



SPACE SCIENCE AND
ENGINEERING CENTER





Agenda

- Organizational Changes
- Program Launch Schedule
- Field Terminal Architecture
- Manifested Sensors/Environmental Data Records
- IPO Direct Readout Business Philosophy
- IPOPP Development Team
- IPOPP Alpha Test Site Opportunity
- IPOPP – Overview

PEO Organization*

* As Approved by the EXCOM
on March 14, 2006

NPOESS EXCOM

Dr. M. Griffin - *Administrator of NASA*
G. Peyton – *Under Secretary of the Air Force (A)*
VADM (ret.) C. Lautenbacher – *Under Secretary of
Commerce for Oceans and Atmosphere*

Environmental Satellites Program Executive Office (PEO)

Dan Stockton – PEO (NOAA)

Deputy PEO – Col E. Phillips (USAF) (Acting)

Senior Policy/Plans - P. Wilczynski (NOAA)

Senior Policy/Plans - **Vacant**

Chief Engineer - K. Anderson (NASA)

Chief Scientist - **Vacant**

Senior DoD - Maj T. Cole (USAF)

Senior NOAA – K. Boyd (Acting)

Senior NASA - A. Carson

Senior Budget Advisor - K. Gilmore

Senior Tech. Advisor - M. Haas

Senior Comm. Advisor - T. Bucher

SUAG Rep – M. Bonadonna (NOAA)

PEO Portfolio

**POES
MGR**

M. Mignogno
(NOAA)

**NPOESS
SPD**

S. Simione
(USAF)
(Acting)

**ATP
DIR**

S. Schneider
(NASA)

**OPS
DIR**

B. Needham
(NOAA)

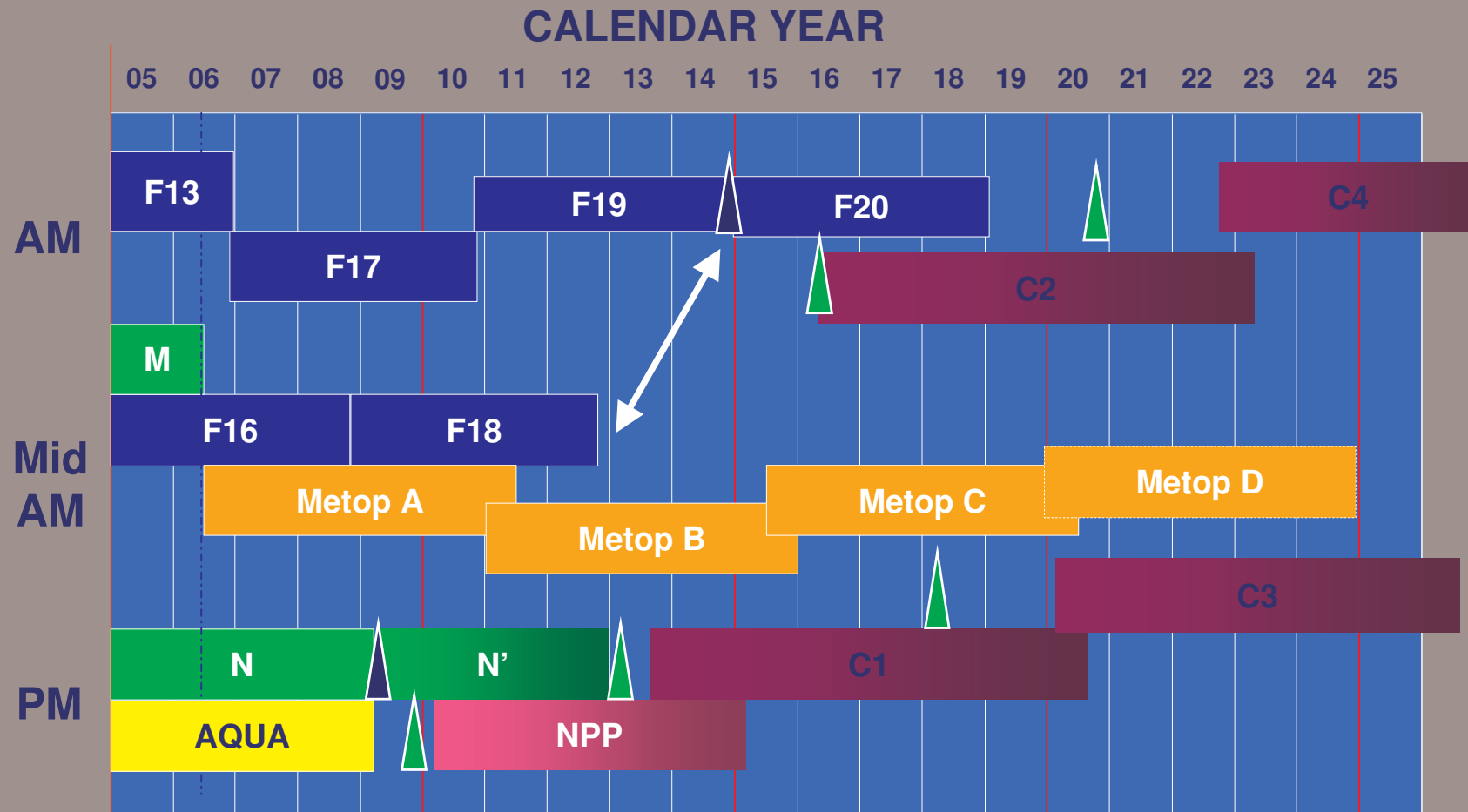
**DMSP
SPD**

Col B. Smith
(USAF)

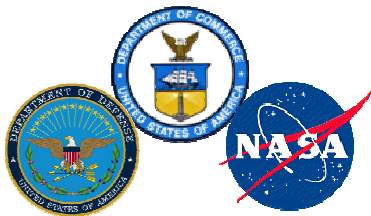
**NPP
PROJ MGR**

K. Schwer
(NASA)

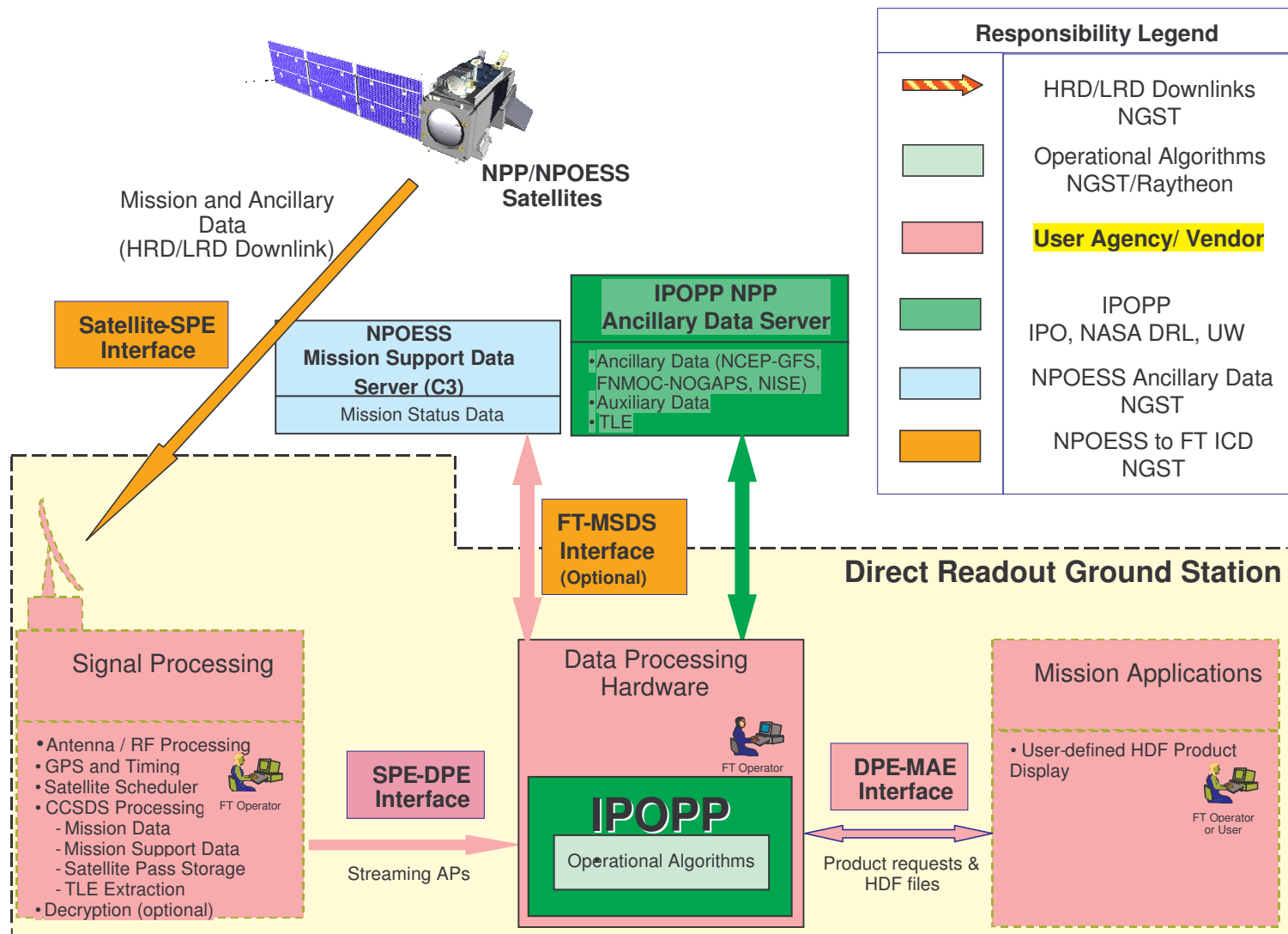
Launch Schedule

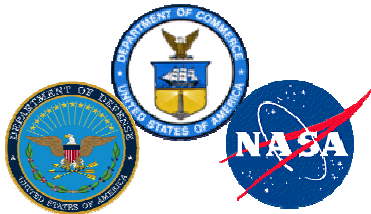


Preserves Mission Continuity!



The “New” Field Terminal Architecture

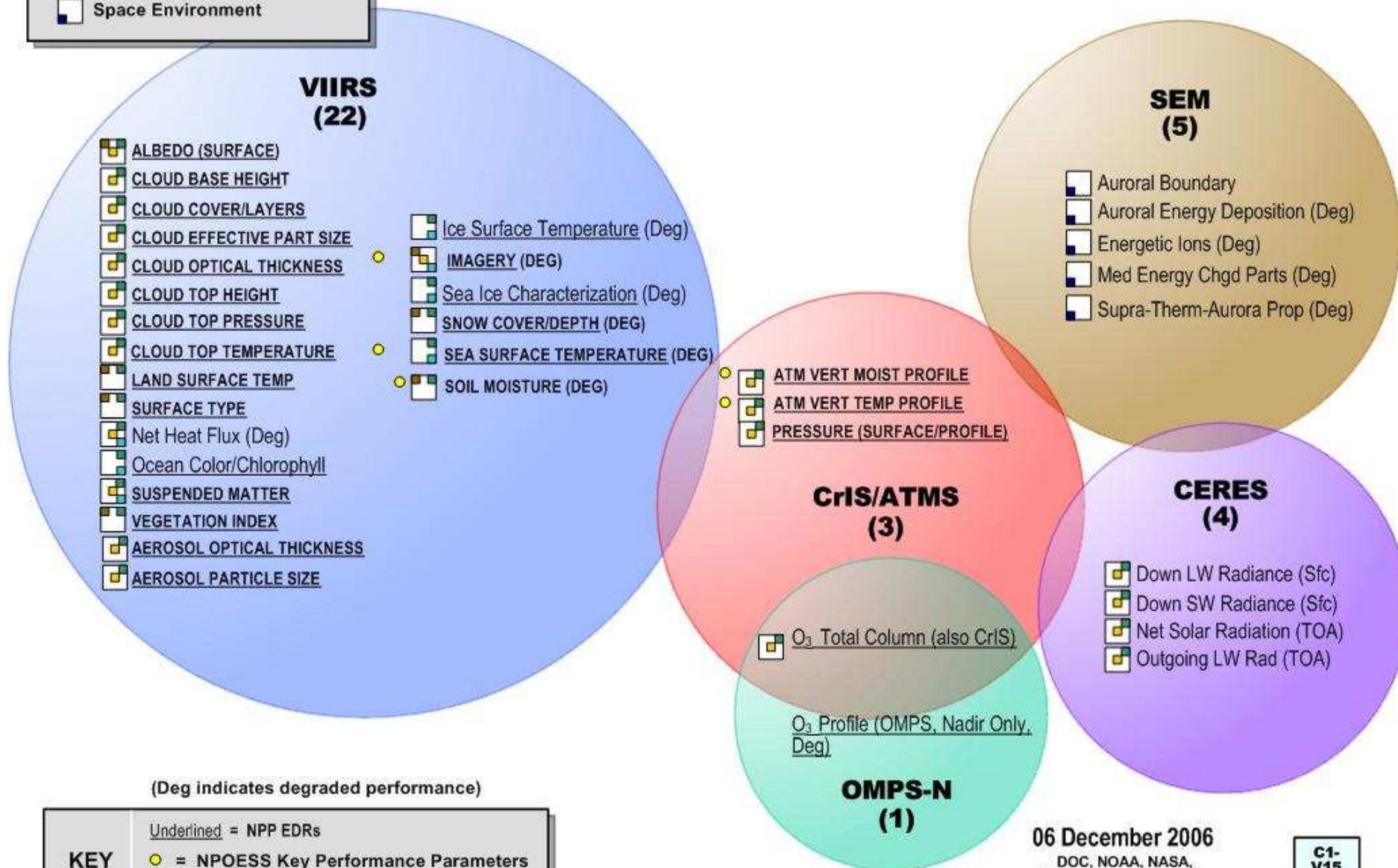




Post Certification Sensors

Satellite	NPP	C1	C2	C3	C4
Launch	Sep 2009	2013	2016	2020	2022
Nodal Time Ascending	1330	1330	0530	1330	0530
VIIRS	X	X	X	X	X
Microwave Imager/Sounder			X	X	X
CrIS	X	X		X	
ATMS	X	X		X	
OMPS Nadir	X	X		X	
SEM (MEPED and TED)		X		X	
CERES		X			
SARSAT		X	X	X	X
ADCS		X	X	X	X

NPOESS C1 – 35 IORD EDRs



(Deg indicates degraded performance)

KEY

Underlined = NPP EDRs

● = NPOESS Key Performance Parameters

BOLD CAPS = LRD Environmental Data Records

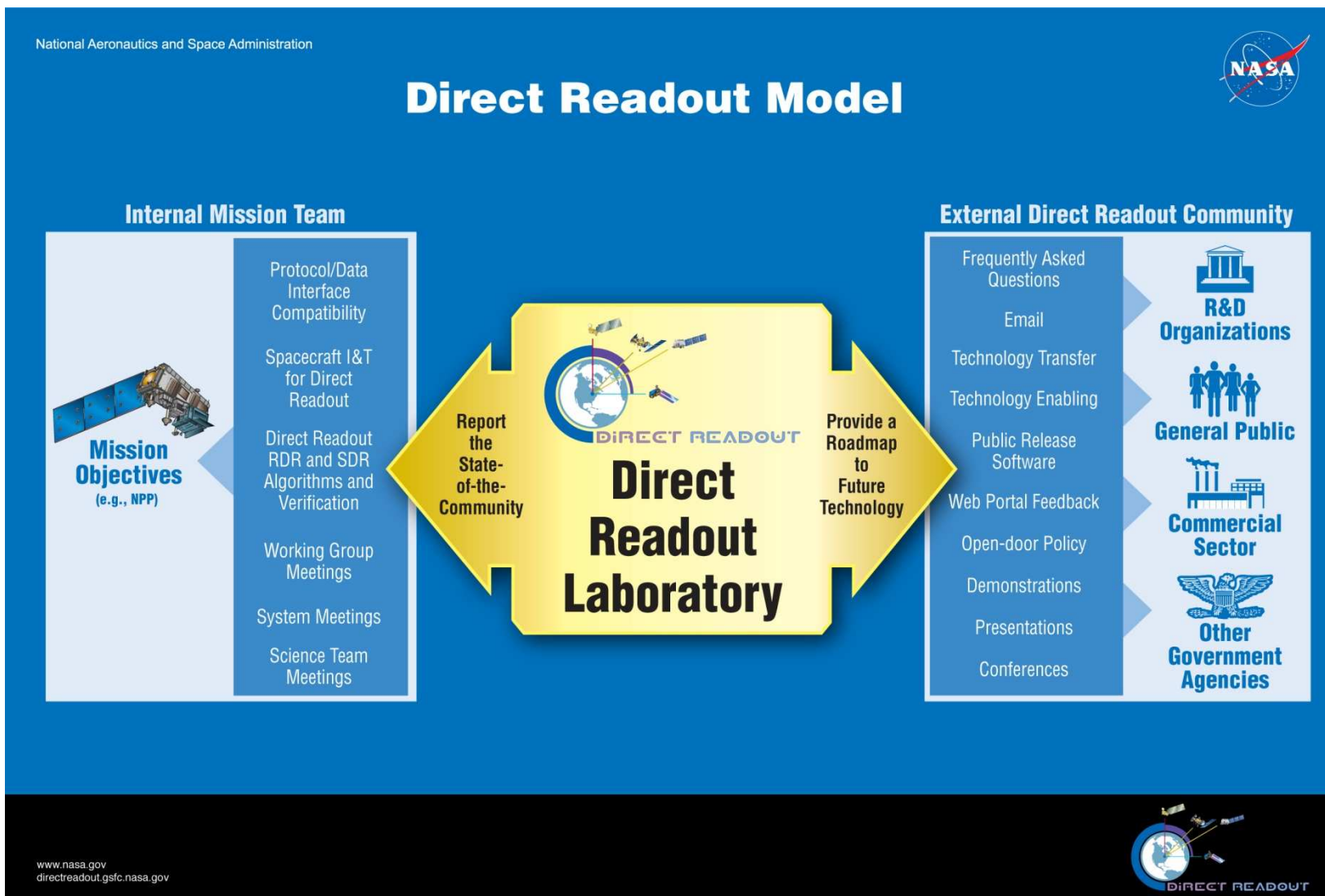
06 December 2006

DOC, NOAA, NASA,
Integrated Program Office
M. Bonadonna, M. Haas,
D. Stockton, J. Whitcomb

C1-
V15



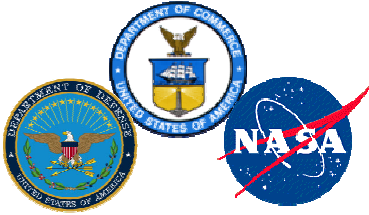
Business Philosophy





International Polar Orbiter Processing Package

- The International Polar Orbiter Processing Package (IPOPP) is a software package that will be critical to the Direct Broadcast (DB) user community throughout its transition from EOS to NPOESS
- IPOPP is the primary processing package that will enable the DB community to process, visualize, and evaluate NPP Sensor and Environmental Data Records - which is a necessity for the DB community during the transition from the Earth Observing System Era to the NPOESS Era.
- NOTE: Terra (and perhaps Aqua) are subject to being decommissioned once NPP has completed CAL/VAL. Terra mission life was extended when NPP launch schedule moved to April 08 (now September 09).



The IPOPP Partnership

- NASA Direct Readout Lab – NPP In-situ Ground Station
 - Director: Patrick Coronado
 - System Engineer: Kelvin Brentzel
- University of Wisconsin, Space Science Engineering Center, Cooperative Institute of Meteorological Satellite Studies (CIMSS) – IMAPP
 - Principal Investigator: Dr. Allen Huang
 - Co-Principal Investigator: Liam Gumley
- NPOESS Integrated Program Office – Direct Readout Mission
 - Project Manager: John Overton
 - System Engineer: Dr. Bill Thomas
 - System Analyst: Gordon Fesenger



IPOPP Development Goals

- Facilitate the International Direct Broadcast Community Continuous Involvement in Algorithm development for NPP/NPOESS
 - By providing mission continuity from EOS to NPOESS; by participating in NPP Calibration/Validation
 - By Enabling Regional Application Development
- Provide software to generate EDRs in near real-time from NPP/NPOESS Direct Broadcast Downlinks
 - Open source (GPL)
 - Freely available (no COTS licenses required)
 - Easy to install & run
 - Multi-platform (e.g., Linux, Solaris, OS X)
 - HDF5 data format
 - Self-contained, Modular
 - Uses consistent & up to date calibration Look Up Tables
 - Reuse and leverage legacy software (IMAPP)
 - Build on NISGS foundation



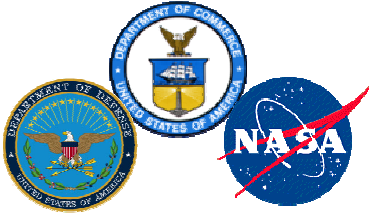
NASA DRL Role in IPOPP Development

- Provide Updated RT-STPS for NPP from NISGS
- Update RT-STPS for NPOESS
- Integrate NPOESS Decryption functionality into RT-STPS
- Build upon NISGS Framework to include (SPA) wrapped MODIS algorithms to develop IPOPP
- Provide SDR's (level 1b) software for VIIRS, CrIS, ATMS, and OMPS
- Provide Active Fires and Vegetation Index Level 2 product software
- Coordinate with NASA SeaDAS project for integration of Ocean products
- Provide visualization and analysis tools
- Provide web portal to DB Community



CIMSS Role in IPOPP Development

- Participate and engage in IDPS Algorithm Transformation into a form where they can be run on Linux
- Focus on Atmosphere EDRs, Utilities, and HRD/LRD CAL/VAL
- Provide visualization and analysis tools
- Prototype and validate multi-platform compatibility
- Support Open Source packaging with NASA DRL
- Provide Training Workshops and Educate Users, Scientists, and Students

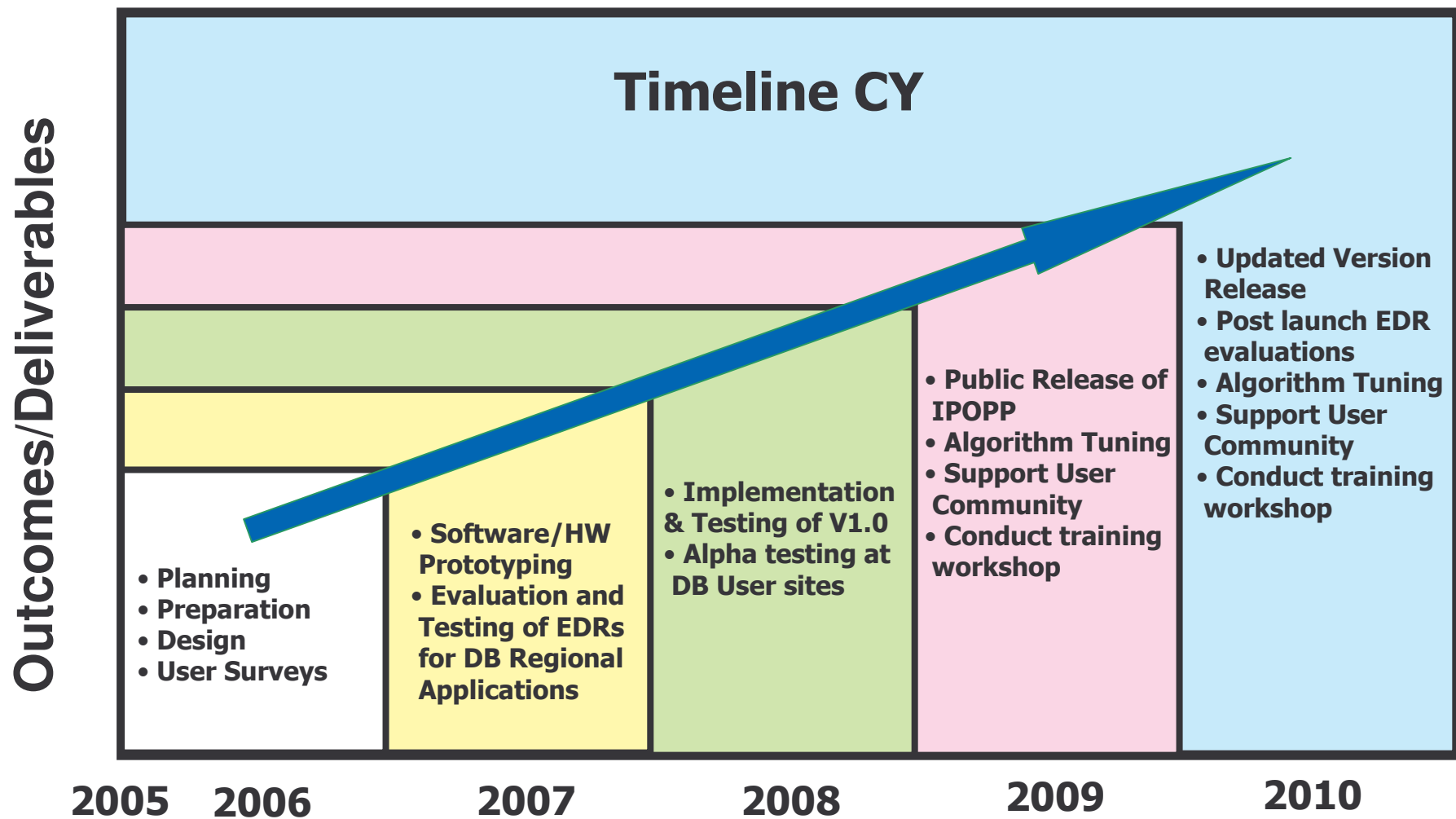


IPO Role in IPOPP Development

- Provide management and system engineering oversight to meet project goals and objectives
- Provide the NPOESS IDPS Operational Algorithms
- Solicit input from DB Community for operational use of IPOPP products
- Focus development on products most needed by DB community and CAL/VAL campaign
- Provide sufficient funding to assure IPOPP availability prior to launch of NPP
- Focal point for DB community to the NPOESS Program



International Polar Orbiter Processing Package (IPOPP) Milestones





Important Documents for DB Community

- NASA DRL portal is place to find program documentation for NPP and in the future NPOESS

(<http://directreadout.gsfc.nasa.gov>)

- Examples of release documents are:
 - *Interface Requirements Document (IRD) for National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Mission System to Direct Broadcast Users Interface*. GSFC 429-01-02-19. December 2001. (PDF)
 - *National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Spacecraft High Rate Data (HRD) Radio Frequency (RF) Interface Control Document (ICD) to the Direct Broadcast Stations*. GSFC 429-03-02-24 (Original CH-01). May 2004. (PDF)
 - *National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Mission Data Format Control Book (MFD CB)*. GSFC 429-05-02-42. Effective Date: April 14, 2006. (PDF)

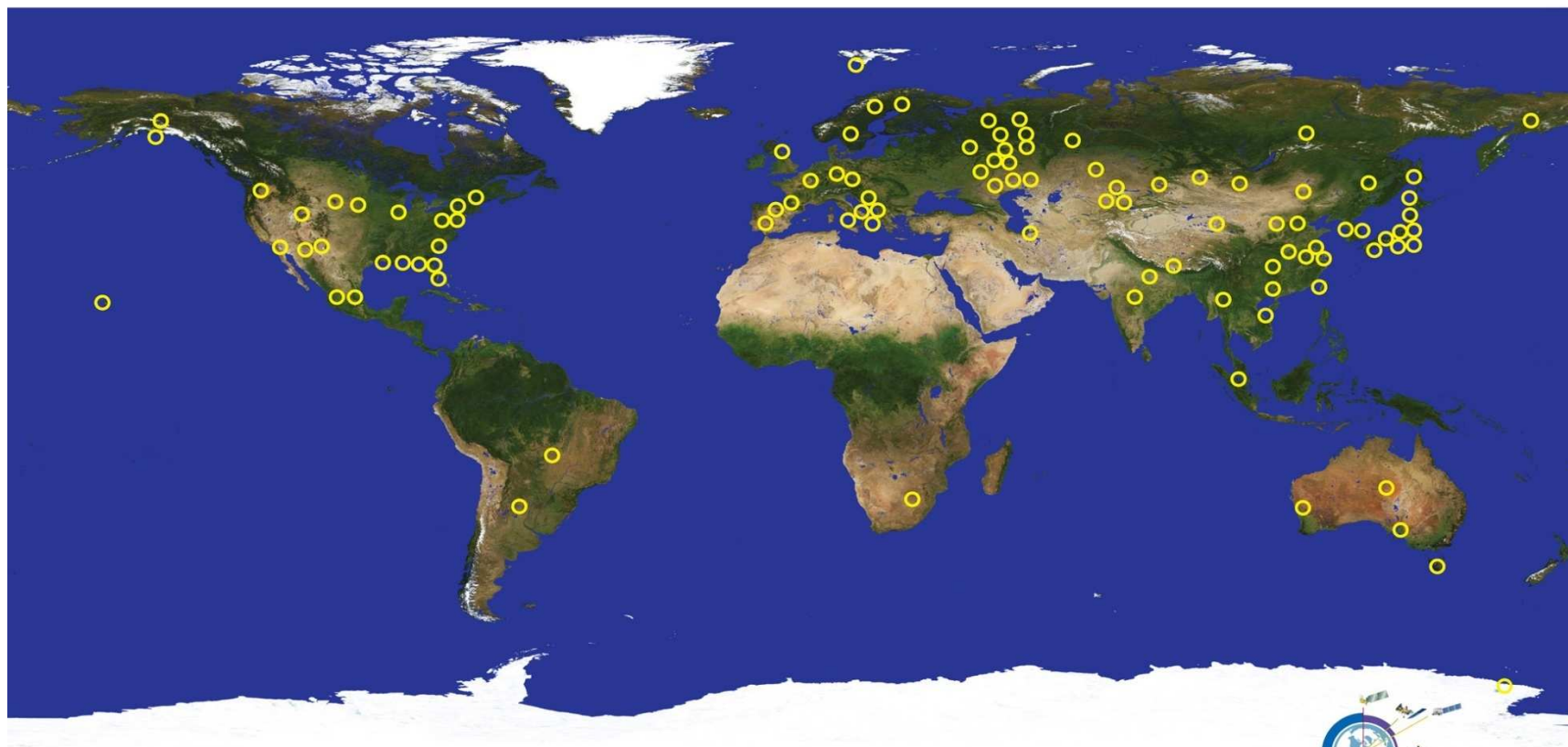


DB Community Registered X-Band Receiving Stations

National Aeronautics and Space Administration



TERRA/AQUA Direct Readout Sites



www.nasa.gov





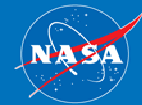
Alpha Test Site Opportunity

- Opportunity join elite group of Test Sites
 - US Government
 - NASA Direct Readout Laboratory
 - USDA Forest Service Remote Sensing Applications Center (RSAC)
 - Universities
 - Oregon State University (OSU)
 - University of South Florida (USF)
 - University of Wisconsin (UW – CIMSS)
 - International (Pending Approval of Agreements)
 - Instituto Nacional de Pesquisas Espaciais (INPE) (Brazil's National Institute for Space Research)
 - Bureau of Meteorology, Australia
 - India National Remote Sensing Agency (NRSA)
- IPO provides IPOPP Software on your hardware
 - Build 1 MODIS (TERRA and AQUA)
 - Build 2 – 4 MODIS, VIIRS, CrIS, ATMS (TERRA, AQUA, NPP)

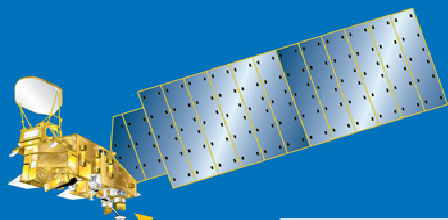


IPOPP Architecture

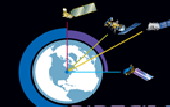
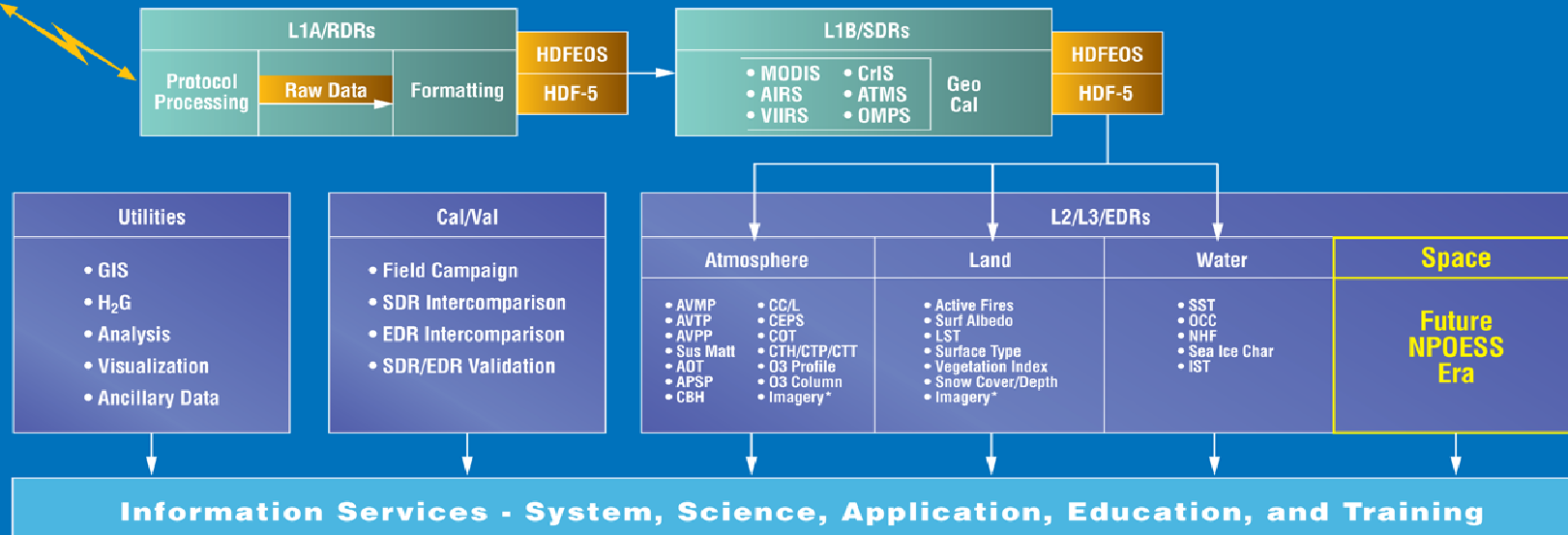
National Aeronautics and Space Administration

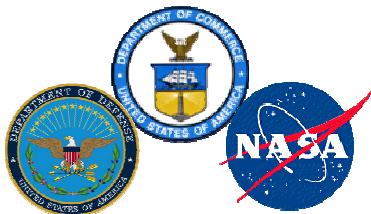


International Polar Orbiter Processing Package (IPOPP) Elements for Terra, Aqua, and NPP

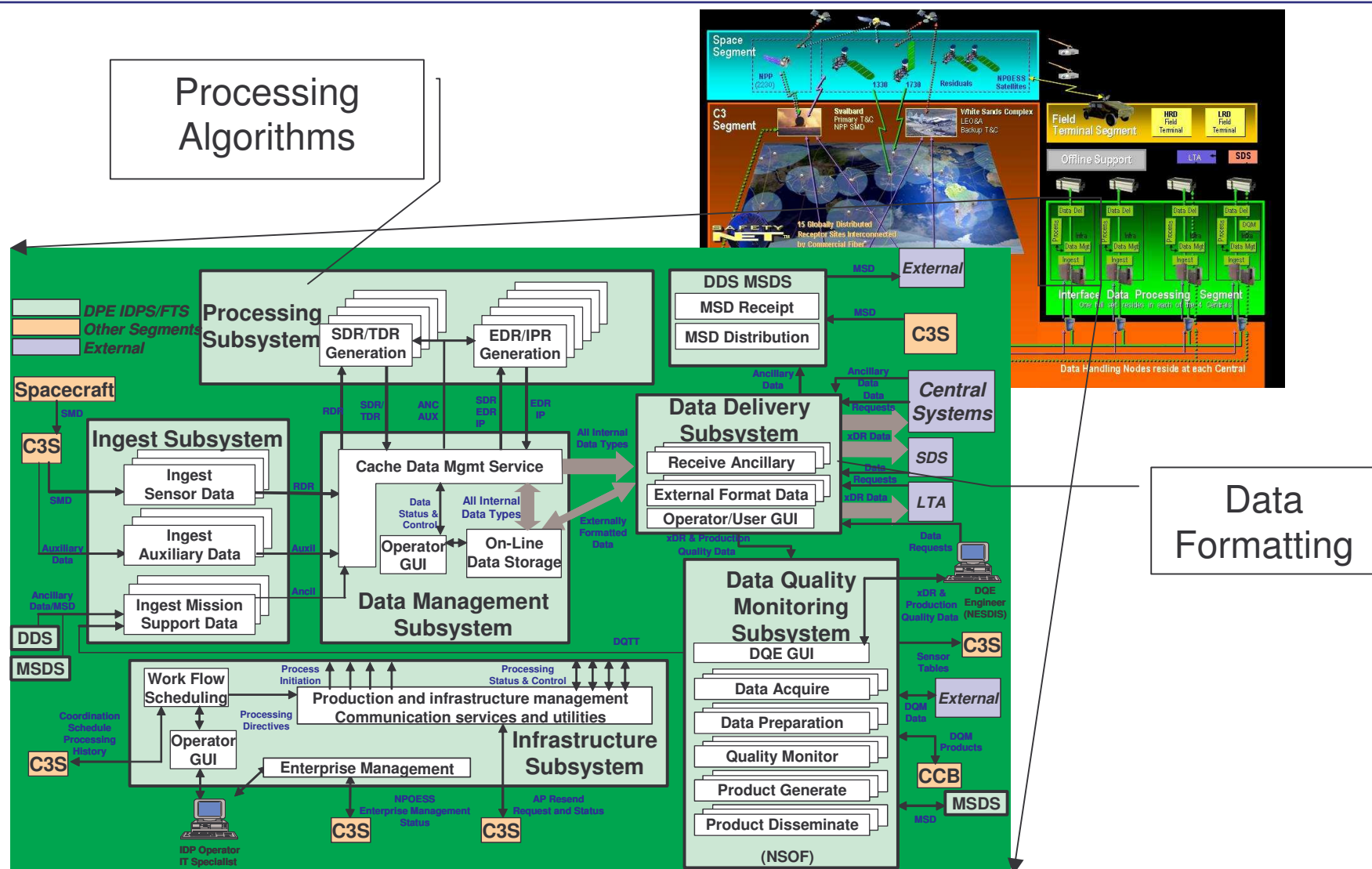


IPOPP is the primary processing package that will enable the Direct Broadcast (DB) community to process, visualize, and evaluate NPP Sensor and Environmental Data Records—which is a necessity for the DB community during the transition from the Earth Observing System Era to the NPOESS Era.



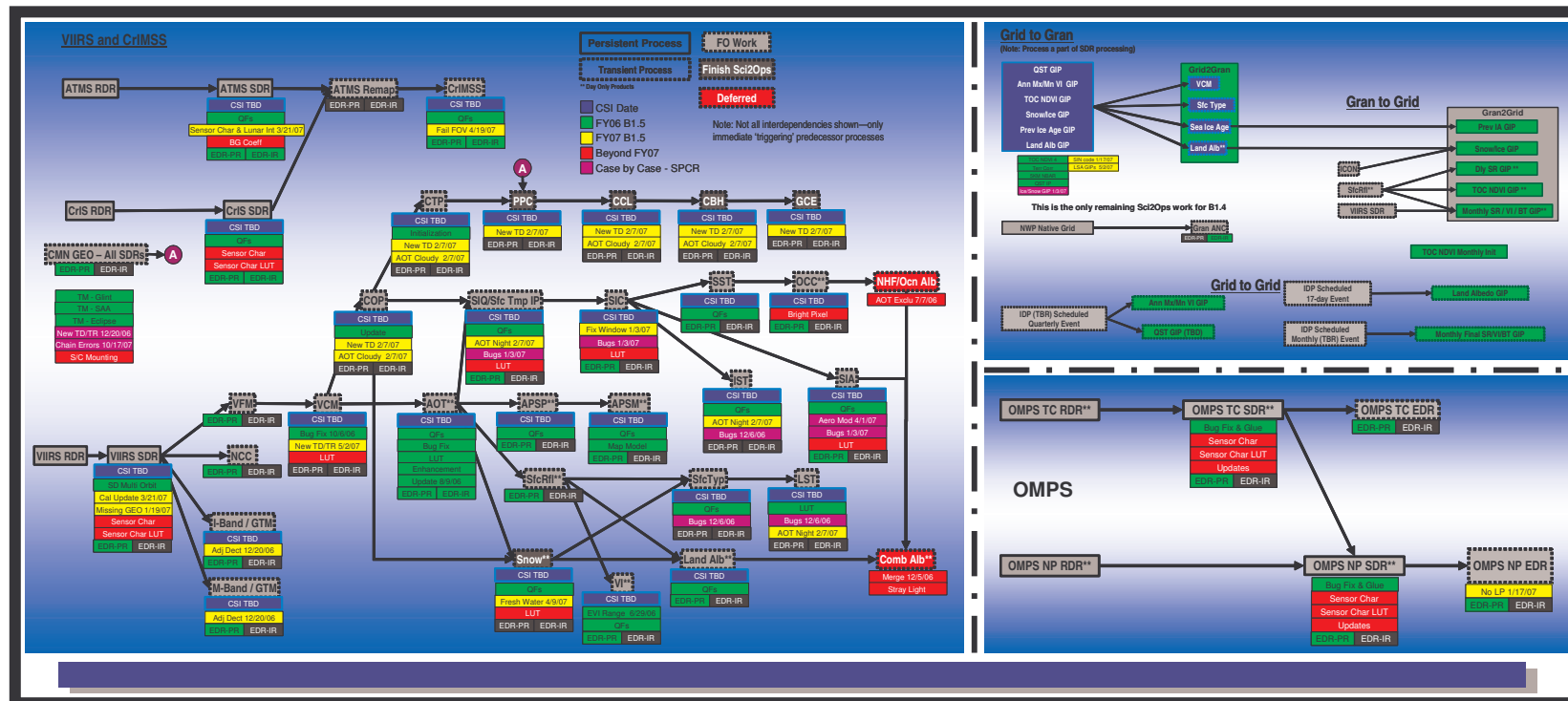


IDPS Architecture





IDPS NPP Algorithm Processing Interdependencies



- IPOPP Science Algorithms for NPP
 - Based on core of IDPS NPP processing algorithms
 - Support NPP data formats
 - Tailored to provide commonality from EOS through NPOESS



Data Processing Algorithm Adaptation Opportunities

- Use of global, retained intermediate products
 - Challenging for DB application
- Ancillary Data Products
 - Starting point is the Official Dynamic Ancillary Data
- Granule vs. swath processing
 - IDPS granule size is optimized for Centrals processing
 - Tailorable for DB processing
- Granule vs. swath output formats
 - SPA wrapper offers flexibility to adapt output formats
- Processing chain simplification
 - DB processing may



Questions

- Points of Contact at IPO
 - NPOESS Ground Systems
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 - Joseph.Mulligan@noaa.gov
 - Direct Readout, John Overton (Aerospace)
 - 301.713.4747
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