NESDIS process for consideration of commercial data

NESDIS Community Engagements Part 2

December 7, 2015

NOAA Satellite and Information Service

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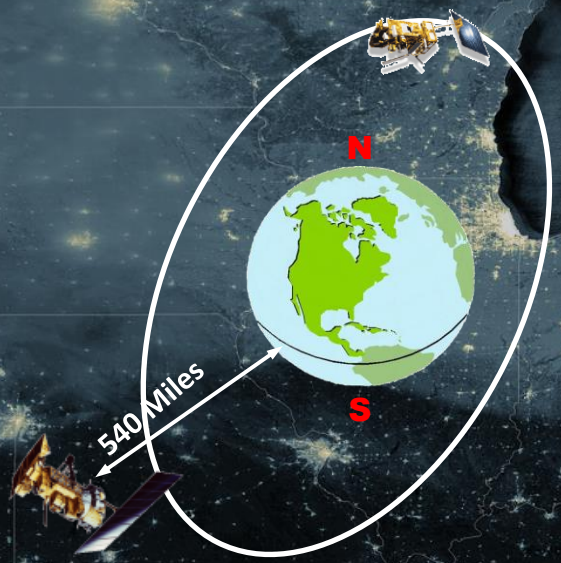
Welcome!

- What we will talk about today:
  - Status of NESDIS architecture studies
  - The steps and timeline to go from requirements to space-based data to end user exploitability, including:
    - Discussion of how and where value is added in the process
    - Discussion of demonstration project process
    - Potential approach to acquiring data for operational use

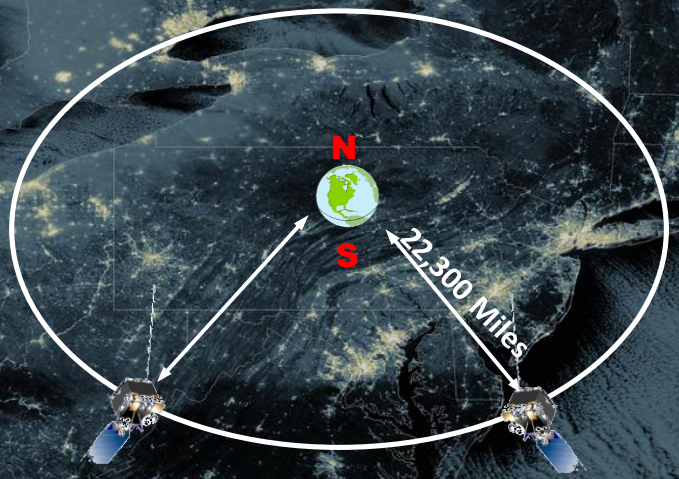
- There are critical issues we are not ready to talk about today, but we recognize are important parameters in any sustained US Government to Industry interaction, including:
  - Contract details
  - Funding
  - Negotiating data rights

Baseline NOAA Observing System

Polar-orbiting Operational Environmental Satellites (POES) Followed by S-NPP and JPSS-1 thru -4



Geostationary Operational Environmental Satellites (GOES), Through GOES-U



NOAA/NASA

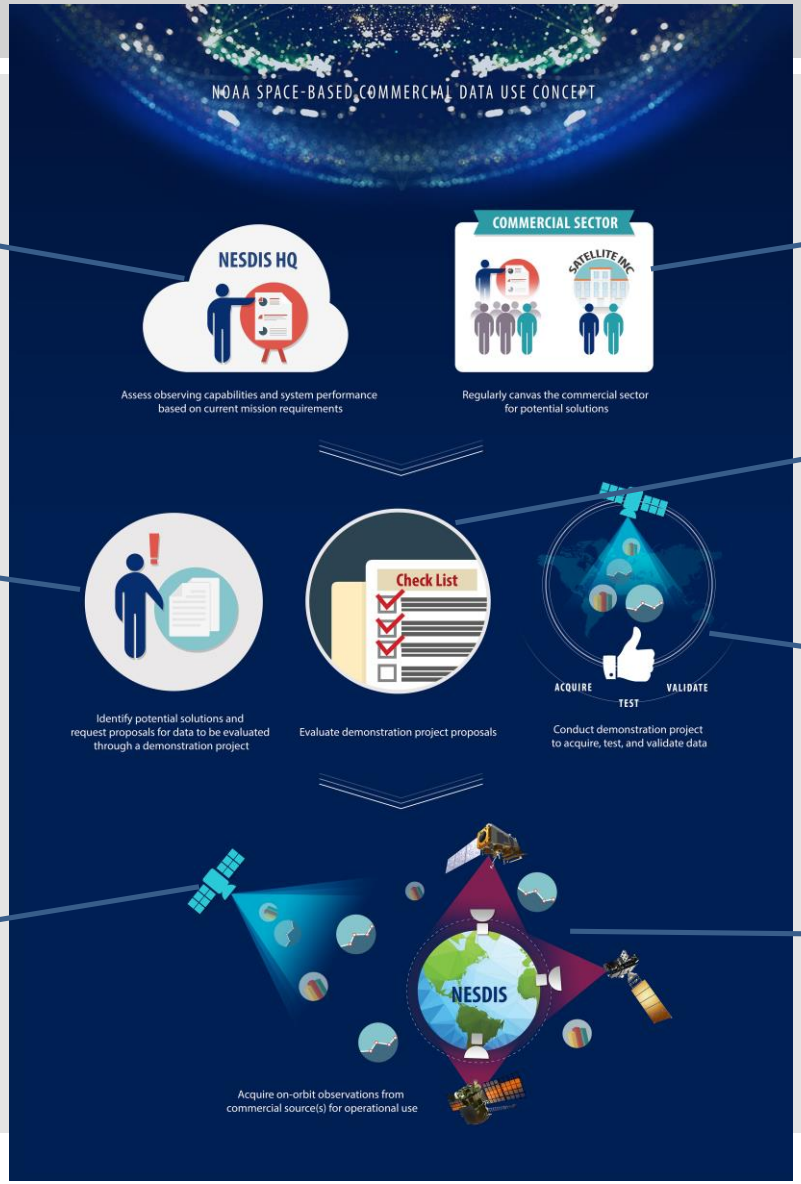
S-NPP image of North America

NOAA Space-Based Commercial Data Use Concept

Requirements Definition

Solicitations & RFIs/RFPs

Sustained Procurements



Capabilities Awareness

Proposals Evaluations

Demonstrated Performance

Integrated Observations

Current context: NESDIS Architecture Studies

- NESDIS Next Generation Architecture Studies are underway
  - Ongoing through 2016
  - Work through 2020 to establish and begin development of programs with operational capability in 2030 epoch
  - Will include candidate mission & measurement concepts in the mid 2020s
- Architecture studies will:
  - Examine National and user community needs for the 2030 epoch
    - Have established a Space Platform Requirements Working Group (SPRWG)
  - Examine remote sensing capabilities that can be operational in the 2030 epoch
    - What potential breakthrough technologies are emergent?
    - What potential commercial solutions may meet NOAA observing system requirements?

Current context: NESDIS Architecture Studies

Architecture Studies Personnel

NESDIS OSAAP Acting Director:	Dr. Tom Burns, NESDIS
Architecture Development Team Lead:	David Di Pietro, NESDIS/NASA GSFC
Architecture Systems Engineer:	Dr. Mark Maier, The Aerospace Corporation
SPRWG Chair:	Dr. Rick Anthes, UCAR

Organizations represented on SPRWG:

NOAA NWS	University of Wisconsin
NOAA NMFS	University of Colorado, LASP
NOAA OAR	Colorado State University
NOAA NOS	Global Weather Corporation
NASA GSFC	Northrop Grumman
NASA/JPL/Cal Tech	

Communication with industry

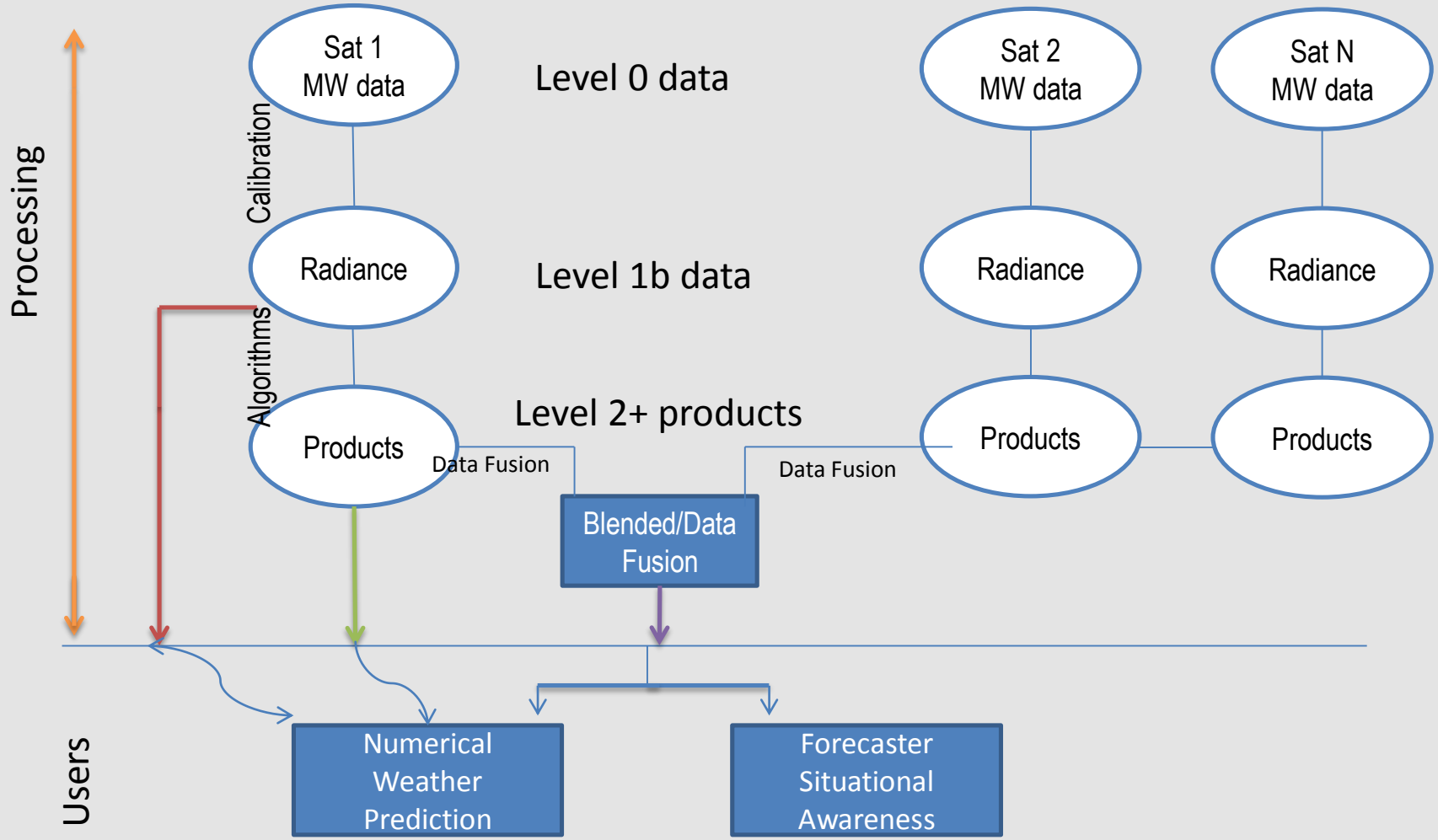
- We need to make informed make vs. buy decisions for our observing assets.
- To do that we will regularly canvas the commercial sector for potential solutions in particular observation areas
- Issue RFIs, typically every 2-3 years
  - Seek emergent solutions to meet NOAA mission requirements, both existing and evolving requirements
  - Individual RFIs may be tailored to specific observational capability or requirement.
- Sponsor periodic meetings or workshops like today's
  - To review or present developing processes
  - To communicate developing architecture or program plans

RFP for Demonstration Project

- Once a potentially profitable avenue for investigation is identified, potential solutions may be evaluated via demonstration project
- Steps to completing this include:
  - Issue an RFP tailored to the measurement
  - Contract with vendor or vendors to acquire demonstration data
  - Conduct the demonstration activities
    - Duration may vary, as specified in the RFP
    - Acquire, test, and validate data via demonstration project
  - Complete evaluation

Overview of Satellite Data Handling

Example: Microwave Sounder Data



Demonstration Project Steps: Pre-launch

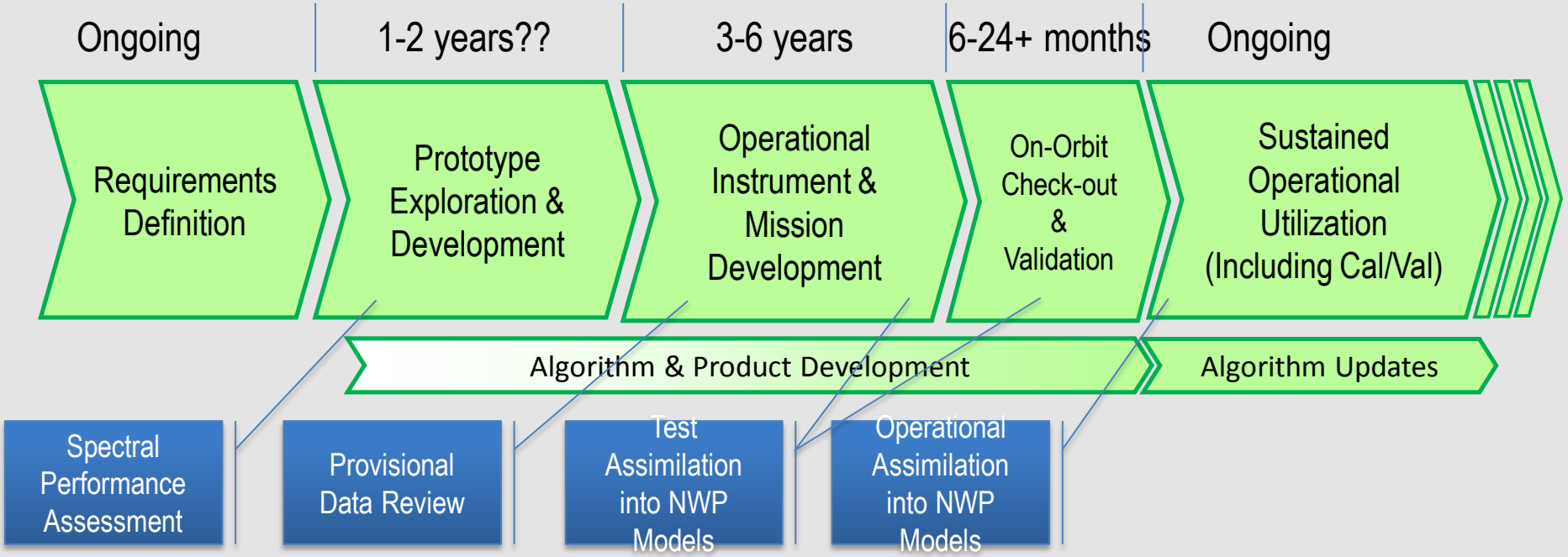
- Ground system framework development
- Pre-launch data acquisition to begin early calibration and assimilation work
- Numerical Weather Prediction Models prep:
  - Algorithm development and testing
  - Data formatting and Data delivery requirements
  - Practice assimilation demonstration into NWP
- Forecaster situation awareness prep:
  - Operations proving ground testing
  - End to end operational testing
  - Forecaster training

These are steps NESDIS conducts for instruments to ensure the data will meet our observation requirements. The early understanding of the instrument characteristics accelerate operational use.

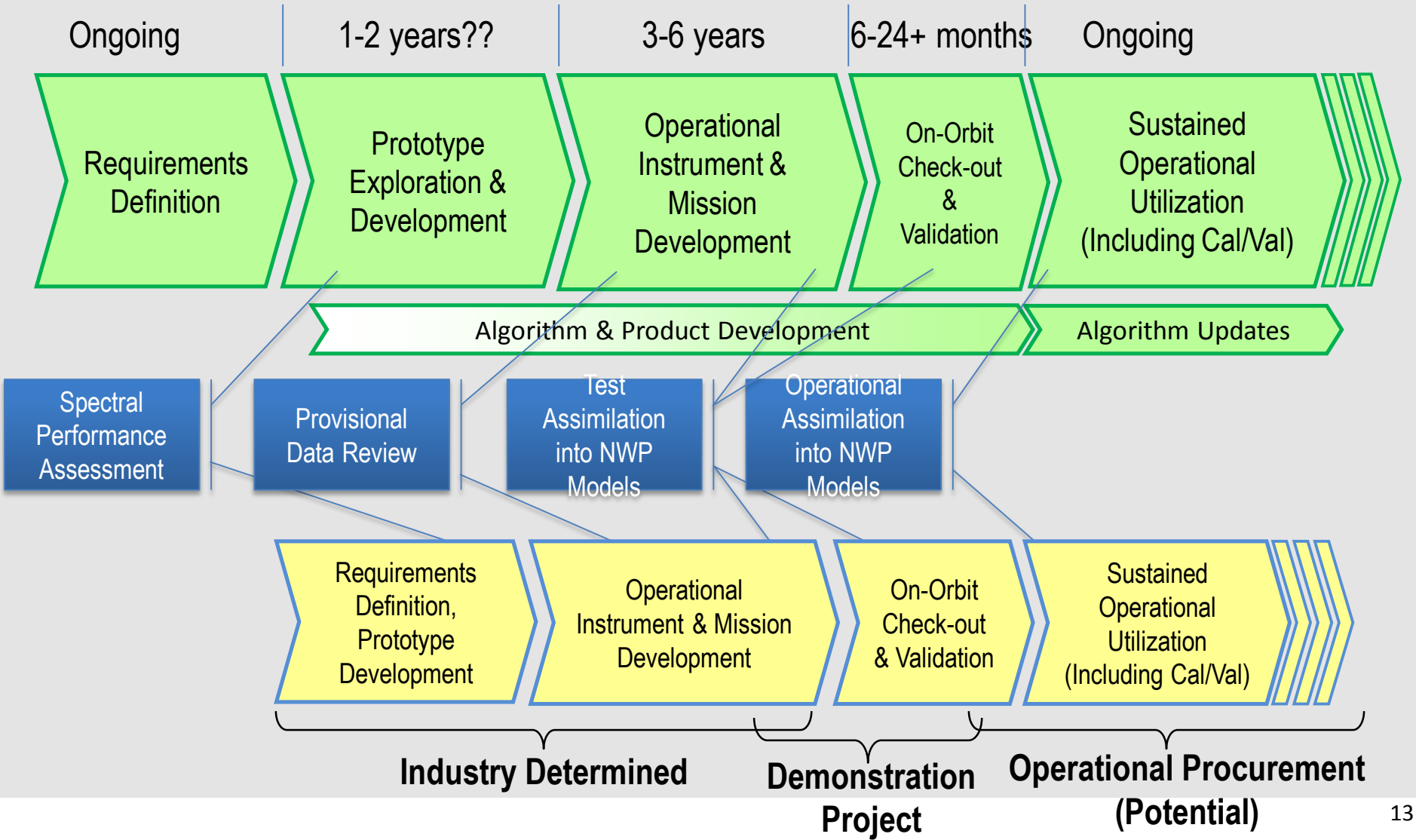
Demonstration Project Steps: Post-launch

- Ingest data into NOAA ground systems
- Distribute data to users (e.g., National Weather Service)
- For Numerical Weather Prediction models:
  - Perform on-orbit calibration and validation
  - Monitor data quality
  - Test impact of data on models through full data assimilation
- For forecaster situation awareness:
  - End-to-end operational testing, integration, evaluation
  - Accelerated forecaster training

Satellite Product Development Timeline



Satellite Product Development Timeline
Demonstration Project Development Timeline



Demonstration Project Steps: Timeline

- NOAA experience for validation durations:
  - Pre-launch: 18 months
  - Post-launch: 6 to 12 months, often much longer for complex products
- Examples of transition to operations timelines for current NOAA assets:

Launch	Product	Pre-launch	Post-launch	Operational
Oct 2011	S-NPP ATMS Radiances	18 months	6 months	May 2012
Oct 2011	S-NPP CrIS Radiances	18 months	22 months	August 2013
Oct 2011	S-NPP VIIRS imagery	12 months	6 months	May 2012
Oct 2011	S-NPP Atmospheric Temp/Moisture	6 months	22 months	Aug 2013
March 2010	GOES-15 imagery	6 months	6 months	September 2010
March 2010	GOES-15 Cloud Drift Winds	6 months	6 months	September 2010

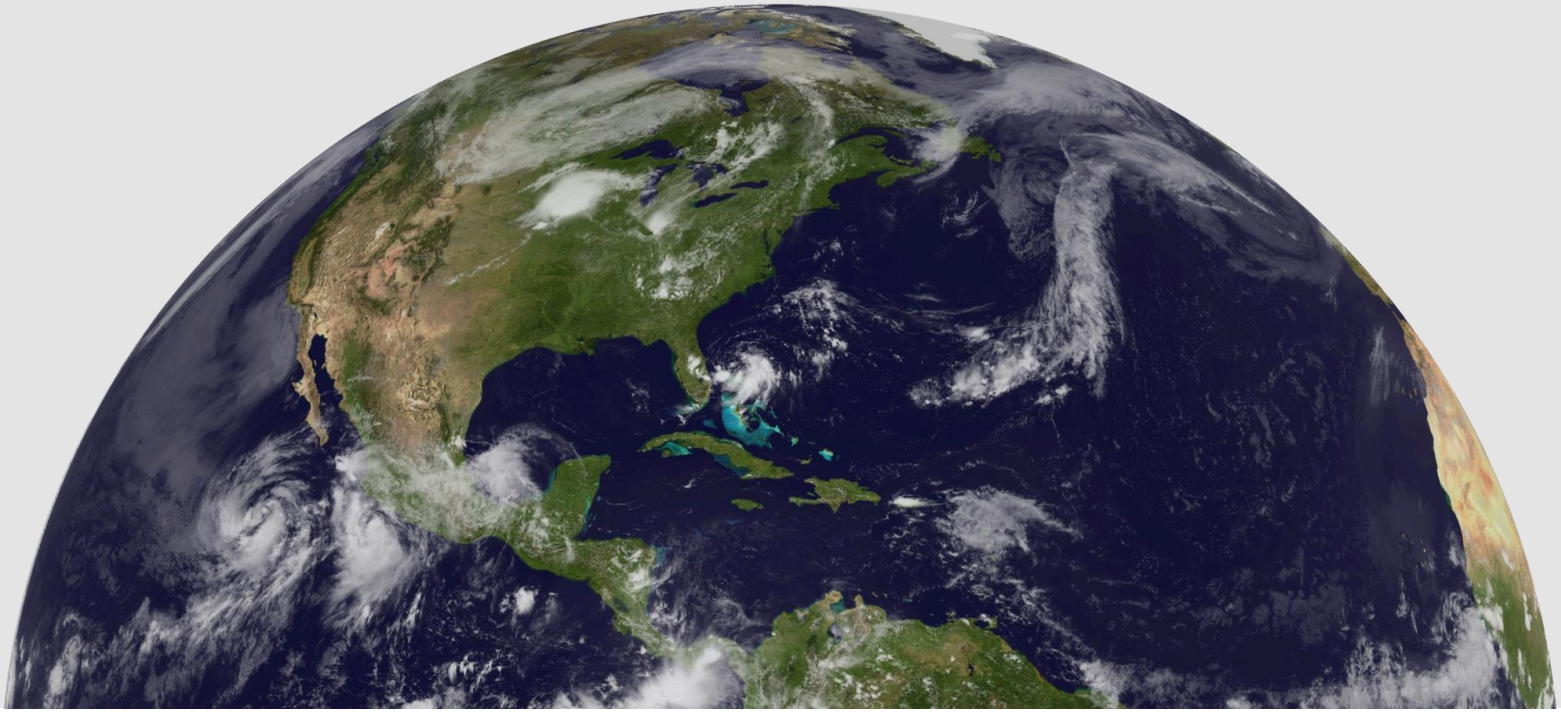
RFP for operational data use

- Assumes a promising commercial dataset is identified through demonstration project
- One or more RFPs to purchase on-orbit data
- Specifics of the contracted activities may vary for different measurements, depending on what is determined to be the most efficient and effective interface
  - Could be level 0 raw data, or higher processed data with visibility into the raw data for validation and calibration
  - Additional details include such items as terms for processing, delivery, exploitation and assimilation of on-orbit data, ongoing maintenance, archival and monitoring of data and/or product outputs
  - Transition of algorithms and demo hardware to operational systems
- Distribution of operational data to end users remains a NOAA function

Wrap up

- Where we are:
  - Preparing to release final NOAA Policy
  - Engaging community on NESDIS process
  - Working on Observing system architecture and requirements evaluation

- Where we are going:
  - Following finalization of the NOAA Policy, NESDIS Process document will be released for public comment, informed by the public comments and by workshops such as this
  - Commercial activities will be a topic of discussion at the National Space Symposium, in Colorado Springs in April 2016

http://www.space.commerce.gov/category/government-business/noaa-commercial-space-solutions/

Discussion