

IOOS Glider DAC

May 22th, 2019

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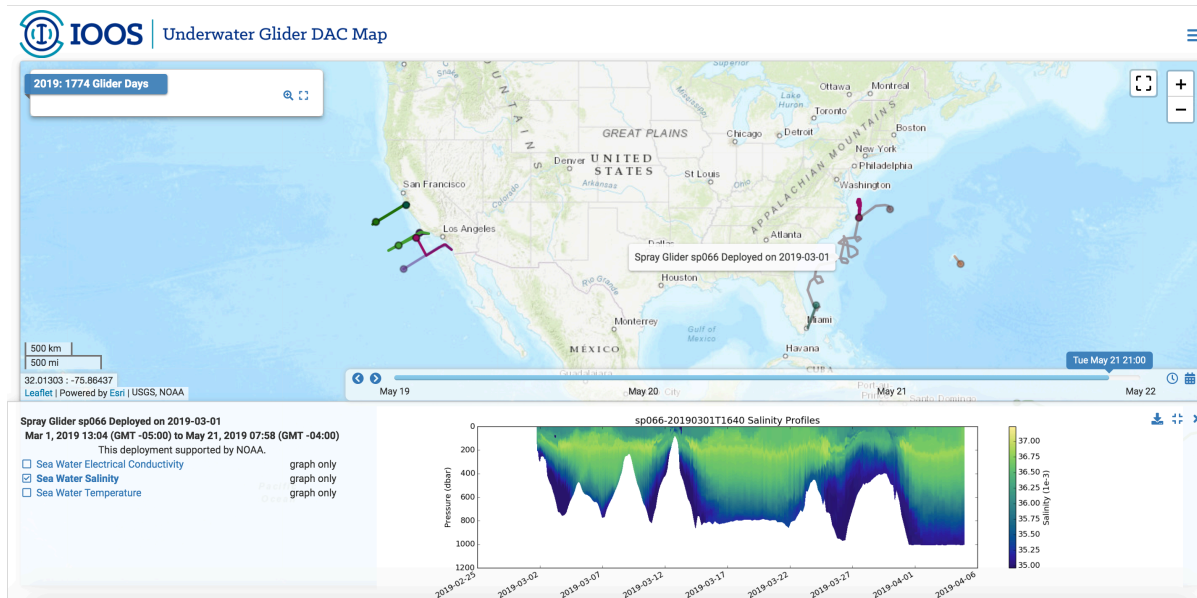
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Ben Adams, RPS



Outline

- Glider DAC overview
- Recent Milestones
- Upcoming Milestones



Glider DAC Goals

- ✓ Develop a self-describing NetCDF file specification.
- ✓ Provide glider operators a process for registering and submitting glider data sets to a centralized storage location.
- ✓ Provide public access to glider data sets via existing web services and standards.
- ✓ Provide automated QAQC on core CTD variables
- ✓ Distribution of glider data sets on the Global Telecommunication System.
- ✓ Work with National Centers for Environmental Information (NCEI) to create a permanent data archive.

<https://ioos.github.io/ioosngdac/>

Mission Statement

“To provide glider operators with a simple process for submitting glider data sets to a centralized location, enabling the data to be visualized, analyzed, widely distributed (GTS) and archived (NCEI).”

<https://gliders.ioos.us/data/>

Key Capabilities

- ✓ Storage
- ✓ Accessibility
- ✓ Discoverability
- ✓ Compliance
- ✓ Visualization

Overview: Web Resources

Wiki

<https://ioos.github.io/ioosngdac/>

Providers Page

<https://gliders.ioos.us/providers/>

Status Page

<https://gliders.ioos.us/status>

ERDDAP

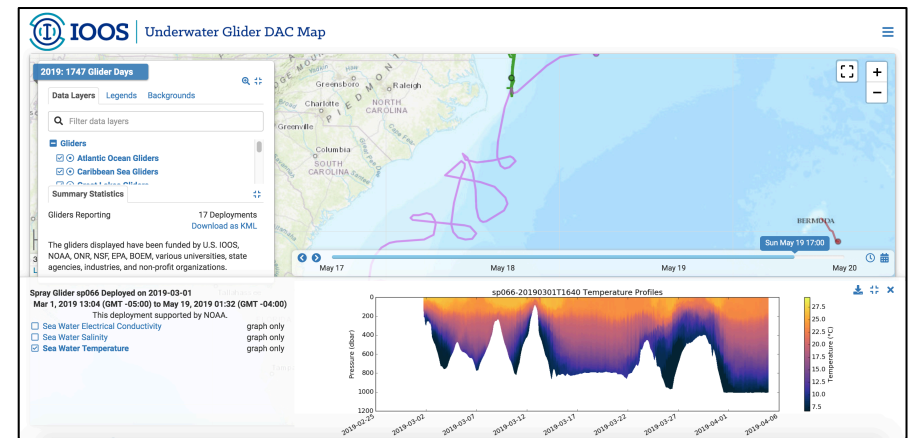
<https://gliders.ioos.us/erddap/index.html/index.html>

THREDDS

<https://gliders.ioos.us/thredds/catalog.html>

GliderMap

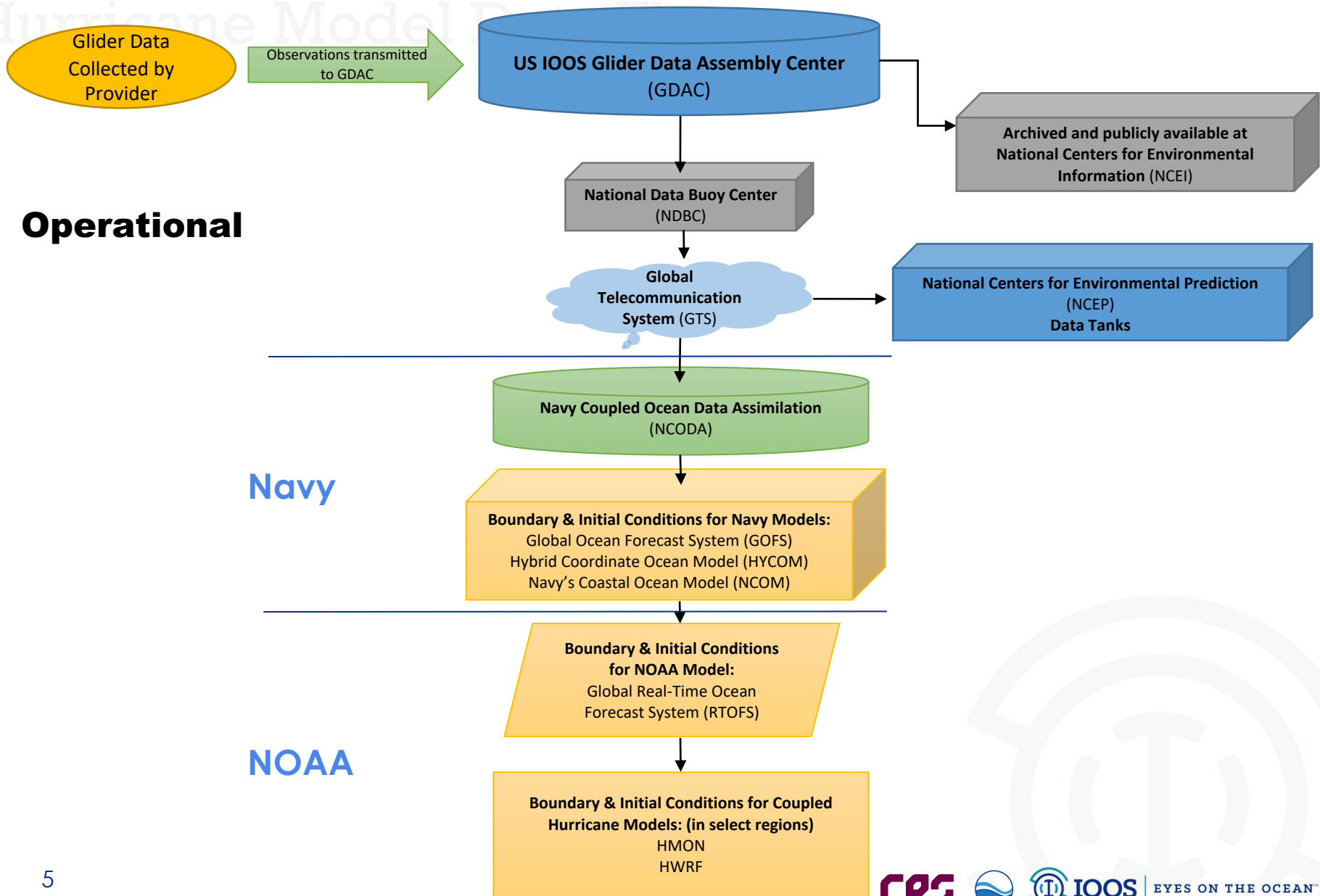
<https://gliders.ioos.us/map/>



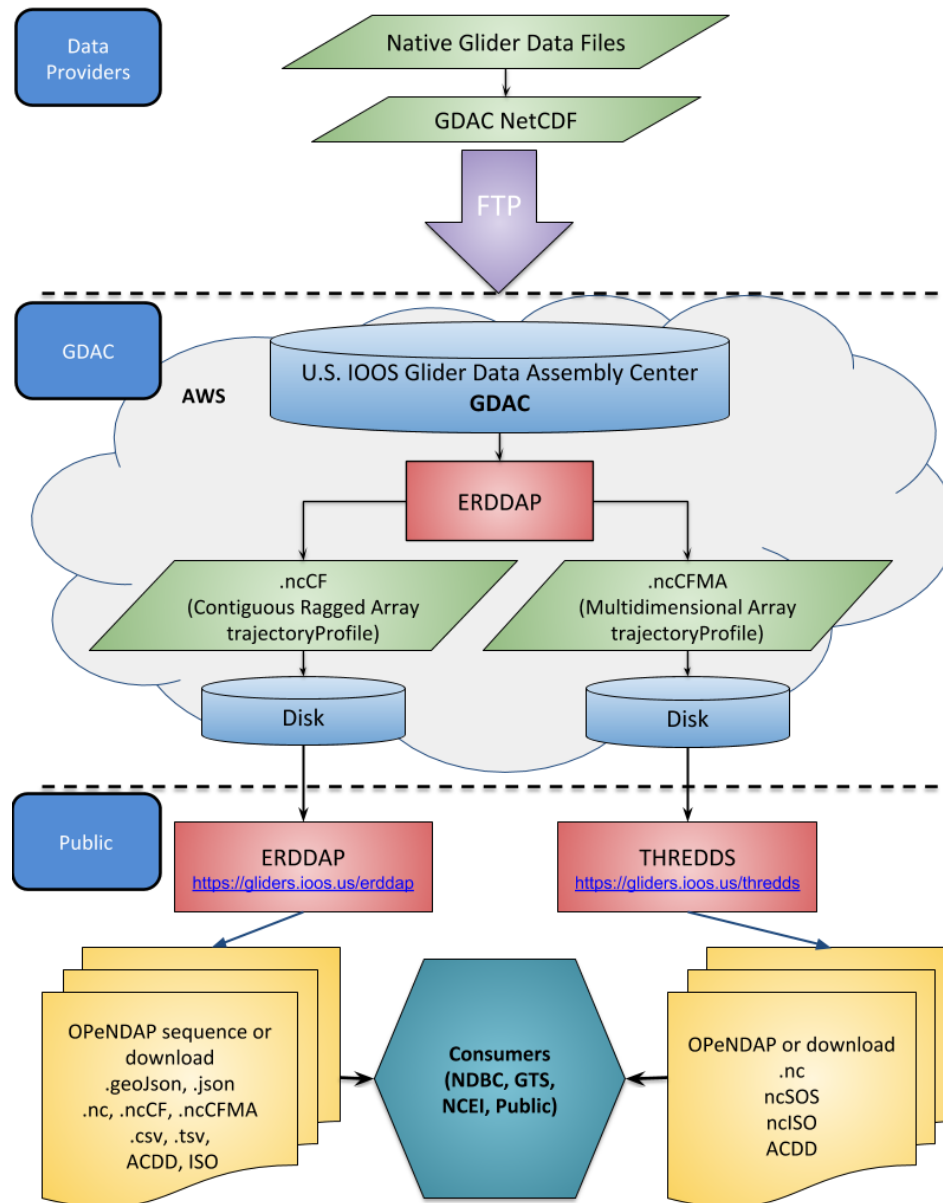
The screenshot shows the IOOS NGDAC 2.0 '15 Latest Dataset Updates' page. It features a table of dataset updates with columns: Deployment, Operator/Provider, WMO ID, ERDDAP, Graph, Metadata, # Profiles, Time Coverage, and THREDDS. A green banner at the top states 'All Datasets Are Complete'. Below the banner, there is a table of dataset updates. The table has columns: Deployment, Operator/Provider, WMO ID, ERDDAP, Graph, Metadata, # Profiles, Time Coverage, and THREDDS. The table lists 15 dataset updates, each with a deployment ID, operator/provider, WMO ID, ERDDAP link, graph link, metadata link, number of profiles, time coverage, and THREDDS link. The table is sorted by deployment ID.

Deployment	Operator/Provider	WMO ID	ERDDAP	Graph	Metadata	# Profiles	Time Coverage	THREDDS
ru24-20150126T1315	Rutgers University	7801501	ERDDAP	Graph	Metadata	517	2015-01-26 13:21	THREDDS
ud_134-20150122T1955	University of Delaware	7801503	ERDDAP	Graph	Metadata	328	2015-01-24 15:38	THREDDS
un1_191-20150108T1443	University of Alaska Fairbanks	7801504	ERDDAP	Graph	Metadata	453	2015-01-05 14:57	THREDDS
sp028-20141210T1741	Scipos Institution of Oceanography	4801524	ERDDAP	Graph	Metadata	602	2014-12-10 19:01	THREDDS
sp025-20150108T1921	Scipos Institution of Oceanography	4801900	ERDDAP	Graph	Metadata	316	2015-01-08 19:56	THREDDS
sp030-20150109T2113	Scipos Institution of Oceanography	4801901	ERDDAP	Graph	Metadata	266	2015-01-09 22:34	THREDDS
sp001-20150111T2247	Scipos Institution of Oceanography	5801900	ERDDAP	Graph	Metadata	140	2015-01-12 00:12	THREDDS
sp039-20150122T1750	Scipos Institution of Oceanography	4801902	ERDDAP	Graph	Metadata	164	2015-01-22 19:12	THREDDS
sp048-20150127T1824	Scipos Institution of Oceanography	4801903	ERDDAP	Graph	Metadata	81	2015-01-27 19:47	THREDDS
ru05-20150201T2130	Rutgers University	7801500	ERDDAP	Graph	Metadata	156	2015-02-01 21:41	THREDDS
ru05-20150115T1443	Rutgers University	7801500	ERDDAP	Graph	Metadata	522	2015-01-15 15:12	THREDDS
ru260-20141225T1450	Rutgers University	7801502	ERDDAP	Graph	Metadata	463	2014-12-25 15:48	THREDDS
sp047-20140623T2230	Scipos Institution of Oceanography	4801531	ERDDAP	Graph	Metadata	793	2014-06-23 23:47	THREDDS
ud_134-20150105T1601	University of Delaware	7801503	ERDDAP	Graph	Metadata	416	2015-01-05 16:05	THREDDS

Glider Data Flow to Global Forecast Models

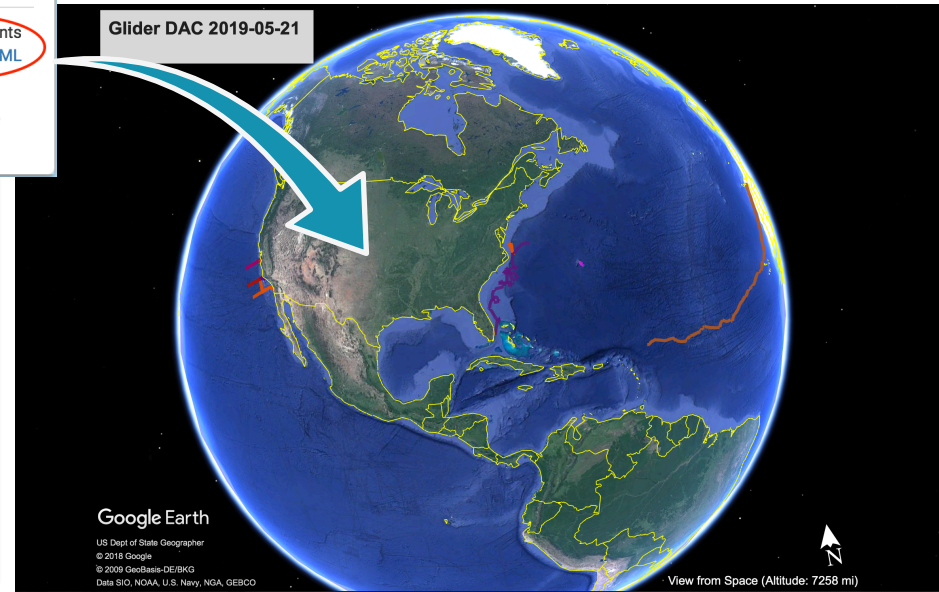
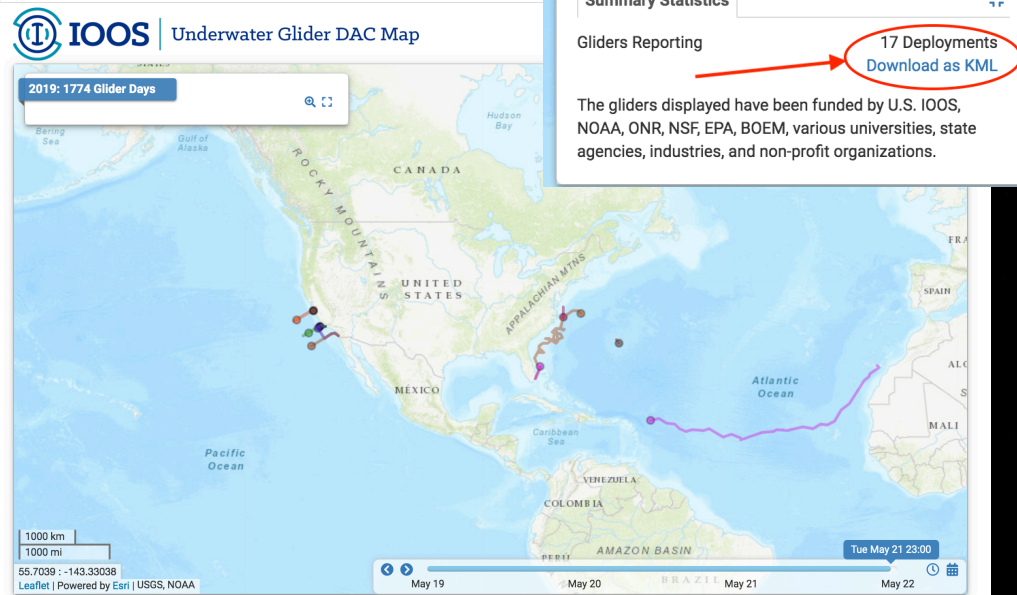


Recent Milestone: Updated Architecture



Recent Milestone: Map updates

- KML Export
- New time slider
- Better track resolution



Recent Milestones: New Variables

- **Historically DAC accepted core CTD variables only**
 - Temperature
 - Conductivity/Salinity
 - Pressure
 - Density
- **DAC now accepts new variables**
 - Must have a **valid CF Standard Name** in the standard_name attribute
 - Ancillary variables come along as well
- **Restrictions:**
 - QARTOD not run on new variables
 - No common variable names, user provided
 - No visualizations on Glider Map (yet)
 - Not ingested into GTS (yet)



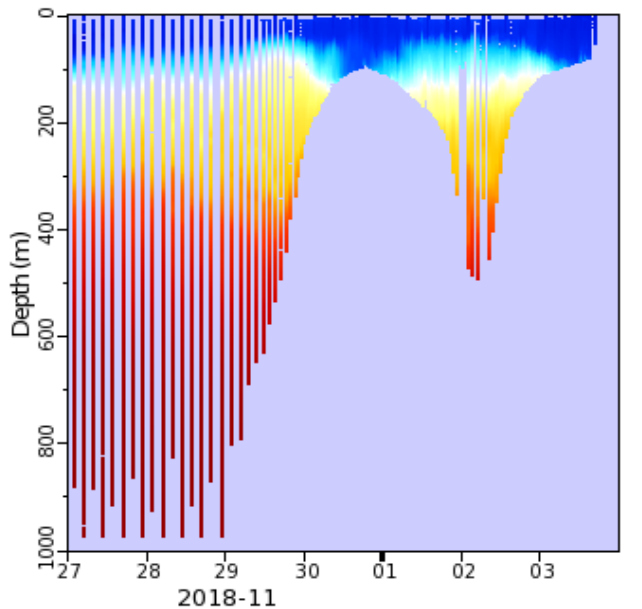
Image courtesy of NOAA Okeanos Explorer Program, INDEX-SATAL 2010.

Recent Milestones: New Variables

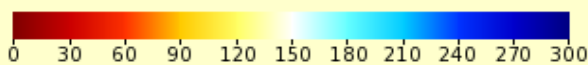
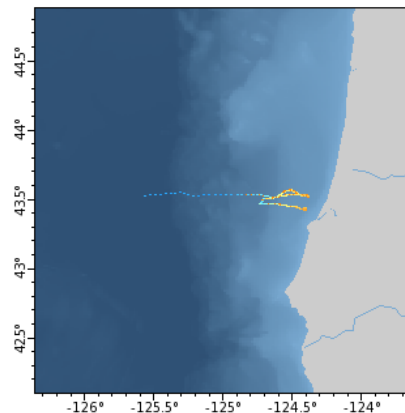
OOI Coastal Endurance

ce_382-20180907T0000-delayed

Dissolved Oxygen Concentration

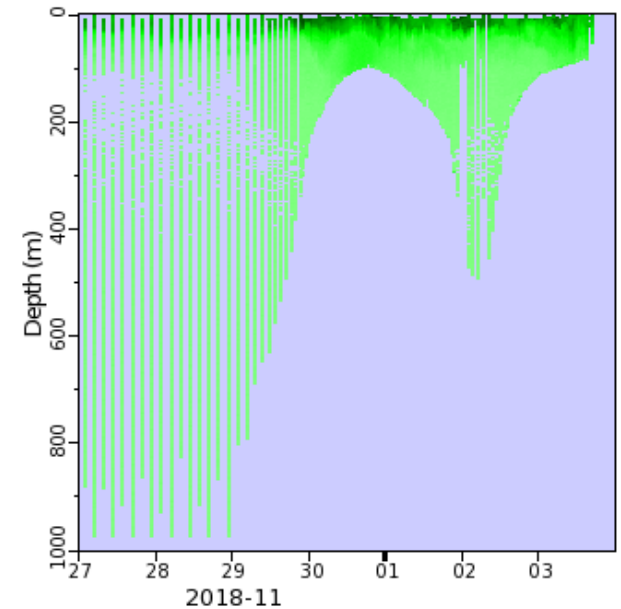


- radiation_wavelength (nm)
- backscatter (Optical Backscatter (red wavelengths), m-1)
- dissolved_oxygen (Dissolved Oxygen Concentration, umol kg-1)
- PAR (Photosynthetically Active Radiation, umol m-2 s-1)
- CDOM (Fluorometric CDOM Concentration, ug l-1)
- chlorophyll (Chlorophyll Concentration, ug l-1)
- oxygen_saturation (percent)



Dissolved Oxygen Concentration (umol kg⁻¹)
ce_382-20180907T0000-delayed
(dissolved_oxygen>=0)
Data courtesy of OOI Coastal Endurance

Chlorophyll Concentration



Chlorophyll Concentration (ug l⁻¹)
ce_382-20180907T0000-delayed
(chlorophyll>=0)
Data courtesy of OOI Coastal Endurance

Recent Milestones: Compliance Checking

- **GliderDAC file format issues are common**
 - File format guidance available on [wiki](#)
 - Compliance to this standard is was not enforced
 - Non-compliance can cause issues downstream
 - ERDDAP
 - GTS
 - Glider Map
 - NCEI archive
- **GliderDAC compliance checker plugin**
 - <https://github.com/ioos/cc-plugin-glider>
 - [Release 2.0.0](#)
 - New checks for common NCEI archiving issues
 - Improved checks on units and standard names
 - Refactored and reprioritized existing checks
- **Files checked on submission**
 - Emails
 - When files first submitted
 - Weekly checks if issues were found
 - If high priority (critical) checks fail, data will not get into DAC



Recent Milestones: Delayed Mode Data

- GliderDAC now accepts delayed mode data
- Treated as a separate deployment in the DAC
- Still need to think about limiting engineering variables
- 24 day delayed mode data >114 GB

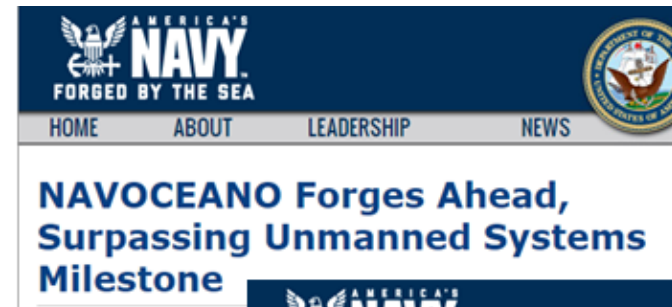
Deployments for bobfrat

 ☐ **Delayed Mode?**

Deployment	Operator	Last Updated	
test-20180120T0000	Bob	2018 Mar 21	+ Delayed Mode
test-20180120T0000-delayed	Bob	2018 Mar 21	
test2-20180120T0000	TEST	2018 Mar 21	+ Delayed Mode
test2-20180120T0000-delayed	TEST	2018 Sep 19	
testcc-20190426T1200		2019 Apr 26	+ Delayed Mode
testru28-20170511T1339		2019 Feb 27	+ Delayed Mode

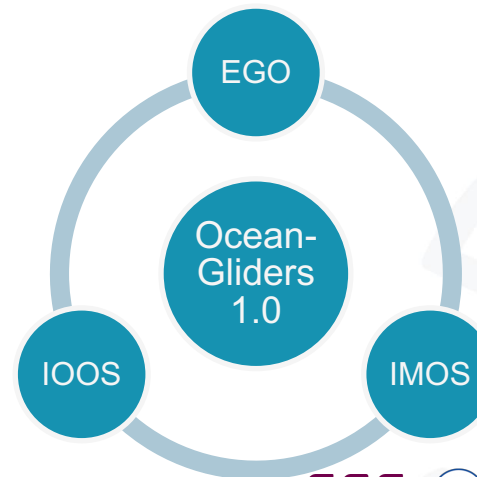
Recent Milestones: Navy Partnership

- Largest Glider Fleet in the world.
- Used to collect oceanographic data in data deprived environments.
- 100 simultaneous glider milestone reached.
- Data from 30 Navy gliders made available to public via IOOS GDAC.
- 10 Gliders loaned to NOAA for Hurricane Glider work in the Caribbean.



Future Plans

- Raw data upload tool (metadata editor)
- Better support assimilation needs
- Evaluate Wave Gliders
- Additions to the status page
 - Feedback from the GTS
 - Other Metrics/KPIs
- International Collaboration
 - OceanGliders 1.0 Data Format



Data Upload/Metadata Editor

 **IOOS** | Integrated Ocean Observing System

 **IOOS**

Data Upload Tool

 Log Out

Home > The US West Coast Model Intercomparison Project

General Attribution Data Extents Variables Admin Summary

VARIABLES

Variable Name	Dimensions	Units		Standard Name		Long Name
lat	1D	degrees_north	✓	latitude	✓	station latitude
lon	1D	degrees_east	✓	longitude	✓	station longitude
time	1D	seconds since 1970-01-01T00:00:00Z	✓	time	✓	time of measurement
temperature	1D	K	✓	temperature	!	suggested field
trajectory_id	1D	suggested field	✓	32782	!	32782

Back

FTP

Save

Undo

Next

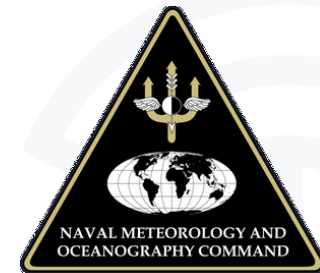
Questions?

Please come talk to me if you have glider data that you'd like to submit to the DAC

robert.fratantonio@rpsgroup.com
glider.dac.support@noaa.gov

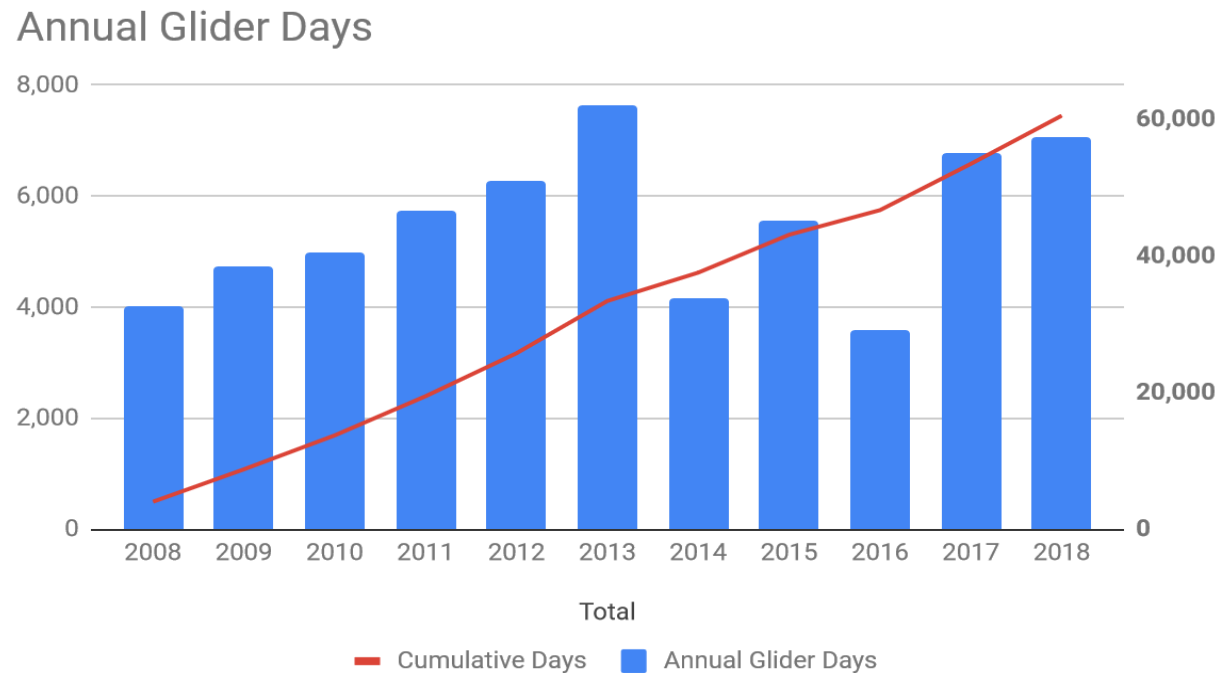
IOOS Glider Partners

- IOOS Regional Associations
- OOI glider data managers
- Canada glider operators
- NDBC
- NCEI
- Navy
- JCOMM



Summary of Glider Days for 2008-2018

- 17 Providers
- 519 Deployments



** Glider Days provided with support from Federal Agencies including NSF, ONR, NOAA, EPA, state, tribal and local governments and private foundations.*

Data Provider Workflow

1. Use GliderDAC wiki to prepare glider profiles into common DAC format (CF compliant netCDF)
 - <https://ioos.github.io/ioosngdac/ngdac-netcdf-file-format-version-2>
 - Metadata - CF 1.6, ACDD 1.3, IOOS 1.2
2. Register for user account 
3. Request WMO ID (for RT data)
4. Register deployment
5. Push data via FTP
6. DAC takes care of the rest
 - ❖ GTS
 - ❖ QAQC
 - ❖ ERDDAP
 - ❖ THREDDS
 - ❖ GliderMAP
 - ❖ NCEI Archiving