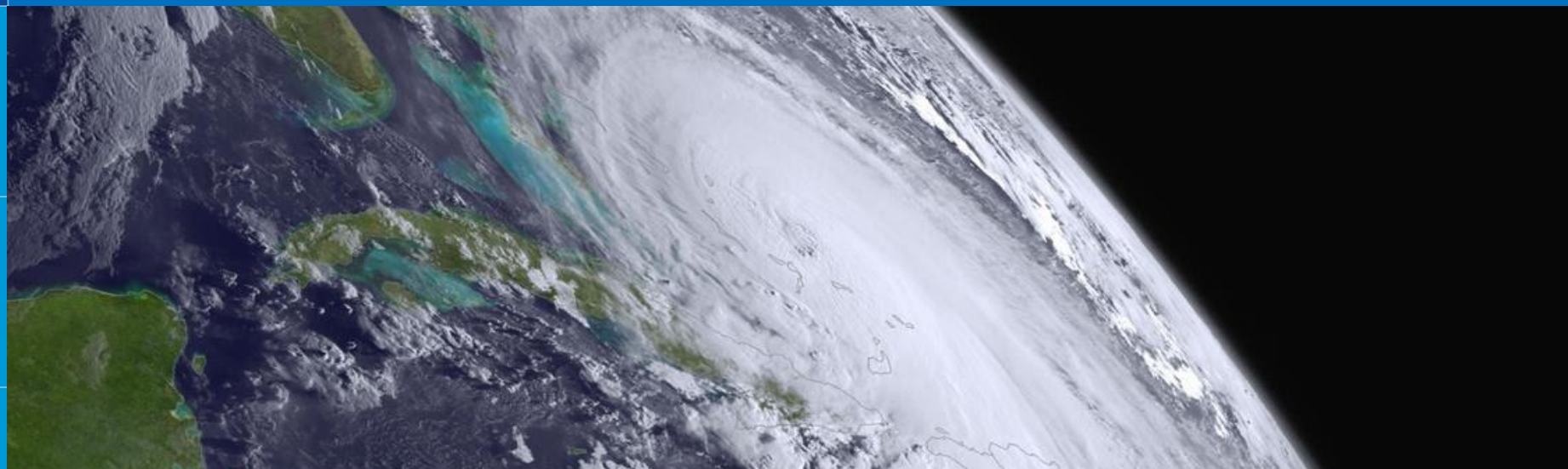
NOAA

Satellite and Information Service

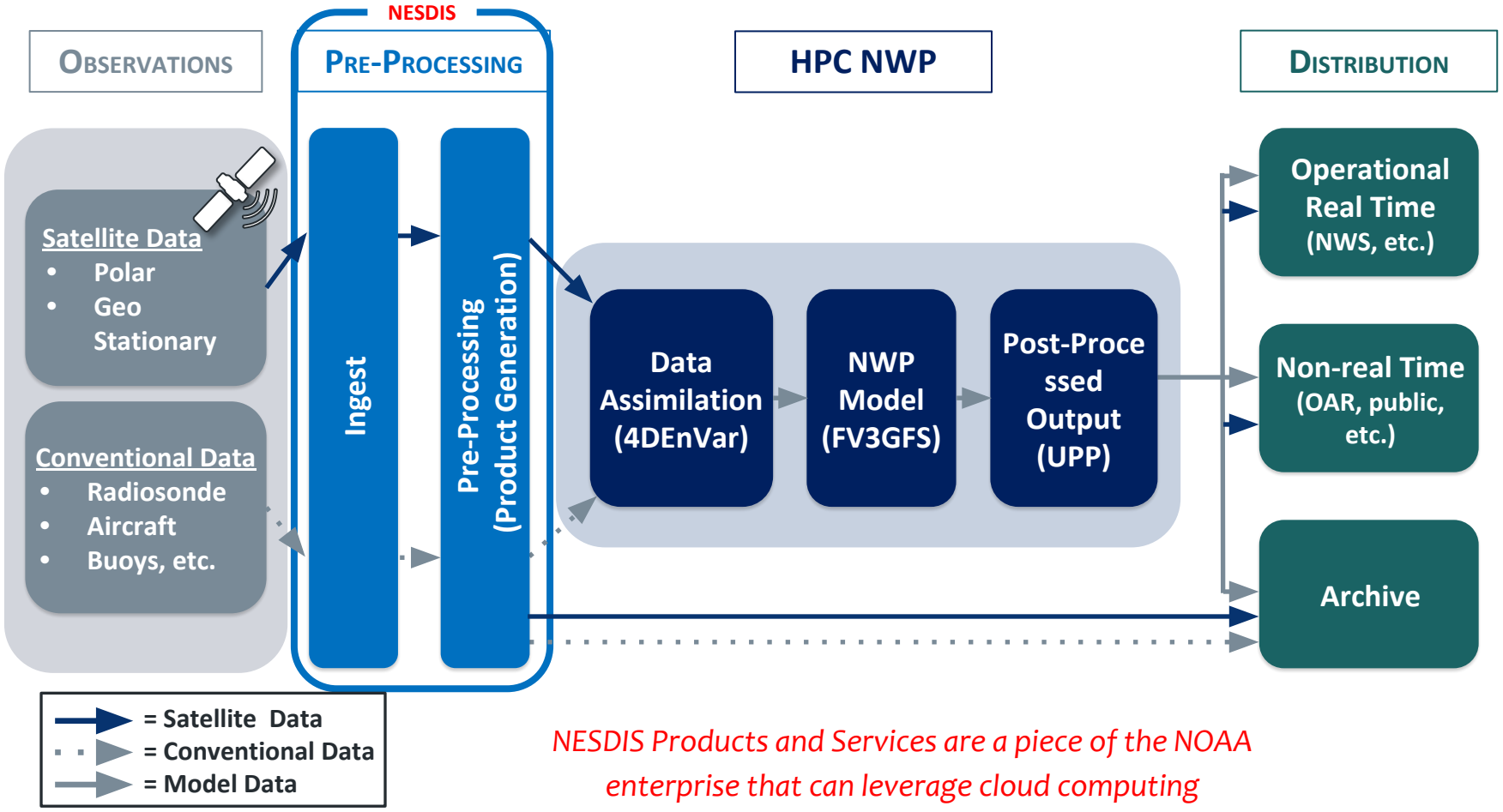
NESDIS Cloud Activities Update & Discussion

November 21, 2019



High Level Overview of NOAA's Current end-to-end Product and Data Management

All aspects of products and data management should be taken into consideration when exploring Enterprise Cloud solutions.



NESDIS Products and Services are a piece of the NOAA enterprise that can leverage cloud computing

NESDIS Cloud Activities

NESDIS has strongly advocated for the adaption of innovative technologies across the NOAA enterprise:

a) Drafted a NESDIS Cloud Strategy – June 2018

b) Formulated NESDIS Cloud Pilots Projects – September 2018

c) Currently executing multiple cloud related projects – June 2018-March 2020

- ✔ NESDIS Cloud Pilot projects
- ✔ Other Cloud Pilot projects
- ✔ Operational Cloud projects

d) Participated on the NOAA level Cloud Integrated Project Team (IPT) with the NOAA Administrator – ongoing

e) Supported the development of the NOAA Administrators Cloud Vision & and NOAA OCIO Cloud Strategy – November 2019

f) Supported the development and award of the Big Data Project (BDP) and Cloud Utility contracts – Sept-Oct 2019

g) Supported the development of the NOAA Cloud Concept of Operations – September 2019

h) Actively working with the NOAA OCIO to formalize on-boarding processes and governance with the BDP and Cloud Utility contracts - ongoing

NESDIS Cloud Pilots & Projects

NESDIS has undertaken a series of other Cloud Activities over the past two years:

a) Secure Ingest Pilot – *proof of concept*

b) Operational Secure Ingest Service (OSIS) – *to be operational*

c) JPSS IDPS in the Cloud – *to be operational*

d) CLASS Back-Up on the cloud – *proof of concept*

e) GOES-R LZSS in the cloud – *proof of concept*

f) NESDIS Cloud Pilot projects – *proof of concept*

CLASS: Comprehensive Large Array-data Stewardship System
IPDS: Interface Data Processing Segment
LZSS: Level Zero Storage System

Secure Ingest Gateway Pilot (SIGP)

Overview/Purpose: Develop a scalable and flexible framework to securely ingest data from external sources (Commercial, Foreign, Academic, other Partners)

Milestones:

a) Develop Functional Proof of Concept (POC): Aug 2017 – Mar 2018 (environment build only took 2 months)

b) Conduct Analysis of Alternatives: May – Aug 2018

c) Successfully ran Commercial Weather Data Pilot-2 data through POC: Sept 2018 – Sept 2019

Intended Outcomes:

a) Develop a scalable, flexible, and cloud agnostic framework to ingest data from external sources

b) Validate that a cloud based architecture is a viable solution for an enterprise service

c) Improve the NESDIS security posture with the use of this new function

Aligns with the NESDIS cloud pilots & NOAA enterprise cloud service offerings:

b) This project established the basis of the NESDIS Cloud Framework

c) Leveraged the original NOAA enterprise Cloud services contract

Operational Secure Ingest Service (OSIS)

Overview/Purpose: Operationalize the SIGP framework

Milestones:

a) Program Setup: June 2018 - August, 2019

b) Agile development sprint completion: December, 2019

c) Operational Readiness Review: early March, 2020

d) OSIS in operation: end of March, 2020

Intended Outcomes:

a) Establish a secure enterprise ingest service for all external data within an existing NESDIS FISMA boundary

b) Ingest Himawari-8 and Commercial Weather data for NOAA

Align with the NESDIS cloud pilots & NOAA enterprise cloud service offerings:

b) Will use the NOAA Cloud Utility contract for cloud services

c) Based on the NESDIS Cloud Framework and will serve as the front end ingest service for the NESDIS enterprise cloud service

Interface Data Processing Segment (IDPS) in the Cloud

Overview/Purpose: Migrate the IDPS data processing component of the JPSS Ground Segment Project to the AWS Gov.Cloud in lieu of an on-premises Tech Refresh. Initial migration is a Lift/Shift activity.

Milestones:

- Establish Cloud Utility contract (November 2019)
- Begin Design and infrastructure buildout (January 2020)
- Functional and verification testing (October 2020)
- Parallel Operations (November 2020)
- Transition to Operations (December 2020)

Intended outcomes:

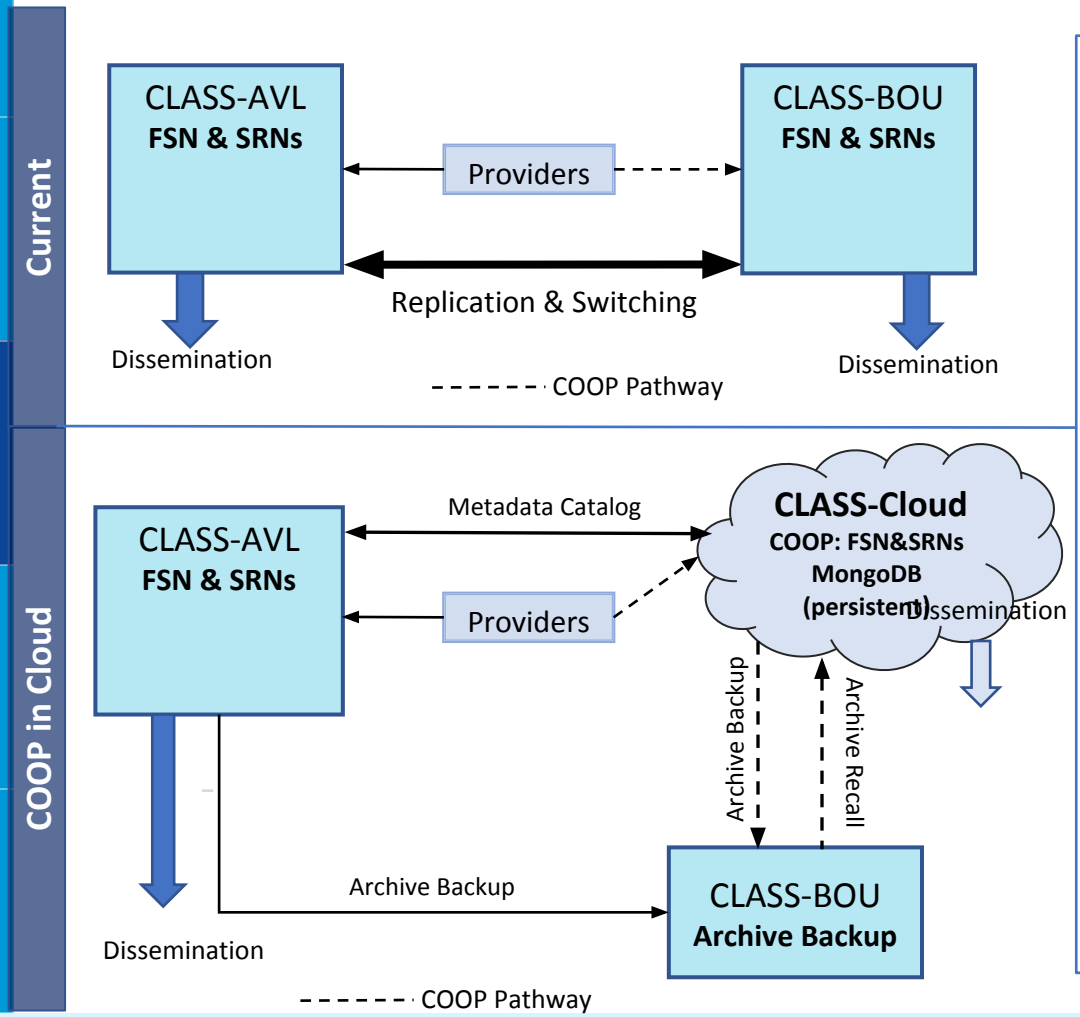
- Multi-mission, near real-time science data processing system for NPP, NOAA-20, JPSS-2, and GCOM that aligns with NOAA's enterprise vision for Cloud
- Cloud Service Provider (CSP) agnostic data processing system that will reduce long-term lifecycle cost
- System that exploits Cloud technology benefits (rapid elasticity and scalability)

Align with the NESDIS cloud pilots & NOAA enterprise cloud service offerings:

- Will leverage the NOAA enterprise Cloud Utility contract
- Continue ongoing coordination with NOAA & NESDIS cloud enterprise initiatives to identify optimization efforts and minimize rework

CLASS COOP in the Cloud

Pilot Purpose: To validate system failover to the commercial Cloud



Pilot Description:

Continuity of Operations (COOP) in the Cloud is a "sustainment reduction" project in the CLASS PMO to reduce the total cost of ownership for the Archive capabilities provided by the CLASS program. The Proof of Concept project provides failover capabilities to the Cloud as a replacement for a fully duplicated system at two (2) sites. Project cost is less than $500K.

Milestones:

- Installation/Configuration – Q1 FY20
- Testing/Validation – Q2 FY20
- Completion/Reporting – March 2020
- Executive decision on next steps – March 2020

Enterprise Alignment:

- ✔ Utilizing NOAA OCIO Cloud Contract
- ✔ Validates capabilities, cost, and performance

GOES-R LZSS in the Cloud

Overview/Purpose: The purpose of this pilot is to evaluate the use of cloud technology to facilitate easier access to and use of GOES-R Series Level 0 data, within existing latency performance characteristics and without Remote Access connections.

***Background**: The GOES-R Ground Segment includes a capability to allow authorized instrument teams and scientist early access to Level 0 (zero) data products. Access to this data by those users is needed to support Post-Launch testing, calibration and validation of instruments and algorithms, and anomaly resolution.*

Milestones:

- Access to cloud development resources: January 2020
- Establish design: March 2020
- Initial testing: May 2020
- External testing: June 2020

Intended outcomes:

a) Refactored LZSS deployed in NESDIS cloud

b) Authorized access to Level 0 data by external users

Enterprise Alignment: i.) Coordinating mission-specific needs with enterprise standards; ii.) Expands use of enterprise IT security standards; iii.) Demonstrates ability to provide low-latency access to external user for high impact mission needs; iv.) Will leverage the NOAA Cloud Utility contract

NESDIS Cloud Pilots

Overview/Purpose: To demonstrate cloud-enabled end-to-end ground service capabilities that are **secure, scalable,** lifecycle **cost effective,** and **data source agnostic**

Milestones: (see Monthly Updates at NESDIS Cloud IPT Google Site)

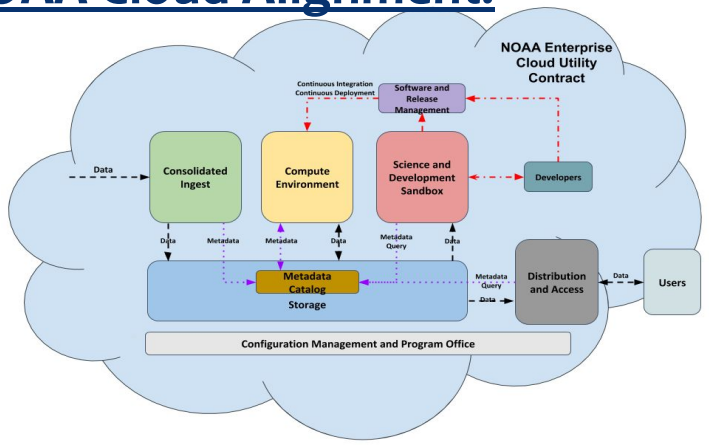
Recent and Upcoming Milestones	9/30/19	Demonstrate OneStop functionality in the Cloud	Complete
	9/16/19	Demonstrate PG for H8 algorithms within the Cloud framework	Complete
	11/30/19	AO Review and Acceptance of Final Documents (ATO Checklist and Process)	On Track
	2/20/20	Create Consolidated Catalog	On Track
	2/28/20	Generate Cloud containerized Algorithms Package (CCAP) delivery standards	On Track

Intended outcomes:

A *reusable* ground service in the cloud which is:

- Capable of ingesting data from all sources, supporting the science enterprise, and generating all types of products
- Scalable both vertically and horizontally
- Resilient, with no single points of failure

NOAA Cloud Alignment:



Next Steps

- Operationalize Secure Ingest (OSIS) - March 2020
- Complete the Cloud Pilot Projects; cost model; and Analysis of Alternatives (AoA) – March 2020
- Based on results of the Cloud Pilot Projects; NESDIS will identify an optimal path to proceed with cloud implementation – March 2020
  - ✔ Influenced by existing system(s) Tech Refresh cycles
  - ✔ Alignment with NESDIS Strategic Implementation Plan (SIP)
  - ✔ Influenced by organizational readiness/maturity to support cloud implementation
- Support the development and maturing of NOAA enterprise cloud services and governance to ensure NOAA moves to the cloud in a standardized manner – ongoing