Integrated Ocean Observing System Glider Data Assembly Center (IOOS-GDAC)

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National Glider Network Design Team

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National Glider Network Plan

- Leverage existing regional association resources & glider operations
- Sustained spatial and temporal sub-surface ocean observations
- Consistency in operational and data processing standards/quality control
- Efficient and timely data dissemination and archiving procedures
- Cooperation with international groups (ANFOG, EGO, GROOM)

Glider Technology Applications

- Emergency Response: Deepwater Horizon
- Climate Variability: El Nino/La Nina
- Hurricane Intensity Forecasting: East Coast, Gulf of Mexico, American Territories
- Harmful Algal Blooms: all coasts
- Hypoxia: all coasts

GDAC Responsibilities

- Specify and create a CF-compliant netCDF file format standard for the exchange of real time, per dive data
- Receive data from glider operators (providers will convert data to glider netCDF format)
- Verify CF-compliance of the netCDF files and report errors back to the individual providers where appropriate. The DAC will provide guidance to the providers on compliance
- Creation of higher level products for data exchange and consumption
- Interface with the National Ocean Data Center (NODC) and other data consumers (public, private, etc.) to provide access to the operational data sets (archiving, dissemination to GTS)
- Publish the datasets using compliant web services (eg. THREDDS, ncISO, ncSOS)
- Support harvesting by IOOS Service Registry and Data Catalogs which includes liaising with NGDC (Registry) and ASA (Catalog) development teams
- Develop publicly available user guides

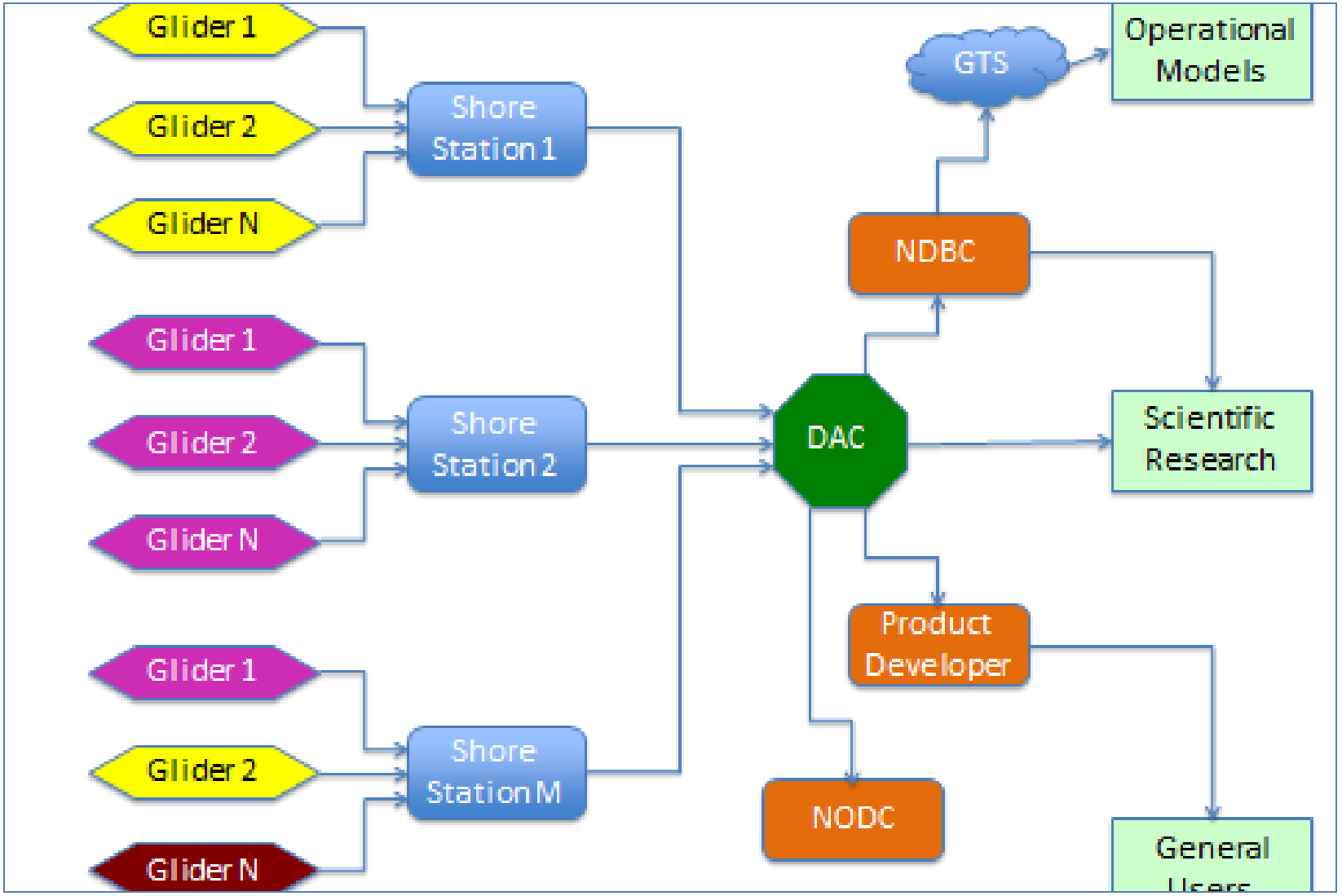
Contributing Organizations

- IOOS Regional Associations
- IMOS/ANFOG (Australia)
- GROOM/EGO (Europe)
- NODC
- NDBC
- Applied Science Associates

Glider Types: Profile Data

- Currently only profiling gliders: trajectories
- Slocum Gliders (Teledyne Webb Research)
- Spray (SIO/Bluefin)
- Seaglider (University of Washington/APL)
- Future: Wavegliders, ?

Data Flow: Glider -> Data Consumers



Community Participation

- Simplify the data standardization & submission process to encourage wide participation
- NetCDF: NODC templates, IMOS, GROOM
- Github
- Community contributed toolboxes
  - Matlab
  - Python

NetCDF Trajectory Feature Type

https://github.com/IOOSProfilingGliders/Real-Time-File-Format/tree/master/examples/proposed_templates

- CF Conventions
- Time-series data preserves original resolution
- Required Variables
  - Time
  - Latitude/Longitude
  - Depth/Pressure
  - **Temperature**
  - Conductivity
  - **Salinity**
  - Density
  - QC Flags: ARGO standards
  - U/V: one or more records specifying a time & depth-averaged current
  - Trajectory id
  - Dive id
  - **Profile id**
- Allows additional (CF conventions) variables (Chl a, O_2, etc.) depending on glider payload

Data Provider/Glider Registration

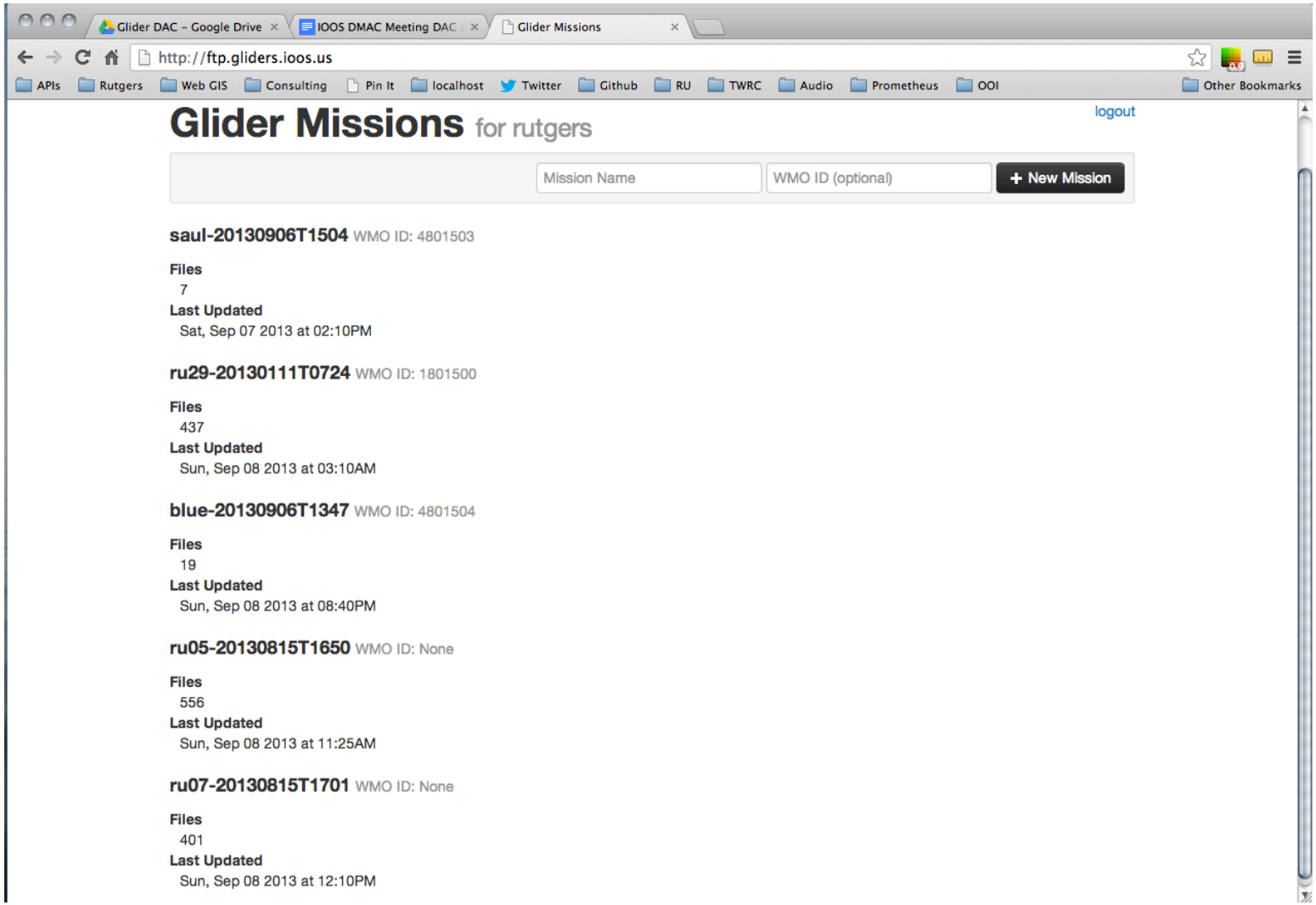
- Data Provider Registration: Web-based
  - Contact Name
  - Institution
  - Phone
  - Email

  } sftp/ftp user account

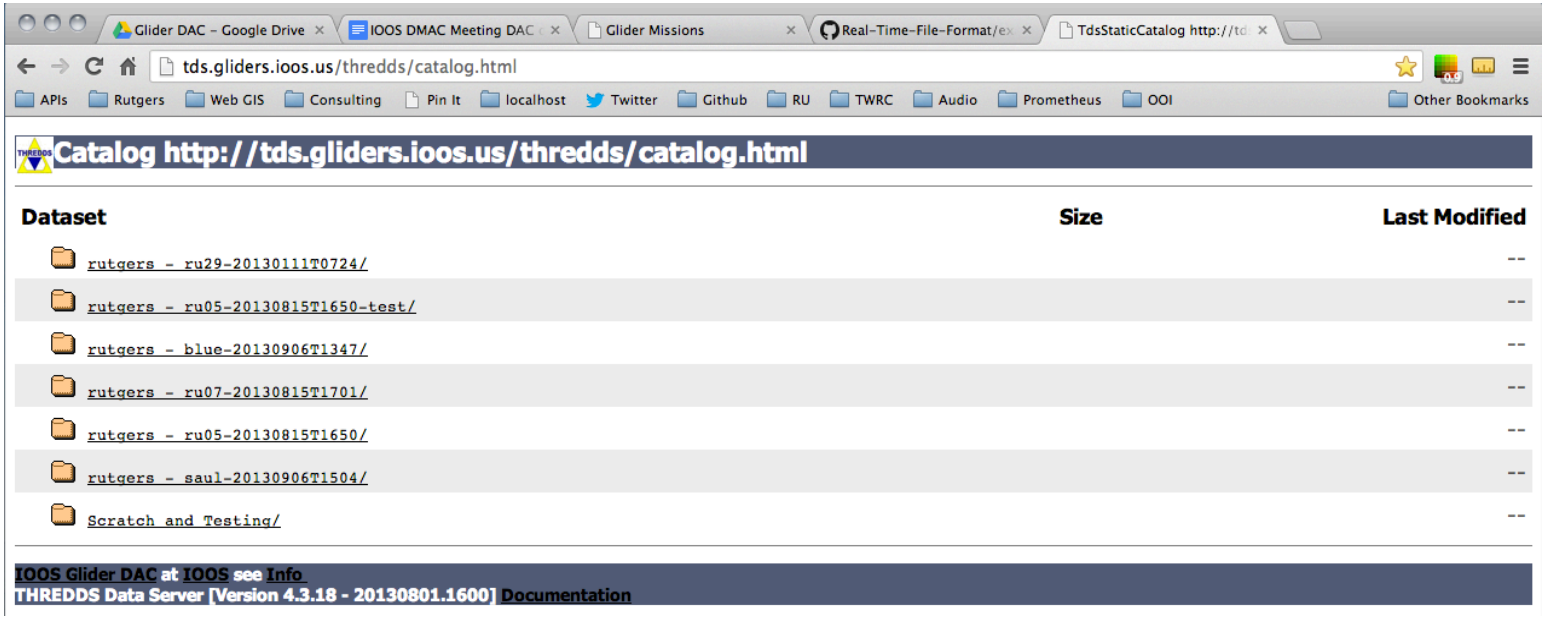
- Glider Registration: Web-based
  - Name
  - Data Provider
  - Launch Date
  - Launch Location

  } WMO id (NDBC)

GDAC Dataset Submission



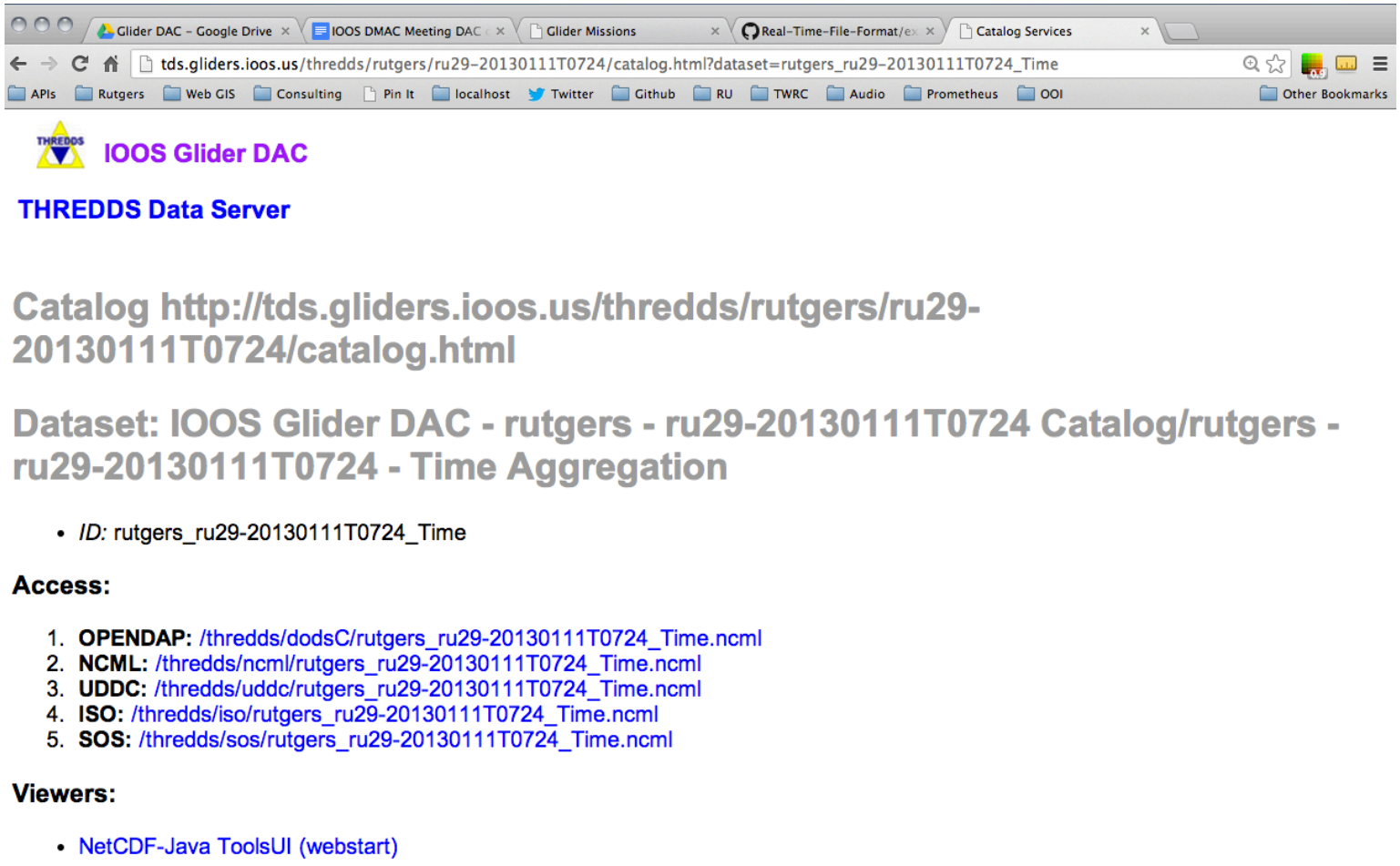
Deployment Data Access (THREDDS)



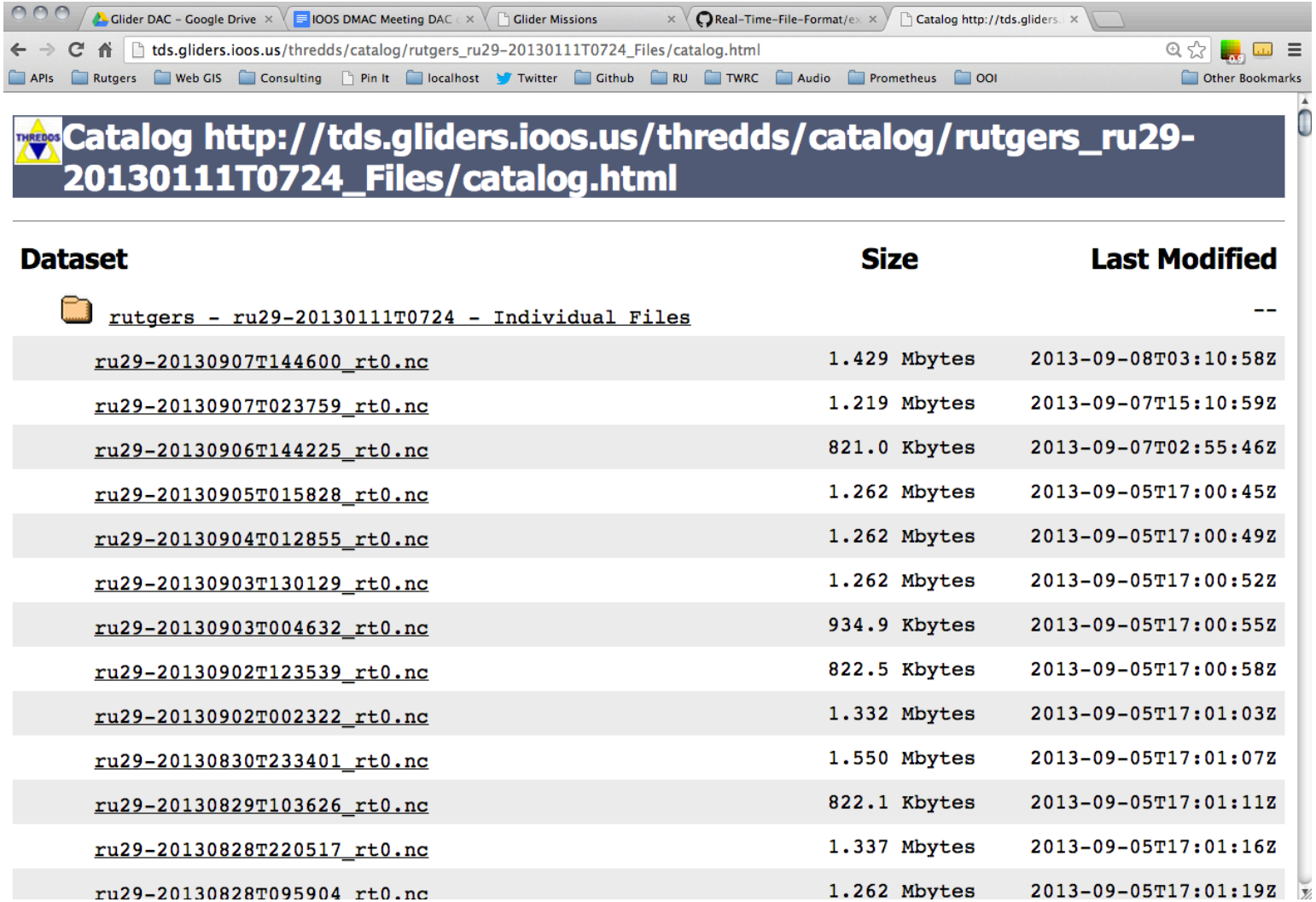
Data Access

- TDS Catalogs
  - Time Aggregation
  - **Time-UV Aggregation**
  - Individual Files/Segments
- Services:
  - OPeNDAP
  - http NetCDF download
  - UDDC: compliance & digital libraries
  - ncSOS
  - ncISO: cataloging

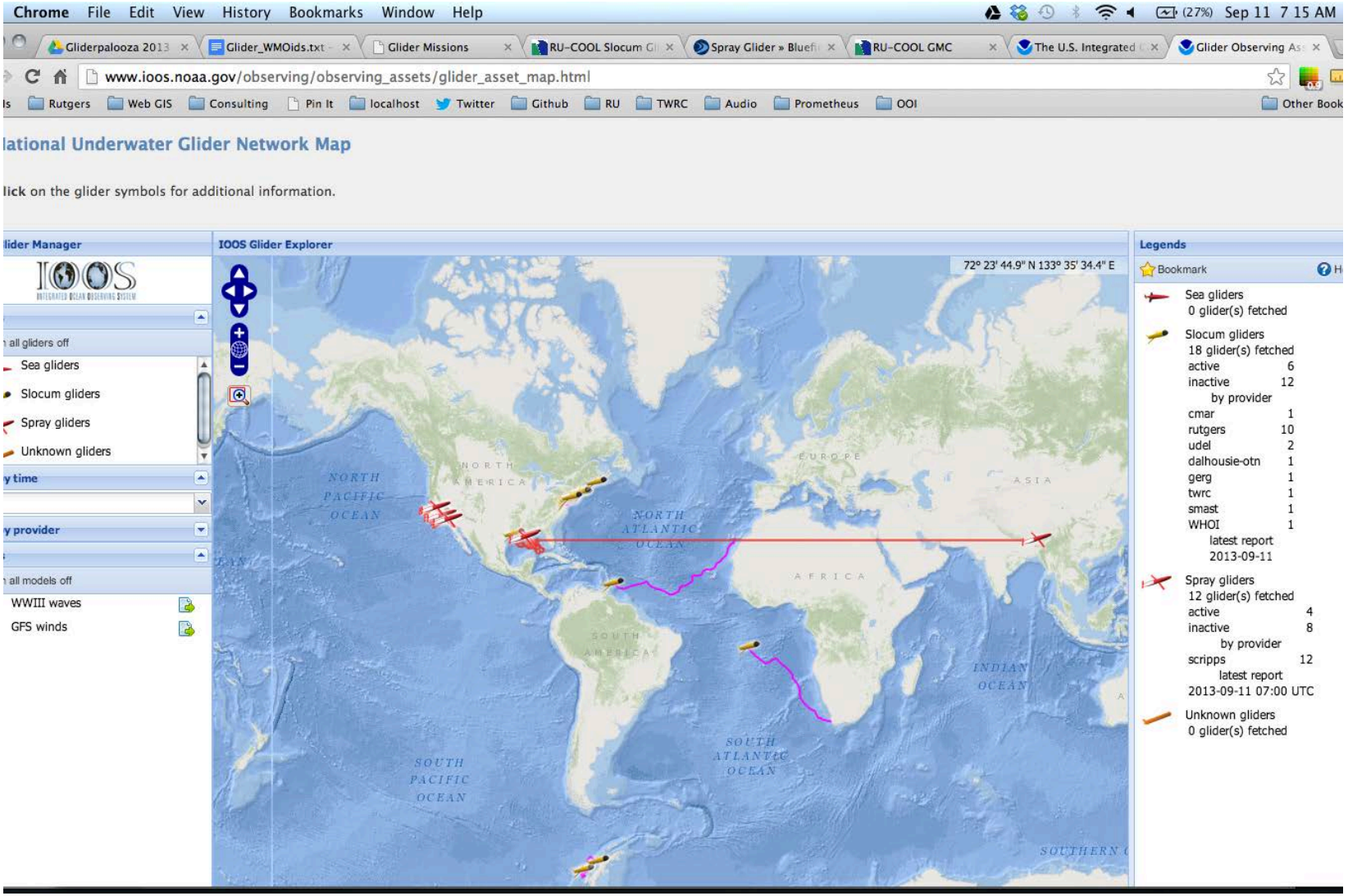
Time & Time-UV Aggregations



Individual Segments



Real Time Fleet Status



Resources

- National Glider Network Plan:
  - http://www.ioos.noaa.gov/glider/strategy/welcome.html
- IOOS Gliders Github:
  - https://github.com/IOOSProfilingGliders/Real-Time-File-Format

Gliderpalooza 2013

- Dalhousie University, University of Maine, WHOI, UMass Dartmouth, Rutgers University, University of Delaware, University of Maryland, VIMS, North Carolina State, Skidaway Institute, Teledyne Webb Research Corporation