

USGEO COMMON FRAMEWORK FOR EARTH OBSERVATION DATA

Image Credit: ISERV/NASA



UNITED STATES GROUP ON EARTH OBSERVATIONS

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BACKGROUND - USGEO

- Chartered as a CENRS Subcommittee
- Tasked with coordinating civil Earth observation activities across Federal agencies
- Four working groups: Assessment Working Group, International Activities Working Group, Data Management Working Group, and Satellite Needs Working Group
- OSTP released the *National Strategy for Civil Earth Observations* in 2013 and the *National Plan for Civil Earth Observations* in 2014 following USGEO coordination
- These and other documents can be accessed at <http://usgeo.gov>



COMMON FRAMEWORK PURPOSE

- Promote interoperability of Earth observations data
 - Discoverability
 - Accessibility
 - Usability
- Establish recommendations to make data more readily usable by portals and tools
- Support U.S. government open data strategy, policies, and practices
- Promote practices and standards that comply with the Data Management Principles of the *National Strategy for Civil Earth Observations*
- Serves as guidance, not a mandate



AUDIENCE

- Federal Data Providers and Data Managers
 - Guidance for improving and standardizing data management practices in Federal agencies
- Data users
 - Government and non-government
 - Communicates what standards are, or will be, used for Federal Earth observations data
 - Ease the creation and enhance the utility of tools and services used to interact with the data
- 12/09/15 release for public comment; deadline for comments is 1/15/16

<https://www.whitehouse.gov/blog/2015/12/09/improving-access-earth-observations>

<https://www.whitehouse.gov/administration/eop/ostp/library/shareyourinput>



ORGANIZATION

- The aspects of data management are organized as follows:
 - Data Search and Discovery Services
 - Data Access Services
 - Data Documentation
 - Compatible Formats and Vocabularies
- In each category, recommendations are discussed at three levels
 - Standards and protocols
 - Methods and practices
 - Implementations



RECOMMENDATIONS

- **Data Search and Discovery Services:**

- Provides guidance on the creation and organization of searchable catalogs of data
- Example: Schema.org, OpenSearch, Digital Object Identifiers (DOIs)

- **Data Access Services:**

- Encourages data providers to offer standards-based services and application programming interfaces (APIs)
- OGC Web Map Service (WMS), Data Access Protocol (DAP)

- **Data Documentation:**

- Documentation, in the form of structured metadata, makes it easier for users outside of a particular group or community to discover, access, use, and understand
- Example: ISO 19115, ISO 19115-2, ISO 19115-1 + 19157 (for quality)

- **Compatible Formats and Vocabularies:**

- Compatibility of data at the format level facilitates the ability to combine, integrate and synthesize observations

Share Your Input on the Draft Common Framework:

<https://www.whitehouse.gov/administration/eop/ostp/library/shareyourinput>



Image credit: Ian Joughin, University of Washington



THANK YOU!

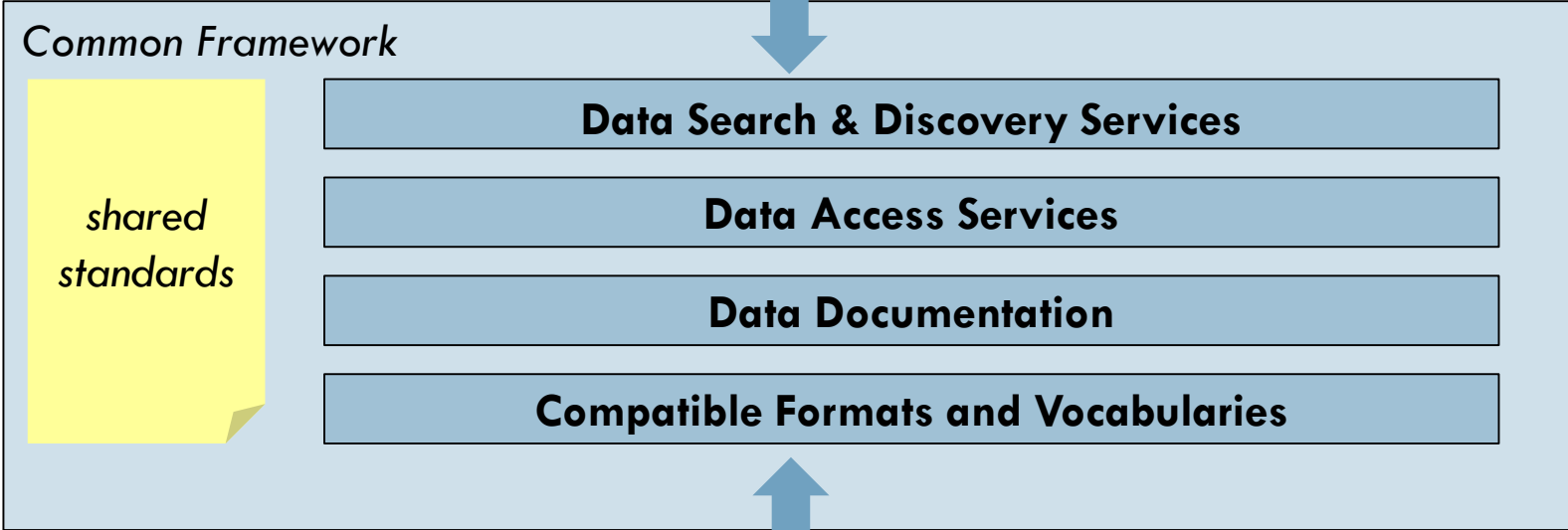
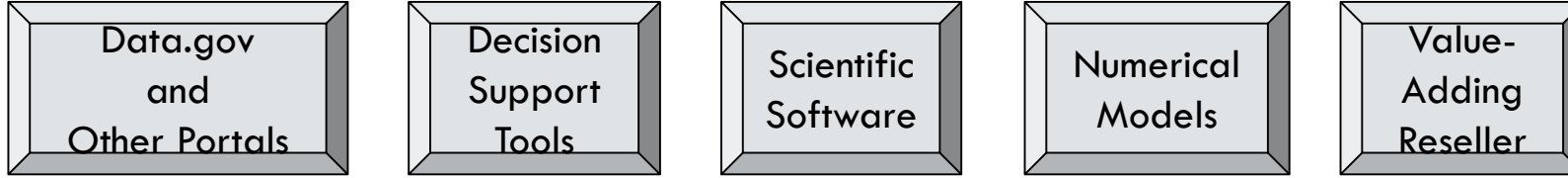


BACKUP

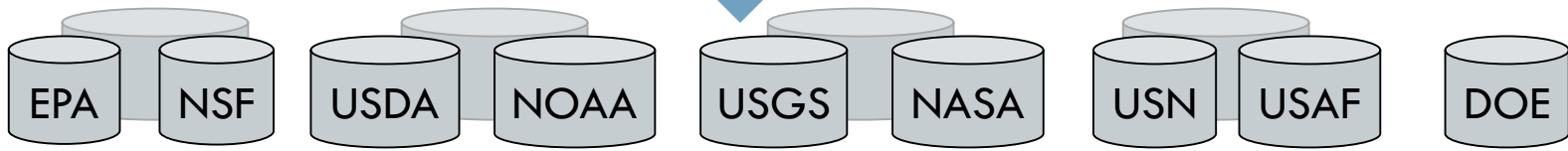


COMMON FRAMEWORK CONCEPTUAL MODEL

User Tools



Data Sources





DATA SEARCH AND DISCOVERY SERVICES

- Provides guidance on the creation and organization of searchable catalogs of data
- Machine-to-machine interfaces should be supported
- The *National Strategy for Civil Earth Observations* called for establishment of formal standards-based catalog services which could be indexed by commercial search engines
- Some examples of standards and protocols
 - Schema.org
 - OGC Catalog Service for the Web (CSW)
 - OpenSearch
 - Open Archives Initiative Protocol for Metadata Harvesting (OAI/PMH)
 - Digital Object Identifiers (DOIs)



DATA ACCESS SERVICES

- Methods users retrieve data for exploration, analysis, and decision-making
- Encourages data providers to offer standards-based services and application programming interfaces (APIs) on the data such as:
 - Subsetting
 - Aggregation
 - Visualization
 - Other
- Allows for more advanced access than simply bulk downloads
- Standards-based services facilitate interoperability by making it easier to obtain and combine data from multiple sources



DATA ACCESS SERVICES

- Standards-based services facilitate interoperability by making it easier to obtain and combine data from multiple sources
- Some examples of standards and protocols
 - OGC Web Map Service (WMS)
 - Data Access Protocol (DAP)
 - OGC Web Coverage Service (WCS)
 - OGC Sensor Observation Service (SOS)
 - OGC Web Feature Service (WFS)
- More information on methods, practices, and implementations available on the CFEOD document



DATA DOCUMENTATION

- Documentation, in the form of structured metadata, makes it easier for users outside of a particular group or community to discover, access, use, and understand.

Metadata	
Model	Encoding Schema
ISO 19115-2	ISO 19139-2
ISO 19115	ISO 19139
ISO 19115-1 + 19157 (for quality)	ISO 19115-3

- *Note: FGDC CSDGM is accepted for legacy data sets that can not comply with newly defined and adopted standards*
- Sensor ML for instrument descriptions



COMPATIBLE FORMATS AND VOCABULARIES

- Interoperability among data assets is a primary goal of the CFEOD
- Compatibility of data at the format level facilitates the ability to combine, integrate and synthesize observations
- Includes machine encodings but also data models and vocabularies
- Limits (in a good way) the potential solution space for exchanging information



COMPATIBLE FORMATS AND VOCABULARIES

- **Formats**

- NetCDF4
- HDF5
- GeoTIFF
- Geography Markup Language (GML)

- **Controlled vocabularies**

- European Petroleum Survey Group (ESPG) Geodetic Parameter Dataset
- National Hydrography Dataset
- Office of Management and Budget Circular A-16
- Global Change Master Directory (GCMD)
- Climate Forecast (CF) Metadata Conventions Standard