Geospatial Digital Data at NOAA

John Bates, Chief
Remote Sensing Applications Division
NOAA's National Climatic Data Center

NOAA – National Oceanic and Atmospheric Administration

- ## VISION
  - An informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions

- ## MISSION
  - To understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs
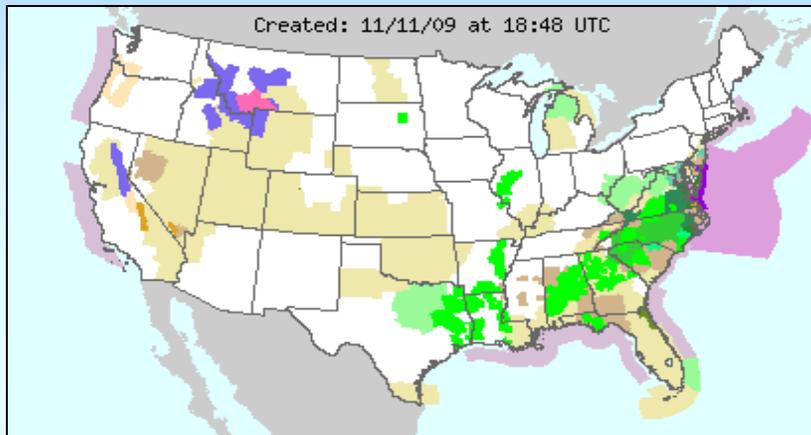
- ## NOAA CORE VALUES
  - People, Integrity, Excellence, Teamwork, and Ingenuity
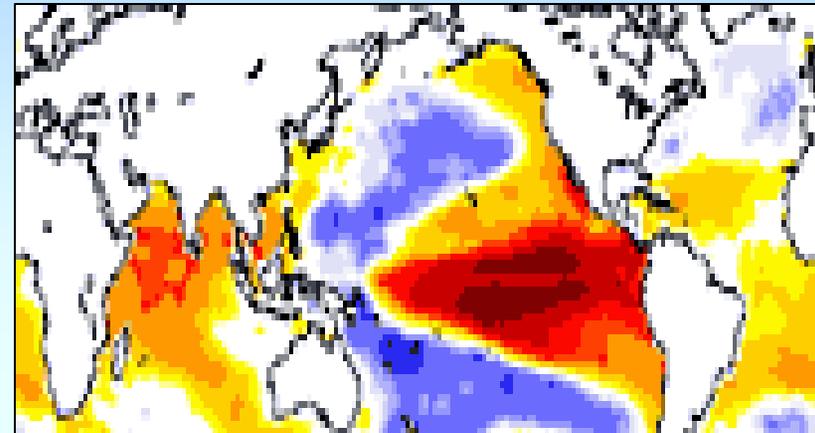 - Science, Service, and Stewardship

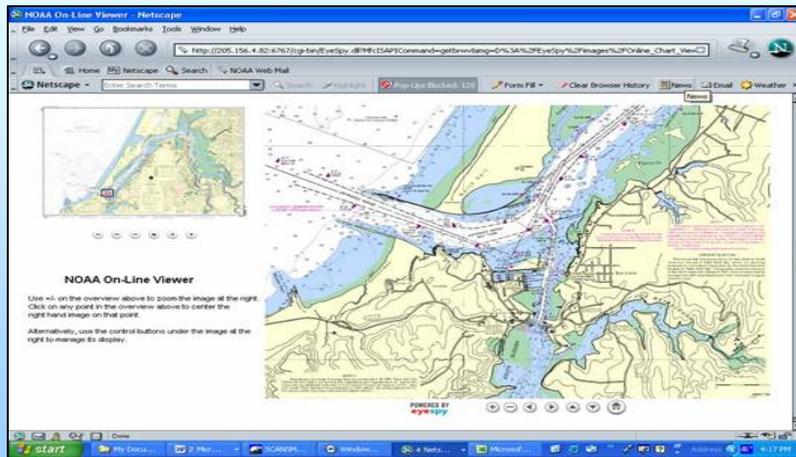# Digital Geospatial Data is Used Extensively in All Four NOAA Goals

Weather and Water

### Climate

Commerce and Transportation

Marine Ecosystems

Identifying Records to be Preserved

- **NOAA Procedure for Scientific Records Appraisal and Archive Approval**

    - **Identification Step**: A NOAA agency or any individual or organization can identify the scientific records by sending the request to the NOAA office that has responsibility for the archive.

    - **Appraisal Step:** The NOAA Office Director responsible for the archive assigns an Appraisal Team to perform a preliminary appraisal with options to perform a formal appraisal and request an External Science Review.

    - **Approval Step:** Using the recommendation from the Appraisal Team, the NOAA Office Director makes the decision and then coordinates the decision with a National Archives and Records Administration records schedule. When needed and required, a Public Comment period is conducted and coordination occurs with higher level NOAA management.

    - **Implementation Step:** The NOAA Office Director responsible for the archive ensures that the decision is implemented.


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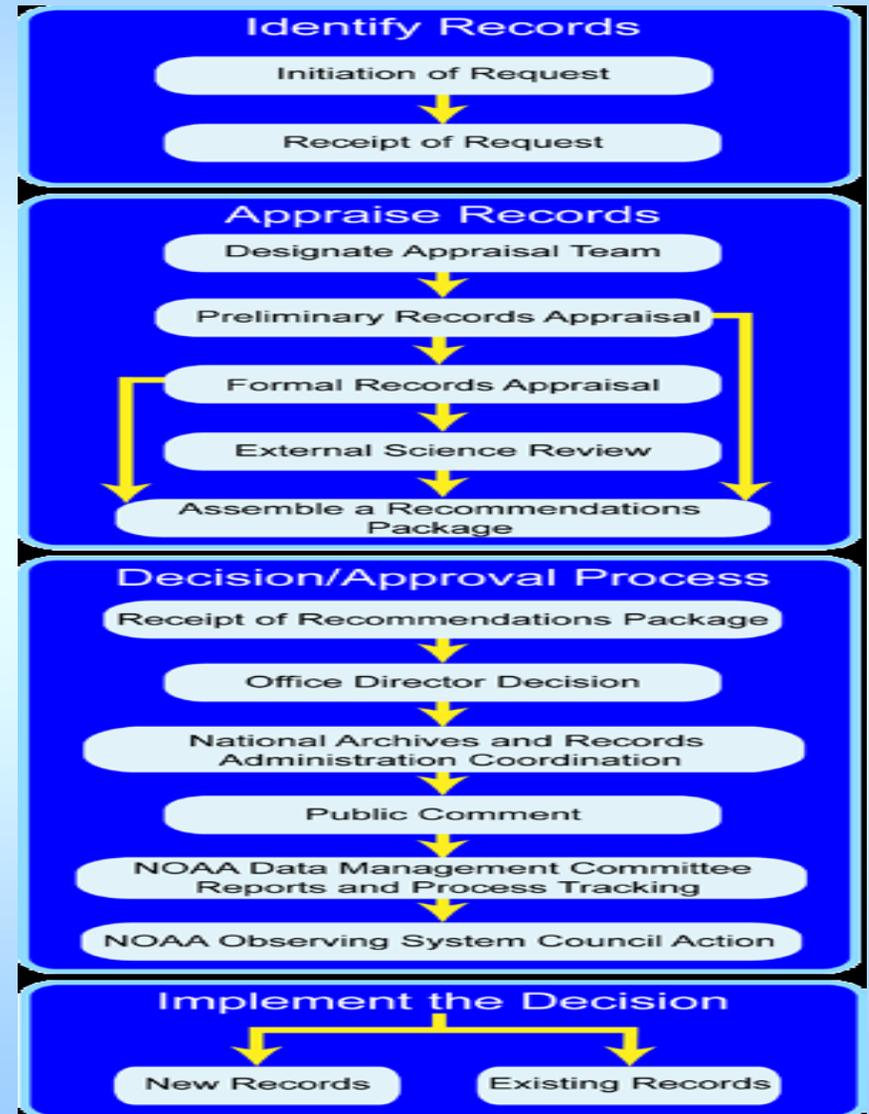
Preservation – Scientific Data Stewardship

- Scientific data stewardship (SDS) is the new paradigm in data management consisting of an integrated suite of functions to preserve and exploit the full scientific value of NOAA's environmental data. These functions are
  - The careful monitoring of observing system performance for long-term applications,
  - The generation of authoritative long-term records from multiple observing platforms,
  - The assessment of the state of the atmospheric, oceanic, land, cryospheric and space environments, and
  - The proper archival of and timely access to data and metadata.
- Successful implementation of scientific data stewardship will ensure NOAA's environmental data are of maximum use to the Nation now and in the future.
- Open Archive Information System – Reference Model (OAIS-RM) has been adopted by NOAA's Data Centers for preservation in addition to SDS principles

Generic Access to Heterogeneous Data – A Data Grid Approach*
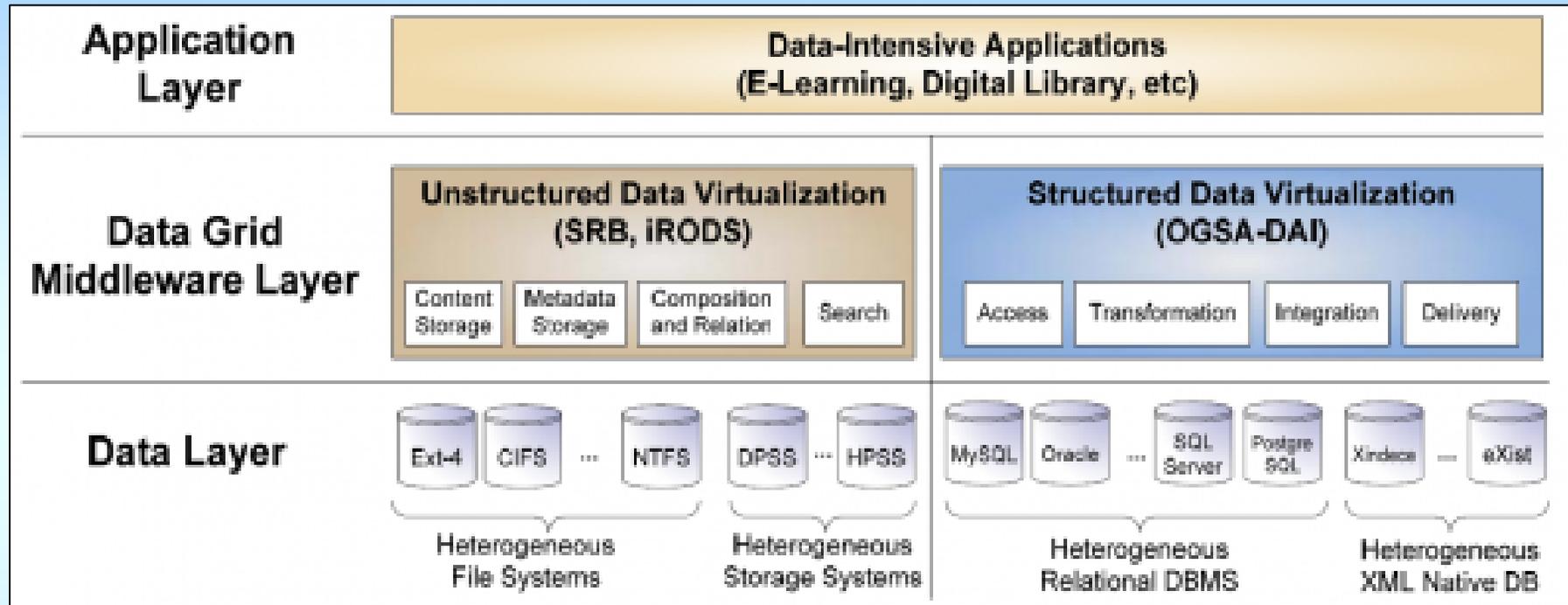
- iRODS (Integrated Rule-Oriented Data System) is a second generation data grid system providing a unified view and seamless access to distributed digital objects across a wide area network

- OGSA-DAI (Open Grid Services Architecture – Data Access and Integration) is a middleware software that allows structured data resources, such as relational or XML databases, from multiple, distributed, heterogeneous and autonomously managed data sources to be easily accessed via web services. It focuses on cases where the assembly of all the data into a single data warehouse is inappropriate

(*from Kurniawan and Hasibuan, 2009)

Fluid Oceans and Atmospheres Community Building Tools – Unidata's Common Data Model

- Unidata's Common Data Model (CDM) is an abstract data model for scientific datasets

- The Common Data Model has three layers, which build on top of each other to add successively richer semantics:
  - The *data access layer*, also know as the *syntactic layer,* handles data reading and writing.
  - The *coordinate system* layer identifies the coordinates of the data arrays. Coordinates are a completely general concept for scientific data; we also identify specialized *georeferencing coordinate systems*, which are important to the Earth Science community.
  - The *scientific feature type* layer identifies specific types of data, such as *grids*, *radial*, and *point data*, adding specialized methods for each kind of data.