

MENDS Breakout

Metadata Evolution for NASA Earth Science Data Systems

ESIP Federation Winter Meeting
Washington, D.C.
2011-01-06

Session Goals

- Brief ESIP community on MENDS effort
 - answer questions
- Report on status of ISO 19115 revision
- Discuss application of ISO 19100 standards for quality and lineage
- Gather feedback from MENDS team members on recommendations report

Procedural Matters

- Report synthesizing activities, discussions, and future action items due at the end of meeting.
- Post notes soon after a session and invite feedback, corrections and comments.
- Coach rapporteur for expected key points and action items.
- Do we have a volunteer?

Origins of MENDS

- NASA ESDIS Project assembled a team of stakeholders and experts from:
 - Decadal Survey missions
 - Clearinghouses
 - NASA Data centers and SIPS
- And directed them to:
 - Study metadata needs and current practices
 - Assess how ISO 19115+ does or does not meet stakeholders needs
 - Determine optimal path for integration of existing data models with ISO 19115+

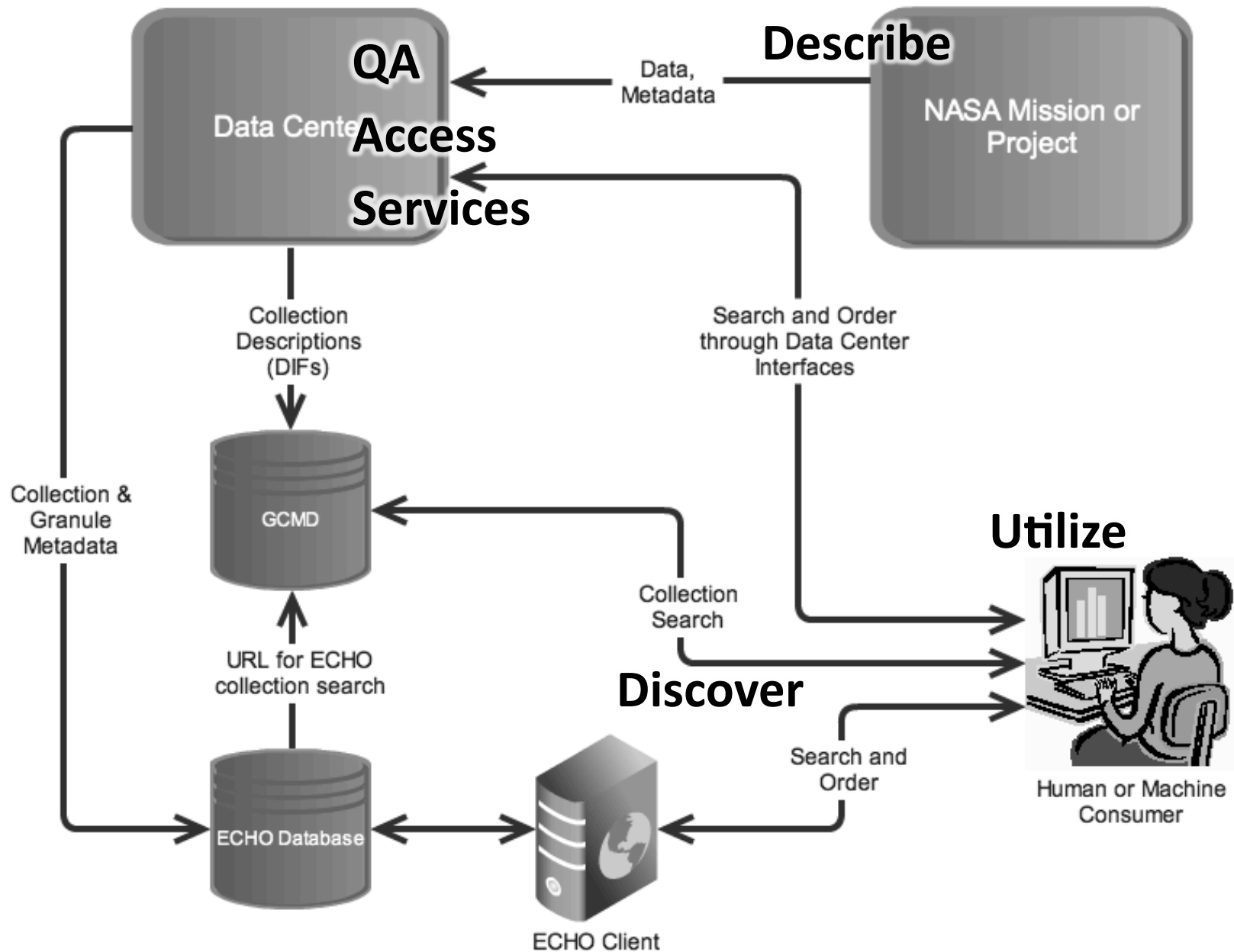
It's Not Just 19115...

- ISO 19108:2002 Temporal Schema
- ISO 19110:2005 Methodology for feature cataloguing
- ISO 19111:2007 Spatial Coordinates
- ISO 19115:2003 Metadata
- ISO 19115-2:2009 Metadata -- Part 2: Extensions for imagery and gridded data
- ISO 19119:2005 Services and extensions for service metadata model
- ISO 19130:2010 Sensor Models for Geopositioning
- ISO 19139:2007 Metadata-XML schema implementation
- ISO 19157:2012 Data Quality (replacing 19113:2002, 19114:2003, assuming part of 19138:2006)

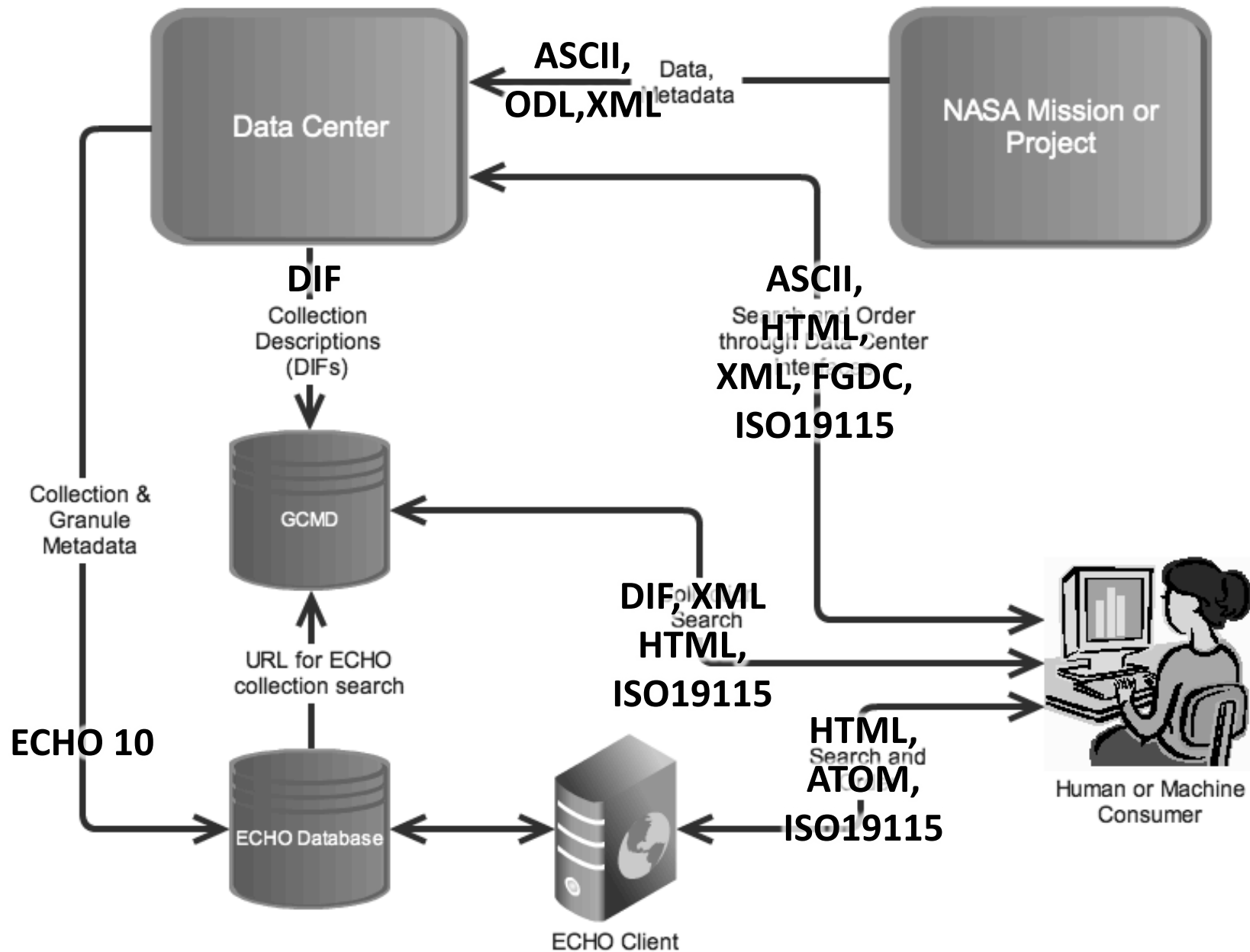
ISO 19115+ can be use to describe

- Collection/file/variable hierarchies
- Variable properties including quality information
- Space/time extent
- Instrument characteristics
- Geometry of the measuring process employed by the instrument
- Production process used to generate higher level products
- Numerical methods and computational procedures used in the derivation
- And more. . .

Metadata Uses in NASA Earth Science Data Systems



Metadata Flows in NASA Earth Science Data Systems



MENDS Process

- Phase I (August 2010 – January 2011)
 - Understand existing metadata usage in EOSDIS
 - Collect stakeholder requirements and concerns
 - Develop use cases detailing metadata flows and usage
 - Analyze data and make recommendations
- Deliver technical paper to ESDIS
 - Describe benefits of ISO 19115+ over existing metadata models and processes
 - Assessment of impacts on existing systems and potential incremental costs for new systems
 - Propose mechanisms for reducing cost and effort

Key Findings

- Adoption of ISO 19115+ is a logical step in the evolution of NASA Earth Science Data Systems
- Common usage across NASA systems of ISO 19115+ attributes and conventions for certain kinds of information is highly desirable
 - Argues for an extension, profile, or guidance on recommended practices
 - May need to be specific to observation type or science discipline
- Must avoid pitfalls of rushing to develop a profile
 - First gain experience implementing ISO 19115+ with NASA data products
 - Stay as close to original model as possible
 - Foster a community-driven process
 - Evolve the adoption of ISO 19115 in support of stakeholder needs
 - Learn from other implementations (NOAA, ESA, INSPIRE, etc.)
- Work to minimize impacts of ISO 19115 adoption on stakeholders
 - Support phased implementation by legacy systems
 - Provide tools for generation and validation

Next Steps

- Submit technical report detailing recommendations
- Research issues exposed in Phase I
 - Placement of metadata inside or outside data files
 - Other metadata standards?
 - CF
 - SensorML vs. 19130
- Help stakeholders map ISO 19115+ to their native data models
 - Identify potential search fields
- Develop tools for data providers
 - Hide complexity of the spec
 - Handle functions common to all data producers
 - Develop website to share tools, knowledge, and experiences
- Submit to NASA Standards Process Group

Summary

- ISO19115 provides tremendous depth and flexibility in documenting all facets of a data product
 - This complexity necessitates substantial investments to fully understand and work with the standard
 - Capable tools can greatly reduce the effort involved in designing, generating and validating ISO metadata
 - No one should have to read ISO specs if they don't want to!
- NASA ESDIS has the opportunity to play a leading role in the application of ISO 19115+ standards to remote sensing data
- Demonstrating benefits is better than mandating conformance

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