NASA's Earth Observing System Data and Information System

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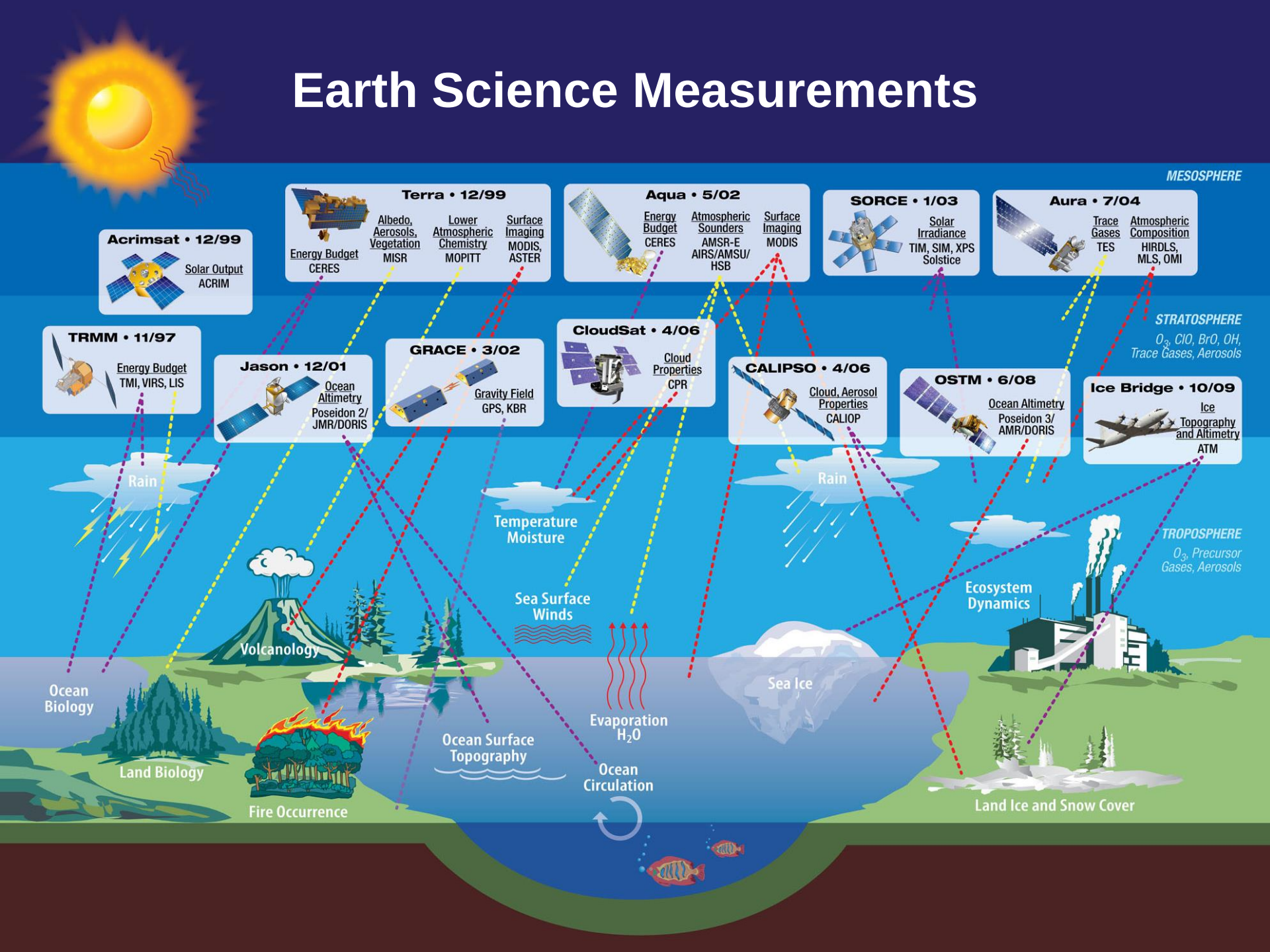
NASA Earth Science Data Systems

- **"Advance knowledge of Earth as a system to meet the challenges of environmental change, and to improve life on our planet." -- *2014 NASA Strategic Plan***
  - **NASA's Earth Science Data Systems directly support this objective by providing end-to-end capabilities to deliver data and information products to users**
- **NASA's Earth Science Data and Information Policy promotes usage of data by the community**
  - **No period of exclusive access - Data are available after initial checkout**
  - **Data available at no cost to all users on a non-discriminatory basis except where agreed upon with international partners**

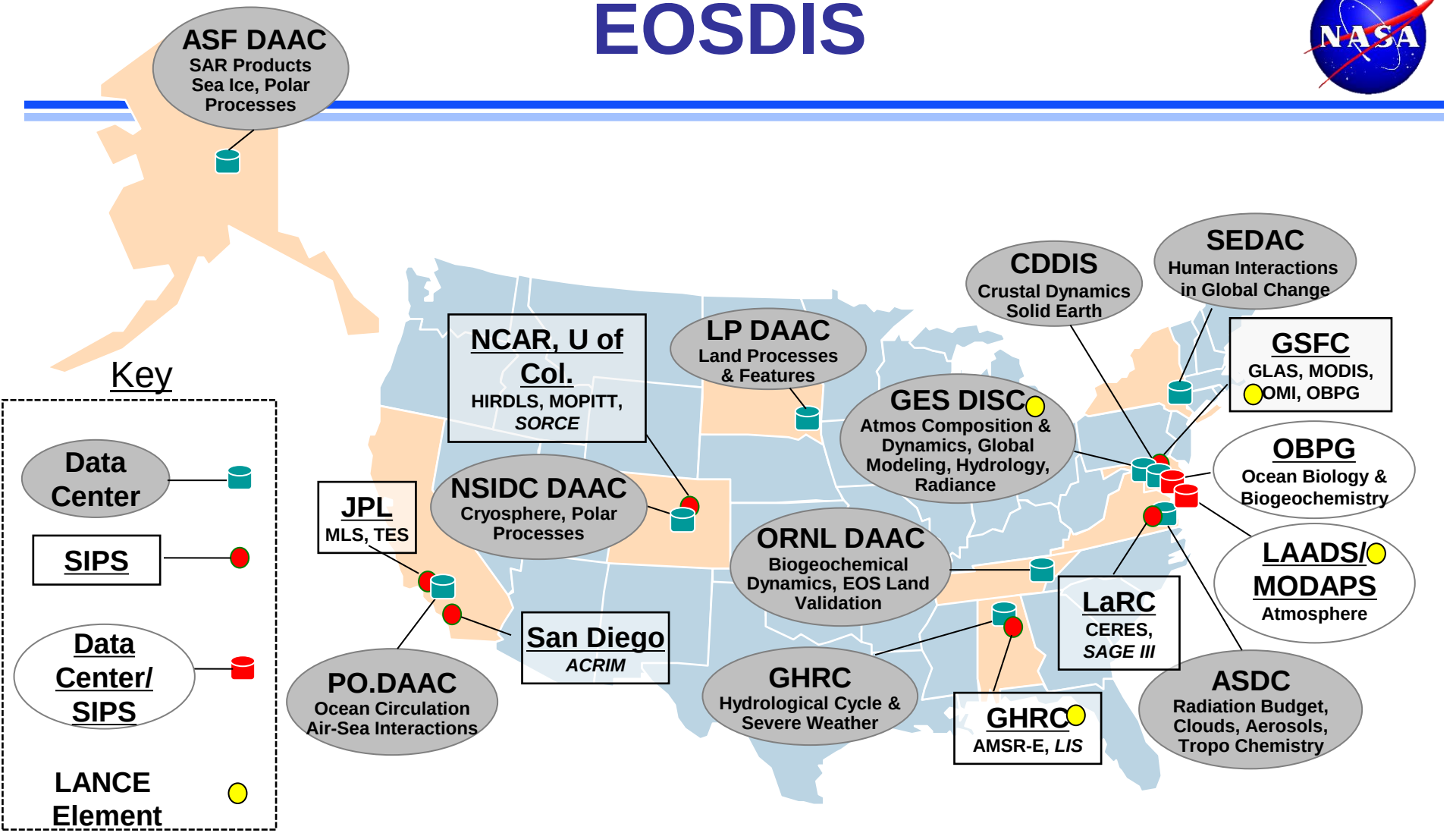
EOSDIS

- **The Earth Observing System Data and Information System (EOSDIS) is a key core capability in NASA's Earth Science Data Systems Program.**
- **EOSDIS provides end-to-end capabilities for managing NASA's Earth science data from satellites, aircraft field measurements, and various other programs.**
- **EOSDIS provides:**
  - **Science Operations**
    - **Science data processing**
    - **Data management**
    - **Interoperable distributed data archives**
    - **On-Line data access services**
    - **Earth science discipline-oriented user services**
  - **Network Data Transport to distributed system elements**

Earth Science Measurements



EOSDIS

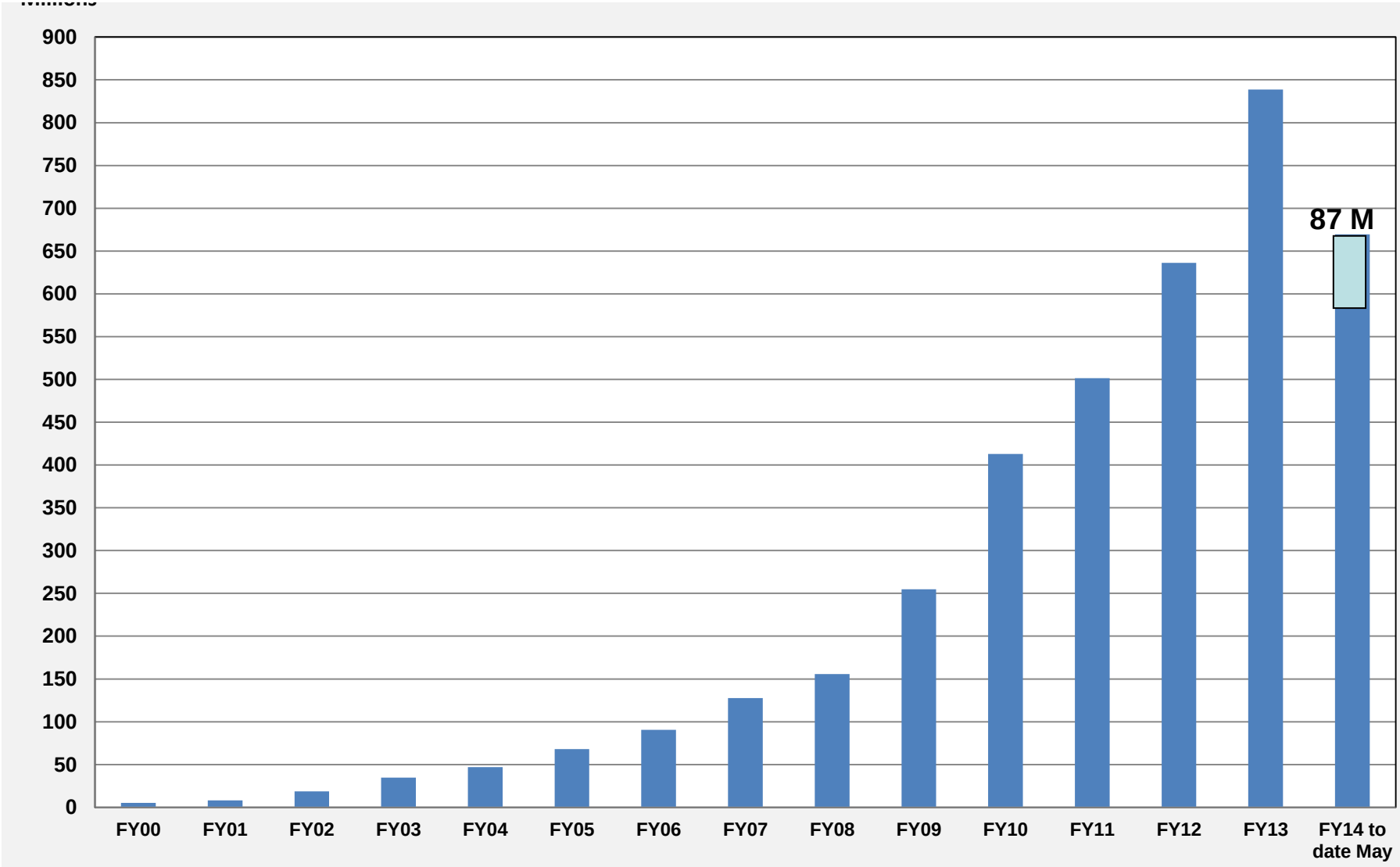


Science Data Processing: Missions	10
Archiving and Distribution: Missions	38
Instrument Product Support:	87 Instruments

FY13:
6861 Unique Products
1.7 Million Users
839 Million Products Distributed

EOSDIS Products Delivered: FY00 thru May 2014

draft



Preservation

- **NASA is not a "permanent archive" agency**
  - **Must maintain "research archive" for as long as data are used for scientific research and/or transition responsibility to permanent archives**
  - **Research-archive responsibilities persist well beyond lives of missions**
  - **NASA works with other agencies for long-term preservation**
  - **NASA has to ensure data and other critical items are preserved and made available to permanent archival agencies**
- **General requirements**
  - **No loss of bits**
  - **Discoverability and accessibility**
  - **Readability**
  - **Understandability**
  - **Usability**
  - **Reproducibility of results**
- **NASA has developed Preservation Content Specifications for Earth Science Data**
- **NASA is participating in Earth Science Information Partners (ESIP) Data Stewardship Committee, on an "emerging" Provenance and Context Content Standard**

Categories of Content to be Preserved

1. **Preflight/Pre-Operations:** Instrument/Sensor characteristics including pre-flight/pre-operations performance measurements; calibration method; radiometric and spectral response; noise characteristics; detector offsets
2. **Science Data Products:** Raw instrument data, Level 0 through Level 4 data products and associated metadata
3. **Science Data Product Documentation:** Structure and format with definitions of all parameters and metadata fields; algorithm theoretical basis; processing history and product version history; quality assessment information
4. **Mission Data Calibration:** Instrument/sensor calibration method (in operation) and data; calibration software used to generate lookup tables; instrument and platform events and maneuvers
5. **Science Data Product Software:** Product generation software and software documentation
6. **Science Data Product Algorithm Input:** Any ancillary data or other data sets used in generation or calibration of the data or derived product; ancillary data description and documentation
7. **Science Data Product Validation:** Records, publications and data sets
8. **Science Data Software Tools:** product access (reader) tools.