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

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<th>2015</th>
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<td>Earth Science</td>
<td>$1,770</td>
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- 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