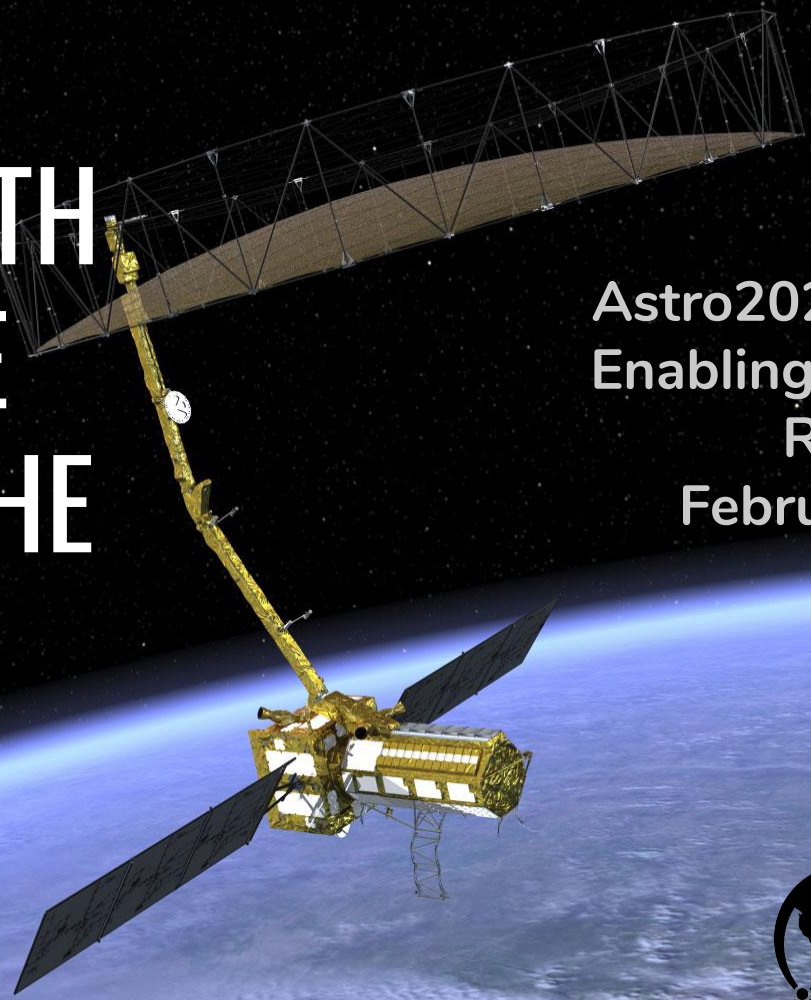
# NASA EARTH SCIENCE DATA IN THE CLOUD



Astro2020: Panel on An Enabling Foundation for Research
February 4, 2020

EARTHDATA
EOSDIS NASA'S EARTH OBSERVING SYSTEM DATA AND INFORMATION SYSTEM

# EOSDIS in Context

Capture and Clean

Distribute

Transform*

Archive

Process

Commercial

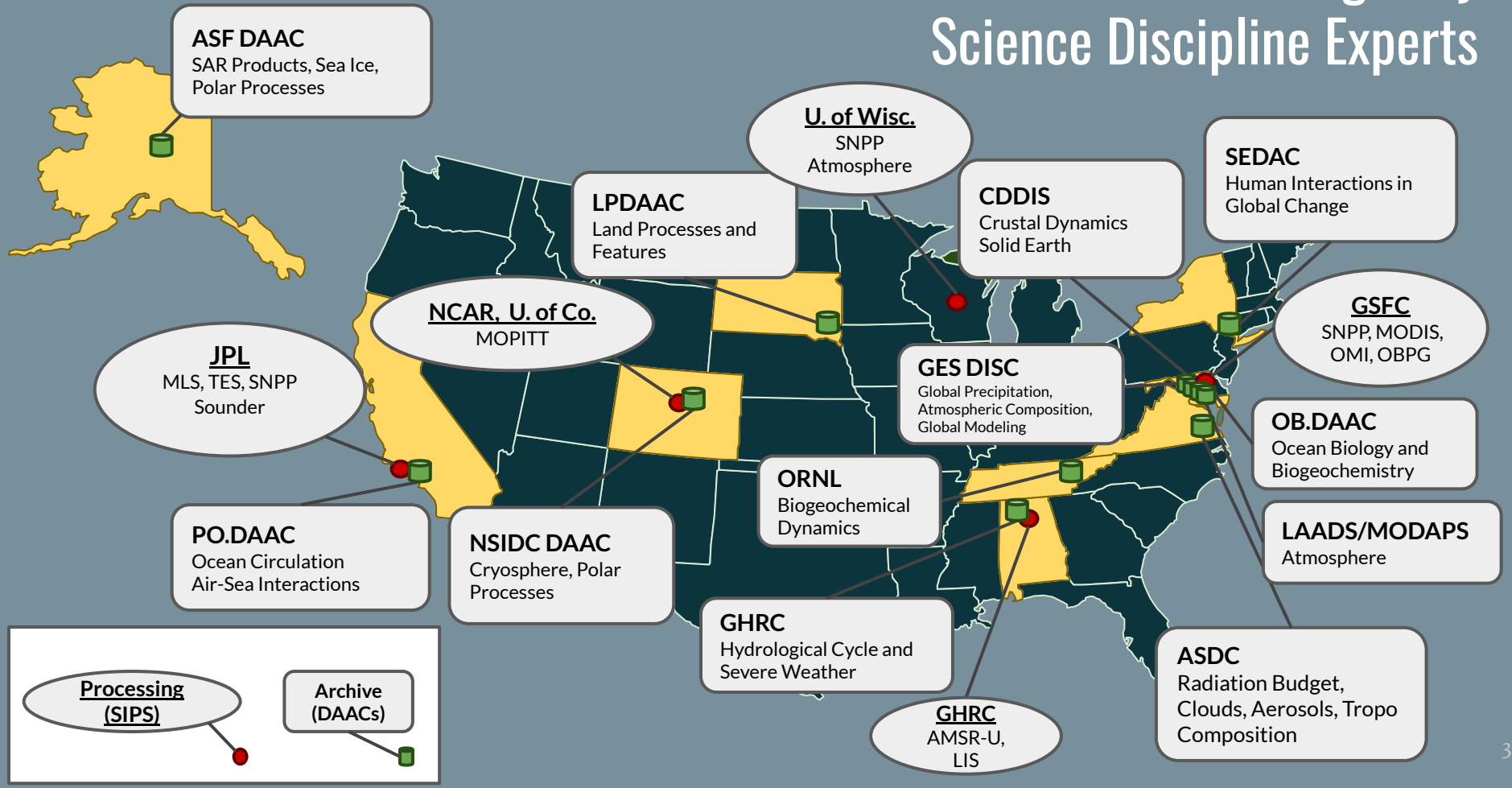
Research

Applications

Education

*Subset, reformat, reproject

# Data are Produced and Managed by Science Discipline Experts



# Big Variety at EOSDIS

## NASA Earthdata Datasets in 2019

- ➔ **12** NASA centers of domain expertise
- ➔ **8,000+** distinct data collections online
- ➔ **420** million cataloged files (granules)

Photo by Nathan Dumlao on Unsplash

# EOSDIS Date Holdings Evolution

**Data Look-ahead**

**Now**
~ 23 TBs/day generated

**Soon**
~126 TBs/day generated

# EOSDIS Current Architecture

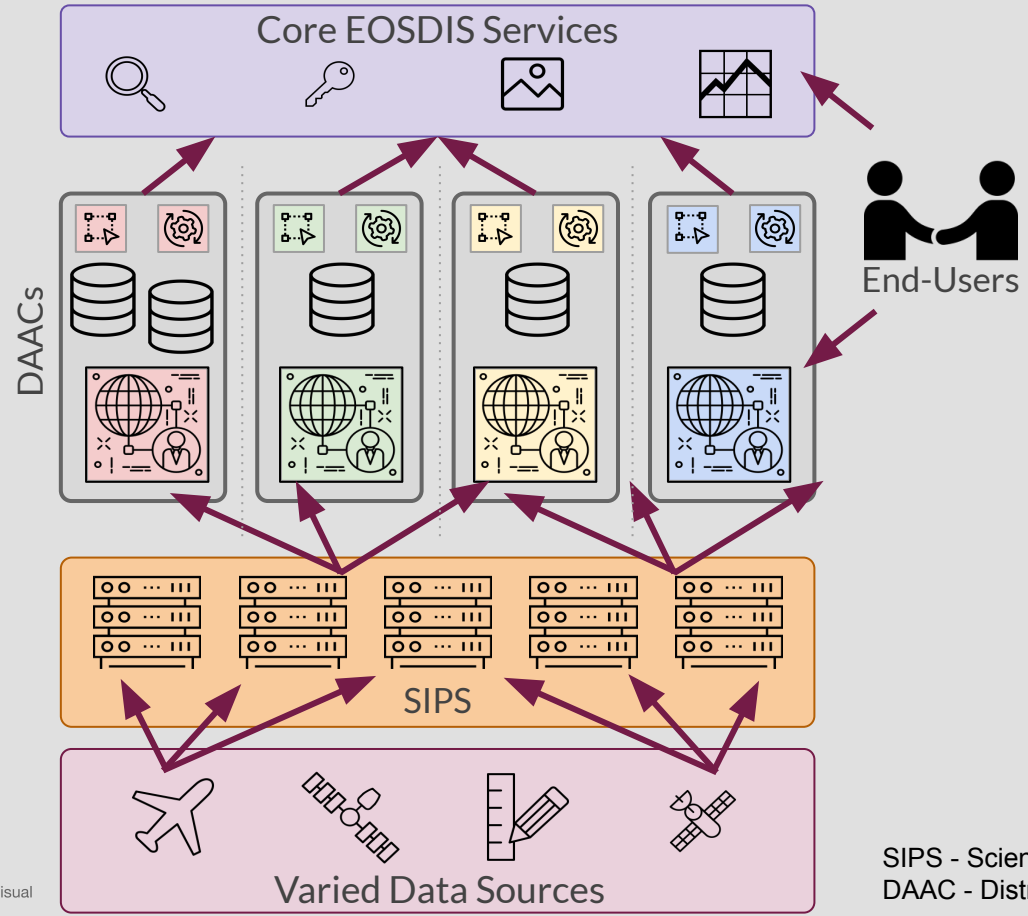
**Benefits**

Optimized for archive, search and distribution

Expert user support

Easily add new data products and producers

Predictable




**Challenges**

Uneven levels of service and performance

Significant time to coordinate interfaces

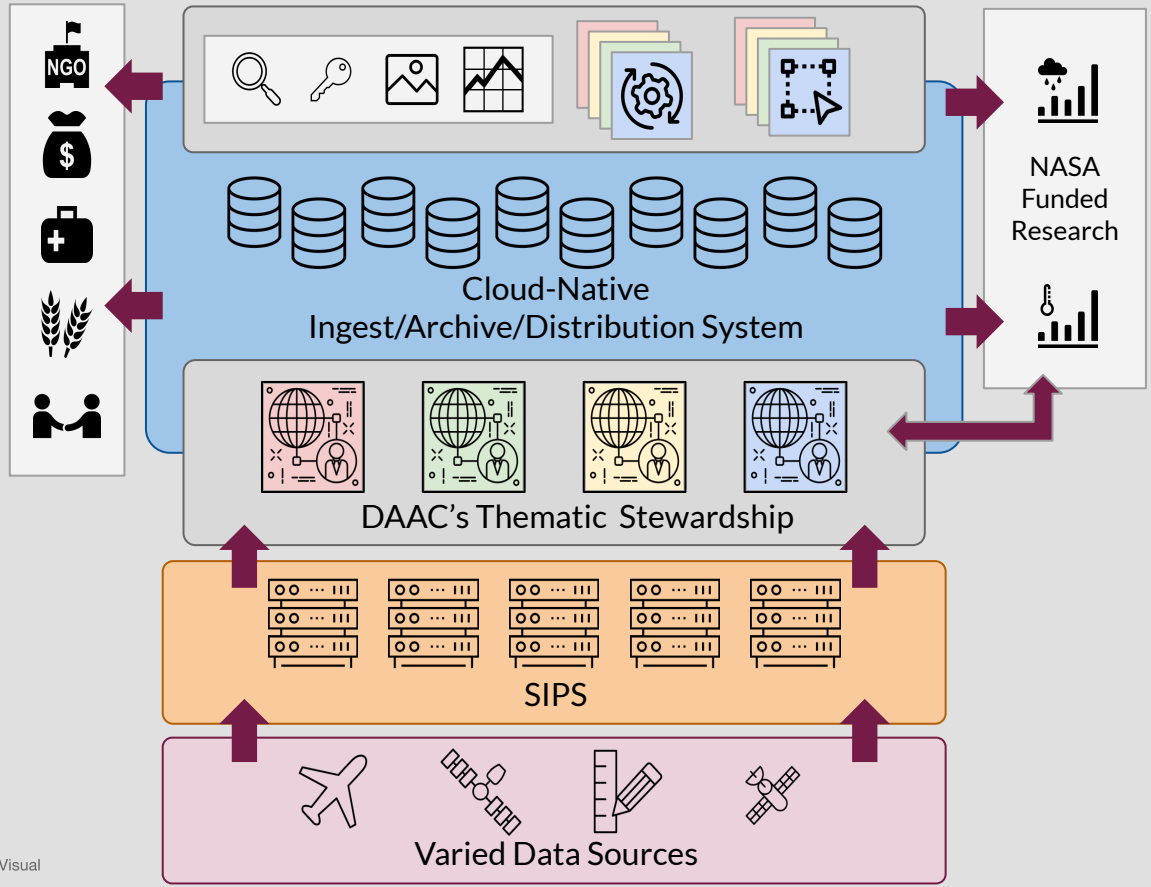
Limited on-demand product generation and end-user processing capabilities

Duplication of storage

Duplication of services and software

SIPS - Science Investigator-led Processing System
DAAC - Distributed Active Archive Center

# Towards a Streamlined Cloud-Based Architecture




**Benefits**

Collocated, pay-as you-go processing for *anyone*

Expert user support

Streamlined product addition

Reduced duplication of tools and services

**Challenges**

Development coordination

Cost Management

Shifting Labor Needs

Security/Export Compliance

Vendor Lock In

# Current EOSDIS Systems Operating in the AWS Cloud

## Common Metadata Repository

https://cmr.earthdata.nasa.gov
https://github.com/nasa/Common-Metadata-Repository

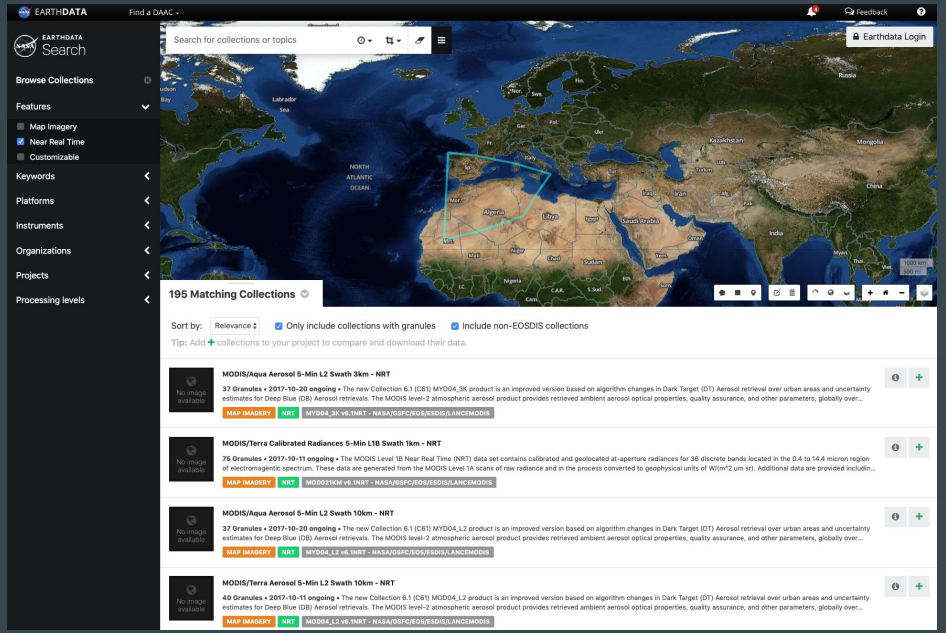
...

## Earthdata Search

https://search.earthdata.nasa.gov
https://github.com/nasa/earthdata-search

API-driven, standards-compliant, sub-second search of:

- ➔ 32,000+ collections
- ➔ 420 million files/granules



# Current EOSDIS and Partner Data in the AWS Cloud

Global Hydrology Research Center

https://ghrc.nsstc.nasa.gov/home/

Alaska Satellite Facility

ESA's Sentinel 1 Archive Mirror
https://search.asf.alaska.edu/

https://media.asf.alaska.edu/uploads/home-cards/satellite-dish-scenic.jpg

# Planned Cloud Dataset Timeline in 2020