NOAA: *Current and Future Satellite Systems*

10th Asia-Oceania Meteorological Satellite Users Conference

Mark S. Paese
Deputy Assistant Administrator for Satellites and Information Services, National Oceanic and Atmospheric Administration
Supporting NOAA’s Mission

Weather Act & Blue Economy

“NOAA’s FY 2019 budget prioritizes government functions that: provide the observational infrastructure, capabilities, and staff to produce timely and accurate weather forecasts and warnings; …to ensure the continued collection of at-sea data vital to the US economy for fisheries management and nautical charting; …”

---

**Weather Research and Forecasting Act of 2017**

- Improve Hurricane Forecasting
  - Improved forecasting tools for National Hurricane Center
  - Historical tropical cyclone tracking

- Prioritize Observation Data Requirements
  - Enhanced observational datasets with Copernicus
  - Reference Environmental Data Records

- Operationalize COSMIC
  - Poised for COSMIC-2 data archival
  - Satellite retrievals of temperature calibration

- Tsunami Warning and Education
  - Coastal Digital Elevation Models
  - Global Historical Tsunami Events

---

**Blue Economy**

- Ocean Mapping
  - Bathymetric & geological data management and role in Seabed 2030
  - Digital Elevation Models for coasts and ports

- Seafood Production
  - Global Sea Surface Temperature, Ocean Heat, and Salt Content
  - Ocean Chemistry and Ocean Acidification

- Maritime Infrastructure
  - Magnetic model supporting ocean oil drilling
  - International Comprehensive Ocean-Atmosphere Data Set

- Tourism and Recreation
  - Coastal Water Temperature Guide
  - Hypoxia Watch and Harmful Algal Bloom Observing System

---

*Preserving data to inform weather research & forecasting and Blue Economy.*
Our aspiration

Provide a truly integrated digital understanding of our earth environment that can evolve quickly to meet changing user expectations by leveraging our own capabilities and partnerships
We will achieve our aspiration by working towards five strategic objectives

1. Maintain observational leadership in geostationary orbit

2. Disaggregate and fully utilize all assets in LEO no matter who owns the asset

3. Develop agile, scalable ground capability to improve efficiency of service deliverables and ingest data

4. Provide superior user engagement to ensure timely response to user needs

5. Deliver integrated program development to provide a suite of integrated products and services
NOAA Recent and Upcoming Launches

JASON-3
OPERATIONAL JULY 1, 2016

DSCOVR
OPERATIONAL JULY 27, 2016

COSMIC-2
COSMIC-2 - June 2019

GOES-R SERIES
GOES-16 - OPERATIONAL Dec 18, 2017
GOES-17 - OPERATIONAL Feb 12, 2019
GOES-T - FY 2022
GOES-U - FY 2025

JPSS SERIES
NOAA-20 - OPERATIONAL May 30, 2018
JPSS-2 - FY 2023
JPSS-3 - FY 2026
JPSS-4 - FY 2031
JPSS & GOES Applications

- New generation of operational polar and geostationary satellites are now providing new capabilities for forecasting and disaster support

- Leveraging international partnerships to produce consistent GEO/LEO integrated flood maps for our hemispheric regions and provide products in near real time

- Work is underway within NOAA to merge VIIRS ocean color products from SNPP and NOAA-20 to create daily ocean color products
NOAA Satellites Monitoring Fires

**JPSS Program – Polar orbiting**

NOAA-20 captures plumes of smoke from the Camp Fire in Northern California

**GOES-R Series - Geostationary**

GOES-R provides nearly continuous observations of fires
NOAA Satellites & Drought

VIIRS Green Vegetation Fraction Product

VIIRS Vegetation Health Product (VVHP)

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period

Valid for September 19 - December 31, 2019
Released September 19

Author:
Adam Allgood
NOAA/NWS/NCEP/Climate Prediction Center

Depicts large-scale trends based on subjectively derived probabilities guided by short and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short-lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas intensities of D1 to D4.

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

http://go.usa.gov/3eZ73
Commercial Weather Data Pilot

- Publish standards for space-based commercial weather data
- Contract with one or more private sector entities capable of providing data that meet published standards
- Assess data’s ability to meet standards and its impact to weather models
New Capabilities Possible and Under Consideration

**LEO**
- Next generation & additional sounders
- Much higher density GNSS-RO
- Precipitation & wind measurements

**GEO**
- Diverse quality imaging from three locations (east, west, center)
- Advanced imaging and/or sounding capabilities
- Tundra missions sharing instruments with GEO to provide Arctic real time imagery

**Space Weather**
- Solar observation and situ space weather
End-to-end System Evolution to Support the integrated observing system

DATA SOURCES

- NOAA Sources (satellites, radar, etc.)
- International Operational
- Research and other partners
- Commercial

Cloud Framework

Real-Time Operational User Data Flow
- Product Generation
- Product Distribution
- Archive

Non-Real-Time Operational User Data Flow
- Product Generation
- Product Distribution
- Archive

USERS

- Real-Time Operational Community
- Non Real-Time Operational Community
- Non-Real-time/Non-Operational User (e.g., Public, etc.)
Thank you!