



**NOAA National
Environmental Satellite, Data, and
Information Service (NESDIS)**

September 2023

NOAA/NESDIS Joint Venture Partnerships' Earth Observation Digital Twin Projects

Fall HSRP Public Meeting, September 27 - 29, 2023

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NOAA NESDIS Office of System Architecture and Engineering (SAE)**

NOAA NESDIS' Joint Venture Partnerships Program is funding Earth Observation Digital Twin Projects

- **Overview of Joint Venture Partnerships**
- **NOAA's Earth Observation Digital Twin Projects**
- *Lockheed Martin Earth Observation Digital Twin Project (next)*

NESDIS = National Environmental Satellite, Data, and Information Service



NOAA Satellite and Information Service (NESDIS)

- Operates the Nation's weather satellites, 24/7
- Develops critical data and operational products
- Provides definitive assessments of the U.S. and global climate
- Maintains one of the most significant archives of environmental data on Earth

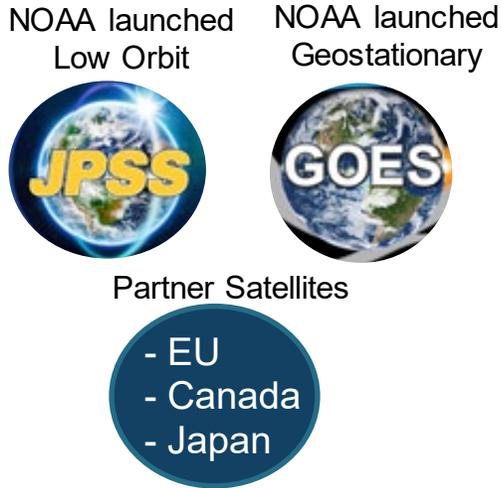


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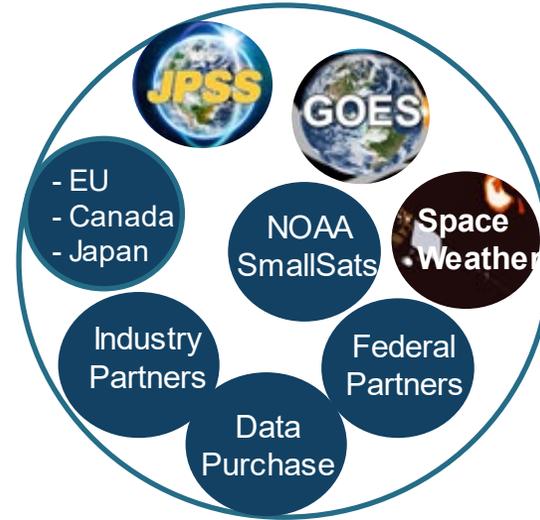
Date

NESDIS Is Moving to an Enterprise Architecture

Historically



2030-2050



- Enterprise Architecture
- Partially disaggregated Low Orbit
 - Mixed US government Geostationary Partner Satellites
 - Mixed resolution, update rates
 - NOAA launched, rideshare, and payload
 - Data buys

Joint Venture

Leverage technologies, capabilities, and data being developed by other government partners & industry



Joint Venture Partnership Projects:

- Benefit:
 - Leveraging capabilities being developed by others for high return on funds
 - Reduces NOAA's risk by demonstrating if emerging technologies can reliably meet NOAA's operational needs



Why We Are Doing Earth Observations Digital Twin Studies/Demonstrations

- Digital Twin may enable us to enhance our ability to process, quality-control, and consolidate environmental observations
- Digital Twin may streamline the satellite data ground processing and dissemination to users
- Study results will help us to determine how Earth Observation Digital Twin might serve as the next generation of ground enterprise system in operations

This project is for demonstration purposes only and there are currently no plans to adopt the Earth Observation Digital Twin into the operational environment



Successful Joint Venture Partnerships Studies/Demonstrations

- A flexible digital earth twin system that allows the user (or general public) to easily access current and past environmental data
- A modern visualization toolset to allow the display of Digital Twin data, including time series
- Able to ingest several large files, at different scales
- Standardized with other Digital Twin efforts, such as NASA's



Joint Venture Studies – Earth Observations Digital Twin Using Artificial Intelligence

- Three contracts were awarded in fall 2022
- Projects are typically 1 to 2 years



Joint Venture Partnerships - Reducing emerging technology risks and leveraging partners' capabilities to provide high return on NOAA funds