NASA Report to Unidata Strategic Advisory Council

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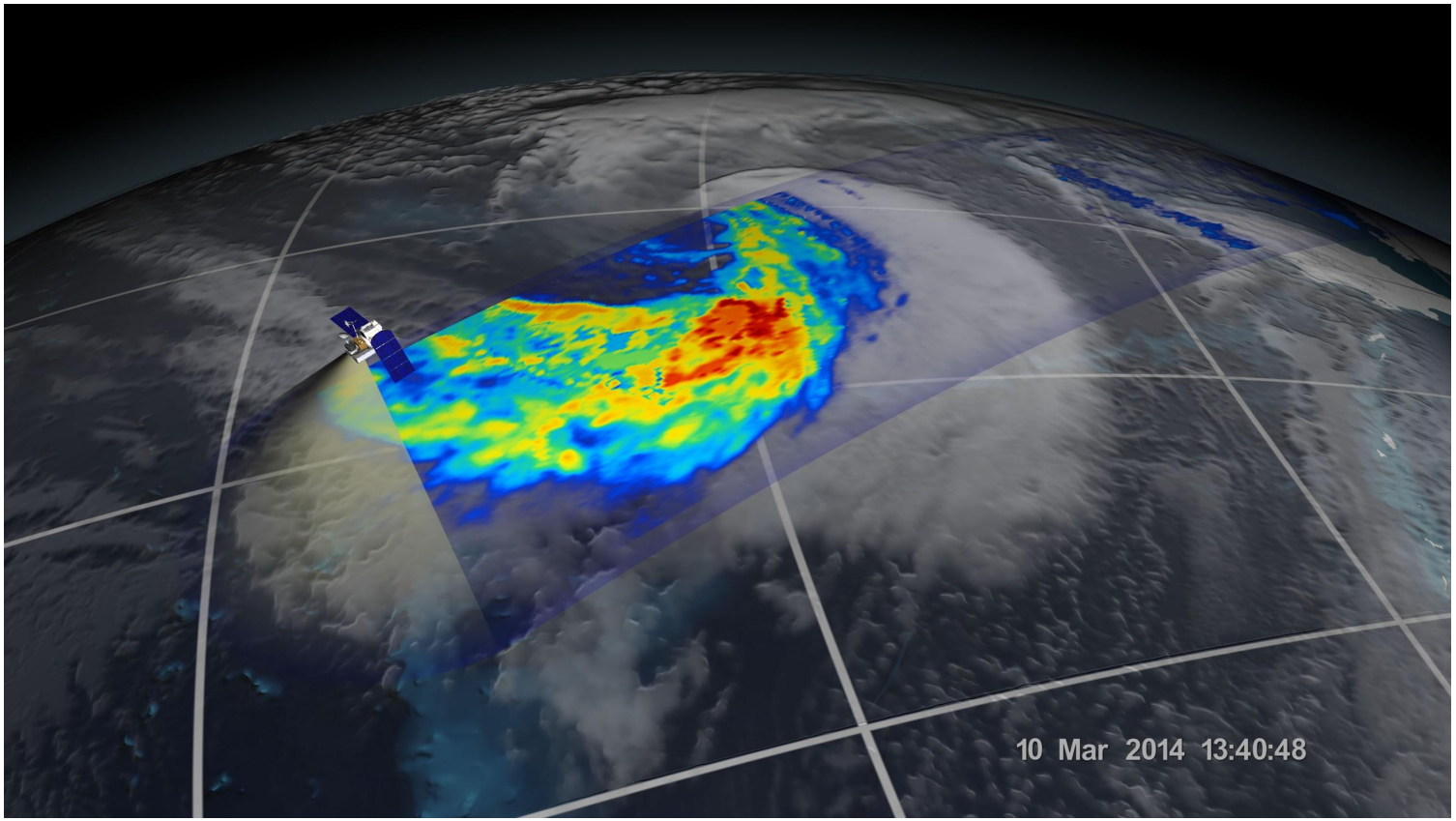
Disclosures

- Information Systems Architect at a NASA EOSDIS data center (GES DISC)
- Co-I with Charlie Zender (UCI) on an NCO project
- Co-I with Rahul Ramachandran (NASA/MSFC) on Collaborative Workbench
- Co-I with Chris Mattmann on an ESG-related project
- PI with 4 other EOSDIS data centers on a Federated Giovanni project
- Using: netCDF (classic), C API, CF, OPeNDAP, nco, TDS, OpenSearch, Panoply, GrADS, GDS

GPM Launch

- Recent Launch of Global Precipitation Measurement Satellite
  - First data to be released soon
  - Format: HDF-5



Upcoming Launches

- Orbiting Carbon Observatory: measure CO2
- Soil Moisture Active Passive (SMAP)
- International Space Station
  - RapidScat: ocean winds
  - Cloud-Aerosol Transport System (CATS)

Earth Science Budget

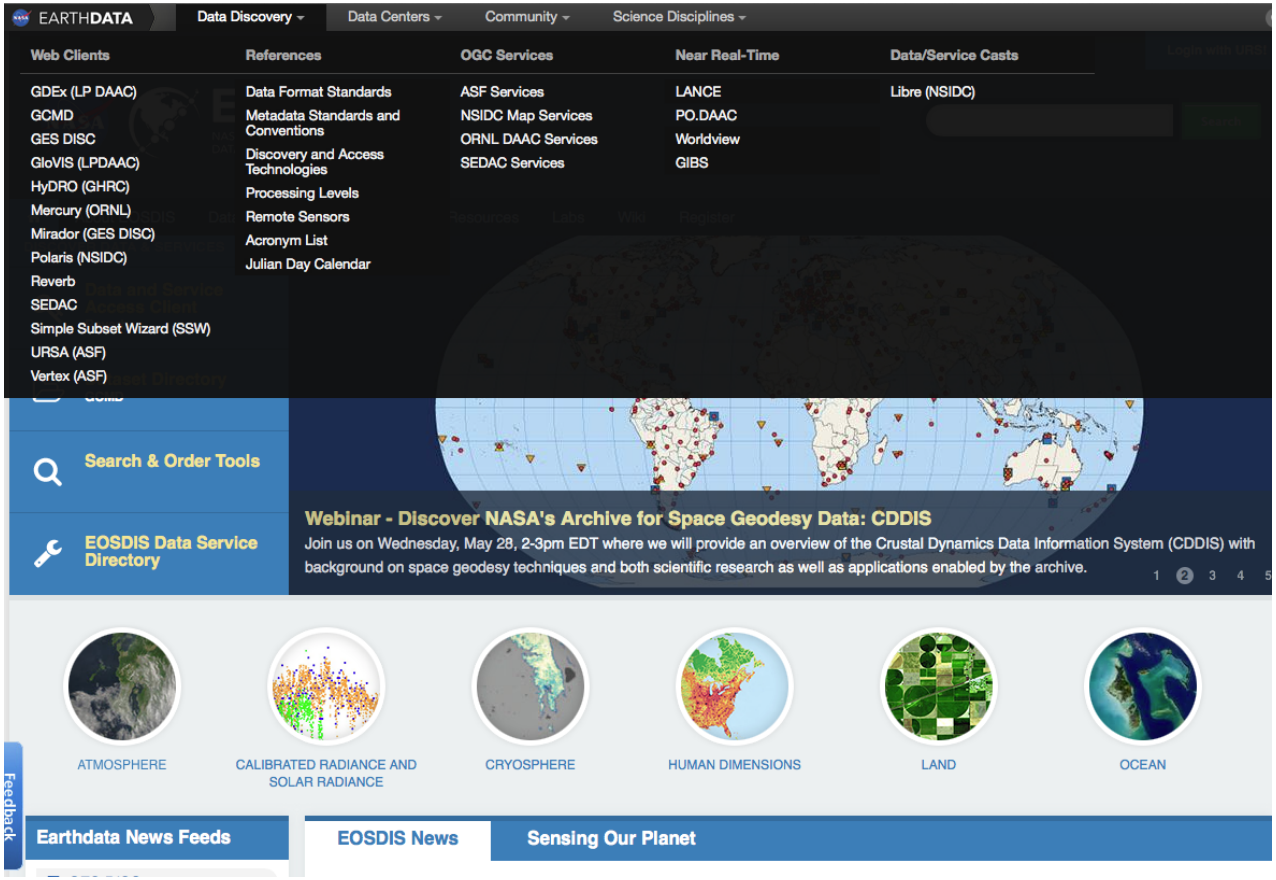
Outyears are notional

($M)	2015	2016	2017	2018	2019
Earth Science	$1,770	$1,815	$1,838	$1,862	$1,886

- Launches the Soil Moisture Active and Passive mission (SMAP), and the Stratospheric Aerosol and Gas Experiment III (SAGE III) to be mounted on the ISS.
- Formulates and develops ICESat-2, GRACE-Follow On, SWOT, CYGNSS, TEMPO, and a sustained Land Imaging capability.
- Develops and implements plans for measurements of solar irradiance, ozone profiles, and Earth radiation budget.
- Maintains weather and climate change modeling capabilities to enhance forecast accuracy.
- Operates over 21 Earth-observing spacecraft.
- Maintains robust R&A, airborne science (including IceBridge), technology development, and funds the Global Learning and Observations to Benefit the Environment (GLOBE) program.

NASA Earth Science Data Systems

- Single starting point for Earth science data:
  - http://earthdata.nasa.gov
  - Pointers to all EOSDIS-related assets



NASA Earth Science Data Strategy Influencers

- HQ
- Earth Science Data Information Systems (ESDIS) at GSFC
- Grassroots
  - DAAC Managers and DAAC Engineers
  - Earth Science Data Systems Working Groups (ESDSWG)
  - Earth Science Information Partners (ESIP)

Earth Science Data System Working Groups

- Airborne Data
- ASCII for Science Data
- Cloud Computing
- Data-Intensive Architecture
- Data Preservation Practices
- Data Quality
- Data Recipes
- Dataset Interoperability
- DOI
- Geospatial
- Innovations Lab
- Open Source
- Provenance for Earth Science
- Technology Infusion
- Vision 2020
- Visualization

NASA Data Challenge: Big Data

- Volume
  - Performance of servers, protocols, formats, ...
- Variety
  - Data descriptions
  - Data conventions
  - Libraries to abstract heterogeneity
- Velocity (onboard, real-time)
  - Streaming
- Veracity
  - Data Quality
- Serving Data Scientists (i.e., non-domain scientists)
- Big Earth Data Initiative (BEDI)

NASA Data Challenge: GIS Support

- Key GIS User Segments
  - Applications
  - Data Scientists (specializing in geospatial)
  - Early Career Scientists
  - Machine-to-machine
- ArcGIS Usage of HDF, netCDF, …
  - Grid data
  - Swath data
  - Profile data