



EOSDIS

NASA'S EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

NASA Data Center Management Using the MMT (Metadata Management Tool)

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Talk Outline

- EOSDIS Overview (5 min)
- Systems Overview (5 min)
- Metadata in Context (5 min)
- Metadata Management Tool (20 min)
 - Overview/Objectives
 - Demo
- Ongoing Curation Activities/Tools (10 min)
- Opportunities for Growth (5 min)
 - Bulk Updates
 - Provider Specific Validations
 - Landing Pages
- Questions (5 min)

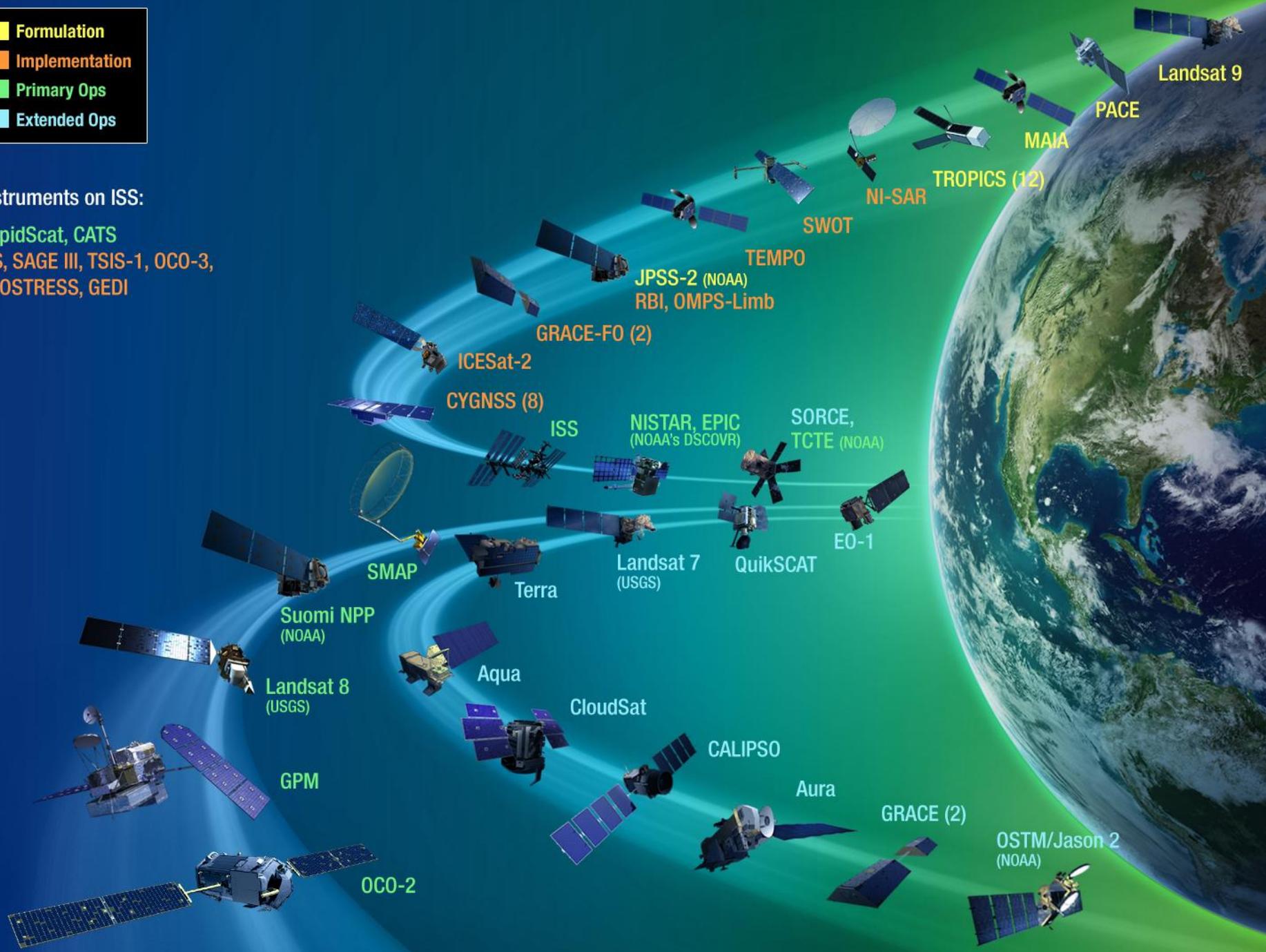


EOSDIS Overview

■	Formulation
■	Implementation
■	Primary Ops
■	Extended Ops

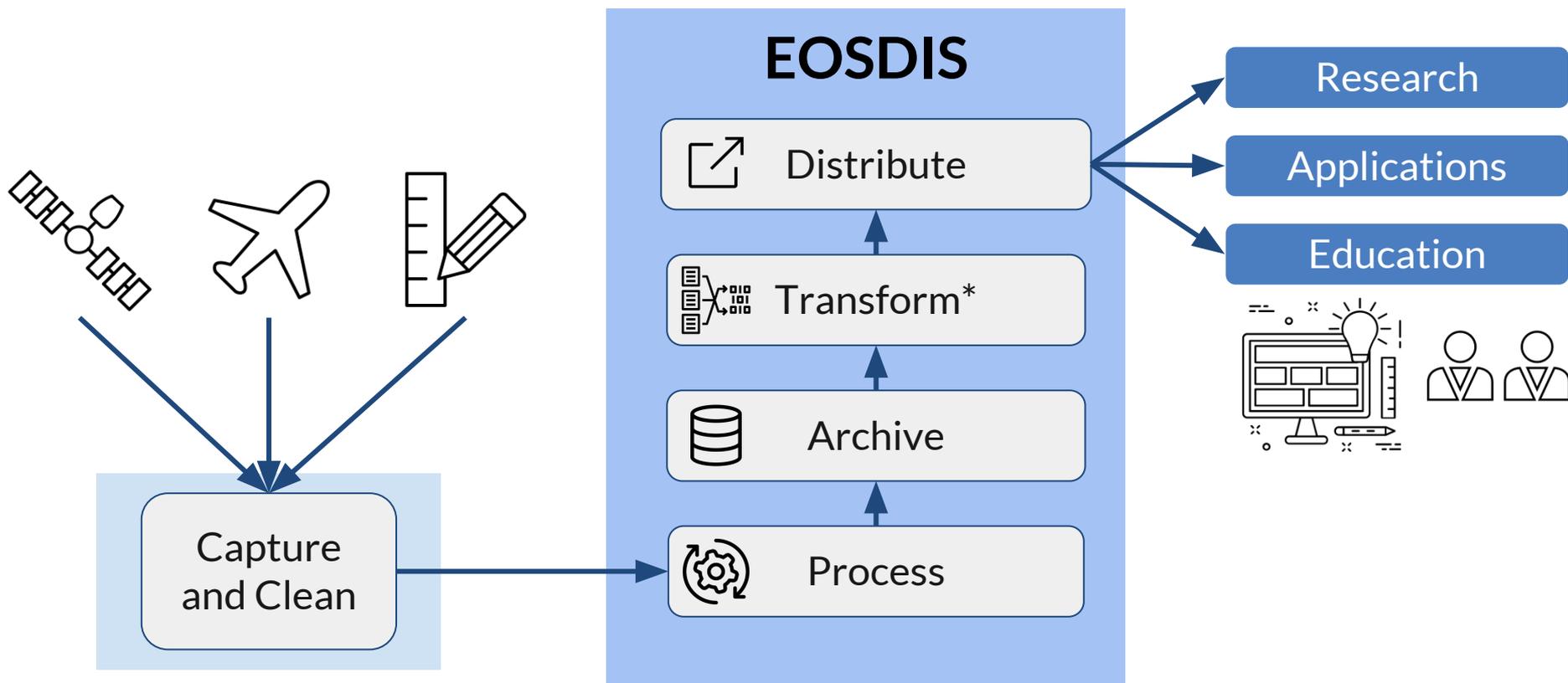
Instruments on ISS:

RapidScat, CATS
 LIS, SAGE III, TSIS-1, OCO-3,
 ECOSTRESS, GEDI





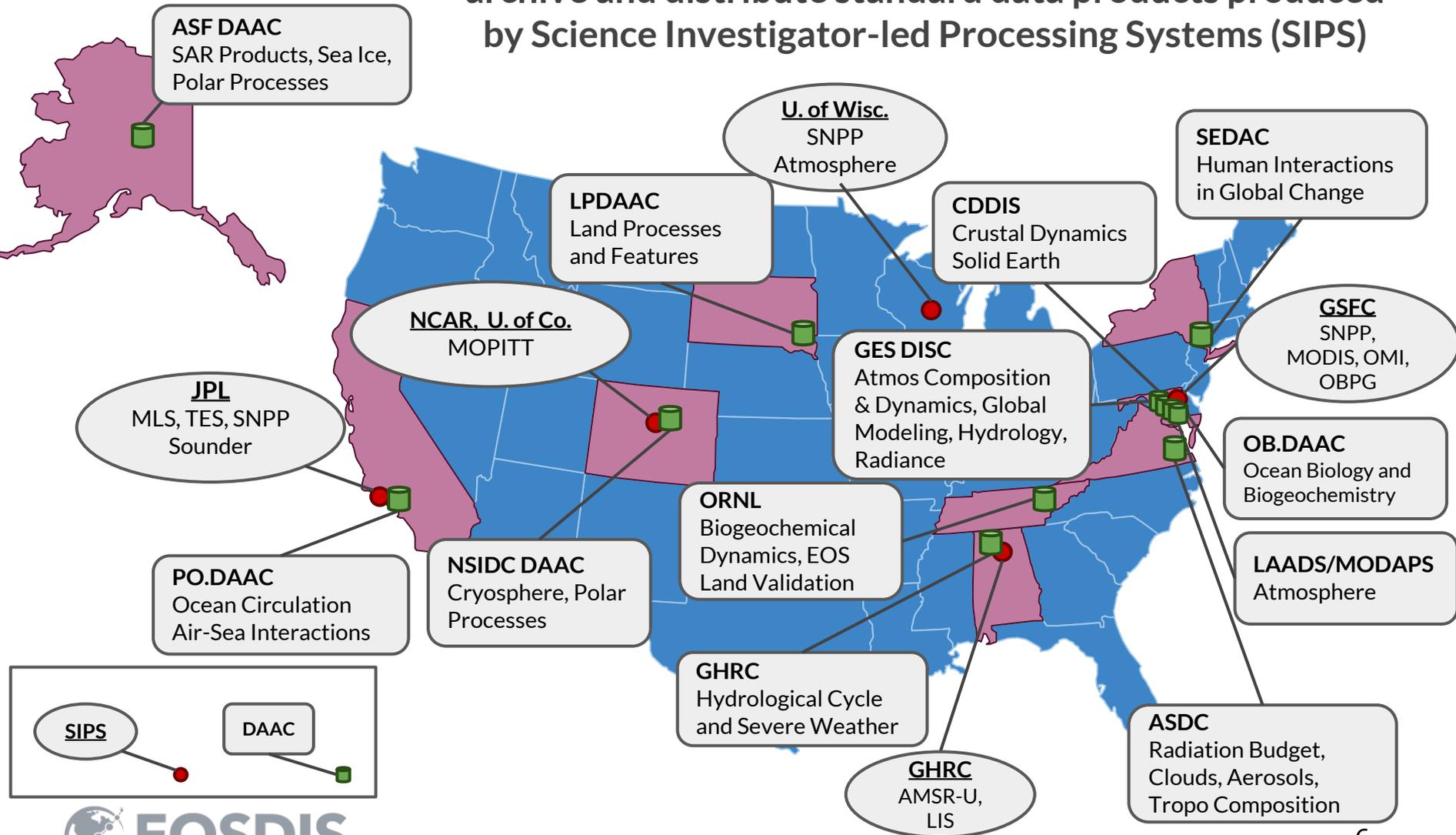
Putting EOSDIS in Context

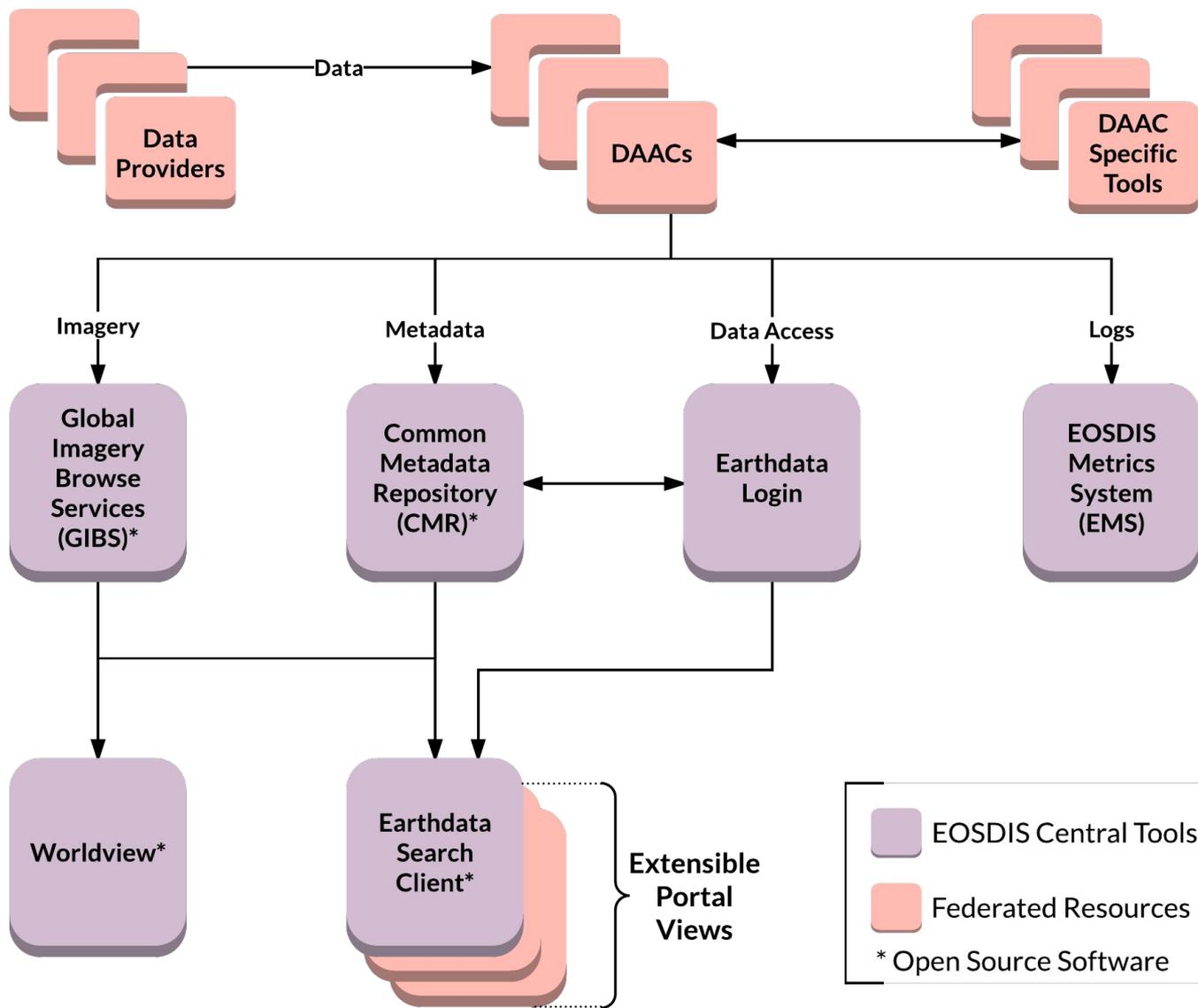


*Subset, reformat, reproject



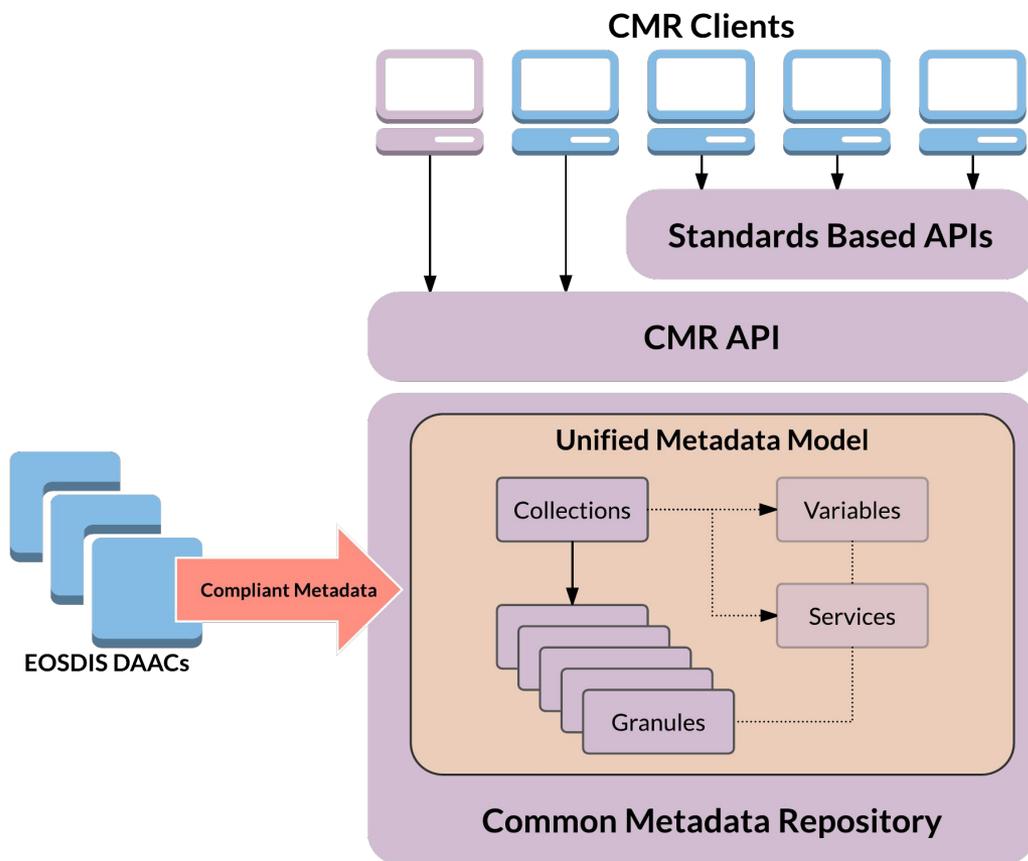
Distributed Active Archive Centers (DAACs), collocated with centers of science discipline expertise, archive and distribute standard data products produced by Science Investigator-led Processing Systems (SIPS)







Common Metadata Repository



Lightning fast, always available

- 95% queries complete in <1s
- 99.98% uptime (last 365d)

Big Data Ready

- 34K collections
- 367 million files indexed
- Prepared to scale 1B+ records

Standards-focused

- ISO-19115 metadata
- OpenSearch/OGC CSW
- REST based APIs

Community-focused

- Developer's portal
- Active Developer's forum
- Ecosystem of supported tools

Internationally Recognized

- Provides the backbone of the Community of Earth Observing Satellites International Directory Network (CEOS IDN)



Data Centric End Users

<https://search.earthdata.nasa.gov>

Imagery Centric End Users

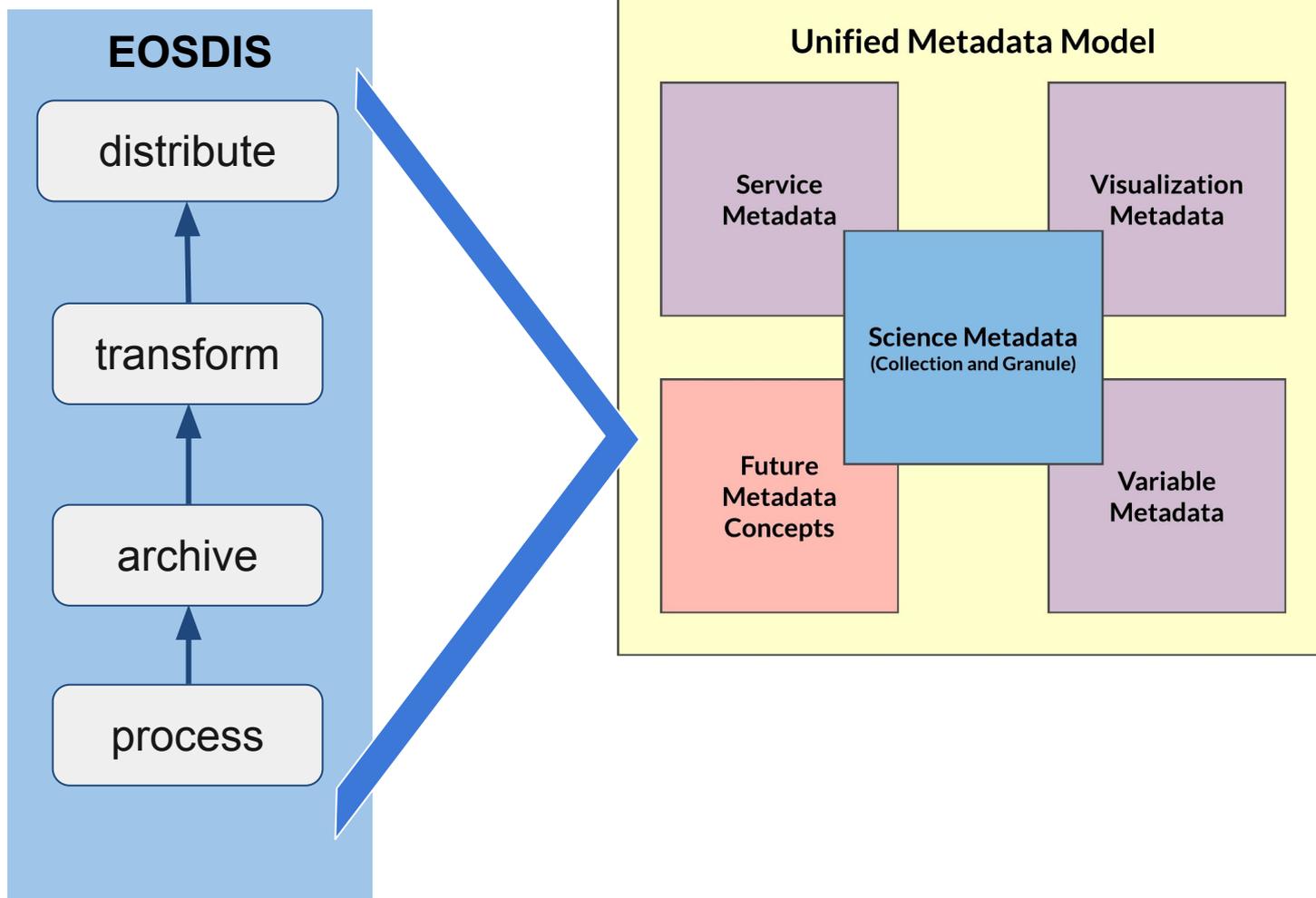
<https://worldview.earthdata.nasa.gov>



Metadata In Context

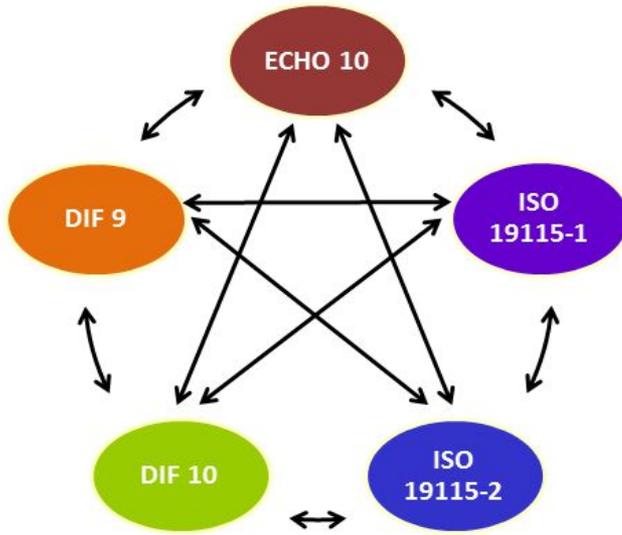


What's so important about metadata?

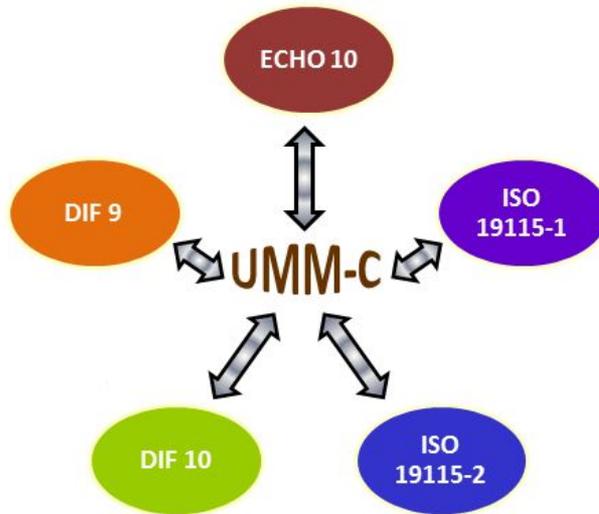


Converging Problems

- Combining two legacy metadata catalogs
 - GCMD (30k collections, not all EOSDIS)
 - ECHO (6500 collections, 260+ million granules, all EOSDIS)
 - 12 EOSDIS DAACs to reconcile (that's a whole different presentation)
- New Missions requiring ISO 19115 compliant metadata
- **Bottom Line: Several new metadata formats required support while continuing to support legacy requirements**



Required Translations = $n \times (n-1)$



Required Translations = $2n$

Developing a Model



Crosswalking Each Element

Abstract

Element Specification

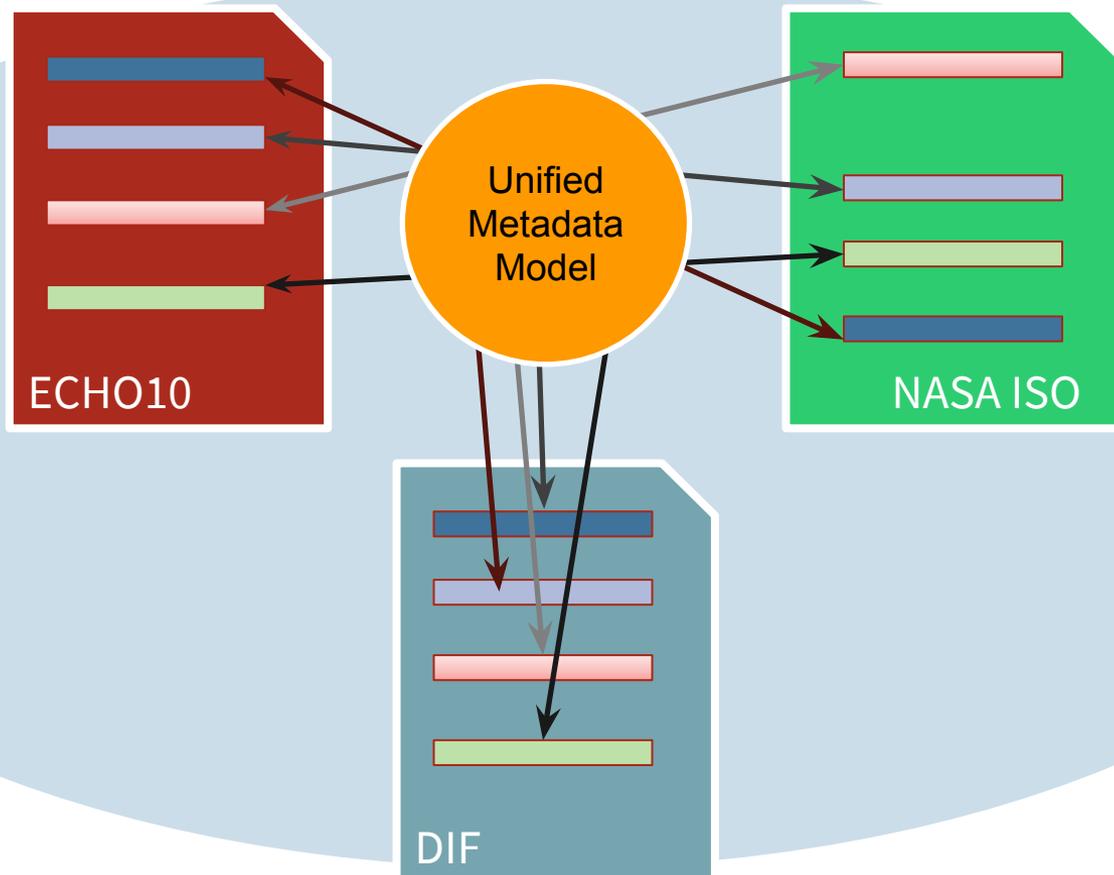
Abstract

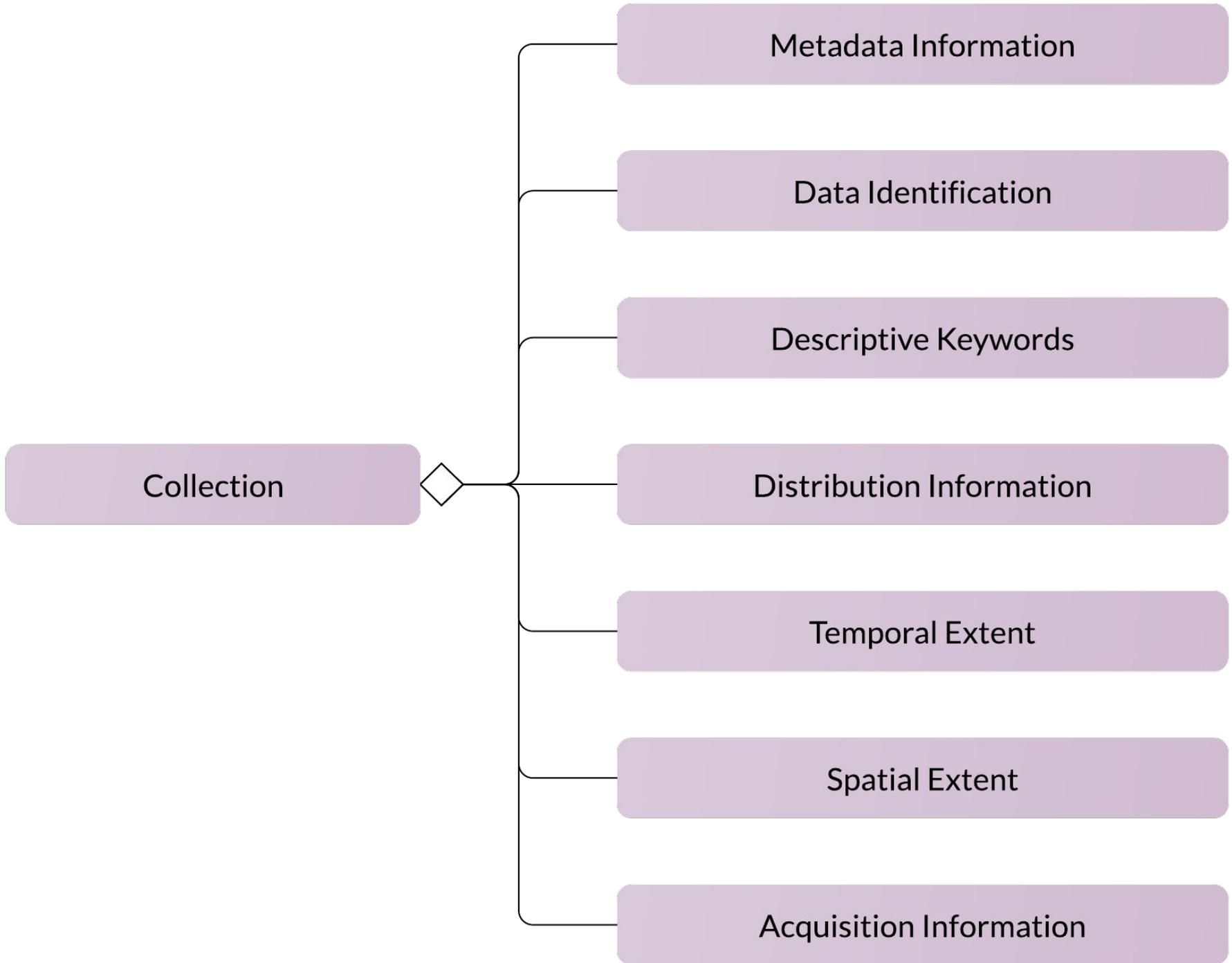
Description

Abstract provides a brief description of the resource the metadata represents.

Mapping

DIF 9	/DIF/Summary/Abstract
DIF 10	/DIF/Summary/Abstract
SERF	/SERF/Summary/Abstract
ECHO 10 Collection	/Collection/Description
ECHO 10 Granule	N/A
ISO 19115-2	/gmi:MI_Metadata/gmd:identificationInfo/gmd:MD_DataIdentification/gmd:abstract/gco:CharacterString
ISO 19115-1	/mdb:MD_Metadata/mdb:identificationInfo/mri:MD_DataIdentification/mri:abstract/gco:CharacterString





Collection

Metadata Information

Data Identification

Descriptive Keywords

Distribution Information

Temporal Extent

Spatial Extent

Acquisition Information



Ongoing Update of the UMM

“The EOSDIS community may contribute requests for updates, changes, clarifications, and deprecations of elements in a UMM Profile, which are then tracked as part of NASA’s Metadata Quality effort. Requests for modifications are documented and an impact analysis is conducted. Recommendations along with their supporting documentation are then put before a UMM review board consisting of EOSDIS community members and the [EOSDIS Standards Office \(ESO\)](#). After a review and commenting period, the UMM Profile is updated to reflect approved changes and a new version is released.”

<https://go.nasa.gov/2qd0Af3>





Metadata Management Tool

NSAR_ALL_INTERFEROMETRIC_PRODUCTS_1

VE

INTERFEROMETRIC_PRODUCTS_1

★
Qua
Req

Data Identification
○ ● ○ **r** - ○ ○ ○ ○ ○ ○ ○ ○

Acquisition Information
○ - ○

Data Centers
○ -

✓ Distrib
r ○

✓ Tempo
r ○

✓ Data C
●

Metadata Management Tool Original Objectives

- ❑ Intended to provide easy, intuitive editing of metadata without xml editor
- ❑ Templates for new products
- ❑ Export in various formats
- ❑ Closely tied to UMM and controlled vocabularies from GCMD
- ❑ Allows access management of metadata catalog entries
- ❑ Scoring of metadata against specified criteria
- ❑ Open Source development
 - ❑ <https://github.com/nasa/mmt>

VERSION 1

SENTINEL-1_INSAR_ALL_INTERFEROMETRIC_PRODUCTS_1

All Interferometric Products (BETA)



Quality Score: 20

Required fields: not complete

RECORD

Draft Delete Draft

Data Fields

Location Information



Data Identification



Distribution Information



Descriptive Keywords



Acquisition Information



Temporal Information



Additional Information



Data Centers



Data Contacts



Demo



METADATA

curation
activities



So what's the problem?

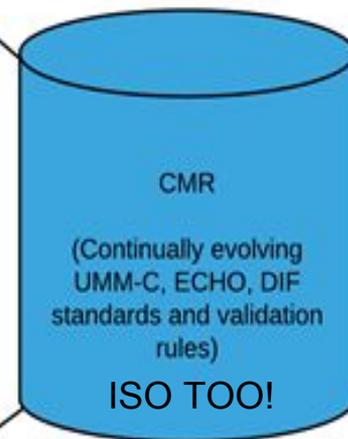
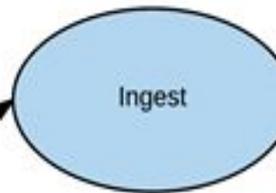
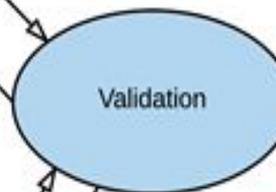
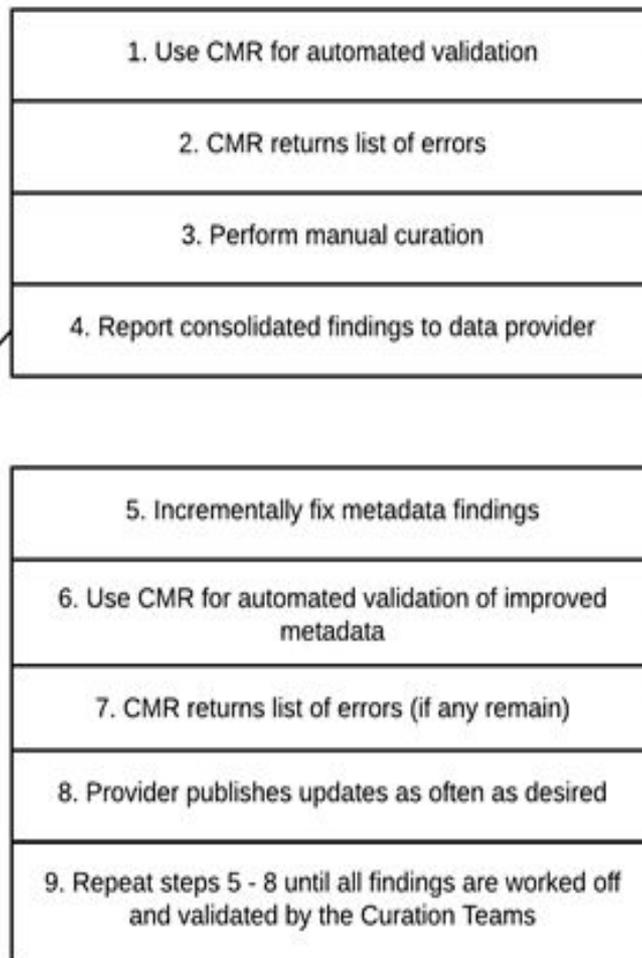
- Links die
- Information gets out of date
- Usage is inconsistent
- Keywords change
- Fields get added
- And on and on and on...



Curation Teams

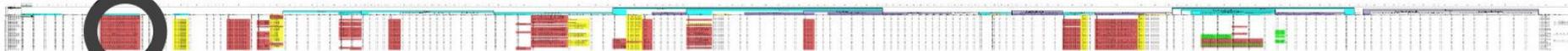
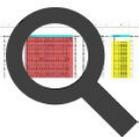


Data Providers





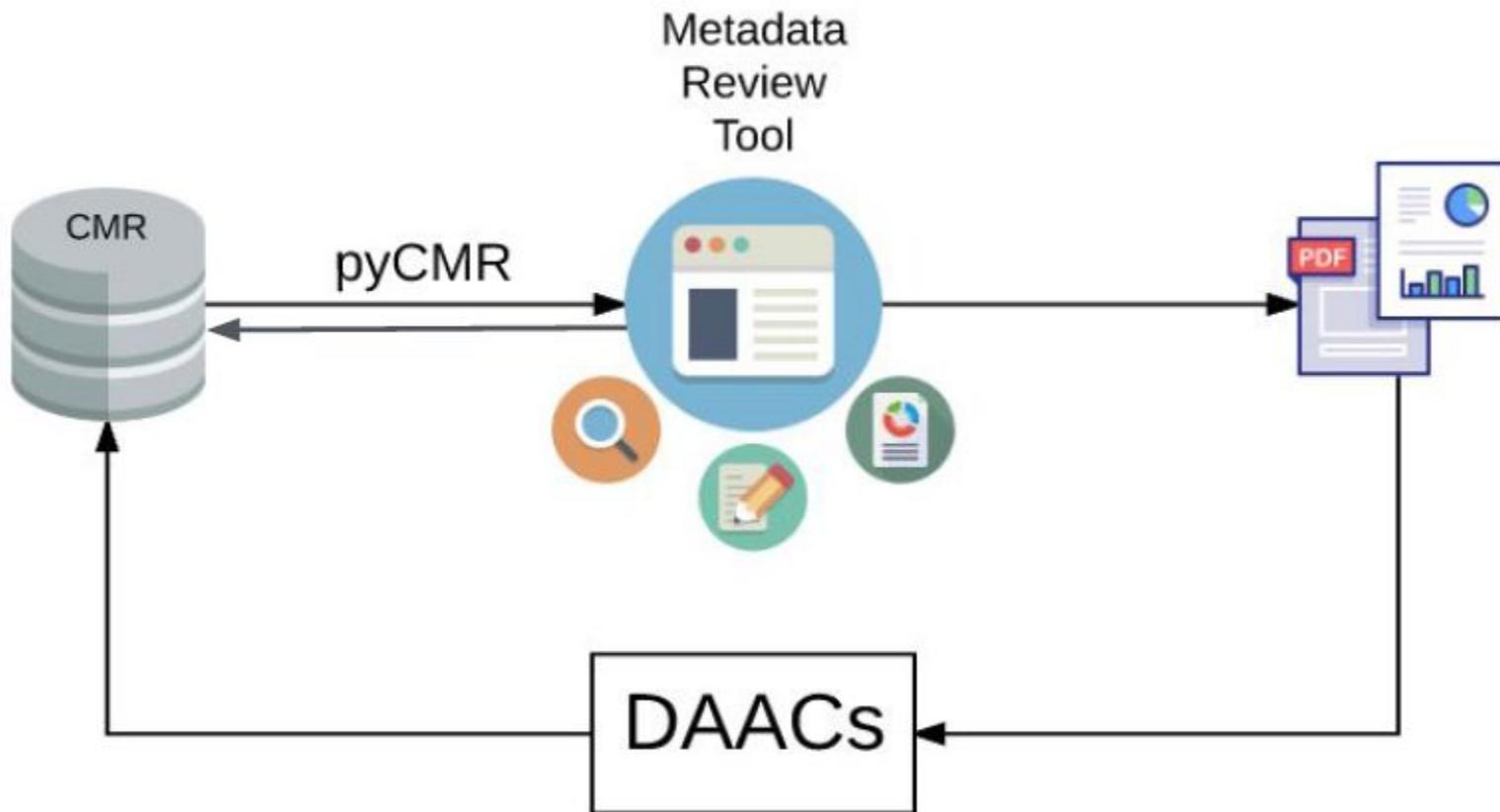
Metadata Review (Now)



Item Link	Short Name	Version Id	Insert Time	Last Update	Long Name	Collection Date	Suggested Usage	Data Set Id	Description	Orderable	Visible	Processing Level Id	Description	Center	Citation for External Publication	Comment	Restriction Flag	Type	Data Format
7	RESOLUTION FILE	OK	OK	OK	OK	no	no	OK	EOSDIS 2.0 Degree Low Resolution Full Climatology (LRF) v. 1.0.1	OK	OK	OK	no	OK	no	no	no	no	OK
8	RESOLUTION MONTHLY TIME	OK	OK	OK	OK	no	no	OK	EOSDIS 2.0 Degree Low Resolution Monthly Time Series (LRFM) v. 1.0.1	OK	OK	OK	no	OK	no	no	no	no	OK
9	RESOLUTION TIME SERIES	OK	OK	OK	OK	no	no	OK	EOSDIS 2.0 Degree Low Resolution Time Series (LRFM) v. 1.0.1	OK	OK	OK	no	OK	no	no	no	no	OK
10	STEREO WIND AND CLOUD	OK	OK	OK	OK	no	no	OK	2. Include some information about the NUMBER campaign, and explain how this dataset	OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
11	AEROSOL PRECIPITATION	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
12	(CAPS-FIP) v1 (name:)	OK	OK	OK	OK	no	no	OK	contributed to the campaign	OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
13	BY ATTENUATED LASER	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
14	CONDENSED WATER CONTENT	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
15	MODIS/TERRA DEEP BLUE	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
16	LAND HOUSEKEEPING (CATS) V1	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
17	LANDWATER (KOH) V1	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
18	(name:)	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
19	SCANNING RAINWATER	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
20	RESEARCH GROUP EXPERIMENT	OK	OK	OK	OK	no	no	OK	Multi-disciplinary Analysis (NAMMA)	OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
21	RESEARCH GROUP EXPERIMENT	OK	OK	OK	OK	no	no	OK	Multi-disciplinary Analysis (NAMMA)	OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
22	SENSING EXPERIMENT (LASE)	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
23	METEOROLOGICAL	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
24	DOOPLES WEATHER RADAR	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
25	RADARSOUNDING V1 (name:)	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
26	RADARSOUNDING AND TOWER	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
27	NETWORK V1 (name:)	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
28	MOBILE LABORATORIES V1	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
29	(name:)	OK	OK	OK	OK	no	no	OK		OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
30	V1 (name:)	OK	OK	OK	OK	no	no	OK	Multi-disciplinary Analysis (NAMMA) Annual Time Difference (ATD)	OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no
31	V1 (name:)	OK	OK	OK	OK	no	no	OK	Multi-disciplinary Analysis (NAMMA)	OK	OK	OK	no	field needs to follow vocabulary	no	no	no	no	no



New Tool





Summary

- EOSDIS has a large amount of metadata, from both NASA and non-NASA sources
- Metadata dialects are mapped via the unified metadata model (UMM) which is updated annually via a EOSDIS wide review process
- The metadata management tool is intended to provide a simplified interface allowing for metadata editing and access control
- Curation activities for EOSDIS collections is ongoing
- A Metadata review tool and dashboard is being developed to aid in those curation activities and will eventually be integrated into the MMT.



NASA EOSDIS Metadata Future

- Metadata Bulk Updates
- Provider Specific Validations
- Ongoing governance of UMM
- Ongoing curation
- Evolution of UMM Profiles to meet evolving needs (services, visualizations, etc)

Questions?

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