JPSS: Celebrating A Decade of Successful Operations of SNPP and Preparing for JPSS-2 Launch

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NOAA
National Environmental Satellite, Data, and Information Service

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VIIRS User Meeting

VIIRS History

- The 1st VIIRS was launched onboard S-NPP in October 2011, and the 2nd sensor followed onboard JPSS-1/NOAA-20 in November 2017.
- SNPP successfully completed 10 years of successful operations and continues to be healthy
- Three more VIIRS are planned to fly on board JPSS-2, 3 and 4 satellites

SNPP Launch on October 28, 2021

Benefits of VIIRS

- VIIRS provides several technical improvements from its heritage on MODIS and ensures continuity to MODIS well in to 2040. A game changer for NOAA compared to AVHRR.

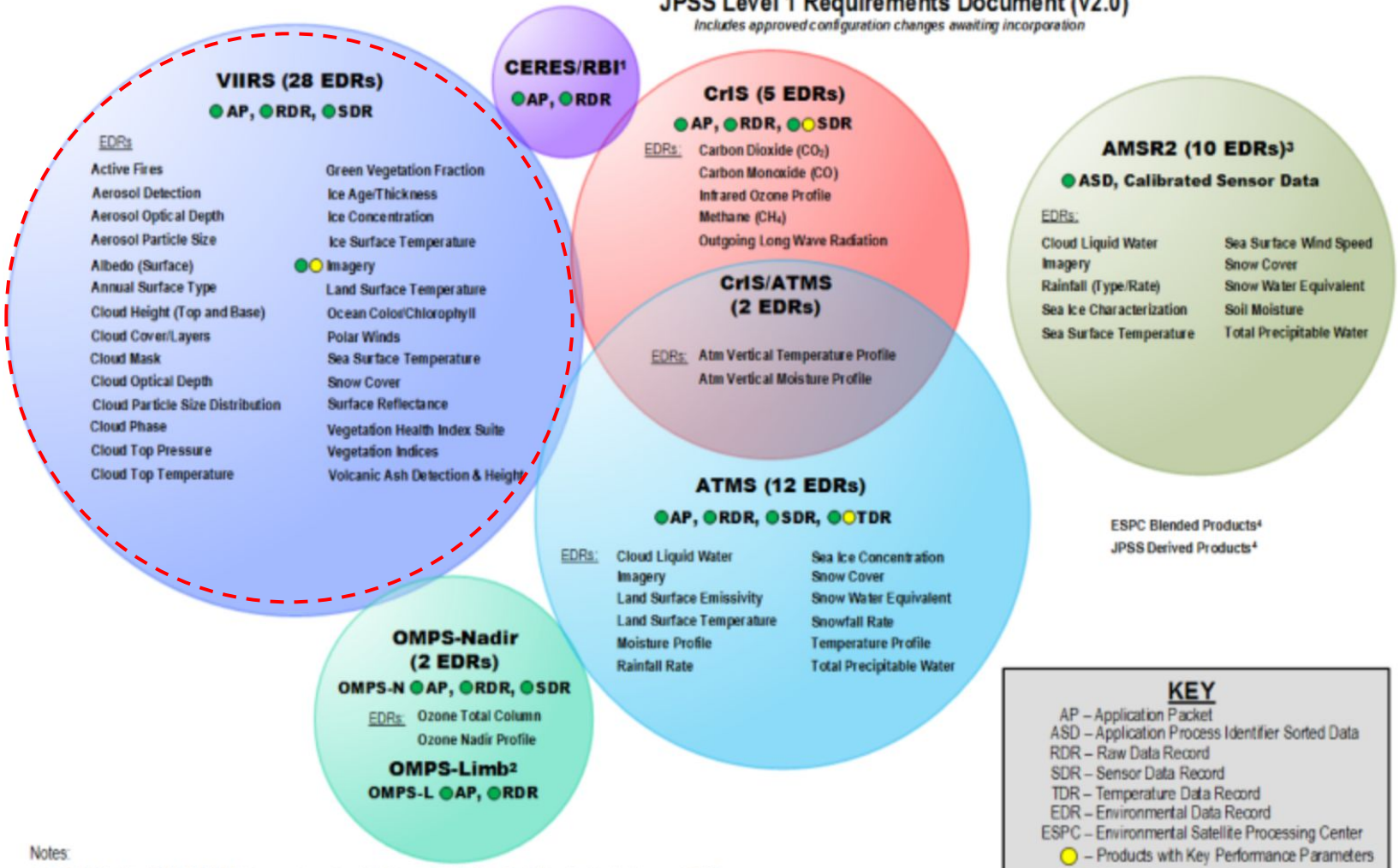
- May 1, 2012, VIIRS imagery from SNPP used to support local warning and forecast operations throughout the NWS Alaska Region for the first time.

- VIIRS on JPSS satellites is a truly multipurpose imager for NOAA, and several Ocean, Land and Atmosphere products are produced operationally in addition to true color and Day Night Band imagery that support several critical applications.

JPSS Program Data Products

JPSS Level 1 Requirements Document (v2.0)

Includes approved configuration changes awaiting incorporation



KEY

AP – Application Packet
ASD – Application Process Identifier Sorted Data
RDR – Raw Data Record
SDR – Sensor Data Record
TDR – Temperature Data Record
EDR – Environmental Data Record
ESPC – Environmental Satellite Processing Center
– Products with Key Performance Parameters
– Mission Unique Data Products

Notes:

[1] AP, RDR for the JPSS-2/3/4 Mission contingent on NASA manifest of the Radiation Budget Instrument (RBI)

[2] Not applicable to JPSS-1; AP and RDR contingent on NASA manifest of OMPS-Limb on the JPSS-2/3/4 Mission

[3] All products contingent on the Global Change Observation Mission (GCOM) provided by the Japan Aerospace Exploration Agency

[4] Blended and Derived Product requirements are managed by the NOAA JPSS Program and specified in segment-level documentation

The JPSS Program includes Ground System Support for the Metop, EPS-SG, DMSP, and GCOM missions

January 2, 2018

This chart is controlled by JPSS Program Systems Engineering

JPSS-P Rev C

Continuity of Multipurpose Imaging by NOAA and EUMETSAT

- EUMETSAT will have an advanced imager (METimage) on EPS-SG (A) satellite which is scheduled to be launched in 2024 to replace AVHRR (Advanced Very High Resolution Radiometer) on Metop in early morning orbit.
- METimage will provide continuity to the AVHRR series on board the EPS and NOAA satellites, and VIIRS on board NOAA satellites.
  - METimage covers a broad spectral range in 20 spectral bands from 443 to 13.345µm at 500m spatial resolution at nadir
    - No day-night-band or ocean color capabilities
- VIIRS and METimage are expected to provide global LEO measurements beyond 2040

METimage Bands and Uses

Channel	Central Wavelength (in micrometres)	Primary Use
VII-4	0.443µm	Aerosol, 'true colour imagery' (blue channel), vegetation
VII-8	0.555µm	Clouds, vegetation, 'true colour imagery' (green channel)
VII-12	0.668µm	Clouds, vegetation, 'true colour imagery' (red channel)
VII-15	0.752µm	Atmospheric corrections (aerosol), optical cloud top height assignment, vegetation
VII-16	0.763µm	Atmospheric corrections (aerosol), optical cloud top height assignment, vegetation
VII-17	0.865µm	Vegetation, aerosol, clouds, surface features
VII-20	0.914µm	Water vapour imagery
		Water vapour total column
VII-22	1.24µm	Vegetation, aerosol
VII-23	1.375µm	Aerosol, 'true colour imagery' (blue channel), vegetation
VII-24	1.63µm	Cloud phase, snow and ice, vegetation, aerosol, fire
VII-25	2.25µm	Cloud microphysics at cloud top, vegetation, aerosol over land, fire (effects)
VII-26	3.74µm	Cloud variables, cloud microphysics at cloud top, absorbing aerosol, Sea Surface temperature (SST), Land Surface Temperature (LST), fire, sea and land ice, snow
VII-28	3.959µm	SST, LST, fire
VII-30	4.05µm	SST, LST, fire
VII-33	6.725µm	Water vapour imagery (including wind in polar regions), water vapour profile (coarse vertical resolution)
VII-34	7.325µm	Water vapour imagery (including wind in polar regions), water vapour profile (coarse vertical resolution)
VII-35	8.54µm	Cirrus clouds, cloud emissivity
VII-37	10.69µm	Cloud variables including cirrus detection, surface temperatures and other radiative variables, surface imagery (snow, ice etc.)
VII-39	12.02µm	Cloud variables including cirrus detection, surface temperatures and other radiative variables, surface imagery (snow, ice etc.)
VII-40	13.345µm	Carbon dioxide (CO_2) slicing for accurate cloud top height. Temperature profile (coarse vertical resolution)

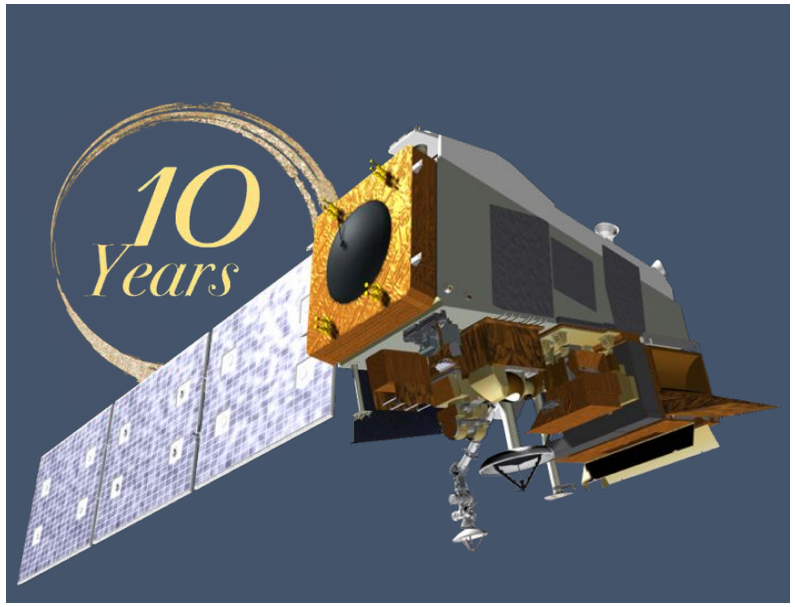
Same as VIIRS

No DNB or OC Bands

METimage complements VIIRS

JPSS Backbone Status

Current and Future



NOAA20 Operating Nominally

Satellite during TVAC preparations

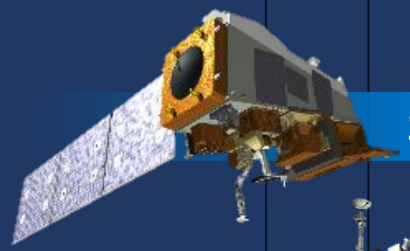
October 28, 2021, marks the successful

10th anniversary of the SNPP satellite

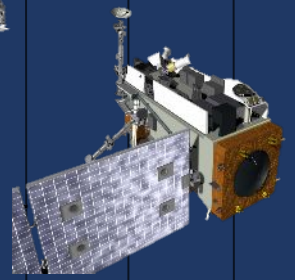
JPSS-2 status

- JPSS 2 successfully completed TVAC on June 2nd
- Pre-Ship Review is planned for August 1st-4th
- JPSS 2 will arrive at Vandenburg on August 24th
- JPSS 2 will move to the Launch Pad on October 17th
- Launch is scheduled on November 1, 2022

JPSS Continuity of Operations



Suomi NPP



NOAA-20

JPSS-2

JPSS-3

JPSS-4

JPSS Program will ensure the continuity of critical capabilities for years to come while looking for ways to make these capabilities even more useful to its operational users.

Suomi NPP: Suomi National Polar-orbiting Partnership
JPSS: Joint Polar Satellite System
PFO: Polar Follow-on

2018 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

Calendar year

Beginning of the LEO Program

- In FY 2022, NOAA was authorized to establish the Low Earth Orbit (LEO) activity, which will set the stage for managing future polar and other low earth and medium earth orbit satellite observations as loosely coupled programs.
- Future NOAA LEO missions are expected to be in a partially disaggregated architecture
- A disaggregated architecture is expected to exploit efficient and quick access to space ; Launch what we want, when we want, where we want it (compared to a single large spacecraft with multiple payloads).
- Strategic investments in the ten-year funding profile aimed at achieving the evolving requirements for LEO observations through continuous innovation by
  - Initiating phased acquisition of the next generation instruments to extend measurements from LEO based on need
- Allows us to manage ***all*** LEO missions (including exploitation of partner and commercial data) as a portfolio.

Purpose of Today's Meeting

- Celebrate 10 years of VIIRS observations from SNPP
- Assess the impacts of VIIRS data on a broad range of applications from a variety of users to gain an appreciation of VIIRS data
- Identify what improvements are needed in next generation of multipurpose imagers
- Explore opportunities for partner missions to augment VIIRS data

Thank You!