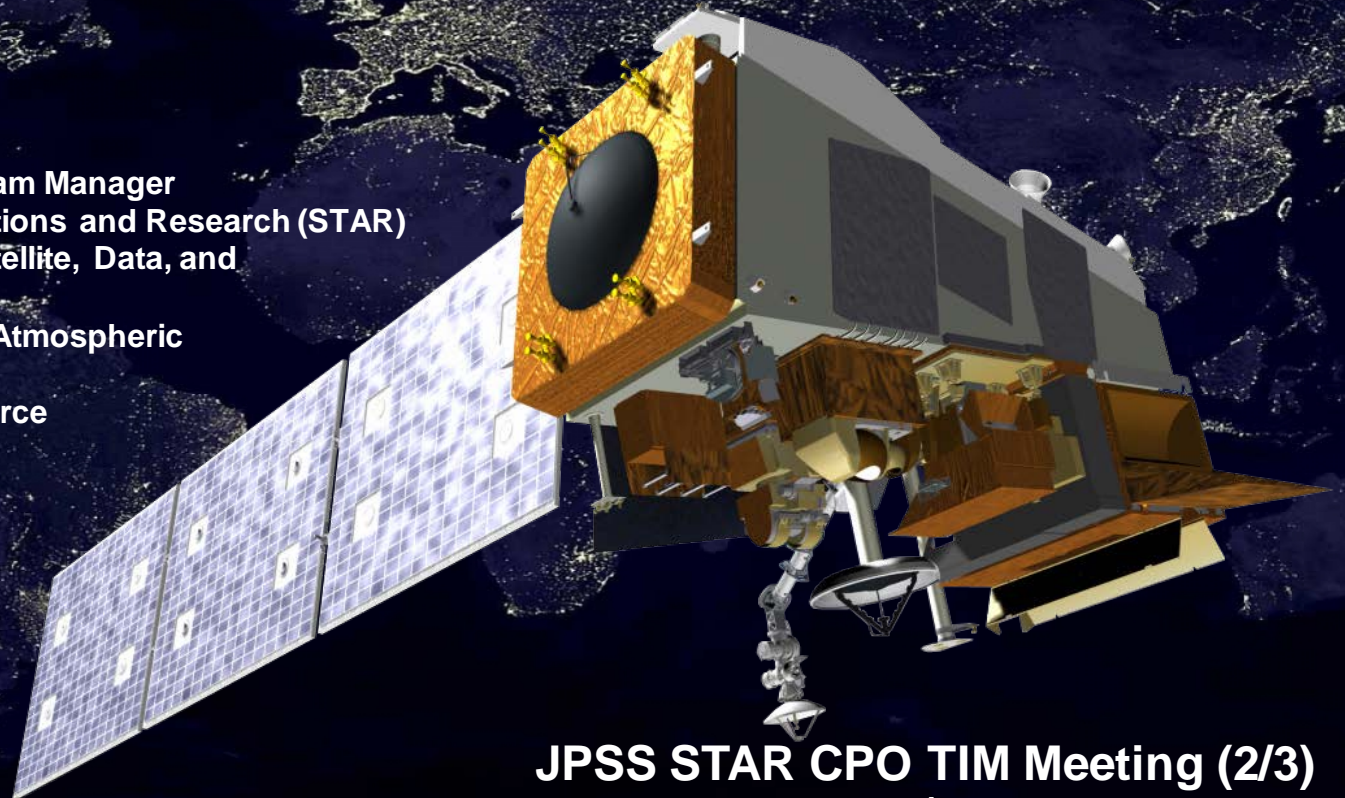


Joint Polar Satellite System (JPSS)

JPSS-CPO TIM : Introduction

Lihang Zhou

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National Environmental Satellite, Data, and
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U.S. National Oceanic and Atmospheric
Administration
U.S. Department of Commerce



JPSS STAR CPO TIM Meeting (2/3)
Jan 30th 2016

Background of JPSS-STAR-CPO TIM 2

- Why JPSS-STAR-CPO TIMs: Enhance Science Outreach; Collaboration; Ensure the products developments are consistent with Users' needs and priorities
- JPSS-CPO Kick Off Meeting Sept 12 2016:
 - JPSS Program Scientist (Mitch Goldberg) briefed on JPSS products and applications
 - CPO Introduced major programs, Portfolio distributions, STAR collaborators, Linkage to JPSS
- Action from the kick off: To organize the follow up 3 technical interchange meetings (TIMs) to have in-depth discussions in specific potential collaboration:
 - AC4/Atmospheric Composition Products (Nov 18 2016);
 - <https://www.star.nesdis.noaa.gov/jpss/meetings2016.php#S961212>
 - Data Assimilation (Jan 30 2017);
 - Arctic (March 1st 2017)

Today's TIM: Data Assimilation

- Purpose of today's TIM:
 - Communicate info about JPSS products (e.g., data variables, length, resolution, quality), with focus on data assimilation applications
 - Communicate info about corresponding CPO programs: MAPP program
 - Understand users' needs - for this meeting, to understand the needs for data assimilation and earth system modeling for research and operational prediction
 - Learn the current state of services/applications, what improvements are still needed, and how satellite data can help
 - Explore potential applications and products
 - Discuss collaboration mechanisms and costs

- TIM POCs:
 - Huan Meng/Ralph Ferraro (STAR), Heather Archambault/Annarita Mariotti (CPO)

- Outcome:
 - TIM Report:
 - Identify high priority JPSS products for data assimilation needs
 - Summary of the presentations/discussions
 - Further actions on collaborations
 - Recommendations to JPSS-STAR/CPO Programs

Organizations Participating in Today's TIM

NESDIS Joint Polar Satellite Systems (JPSS)

- Program Science Office (PSO)
- Algorithm Management Project (AMP)

NESDIS Center for Satellite Applications and Research (STAR)

- Satellite Meteorology and Climatology Division (SMCD)
 - JPSS STAR (JSTAR) Program
- Satellite Oceanography and Climatology Division (SOCD)
- Cooperative Research Programs (CoRP)

OAR Climate Program Office (CPO)

- Earth System Science and Prediction Division
 - Modeling, Analysis, Predictions, and Projections (MAPP) Program
 - Atmospheric Chemistry, Carbon Cycle, and Climate (AC4)
- Ocean Observing and Monitoring Division (OOMD)
 - Arctic Research Program

OAR Geophysical Fluid Dynamics Laboratory (GFDL)

OAR Earth System Research Laboratory (ESRL) Chemical Sciences Division

NWS National Centers for Environmental Prediction

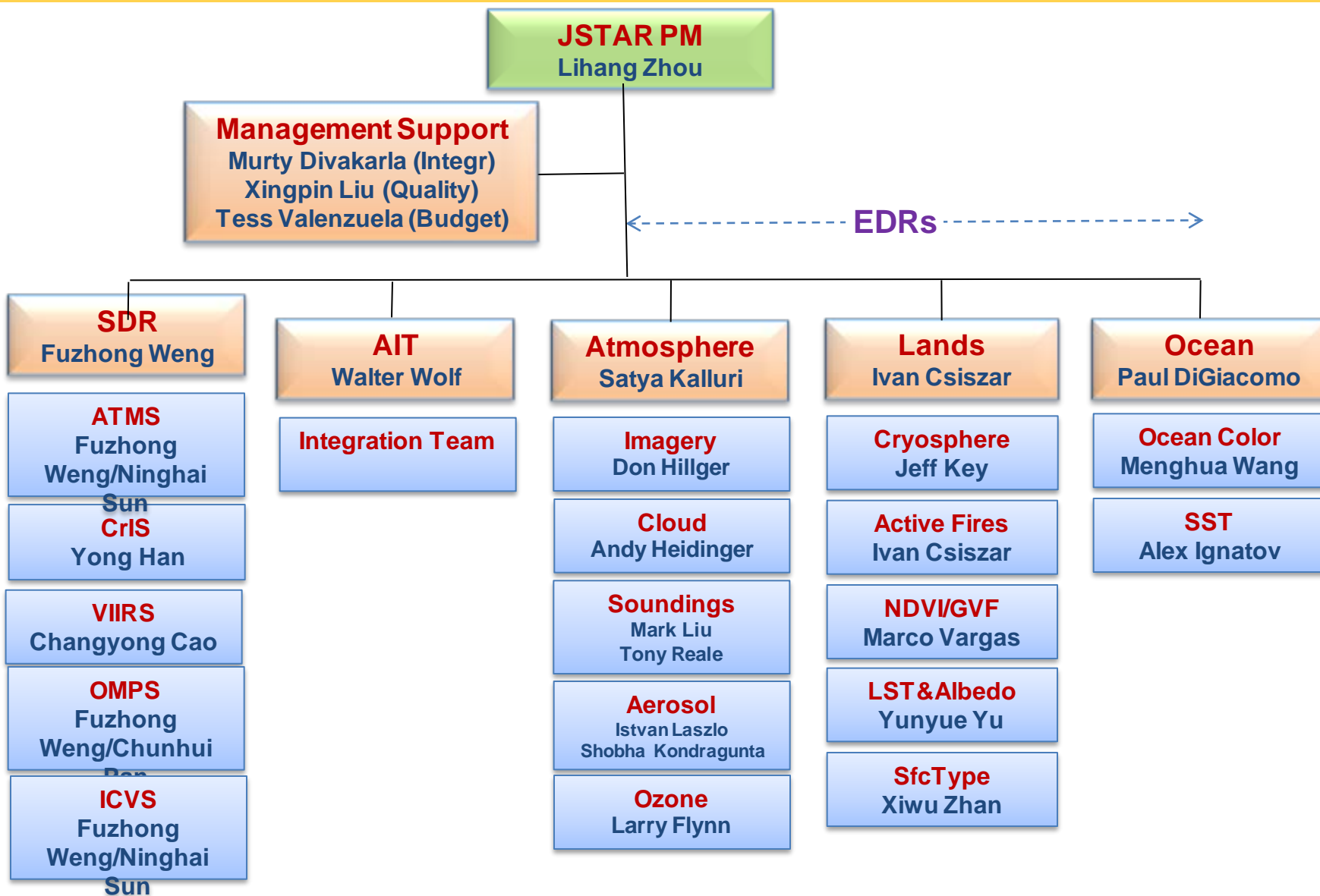
- Environmental Modeling Center (EMC)
- Climate Prediction Center (CPC)

NWS Office of Water Prediction – National Water Center

Interagency:

- Joint Center for Satellite Data Assimilation (JCSDA)
- National Integrated Drought Information System (invited)

JPSS-STAR (JSTAR) Program

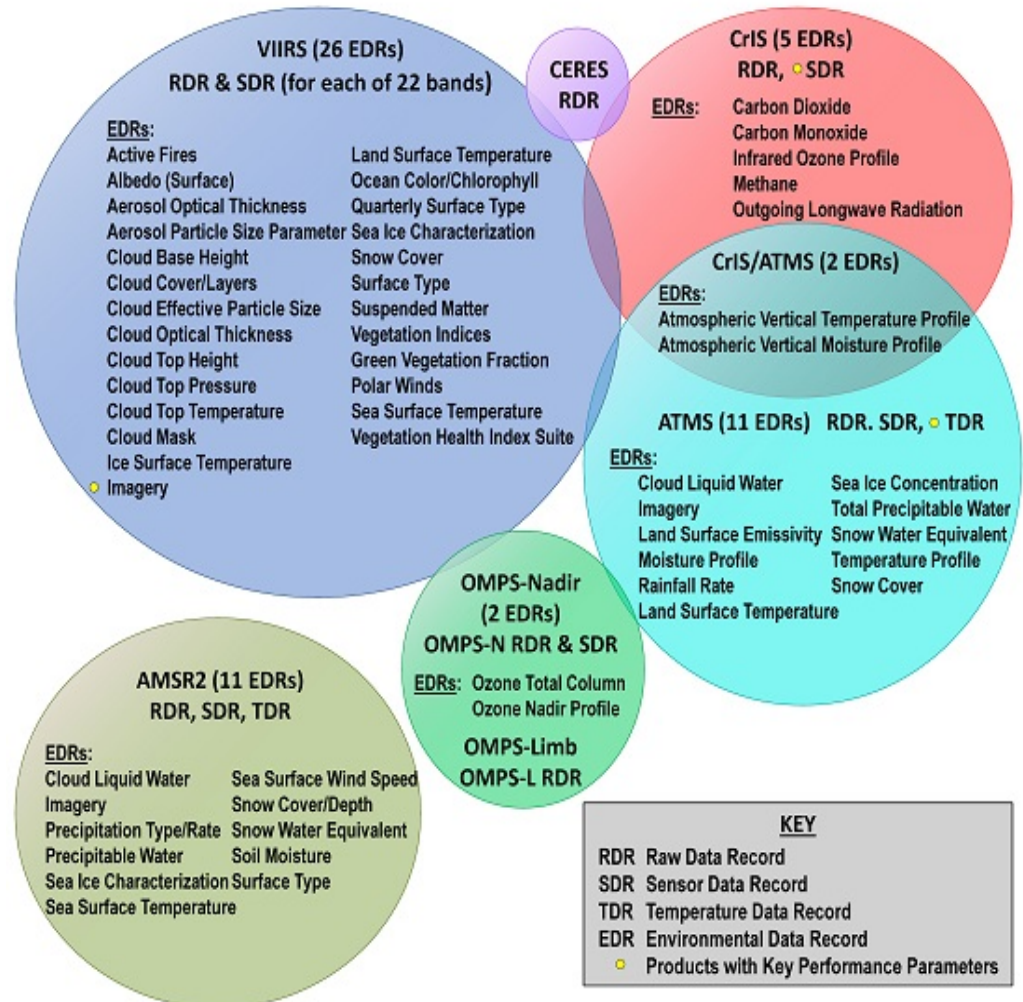


JPSS Instruments and Products

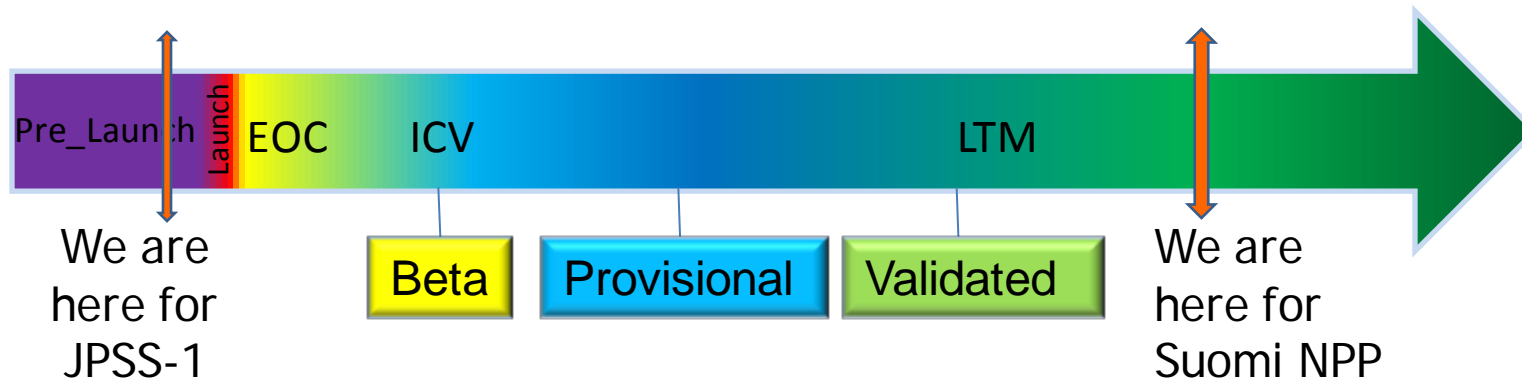
JSTAR Supports *Req. dev; Alg; Cal/Val; Science Maintenance*

JPSS Instruments	Measurements
ATMS - Advanced Technology Microwave Sounder	ATMS and CrIS together provide high vertical resolution temperature and water vapor information needed to maintain and improve forecast skill out to 5 to 7 days in advance for extreme weather events, including hurricanes and severe weather outbreaks
CrIS - Cross-track Infrared Sounder	
VIIRS – Visible Infrared Imaging Radiometer Suite	VIIRS provides many critical imagery products including snow/ice cover, clouds, fog, aerosols, fire, smoke plumes, vegetation health, phytoplankton abundance/chlorophyll, Day night band provide new capabilities!
OMPS - Ozone Mapping and Profiler Suite	Ozone spectrometers for monitoring ozone hole and recovery of stratospheric ozone and for UV index forecasts
CERES - Clouds and the Earth's Radiant Energy System	Scanning radiometer which supports studies of Earth Radiation Budget (ERB)

JPSS Program Data Products



- **Four Phases of Cal/Val:**
 1. **Pre-Launch**; all time prior to launch – **Algorithm** verification, sensor testing, and validation preparation
 2. **Early Orbit Check-out (EOC)** – System **Calibration & Characterization**
 3. **Intensive Cal/Val (ICV)** – Algorithm Calibration & Validation
 4. **Long-Term Monitoring (LTM)**; through life of sensors after ICV (Validated) – Sensor Stability & **Data Product Quality monitoring**
- **Algorithm Cal/Val Timeline**



Suomi NPP: Oct. 28, 2011, J1: 2017, J2: 2021, and J3 & J4 (up to ~2038)

Suomi NPP Data Product Maturity Status

Sensor	Algorithm	Beta	Provisional	Validated
ATMS	ATMS SDR	Jan-2012	Oct-2012	Dec-2013
CrIS	CrIS SDR	Apr-2012	Oct-2012	Dec-2013
VIIRS	VIIRS SDR	Apr-2012	Oct-2012	Dec-2013
OMPS	OMPS SDR: NTC & NP	Feb-2012	Oct-2012	Aug-2015
VIIRS	Imagery (Not Near-Constant Contrast)	May-2012	Jan-2013	Jan-2014
VIIRS	NCC Imagery	Oct-2012	Aug-2013	Jan-2014
VIIRS	Cloud Mask	Jun-2012	Jan-2013	Jan-2014
VIIRS	Cloud Property Algorithms	Jun-2013	Jan-2014	Sep-2014*
VIIRS	Aerosol Optical Thickness and Particle Size	Sep-2012	Apr-2013	Aug-2014
VIIRS	Aerosols - Suspended Matter	Jun-2013	**	**
VIIRS	Ice Surface Temperature	May-2013	Aug-2013	Jan-2014
VIIRS	Sea Ice Concentration and Ice Thickness	May-2013	Nov-2013	**
VIIRS	Binary Snow Cover	May-2013	Nov-2013	Jan-2014
VIIRS	Fraction Snow Cover	May-2013	Nov-2013	**
VIIRS	Active Fires	Oct-2012	Aug-2013	Sep-2014
VIIRS	Land Surface Temperature	Dec-2012	Apr-2013	Dec-2014
VIIRS	Land Surface Albedo	Jun-2013	Apr-2014	Dec-2014
VIIRS	Surface Type	Feb-2013	Jan-2014	Dec-2014
VIIRS	Land Surface Reflectance	Feb-2013	Aug-2013	Sep-2014
VIIRS	Vegetation Index	Feb-2013	Aug-2013	Sep-2014
VIIRS	Ocean Color	Jan-2013	Jan-2014	Mar-2015
VIIRS	Sea Surface Temperature	Feb-2013	Jan-2014	Sep-2014
CrIS	Soundings	Aug-2012	Jan-2013	Sep-2014
OMPS	Total Column Ozone EDR	Jul-2012	Jan-2013	Aug-2015
OMPS	Nadir Profiler Ozone EDR	Aug-2012	Jan-2013	Aug-2015

Latest highlights: NOAA Enterprise Alg. & Reprocessing

Part 1: Overview of programs, operational and research needs

- 9:00 Mitch Goldberg (JPSS Program Scientist): JPSS Overview (10 min)
- 9:10 Lihang Zhou (JPSS STAR Program Manager): JSTAR Overview (10 min)
- 9:20 Mike Farrar (EMC Director): NCEP Strategic Plans for Earth System Modeling and Data Assimilation (20 min)
- 9:40 Heather Archambault (CPO MAPP Program Manager): MAPP Program Overview (10 min)
- 9:50 CPO OOMD Overview (10 min)

- 10:00 Xiasong Yang (GFDL - via telecon): The roles of atmosphere and land initial conditions in predicting the western United States precipitation during 2015/16 winter (15 min)

10:15 Mitch Bushuk (GFDL - via telecon): Arctic sea ice prediction in the GFDL seasonal forecast system (15 min)

10:30 Break (10 min)

Part 2: Thematic discussions

10:40 **Theme 1. Advancing ocean data assimilation** (inclusive of sea-level, salinity, and carbon/color data)

- o JPSS Ocean Products (5 min) (Paul DiGiacomo)
- o Discussion (20 min)

11:05 **Theme 2. Advancing land-surface data assimilation for drought and other applications**

- o JPSS Land Products (5 min) (Ivan Csiszar)
- o JPSS Hydrology Products (5 min) (Ralph Ferraro)
- o Discussion (20 min)

11:35 **Theme 3. Advancing data assimilation for sea ice and other Arctic needs**

- o JPSS Cryosphere (Snow and Ice) Products (5 min) (Jeff Key)
- o Discussion (20 min)

12:00 **Theme 4. Data assimilation for air quality**

- o JPSS Atmospheric Products/Reprocessed Data (5 min) (Fuzhong Weng)
- o JPSS Aerosol Products (5 min) (Shobha Kondragunta)
- o Discussion (20 min)

12:30 Adjourn