NASA's EOSDIS Implementation of ISO 19115: the Common Metadata Repository

FGDC ISO Implementation Forum and Metadata Working Group

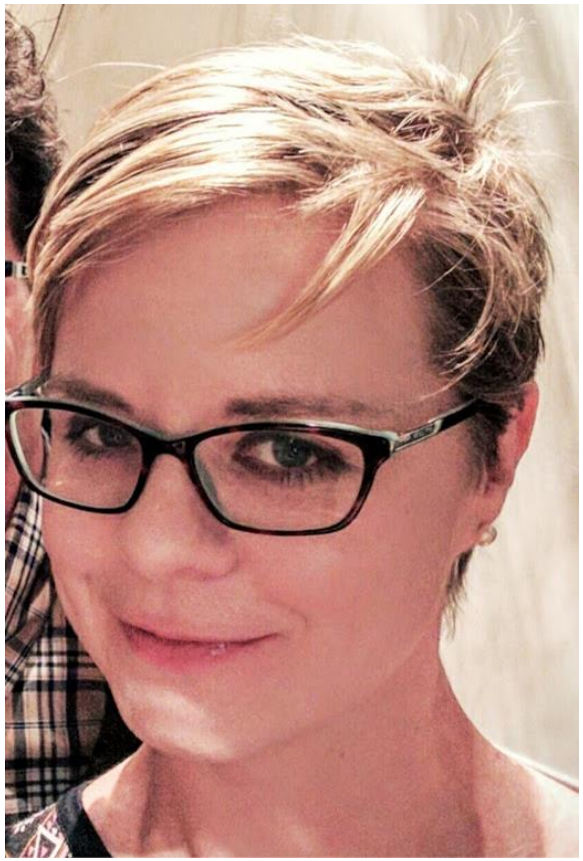
January 2016

Abstract

Earth Observing System Data and Information System (EOSDIS) generates, archives, and distributes enormous amounts of Earth Science data via its Distributed Active Archive Centers (DAACs). This data is accessed and employed by a broad user community. It is therefore imperative that reliable, consistent, and high-quality metadata be maintained in order to enable accurate cataloging, discovery, accessibility, and interpretation.

To this end, the Common Metadata Repository (CMR) has been established to serve as a clearinghouse for these metadata. The CMR employs a metadata model that unifies crosswalk translations between various metadata formats including ISO 19115. This presentation will focus on the usage of ISO 19115 within the CMR including format translations, metadata guidance for new implementers, addressing issues encountered during the CMR model development, and future plans.

A Brief Introduction



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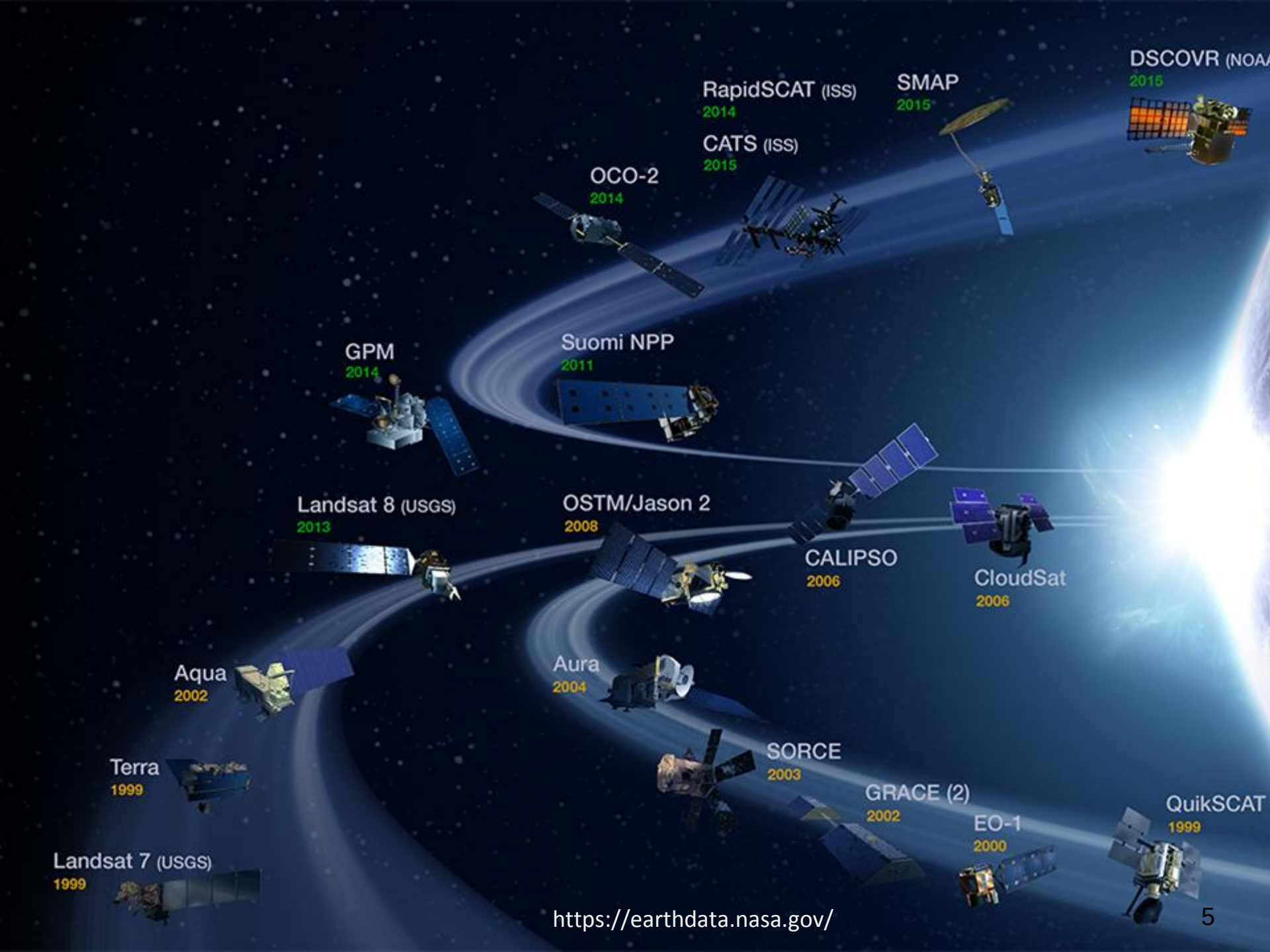
ESDIS Systems Architect
Earth Science Data Information Systems
Goddard Space Flight Center

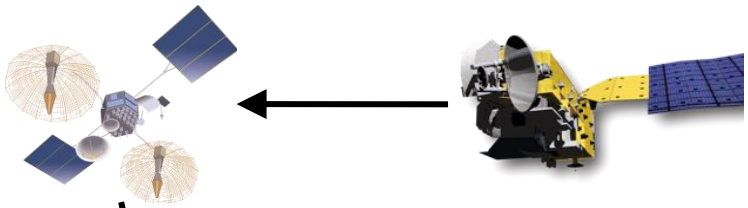
Putting EOSDIS in Context

What is EOSDIS?



https://earthdata.nasa.gov/

EOSDIS Functions



data downlink

EOSDIS

capture and clean

process

archive

subset

distribute

Research

Applications

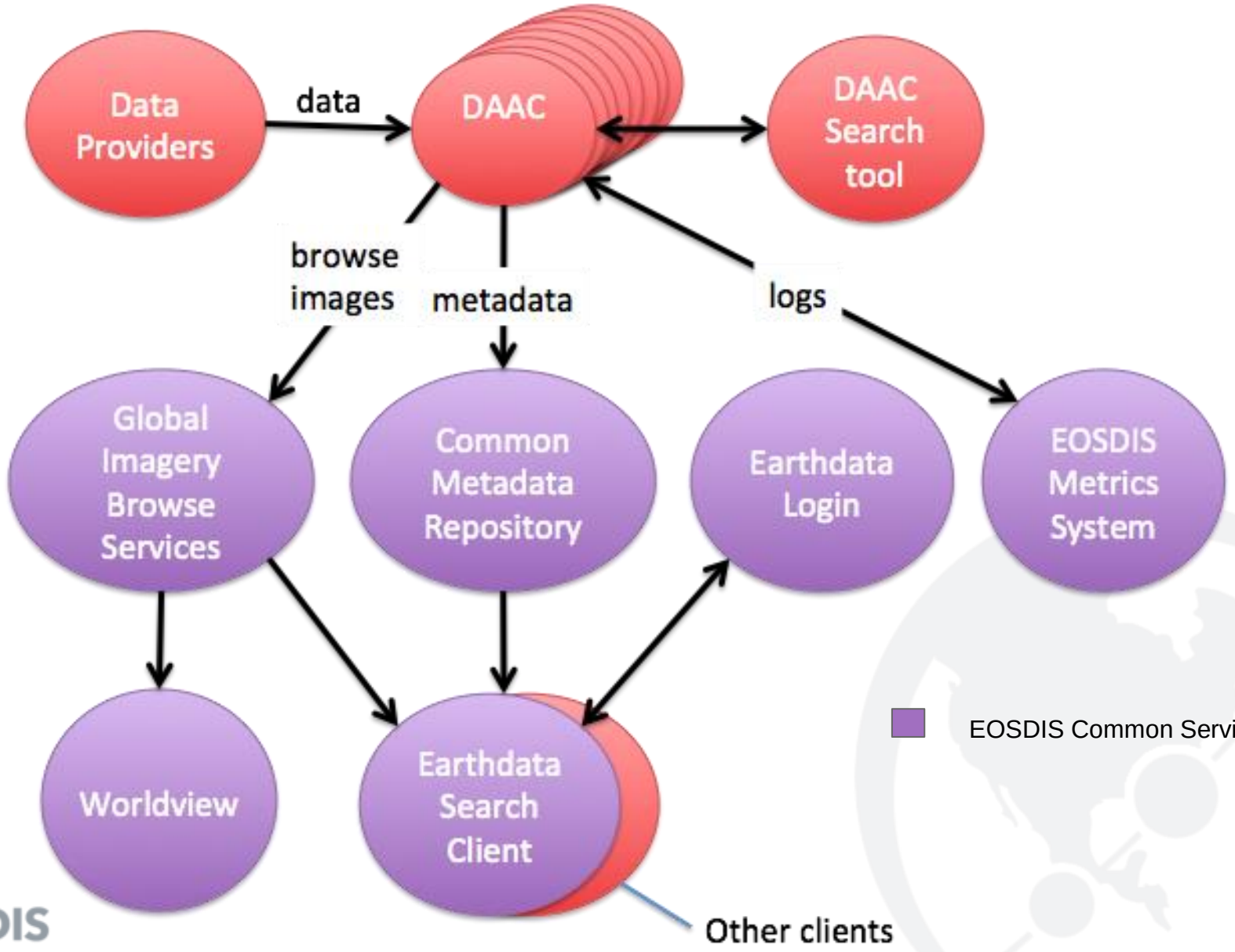
Education

Users

Discipline-Focused Distributed Active Archive Centers (DAACs)

EOSDIS

EOSDIS Common Services



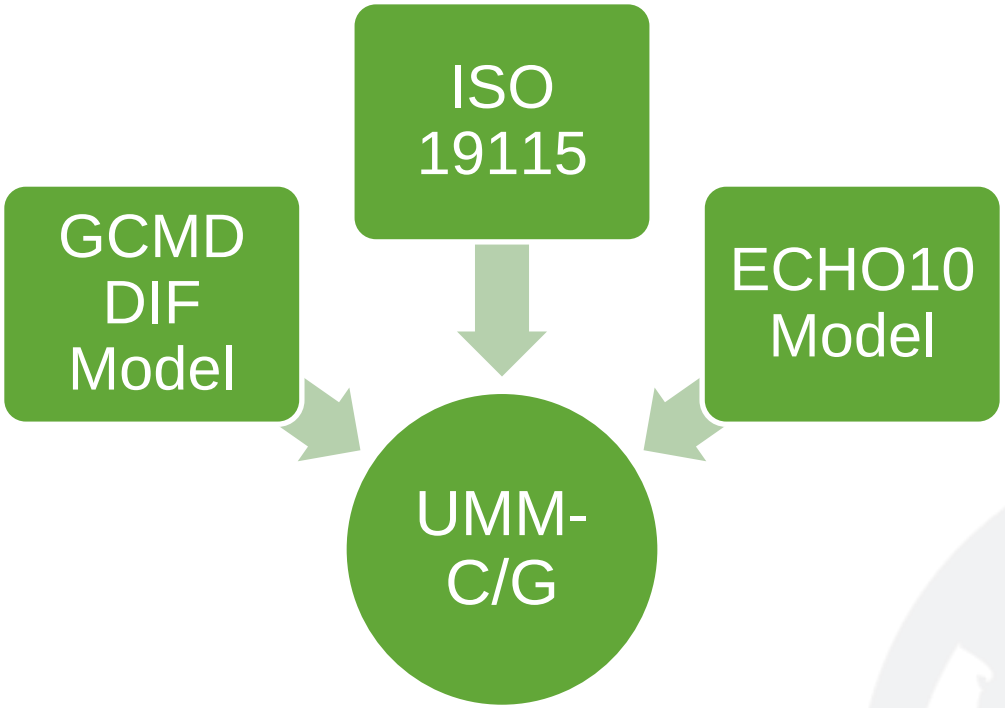
Looking at Our Metadata

Growing Pains

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**

Developing a Model



Crosswalking Each Element

Abstract

Element Specification

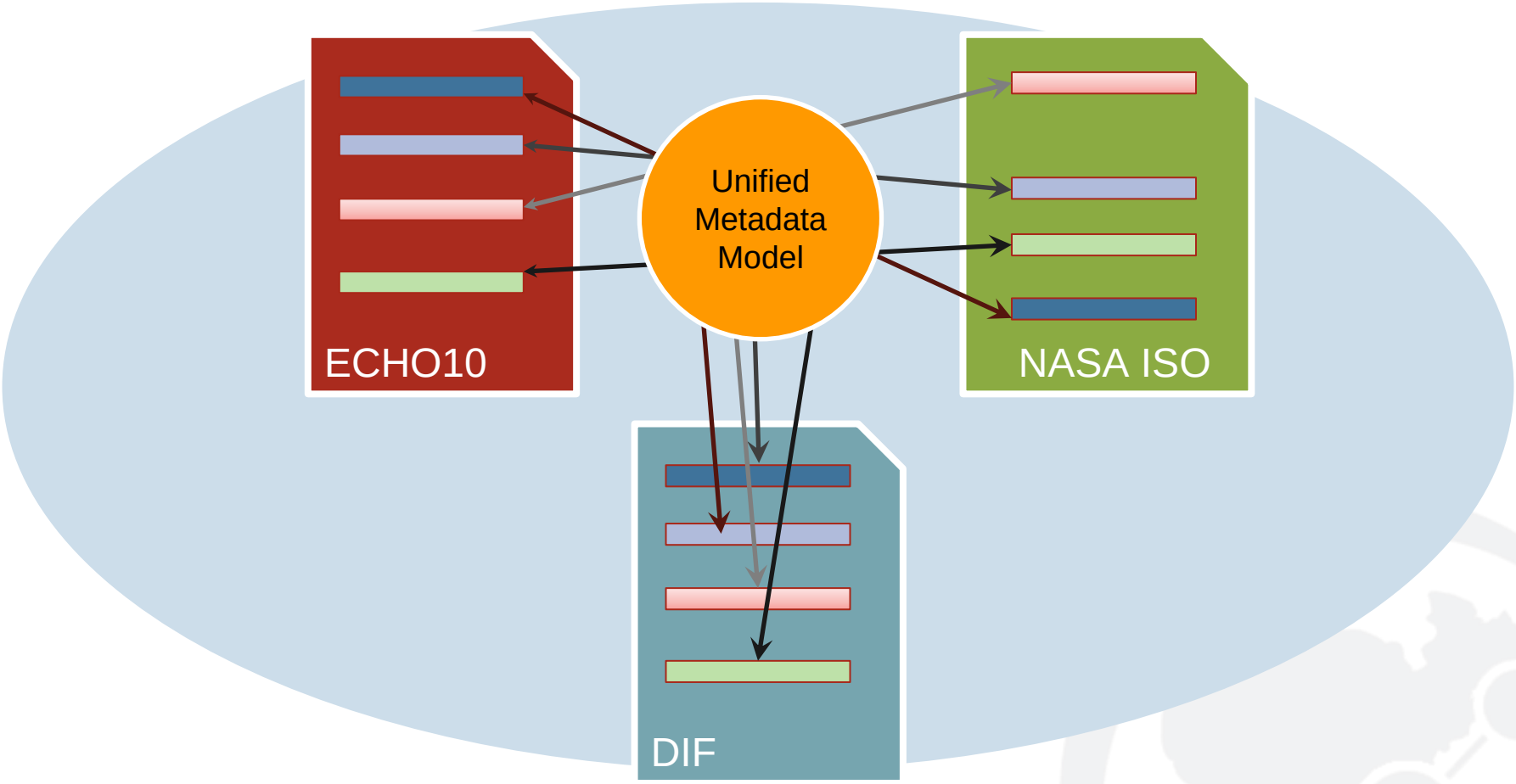
Abstract

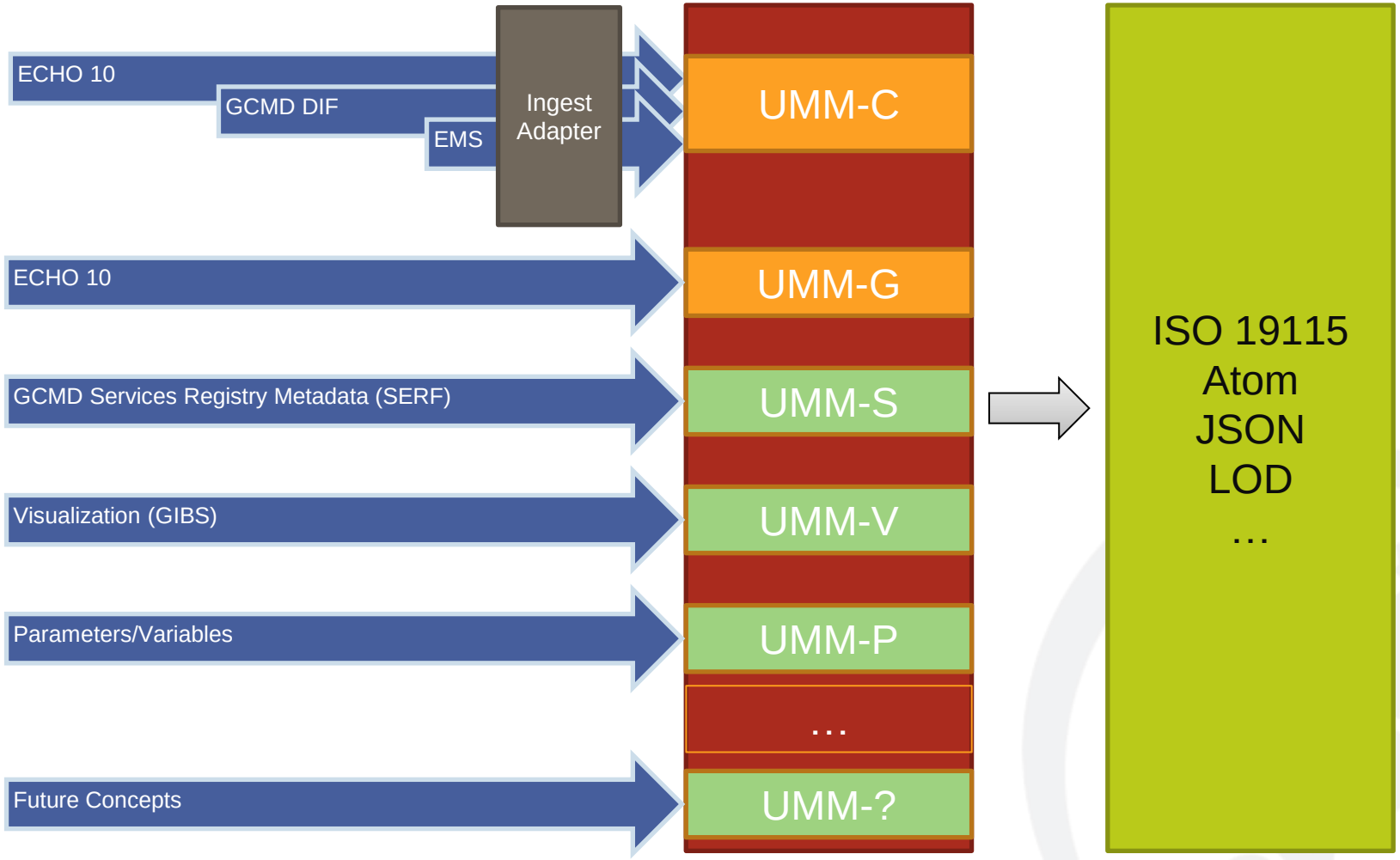
Description

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

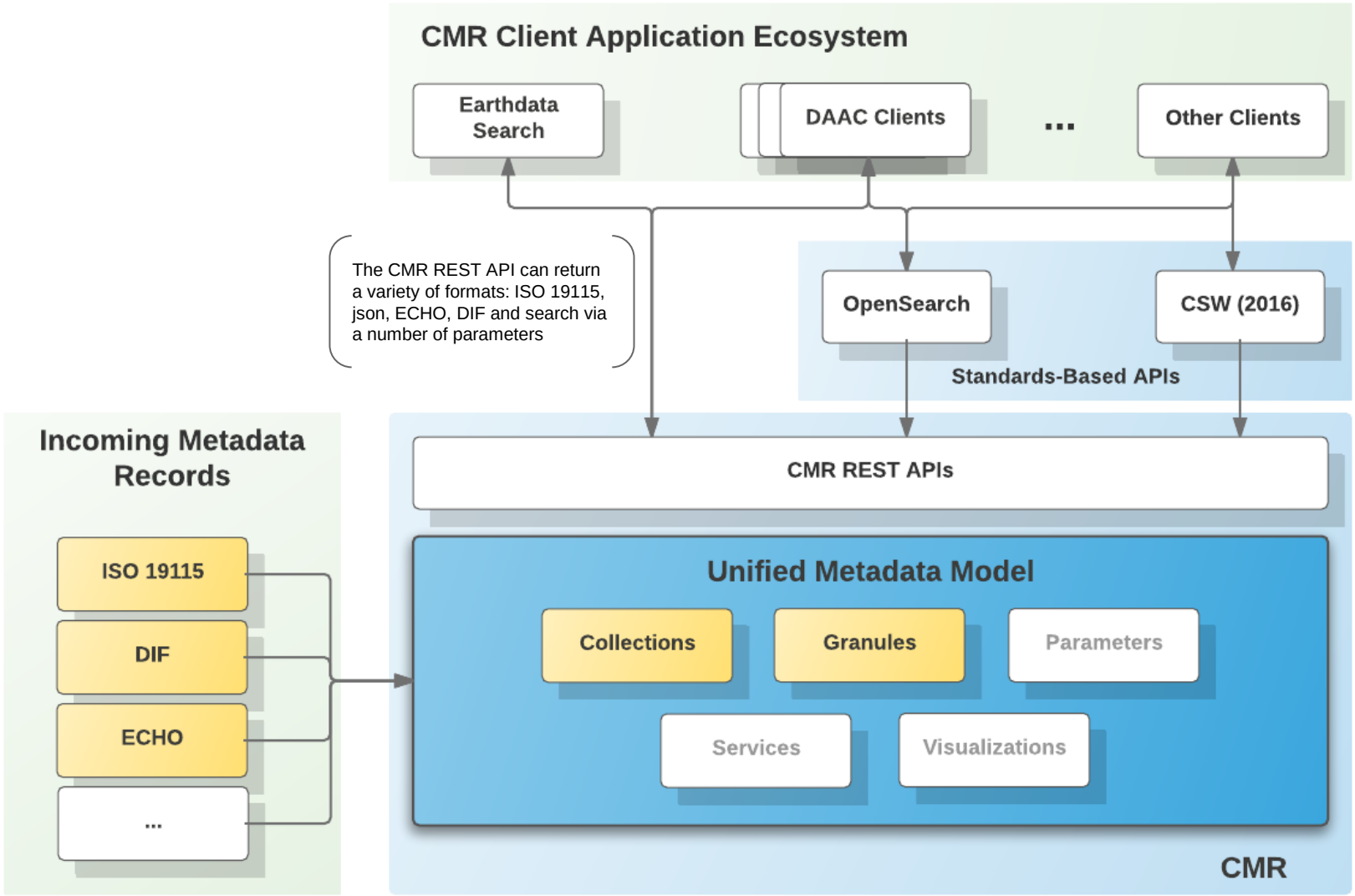
Mapping

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


Unified
Metadata
Model
ECHO10
NASA ISO
DIF

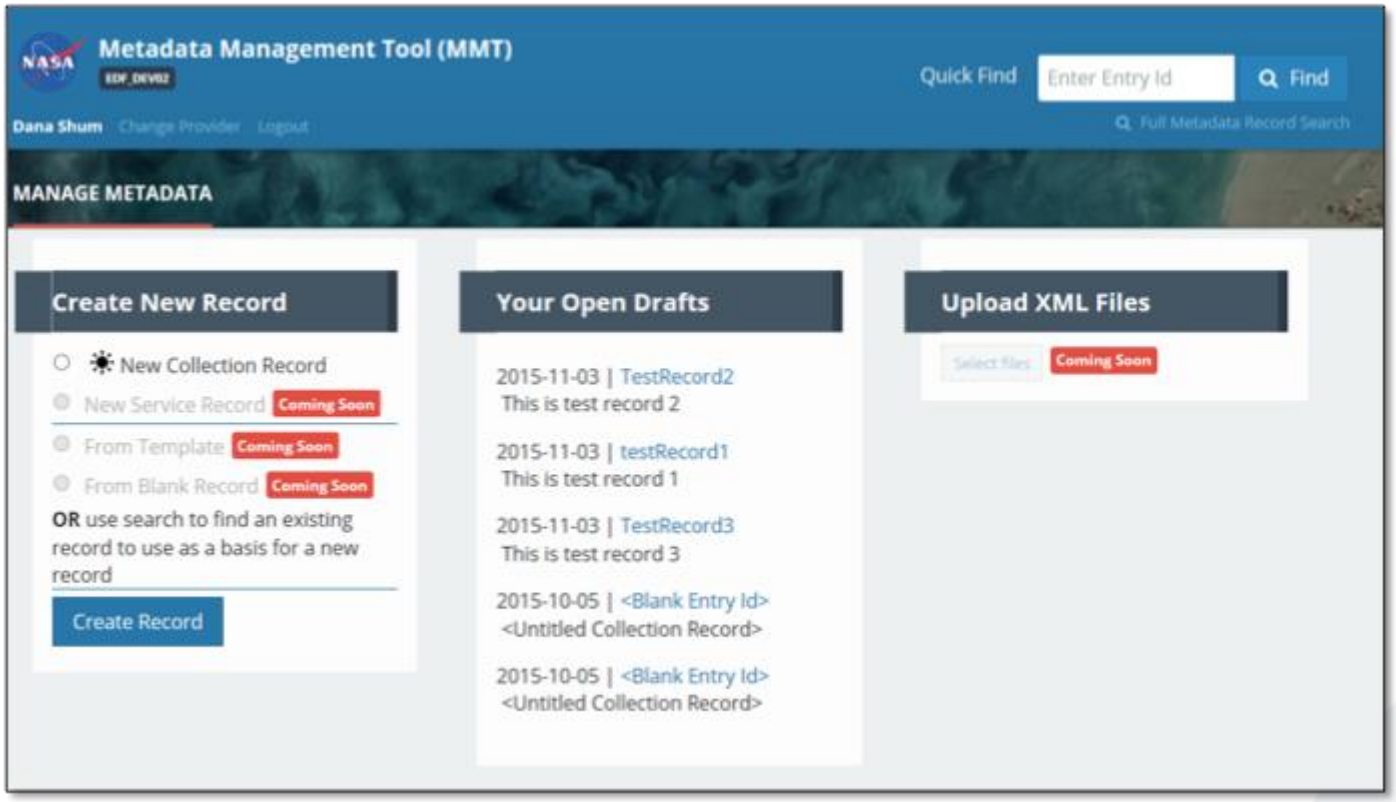

ECHO 10
GCMD DIF
EMS
Ingest Adapter
ECHO 10
GCMD Services Registry Metadata (SERF)
Visualization (GIBS)
Parameters/Variables
Future Concepts
UMM-C
UMM-G
UMM-S
UMM-V
UMM-P
...
UMM-?
ISO 19115
Atom
JSON
LOD
...

Unified Metadata Model in Context

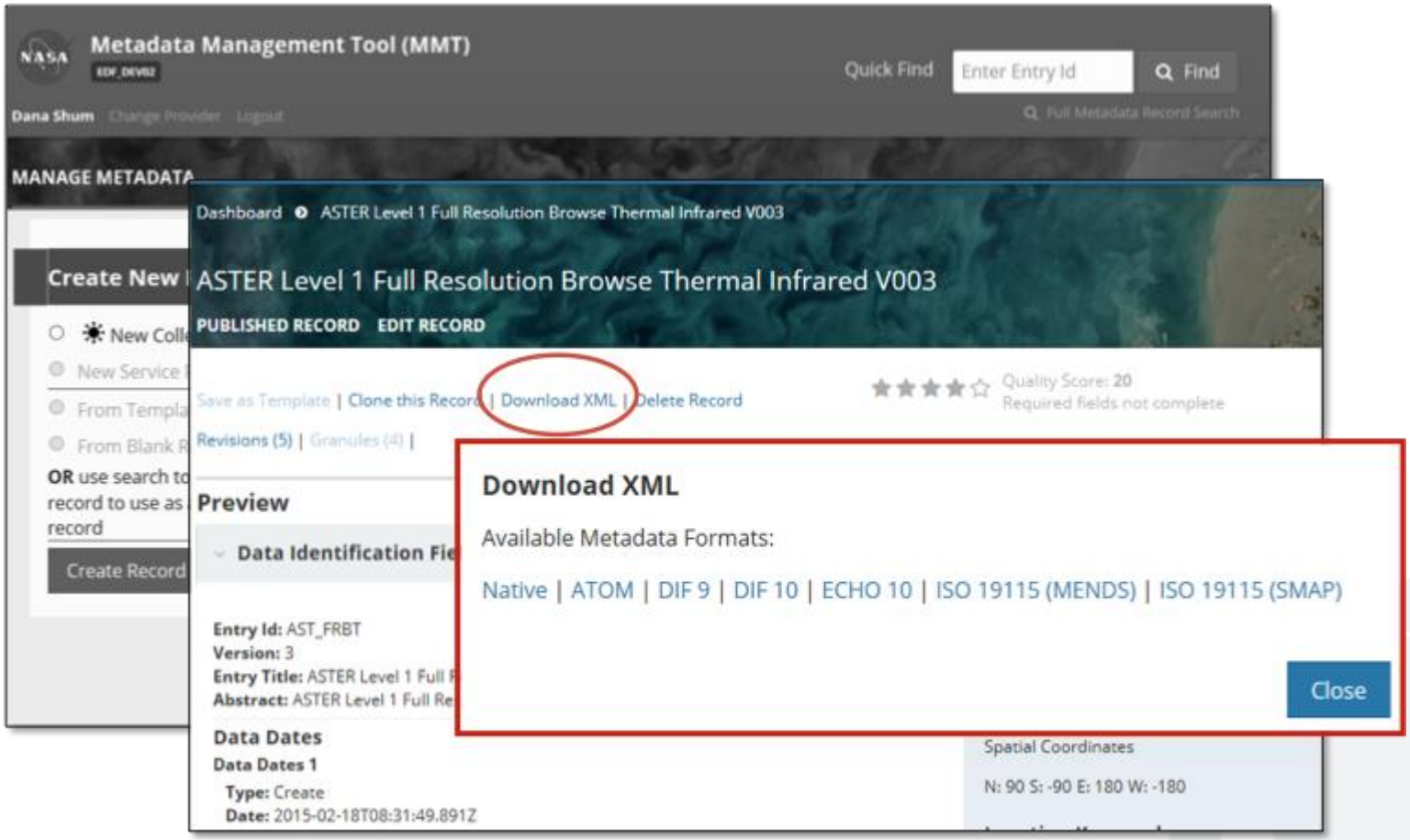


https://cmr.earthdata.nasa.gov/search/site/search_api_docs.html

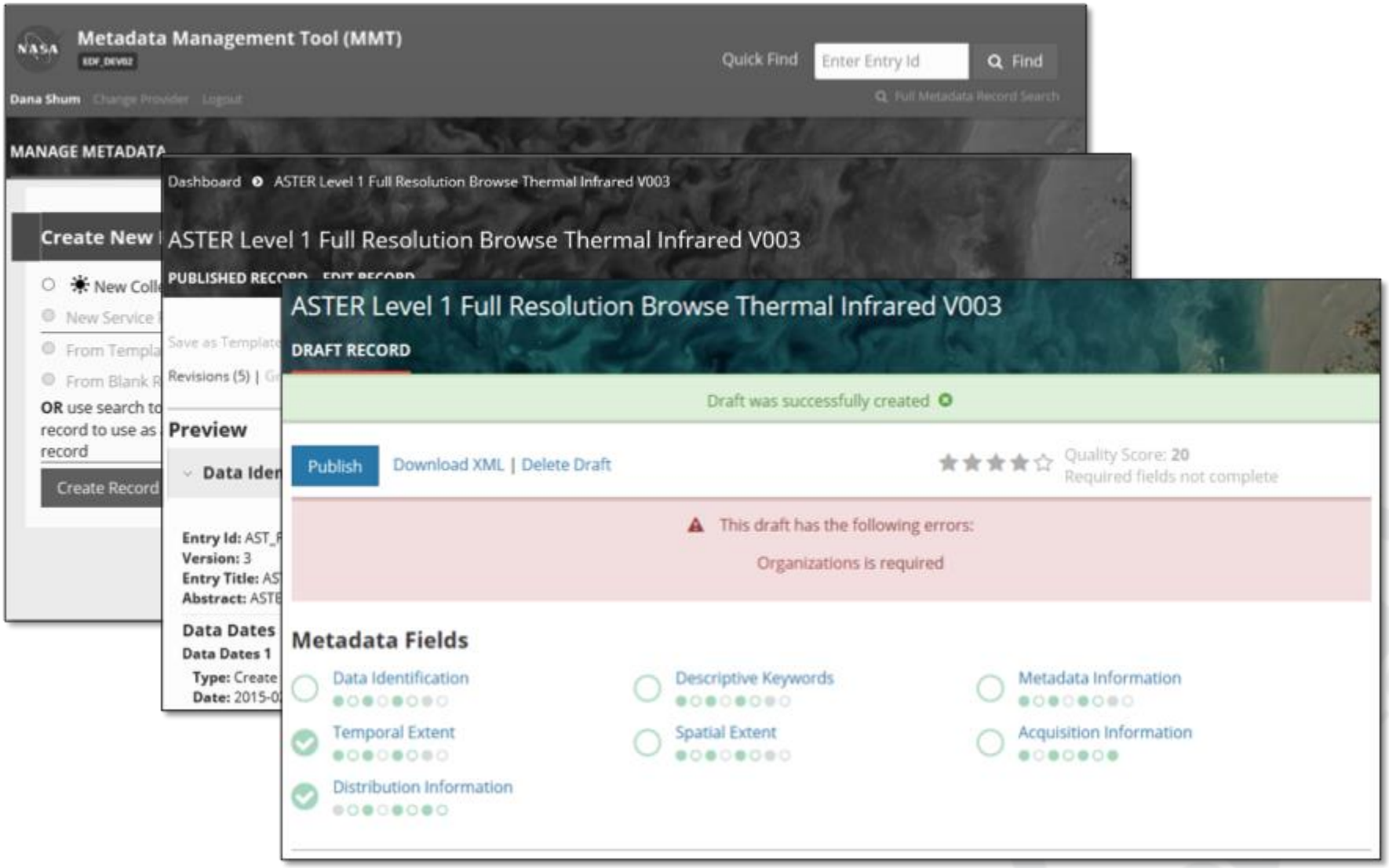
Tools for Metadata Editing



Tools for Metadata Editing



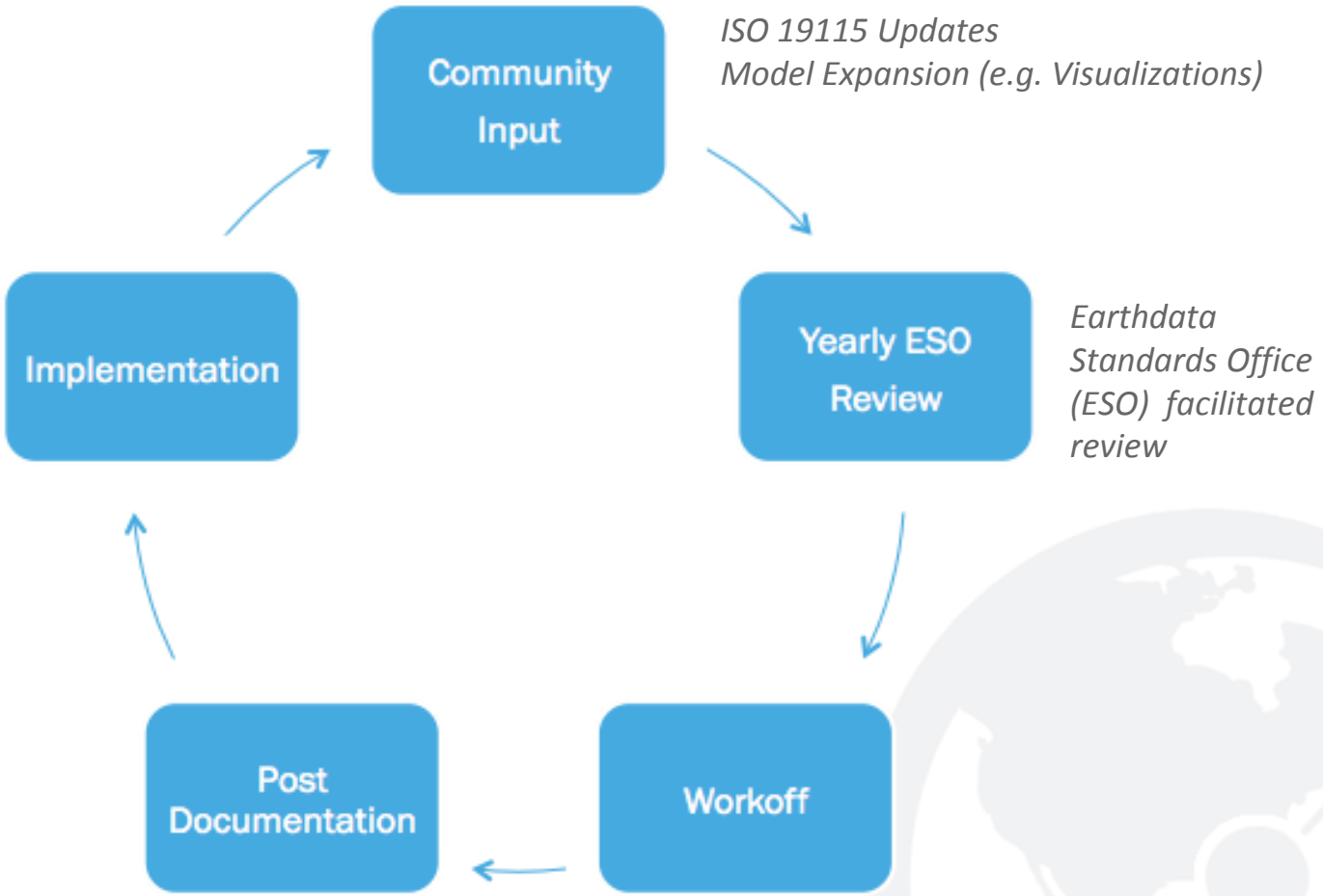
Tools for Metadata Editing



Keeping up with the times

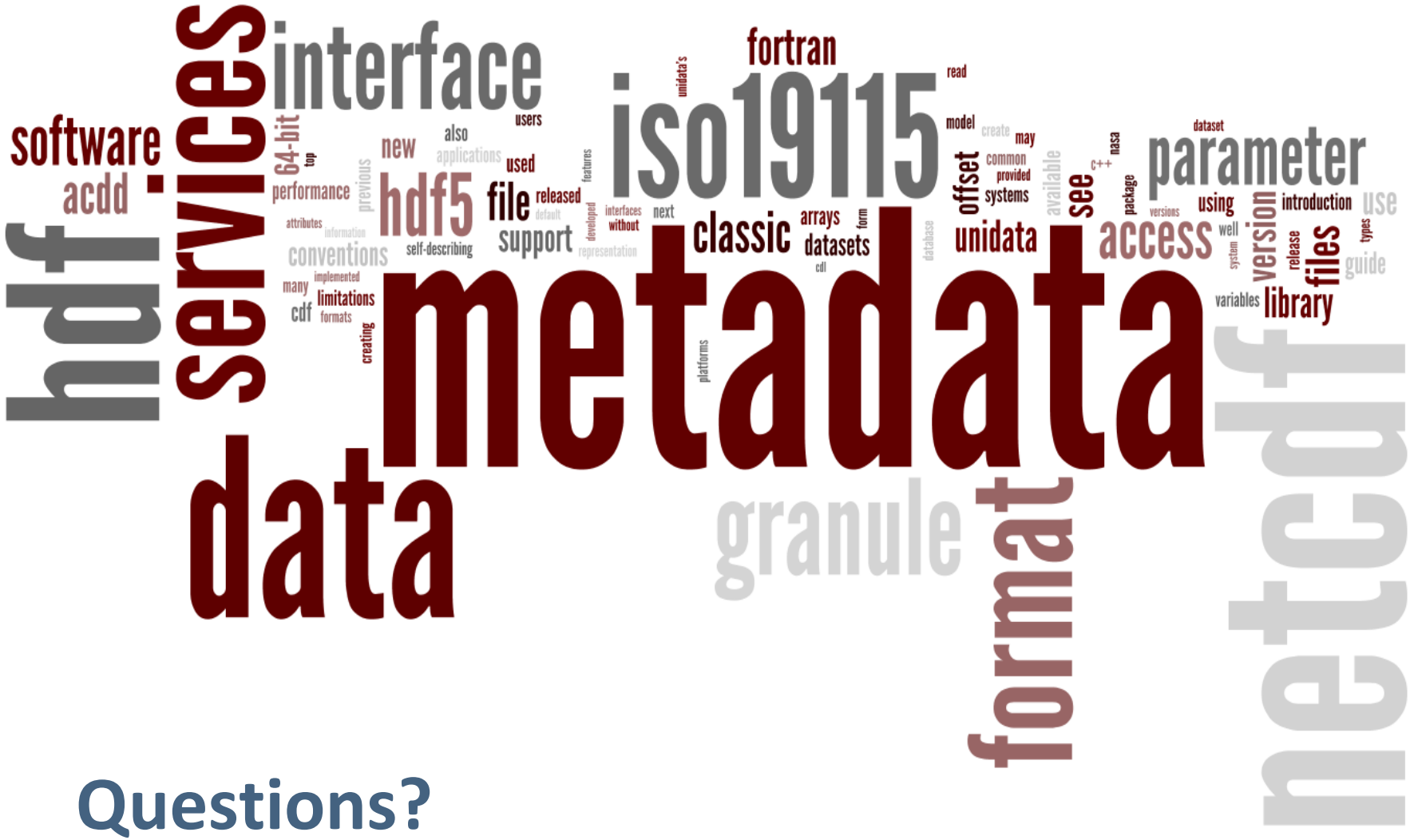
Model Governance

Governing the Unified Model Lifecycle



ISO 19115 Updates
Model Expansion (e.g. Visualizations)

Earthdata Standards Office (ESO) facilitated review



Questions?

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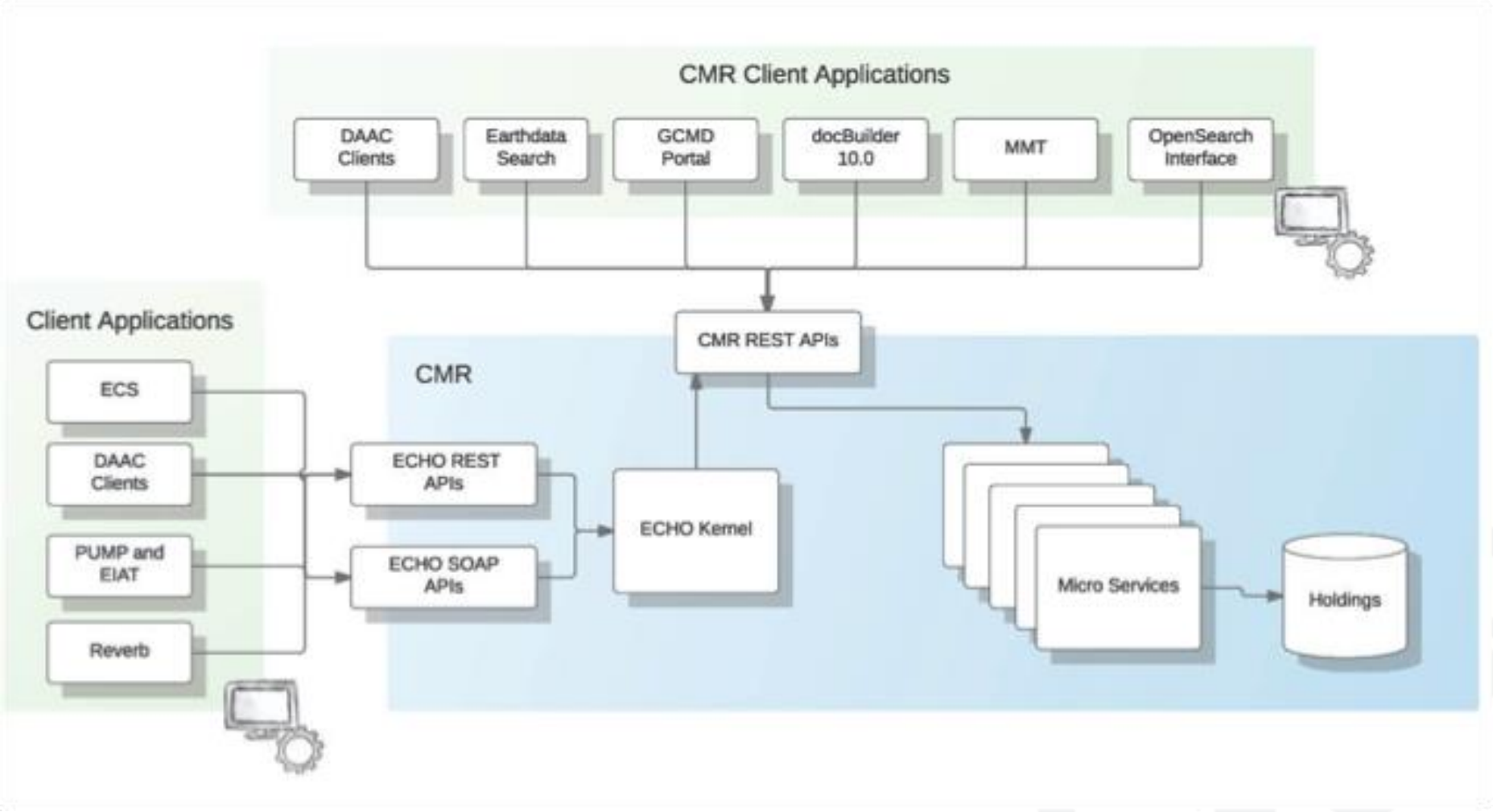
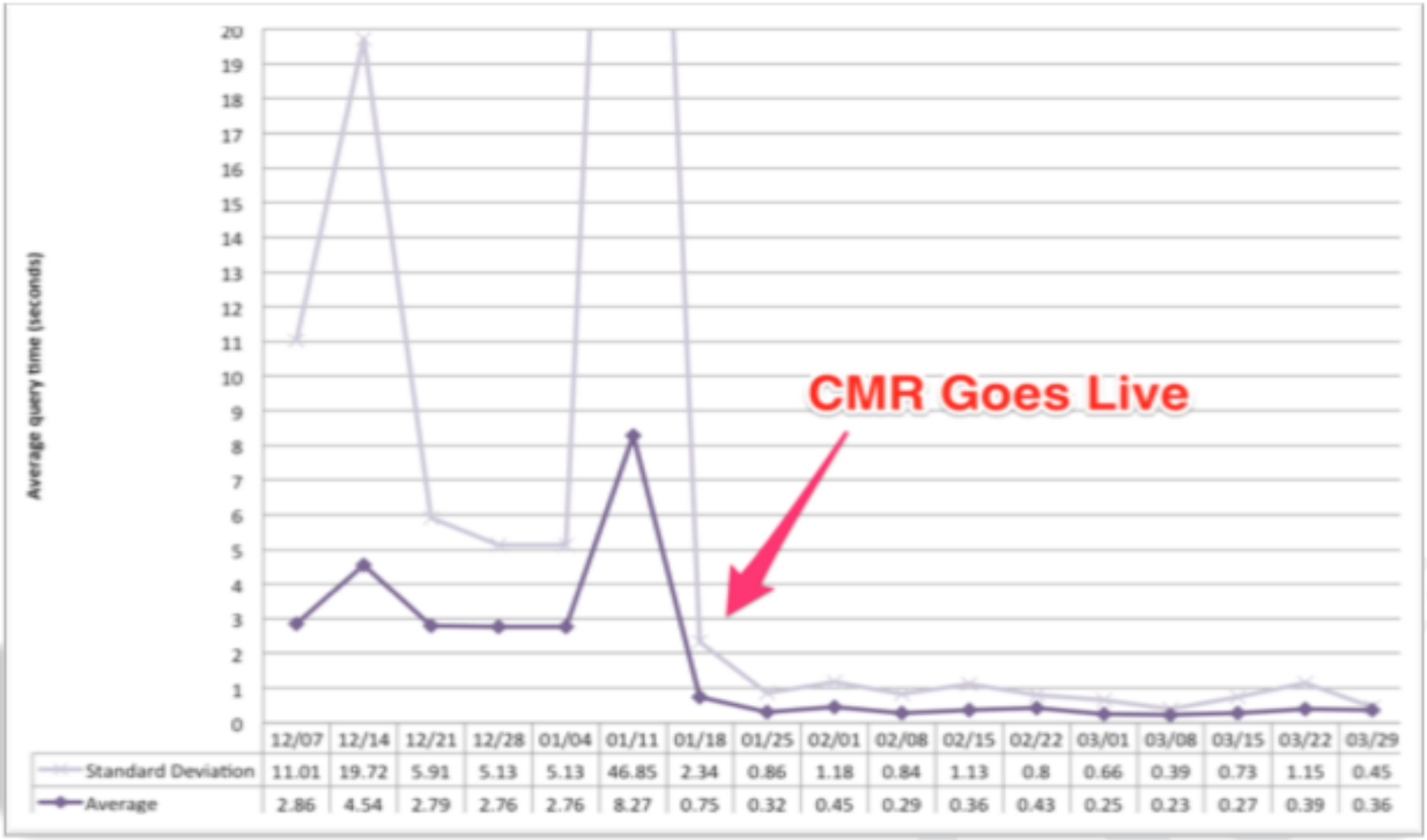
Need More Info?

Backup Slides

ECHO + CMR Transition Architecture

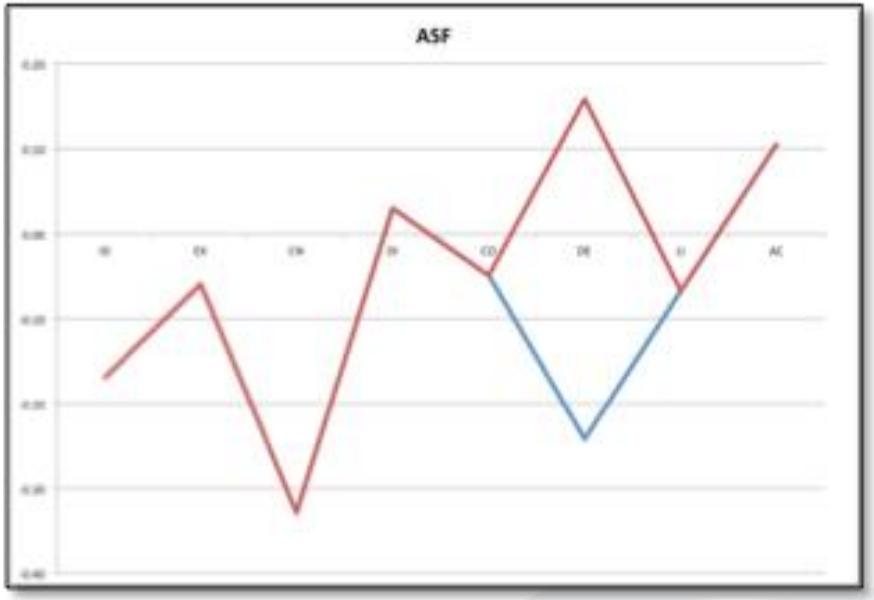


CMR Performance Metrics



	12/07	12/14	12/21	12/28	01/04	01/11	01/18	01/25	02/01	02/08	02/15	02/22	03/01	03/08	03/15	03/22	03/29
Standard Deviation	11.01	19.72	5.91	5.13	5.13	46.85	2.34	0.86	1.18	0.84	1.13	0.8	0.66	0.39	0.73	1.15	0.45
Average	2.86	4.54	2.79	2.76	2.76	8.27	0.75	0.32	0.45	0.29	0.36	0.43	0.25	0.23	0.27	0.39	0.36

Coming Soon: Quality Scoring



Description	Revision Date	Action by	Review Status	Quality Score	Revision Notes	Actions
5 - Published View	2015-11-02T16:00:09Z	ECHO_SYS	Reviewed	82		
4 - Revision View	2015-09-15T14:44:59Z	ECHO_SYS	Reviewed	82		Revert to this Revision
3 - Revision View	2015-09-11T17:48:26Z	ECHO_SYS	Reviewed	82		Revert to this Revision
2 - Revision View	2015-09-11T13:49:03Z	ECHO_SYS	Reviewed	82		Revert to this Revision
1 - Revision View	2015-09-10T19:31:45Z	ECHO_SYS	Reviewed	82		Revert to this Revision