and returns (in this case) a text listing of NGDC's daily sunspot number (SSN);

http://lasp.colorado.edu/lisird/tss/spidr_ssn.csv?&time%3E=2000-01-01.



Days since 1/1/2000

Accomplishment
Space Physics Interactive Data Resource

SPIDR Development Team (missing Eric Kihn)

Recent Upgrades

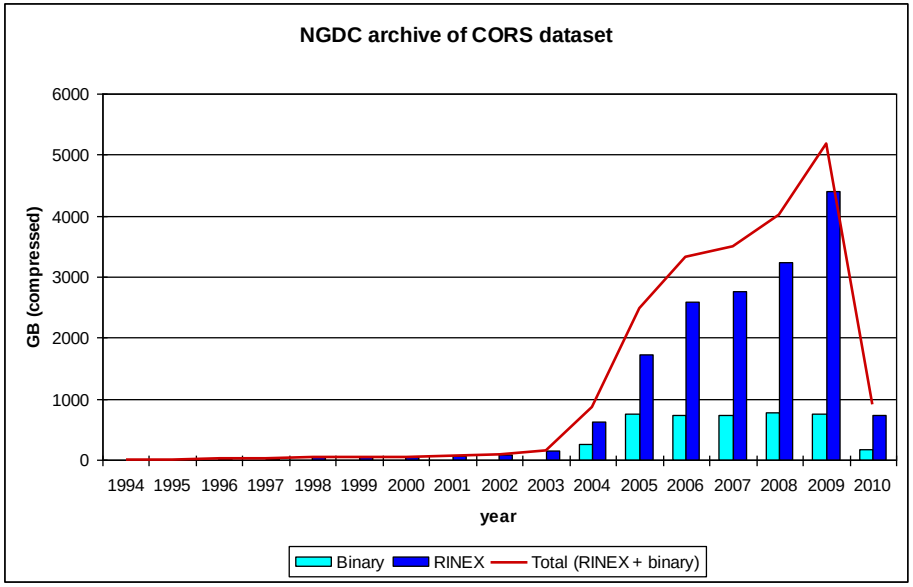
- New REST Web Service Interface
  - ✓ Several additions to previous interface
  - ✓ Data formats, access mechanisms, inter-operability
  - ✓ Internal (SWPC)/External (LASP) inte-grations
- Workflow Client (Kepler) - FY10 Milestone nearing completion
  - ✓ Automatic and interactive data downloads, plots, manipulation
  - ✓ Accessible from, more integrated into SPIDR

Russian colleagues, **Misha**, **Dima** and **Mitja**, are visiting NGDC for two months to add capabilities to SPIDR's web services and to develop an Auroral Resources Web Portal. New SPIDR web service capabilities will improve the accessibility of NGDC data holdings to customers and provide transparent access to external data sources. The Auroral Resources Web Portal will aggregate resources and data from within and external to NGDC to present a comprehensive point of access to a wide range of auroral data products, including DMSP imagery and sensor data, POES particles, Ovation auroral predictions and AMIE model runs.

AMIE – Assimilative Mapping of Ionospheric Electrodynamics
REST – Representational State Transfer

Accomplishment
CORS Submission Agreement

Fran Coloma and Dan Kowal have successfully coordinated a Submission Agreement (SA) for the Continuously Operating Reference Stations (CORS) dataset. The CORS SA is a formally documented agreement between NOS/NGS and NGDC which details the contents, formats and distribution policies for CORS GPS data submitted to the data center. This SA is a fundamental element for compliance with the Open Archival Information System (OAIS).



DOC. NUMBER: NGDC/STP-08/006	U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite, Data, and Information Service (NESDIS)	RELEASE DATE: 01 April 2010	
VERSION: 1.0		REV:	PAGES: 36

Continuously Operating Reference System (CORS) Program Data

SUBMISSION AGREEMENT BETWEEN

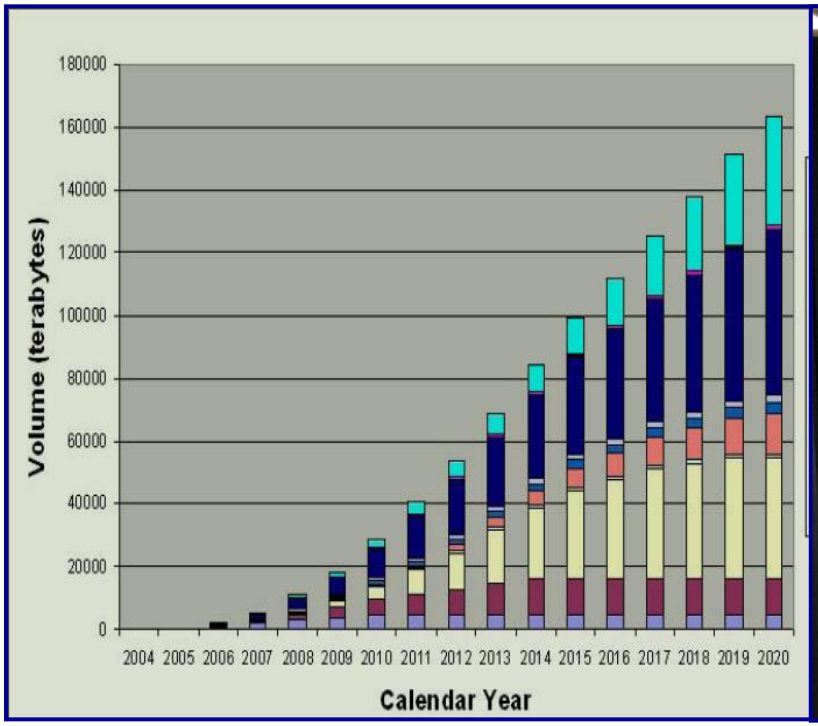
National Geodetic Survey (NGS)
and the
National Geophysical Data Center (NGDC)

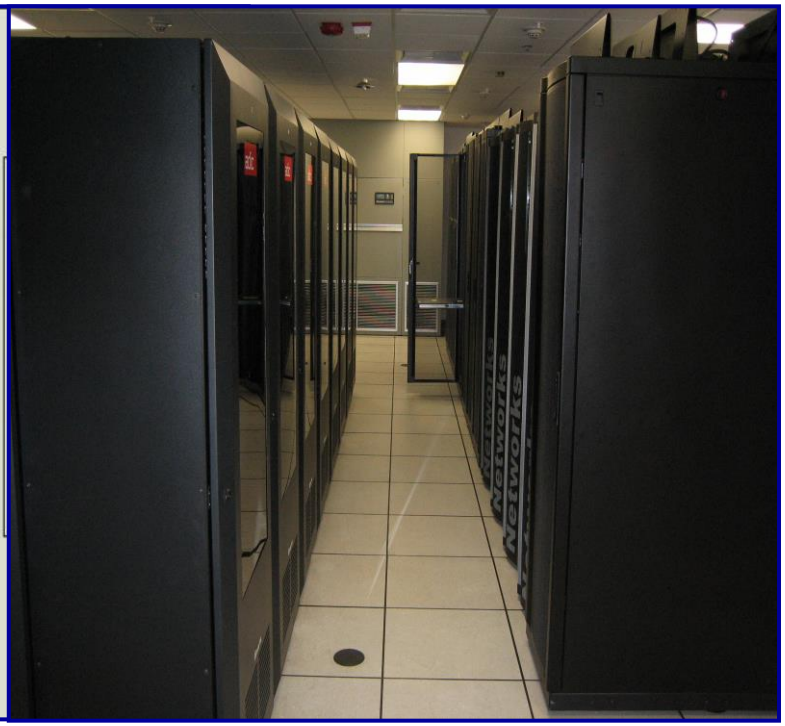
Signed

Accomplishment
CLASS Developers' Workshop

Rob Prentice and Eric Kihn participated in the CLASS Developers' Workshop, 06-09 Apr, in Ashville, NC. Feedback (from Rob) is that the Workshop was highly successful for the following reasons:

- Contractor presented a well-conceived 5-year plan that is responsive to data center requirements
- New capabilities are coming on-line that will improve the efficiency and utilization of CLASS
- Concept of Operations plan is under development by the COWG with assigned responsibilities
- Expedited NEAAT development supports increased interaction between developers & stakeholders

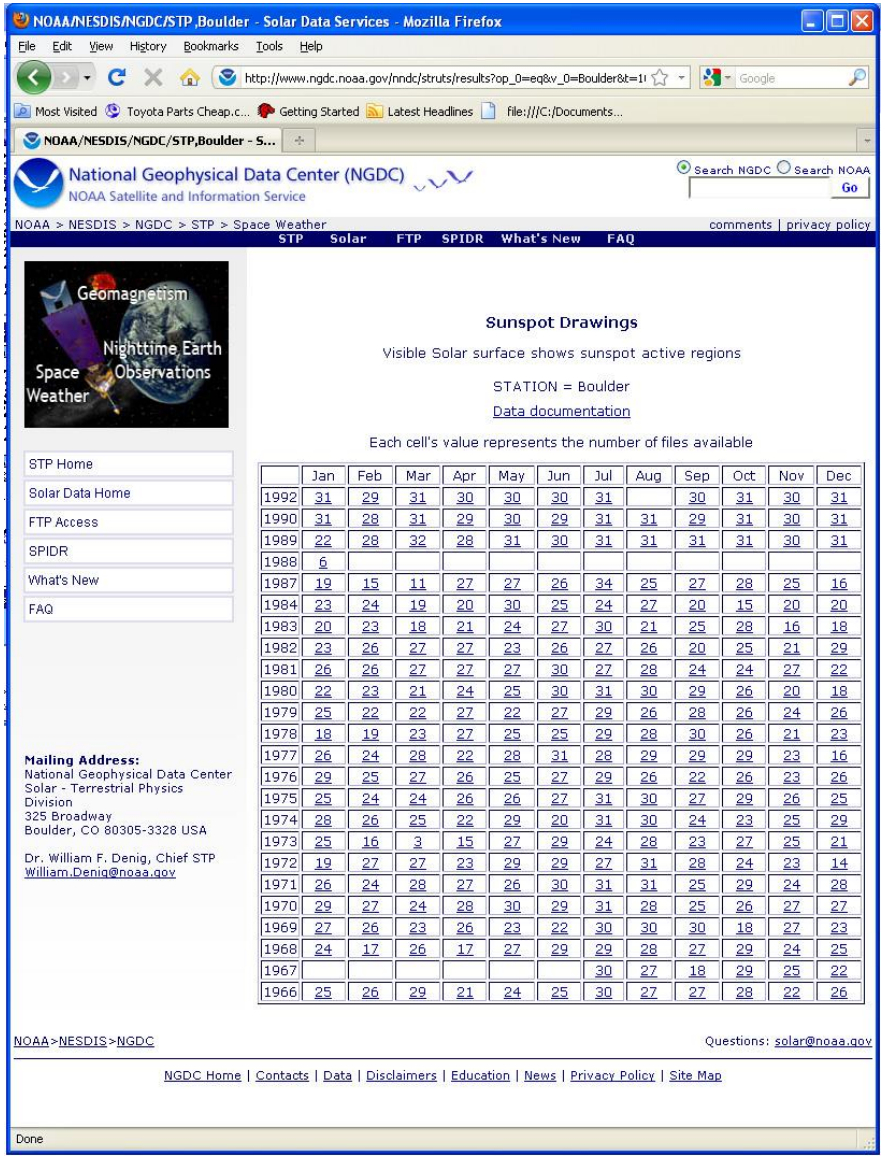




Accomplishment
New STP Website

STP's released its new website on 26 April 2010. Anu Sundaravel and Kelly Prendergast have been working with the data managers over the last few months preparing for the new release. Access is provided via the NGDC homepage or directly from:

http://www.ngdc.noaa.gov/stp/stp.html



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1992	31	29	31	30	30	30	31		30	31	30	31
1990	31	28	31	29	30	29	31	31	29	31	30	31
1989	22	28	32	28	31	30	31	31	31	31	30	31
1988	6											
1987	19	15	11	27	27	26	34	25	27	28	25	16
1984	23	24	19	20	30	25	24	27	20	15	20	20
1983	20	23	18	21	24	27	30	21	25	28	16	18
1982	23	26	27	27	23	26	27	26	20	25	21	29
1981	26	26	27	27	27	30	27	28	24	24	27	22
1980	22	23	21	24	25	30	31	30	29	26	20	18
1979	25	22	22	27	22	27	29	26	28	26	24	26
1978	18	19	23	27	25	25	29	28	30	26	21	23
1977	26	24	28	22	28	31	28	29	29	29	23	16
1976	29	25	27	26	25	27	29	26	22	26	23	26
1975	25	24	24	26	26	27	31	30	27	29	26	25
1974	28	26	25	22	29	20	31	30	24	23	25	29
1973	25	16	3	15	27	29	24	28	23	27	25	21
1972	19	27	27	23	29	29	27	31	28	24	23	14
1971	26	24	28	27	26	30	31	31	25	29	24	28
1970	29	27	24	28	30	29	31	28	25	26	27	27
1969	27	26	23	26	23	22	30	30	30	18	27	23
1968	24	17	26	17	27	29	29	28	27	29	24	25
1967							30	27	18	29	25	22
1966	25	26	29	21	24	25	30	27	27	28	22	26

Accomplishment
Spectral Signatures of Nighttime Lights

Major lighting types can be identified based on their spectral signatures. This information has been used to determine spectral band combinations proposed for the Nightsat mission.

Feature Film

Cities at Night World Tour

Sensors **2010**, *10*, 3961-3988; doi:10.3390/s100403961

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Article

Spectral Identification of Lighting Type and Character

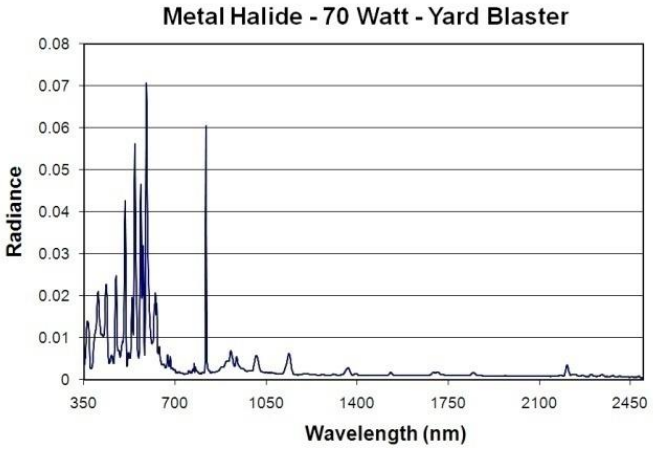
Christopher D. Elvidge [1,*], David M. Keith [2], Benjamin T. Tuttle [3,4] and Kimberly E. Baugh [3]

1 Earth Observation Group, Solar and Terrestrial Division, NOAA National Geophysical Data Center , 325 Broadway, Boulder, CO 80305 USA.

2 Marshall Design Inc., Boulder, CO, USA; E-Mail: david.keith@mindspring.com

3 Cooperative Institute for Research in Environmental Science, University of Colorado, Boulder, Colorado 80303, USA; E-Mails: ben.tuttle@noaa.gov (B.T.T.); kim.baugh@noaa.gov (K.E.B.)

4 Department of Geography, University of Denver, Denver, CO, USA



Accomplishment
SEM-N delta ARR and TIM

The SEM-N Algorithm Development Team successfully conducted a delta Algorithm Requirements Review on 09 March. The team is now pressing forward towards a Preliminary Design Review (PDR) in mid summer. On 20-21 Apr the algorithm team held a Technical Interchange Meeting in Boulder to review the status of the Algorithm Theoretical Basis Documents for the assigned Environmental Data Records and to develop an overall strategy for the PDR.

Related Note: The Requirements Working Group for the Joint Polar Satellite System (JPSS-RWG) is including the SEM-N requirements as a USAF (paid) option for the JPSS. The USAF will decide whether to continue with the SEM-N development by August 15th.

The SEM-N Algorithm Development Team consists of (left to right):

- Janet Green – SWPC
- Janet Machol – NGDC @ SWPC
- Paul Meade – CPI @ NGDC
- Dan Ober – AFRL/RV
- Dan Smith – JHU/APL
- Tom Sotirelis – JHU/APL
- Pat Purcell - NGDC
- Ernie Holeman - BC @ AFRL/RV (not shown)

Status Update
DMSP Operational Linescan System (OLS)

Ed Erwin is nearing completion of 85 satellite-years of recalibrated DMSP OLS Smooth and Fine data. This effort is part of the Tivoli to ADIC transition

REPROCESSING OF DMSP OLS DATA

	To be done
	Done

	ARPS/SDFS FORMATS					SIMPLE FORMAT								
SMOOTH	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
F10														
F11														
F12														
F13														
F14														
F15														
F16														

	ARPS/SDFS FORMATS					SIMPLE FORMAT								
FINE	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
F10	19 files													
F11	200 files													
F12	645 files													
F13														
F14														
F15														
F16														

46 years of OLS X2 – Ascending and Descending

29+ years of FINE

Started this effort May 17, 2009

Status Update
Preparing for GOES-R AAA[1]

Prototype Data Browse and Retrieval Interface for GOES-R Space Weather Data

- **Dan Wilkinson** is using data from the GOES-NOP solar and space instruments as proxy data for GOES-R
- Granular level metadata control the generation of all products
  - ✓ Self-documenting NetCDF
  - ✓ Self-documenting NetCSV
  - ✓ Browse graphics
  - ✓ Combined SXI & XRS movies
  - ✓ Quality control graphics
  - ✓ Comprehensive dataset-wide record level documentation
- Edits to these metadata propagate changes to all products
- Users can choose either canned or custom product
- Dataset migrated from relational database to NetCDF to mirror future GOES-R archive

Remaining Tasks

- Develop REST and OpenDAP web services to facilitate advanced user access
- Integrate all above with web interface

[1]Archive, Access, and Assessment

OUTLINE
Solar & Terrestrial Physics Division

STP Program Overview

Milestones & Performance Measures

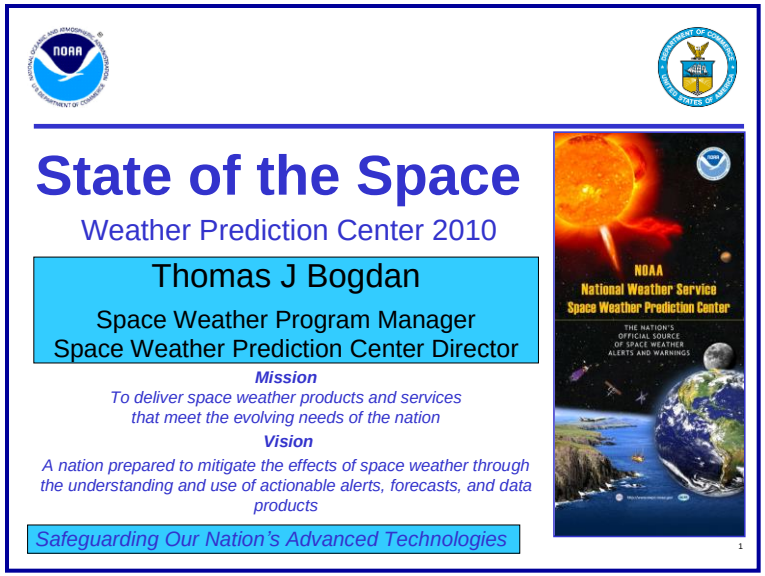
Awards & Personal Achievements

Accomplishments/Status Updates

Special Interest Items

Issues & Summary

Special Interest Item
15th Annual Space Weather Workshop



Tom Bogdan provided a status report on the NOAA Space Weather Program including the recent rise in solar activity, SWPC fiscal status, and future NOAA SWx data sources and models. Notable take-aways included the status of:

- ACE replacement – DSCOVR
- COSMIC F/O – GPS Radio Occultation
- WSA-ENLIL model transition
- SEM-N development for the JPSS
- ***Potential changes to current NOAA data sources***

NGDC Papers & Posters Presented at SWW

- Space Weather Data Stewardship in NOAA (Invited), **W. Denig**
- Validation of the Operational D-Region Absorption Prediction (D-RAP) Model at NOAA SWPC (Poster), I-17, R.A. Akmaev, A. Newman, M.V. Codrescu, C. Schultz, E. Nerney and **H. Sauer**
- Operating Network of Phase Ionosondes (Dynasondes), I-16, M. Rietveld, N. Zabotin, **T. Bullett**, R. Livingston and S. Kolesnik
- The Space Physics Interactive Data Resource – ReST Web Services (Poster), SW-4, **E. Kihn**, **M. Zhizhin**, **P. Elsepuru** and **R. Redmon**
- A Forecasting Ionospheric Real-time Scintillation Tool (Poster), I-18, **R. Redmon**, D. Anderson, R. Canton and **T. Bullett**
- NGDC Ionosphere Program (Poster), I-19, **J. Schminsky**, **R. Redmon**, **T. Bullett**, **E. Kihn**, **W. Denig**, **K. Prendergast**, **P. Elespuru**, **J. Manley**, **R. Conkright** and **K. Horan**

Special Interest Item
GOES-P Launch

The GOES-P satellite was launched from the Cape Canaveral Air Force Station at 6:57 PM on 04 Mar 2010. Now designated as GOES-15, this satellite is the last in the N-O-P series. Space environmental sensors included on the GOES-15 satellite are:

- ✓ Energetic Particle Sensor (EPS)
- ✓ High Energy Proton and Alpha Detector (HEPAD)
- ✓ Magnetometer 1 (MAGNETOMETER1)
- ✓ Magnetometer 2 (MAGNETOMETER2)
- ✓ X-Ray Sensor / Extreme Ultraviolet Sensor (XRS_EUV)
- ✓ Solar X-Ray Imager (SXI)

GOES-15 is currently undergoing Post Launch Test (PLT). **Dan Wilkinson** is responsible for the management of the GOES N-O-P datasets.

Special Interest Item
Solar Dynamics Observatory (SDO) Launch

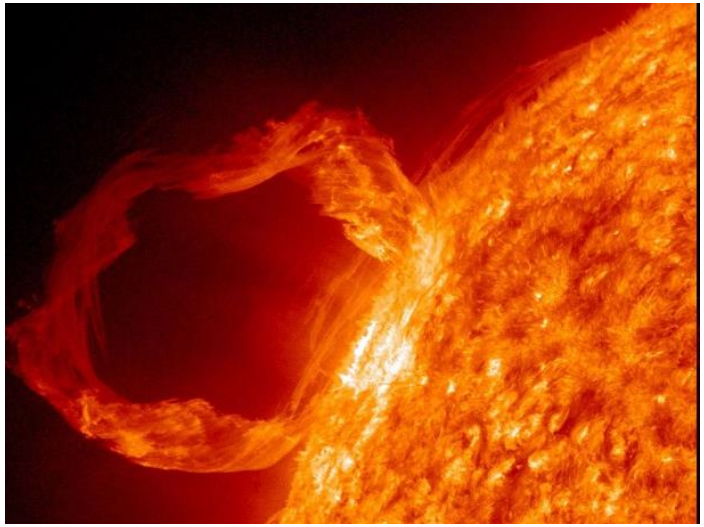
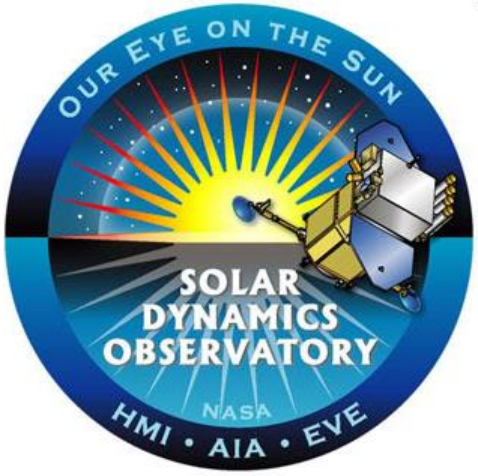


Image of a solar eruption from the SDO's Atmospheric Imaging Assembly (AIA) taken on 30 March 2010 eruption.

The University of Colorado's Laboratory for Atmospheric and Space Physics (LASP) developed the Extreme ultraviolet Variability Experiment (EVE) sensor for the SDO. EVE measures the solar extreme ultraviolet (EUV) spectral irradiance to understand variations on timescales which influence Earth's climate and near-Earth space.

Launched on Feb. 11, 2010, SDO is the most advanced spacecraft ever designed to study the sun. During its five-year mission, it will examine the sun's magnetic field and also provide a better understanding of the role the sun plays in Earth's atmospheric chemistry and climate. Since launch, engineers have been conducting testing and verification of the spacecraft's components. Now fully operational, SDO will provide images with clarity 10 times better than high-definition television and will return more comprehensive science data faster than any other solar observing spacecraft.



Special Interest Item
Galaxy 15 Failure – Space Weather

NOAA / Space Weather Prediction Center

SWPC Space Weather Advisory

Official Space Weather Advisory issued by NOAA Space Weather Prediction Center Boulder, Colorado, USA

SPACE WEATHER ADVISORY BULLETIN #10- 1
2010 April 05 at 12:13 p.m. MST (2010 April 05 1213 UTC)

****** STRONG GEOMAGNETIC STORM IN PROGRESS ******

A geomagnetic storm began at 05:55 AM EST Monday, April 5, 2010. Space weather storm levels reached Strong (G3) levels on the Geomagnetic Storms Space Weather Scale. The source of the storming is an Earth-directed Coronal Mass Ejection associated with a weak solar flare that occurred in Active Region 1059 on April 3 at 05:54 AM EST. This is expected to be an isolated storm that should subside quickly. Other than the flare and CME erupting on April 3, this active region has not produced any significant activity. Systems that can be affected include electric power systems, spacecraft operations, high-frequency communications, GPS, and other navigation systems.

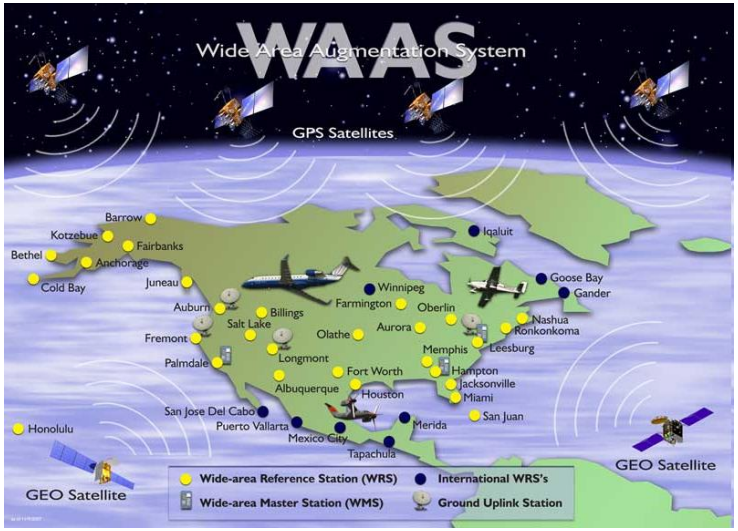
For current space weather conditions see: Space Weather Now, Today's Space Weather and Space Weather Alerts

Data used to provide space weather services are contributed by NOAA, USAF, NASA, NSF, USGS, the International Space Environment Services and other observatories, universities, and institutions. For more information, including email services, see SWPC's Space Weather Advisories Web site http://swpc.noaa.gov/advisories or (303) 497-5127.

NOAA Space Weather Scales - Description of catagories used in Outlooks.

SWPC Home

Space Weather Topics:
Alerts / Warnings, Space Weather Now, Today's Space Wx, Data and Products, About Us, Email Products, Space Wx Workshop, Education/Outreach, Disclaimer, Customer Services, Contact Us



The Galaxy 15 communications satellite suffered an apparent space weather episode on 05 Apr during an interval of heightened space weather. At 09:48 UTC satellite operations lost contact with the satellite and at this point it is uncertain whether communications can be re-established. Galaxy 15 is a prime satellite used for the FAA's Wide Area Augmentation System (WAAS). Without Galaxy 15 WAAS can continue to operate albeit without a backup capability.

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CASBAA Singapore Satellite Industry Forum 2010

04/20/10 02:05 PM ET

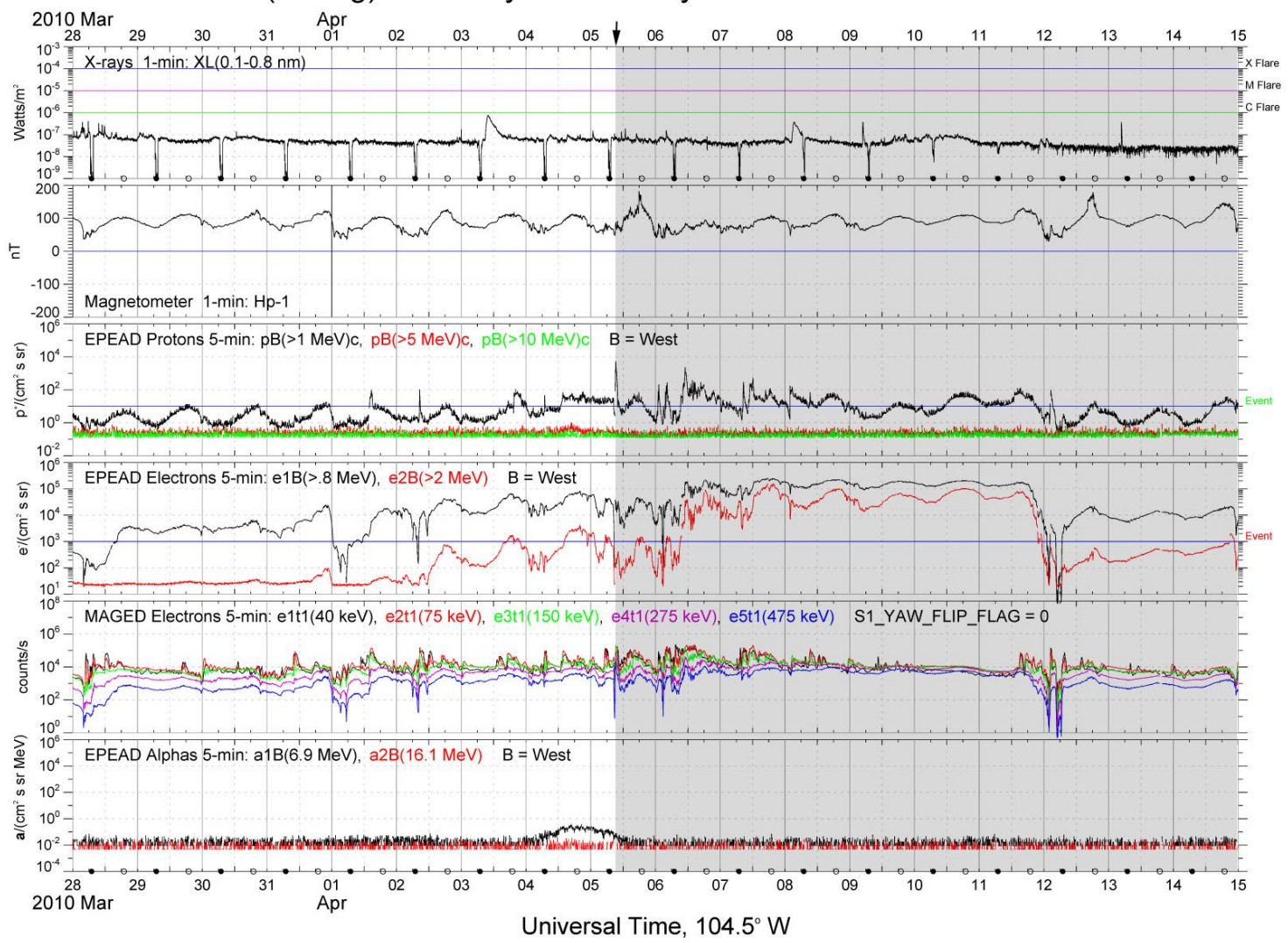
Orbital Blames Galaxy 15 Failure on Solar Storm

By Peter B. de Selding

PARIS — The in-orbit failure of the Orbital Sciences-built Intelsat Galaxy 15 telecommunications satellite April 5 was likely caused by unusually violent solar activity that week that damaged the spacecraft's ability to communicate with

Galaxy 15 satellite. Credit: Orbital

Special Interest Item
Galaxy 15 Failure – Follow-up (DCW)



OUTLINE
Solar & Terrestrial Physics Division

STP Program Overview

Milestones & Performance Measures

Awards & Personal Achievements

Accomplishments/Status Updates

Special Interest Items

Issues & Summary

Issues & Summary

STP Publications – FY10 YTD (13)

Alken, P. and S. Maus (2010), The Relationship Between the Ionospheric Eastward Electric Field and the Equatorial Electrojet, *submitted to Geophys Res. Lett.*

Buaba, R., **E. Kihn**, M. Gebril, A. Homaifar, and M. Zhizhin (2009), Locality Sensitive Hashing For Satellite Images Using Texture Feature Vectors, IEEE Aerospace Conference Proceedings, Nov 2009.

Elvidge, C.D., **K.E. Baugh**, P.C. Sutton, B. Bhaduri, **B.T. Tuttle**, **T. Ghosh**, **D. Ziskin** and **E.H. Erwin** (2010), Who's In The Dark: Satellite Based Estimates Of Electrification Rates, *Urban Remote Sensing: Monitoring, Synthesis and Modeling in the Urban Environment, ed. X. Yang*, Wiley-Blackwell, Chichester, UK, *In Press.*

Elvidge, C.D., **K. Baugh**, **B. Tuttle**, **D. Ziskin** and **T. Ghosh** (2009), "Satellite Observation of Heavily Lit Fishing Boat Activity in the Coral Triangle Region", Proc. 30th Asian Conference on Remote Sensing, 18-23 Oct 2009, Beijing, China.

Elvidge, CD, D.M. Keith, **B.T. Tuttle** and **K.E. Baugh,** Spectral Identification of Lighting Type and Character*, Sensors 2010*, *10*, 3961-3988; doi:10.3390/s100403961.

Gebril, M., **E. Kihn**, R. Buaba, A. Homaifar, and M. Zhizhin (2009), Structural Indexing of Satellite Images using Texture Feature Extraction for Retrieval, IEEE Aerospace Conference Proceedings, Nov 2009.

Ghosh, T., R.L. Powell, S. Anderson, P.C. Sutton and **C.D. Elvidge** (2010), "Informal Economy And Remittance Estimates of India Using Nighttime Imagery", *International Journal of Ecological Economics & Statistics, 17*, pp. 16-50.

Matsumura, K., R.J. Hijmans, Y. Chemin, **C.D. Elvidge**, K. Sugimoto, W.B. Wu, Y.W. Lee and R. Shibasaki (2009), Mapping the Global Supply and Demand Structure of Rice, *Sustainability Science, 4*, pp. 301-313, doi: 10.1007/s11625-009-0077-1.

Nghiem, S.V., D. Balk, E. Rodriguez, G. Neumanna, A. Sorichetta, C. Small and **C.D. Elvidge** (2009), "Observations of Urban and Suburban Environments with Global Satellite Scatterometer Data", *ISPRS Journal of Photogrammetry and Remote Sensing, 64*, pp. 367-380.

Soloviev, A. A., Sh. R. Bogoutdinov, S. M. Agayan, A. D. Gvishiani, and **E. Kihn** (2009), Detection of Hardware Failures at INTERMAGNET Observatories: Application of Artificial Intelligence Techniques to Geomagnetic Records Study, *Russ. J. Earth Sci., 11*, ES2006, doi:10.2205/2009ES000387.

Sutton, P. C., A. Goetz, S. Fildes, C. Forster and **T. Ghosh** (2009), Darkness on the Edge of Town: Mapping Urban and Peri-urban Australia Using Nighttime Satellite Imagery, *The Professional Geographer, 62*, pp. 119-133.

Sutton, P. C., S.A. Anderson, **C.D. Elvidge**, **B.T. Tuttle** and **T. Ghosh** (2009), Paving the Planet: Impervious Surface as Proxy Measure of the Human Ecological Footprint, *Progress in Physical Geography, 33*, pp. 510-527, doi: 10.1177/0309133309346649.

Ziskin D., **C. Elvidge**, **K. Baugh**, **B. Tuttle** and **T. Ghosh**, The Night Time Lights of Urban Areas, *MEGAPOLI Project News Letter, 6*, pp. 32, March 2010.

Issues & Summary
STP Presentations – Pg 1 – FY10 YTD (29)

30th Asian Conference on Remote Sensing, 18-23 October 2009, Beijing, China

– Remote Sensing in the Cause of a Sustainable Society (Keynote), **C.E. Elvidge**.

– Satellite Observation of Heavily Lit Fishing Boat Activity in the Coral Triangle Region (Oral), **C.E. Elvidge**, **K. Baugh**, **B. Tuttle**, **D. Ziskin** and **T. Ghosh**.

3rd Annual RASEI Research Symposium, 21 October 2009, Boulder, CO

– Lighting the Sky (Poster), **D. Ziskin**, **C. Elvidge, K. Baugh, B. Tuttle**, **T. Ghosh** and **E Erwin**.

AGU Fall Meeting, 14-18 December 2009, San Francisco, CA

– An Absence of Equatorial Scintillation Activity Prior to Large Geomagnetic Storms (Oral), SA13B-07, D.N. Anderson and **R.J. Redmon**.

– GNSS Absolute Antenna Calibration at the National Geodetic Survey (Poster), G11B-0645, **A.L. Bilich** and G.L. Mader.

– The Impact of the Virtual Observatories on Space Weather Science, Modeling, and Predictions (Invited), SH54A-04, J.C. Green, R.S. Weigel, **E.A. Kihn** and D. Baker.

– The Intercalibration of the Night Lights Dataset (Poster), IN43B-1157, **D.C. Ziskin, C. Elvidge**, **K. Baugh**, **B. Tuttle** and **T. Ghosh**.

– Ionosphere Scientific Data Stewardship at NGDC (Poster), SA43A-1607, **T.W. Bullett**, **R.J. Redmon**, **J. Manley, R. Conkright**, **E.A. Kihn**, **K. Prendergast**, **P. Elespuru**, **K. Horan**, **J. Schminky** and **W.F. Denig**.

– New Observations of Ionospheric Instabilities in the Equatorial Electrojet (Poster), SA23B-1481, **P. Alken** and S. Maus.

– The NOAA Archives of the 21st Century (Oral), IN44A-05, K.S. Casey, J. Relph, **E. Kihn**, J.J. Bates, L. McCulloch, K.R. McDonald and R. Vizbulis.

– A Prototype User Interface for Space and Solar Data - What will be relevant in 2015? (Poster), IN41A-1099, **D.C. Wilkinson** and **A.** Sundaravel

– The Space Environmental Impact System (Oral), IN34A-04, **E.A. Kihn**.

– Tidal Signatures in Thermospheric and Ionospheric Quantities (Invited), SA41B-04, H. Luhr, M. Rother, B.G. Fejer, K. Haeusler and **P. Alken**.

– Vertical Plasma Flow in Auroral Boundary Coordinates for 1997 (Poster), SM41A-1681, **R.J. Redmon**, W.K. Peterson, L. Andersson, **E.A. Kihn** and **W.F. Denig**.

90th AMS Annual Meeting, 17-21 January 2010, Atlanta, GA

– Impacts of Extended Periods of Low Solar Activity on Climate (Poster), Seventh Symposium on Space Weather, **M.J. Niznik** and **W.F. Denig**.

– Status of the Space Environment Monitor for NPOESS (SEM-N) (Poster), 6th Annual Symposium on Future National Operational Environmental Satellite Systems-NPOESS and GOES-R, **W.F. Denig**, T. Sotirelis, V. Grano, R. Hamilton, K. Wolfram, C. Brann and **J. Manley**.

Issues & Summary
STP Presentations – Pg 2 – FY10 YTD (29)

NCAR Coffee, 10 March 2010, Boulder, CO

- Vertical Plasma Flow in Auroral Boundary Coordinates for 1997 (Poster), SM41A-1681, **R.J. Redmon**, W.K. Peterson, L. Andersson, **E.A. Kihn** and **W.F. Denig**

IDL Users Group, 17 March 2010, Boulder, CO

- IDL Driven Space Physics Modeling and Investigations, R. Redmon, E. Kihn, P. Elespuru, M. Zhizhin, D. Mishin, D. Medvedev, W.K. Peterson

HR GEO User Consultation Workshop (ESA), 14-15 April 2010, Frascati, Italy

- Nighttime lights from a geostationary orbit, **C.E. Elvidge**

Association of American Geographers Annual Meeting, 14-18 April 2010, Washington, DC

- Aladdin's Magic Lamp: Building an Active Calibration Target for the Defense Meteorological Satellite Program Operational Linescan System (DMSP OLS), **B. Tuttle**, S. Anderson, P. Sutton, **C. Elvidge**, R. Powell and **K. Baugh**

SWPC Coffee, 30 April 2010, Boulder, CO

- An introduction to new SPIDR features and a sampling of new client applications that use its data, **P. Elespuru**

15th Annual Space Weather Workshop, 27-30 April 2010, Boulder, CO

- Space Weather Data Stewardship in NOAA (Invited), **W. Denig**
- Validation of the Operational D-Region Absorption Prediction (D-RAP) Model at NOAA SWPC (Poster), I-17, R.A. Akmaev, A. Newman, M.V. Codrescu, C. Schultz, E. Nerney and **H. Sauer**
- Operating Network of Phase Ionosondes (Dynasondes), I-16, M. Rietveld, N. Zabotin, **T. Bullett**, R. Livingston and S. Kolesnik
- The Space Physics Interactive Data Resource – ReST Web Services (Poster), SW-4, **E. Kihn**, **M. Zhizhin**, **P. Elsepuru** and **R. Redmon**
- A Forecasting Ionospheric Real-time Scintillation Tool (Poster), I-18, **R. Redmon**, D. Anderson, R. Canton and **T. Bullett**
- NGDC Ionosphere Program (Poster), I-19, **J. Schminky**, **R. Redmon**, **T. Bullett**, **E. Kihn**, **W. Denig**, **K. Prendergast**, **P. Elespuru**, **J. Manley**, **R. Conkright** and **K. Horan**
- NGDC Ionosphere Program (Invited), Workshop to Coordinate Ionospheric Services, **R. Redmon, T. Bullett**, **J. Manley, E. Kihn**, **P. Elespuru**, **R. Conkright, J. Schminky**

Issues & Summary

Solar & Terrestrial Physics Division

- **Satellite processing transition from SWPC (4QFY04) – active**
- **Continuity of solar data services (1QFY09) – active**

✓ *Refocus of NWS/SWPC Objectives (2QFY08) – NLAI*

- **NightSat Mission Concept (1QFY08) – active**

✓ *NGS Aerial Photography (1QFY08) – NLAI*

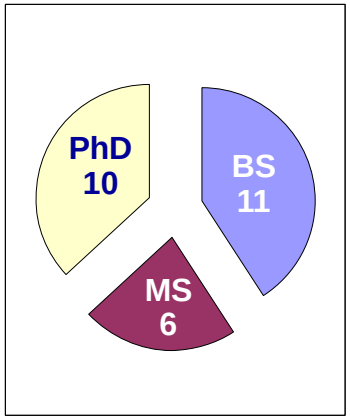
- **DMSP Data in CLASS (1QFY08) – active**

✓ *Migrate the DMSP OLS Archive to CLASS (2QFY07) – O.B.E.*

✓ *ADIC-API Needed (1QFY07) – NLAI*

Metrics (YTD)
Papers published: 13
Papers presented: 29
Professional Societies:17

STP Highest Degrees



NLAI = No Longer an Issue

QUESTIONS?