

NASA's Earth Observing System Data and Information System



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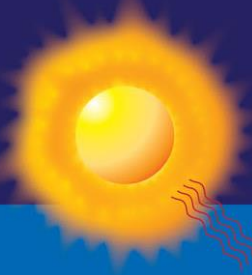


- **“Advance knowledge of Earth as a system to meet the challenges of environmental change, and to improve life on our planet.” -- 2014 *NASA Strategic Plan***
 - **NASA’s Earth Science Data Systems directly support this objective by providing end-to-end capabilities to deliver data and information products 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**



- **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



MESOSPHERE

Acrimsat • 12/99
Solar Output
ACRIM

Terra • 12/99
Energy Budget
CERES
Albedo, Aerosols, Vegetation
MISR
Lower Atmospheric Chemistry
MOPITT
Surface Imaging
MODIS, ASTER

Aqua • 5/02
Energy Budget
CERES
Atmospheric Sounders
AMSU-E, AIRS, AMSU/HSB
Surface Imaging
MODIS

SORCE • 1/03
Solar Irradiance
TIM, SIM, XPS
Solstice

Aura • 7/04
Trace Gases
TES
Atmospheric Composition
HIRDLs, MLS, OMI

TRMM • 11/97
Energy Budget
TMI, VIRS, LIS

Jason • 12/01
Ocean Altimetry
Poseidon 2/JMR/DORIS

GRACE • 3/02
Gravity Field
GPS, KBR

CloudSat • 4/06
Cloud Properties
CPR

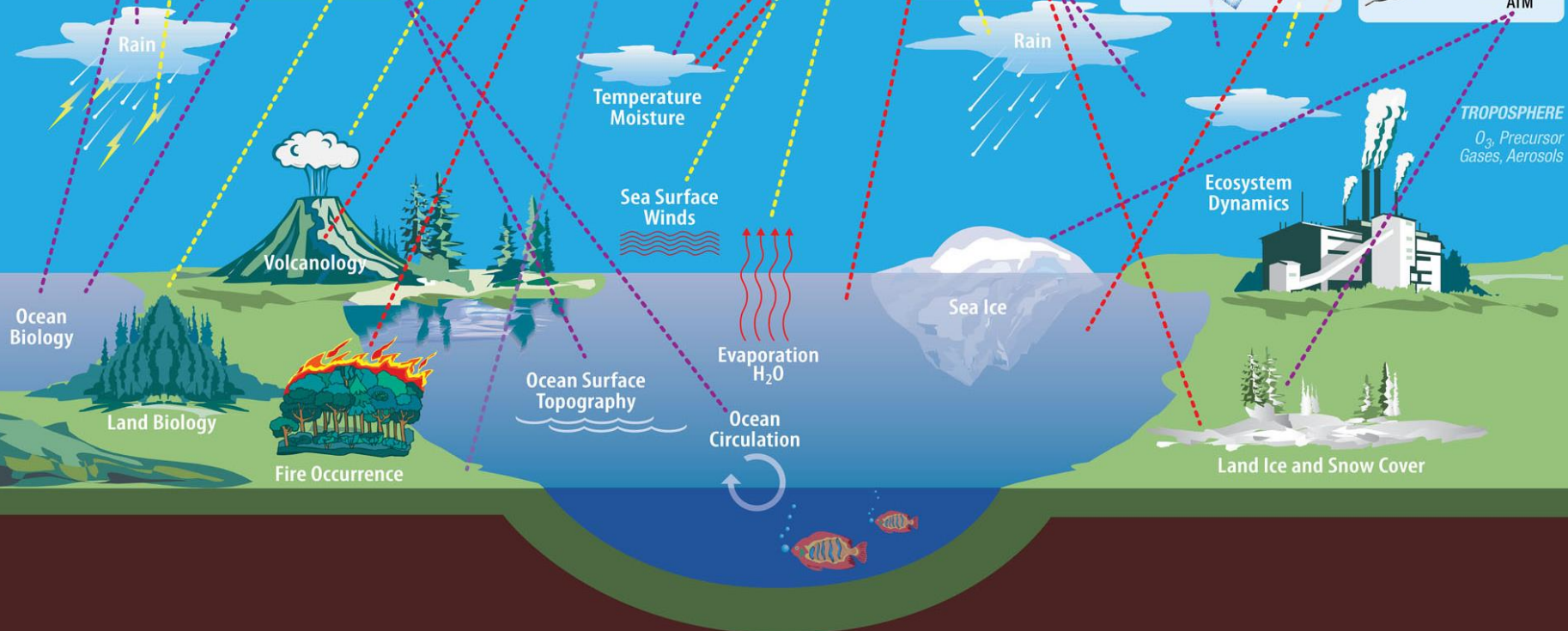
CALIPSO • 4/06
Cloud, Aerosol Properties
CALIOP

OSTM • 6/08
Ocean Altimetry
Poseidon 3/AMR/DORIS

Ice Bridge • 10/09
Ice Topography and Altimetry
ATM

STRATOSPHERE
O₃, ClO, BrO, OH,
Trace Gases, Aerosols

TROPOSPHERE
O₃, Precursor
Gases, Aerosols



Ocean Biology

Land Biology

Fire Occurrence

Volcanology

Ocean Surface Topography

Sea Surface Winds

Evaporation H₂O

Ocean Circulation

Temperature Moisture

Sea Ice

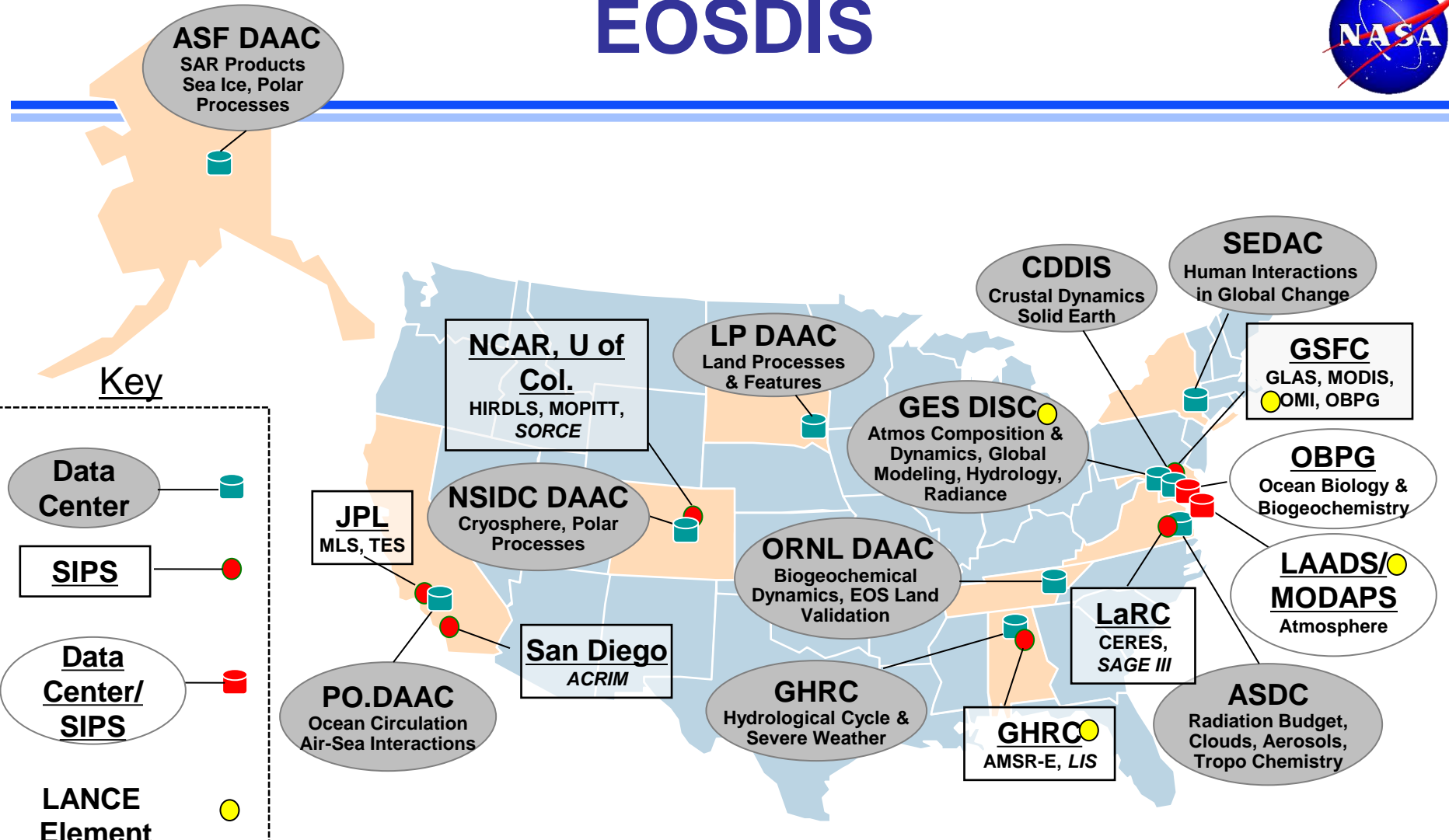
Ecosystem Dynamics

Land Ice and Snow Cover

Rain

Rain

EOSDIS

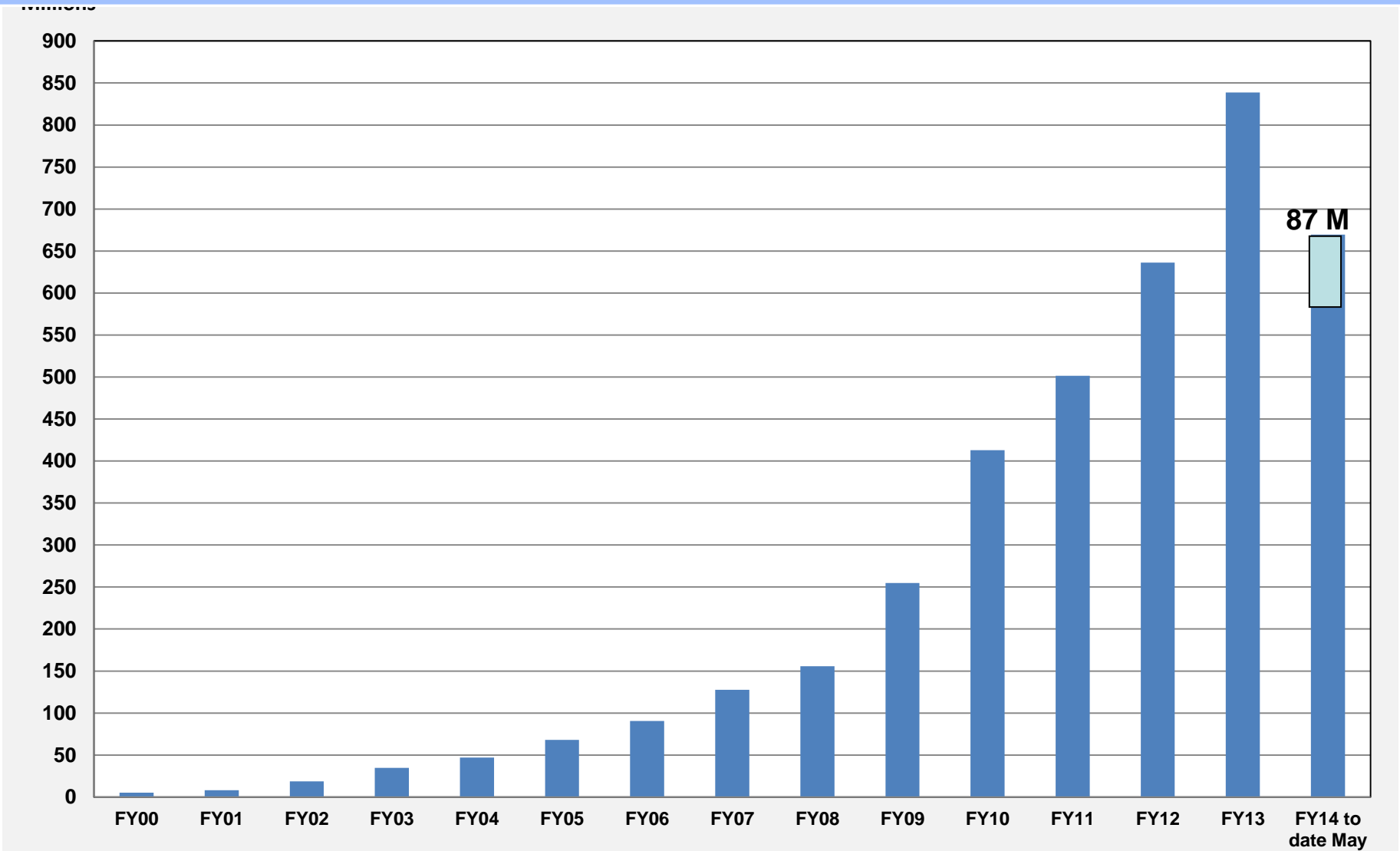


Science Data Processing:	10
Missions	
Archiving and Distribution:	38
Missions	
Instrument Product Support:	87 Instruments

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



EOSDIS Products Delivered: FY00 thru May 2014



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.