GANDALF

An AUV Piloting Portal for Operators in the GOM

https://gandalf.gcoos.org

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GCOOS GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

IOOS Integrated Ocean Observing System

In The Beginning

- First built in late 2005 at Mote Marine Lab for GJK
- Originally generated only KML
- Written in TCL (really)
- Used SQLite as database
- Plotted only surface events
- In 2006 added dead reckoning track/time series
- In 2007 migrated to Python
- In 2008 added ARGOS

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GliderTracker KML

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GCOOS-RA

- Bob moved to GCOOS-RA in November 2014
- Matt Howard asked for GOM AUV portal
- First: pick the acronym. Always!
- GANDALF: Gulf AUV Network and Data Archive/Long-term storage Facility

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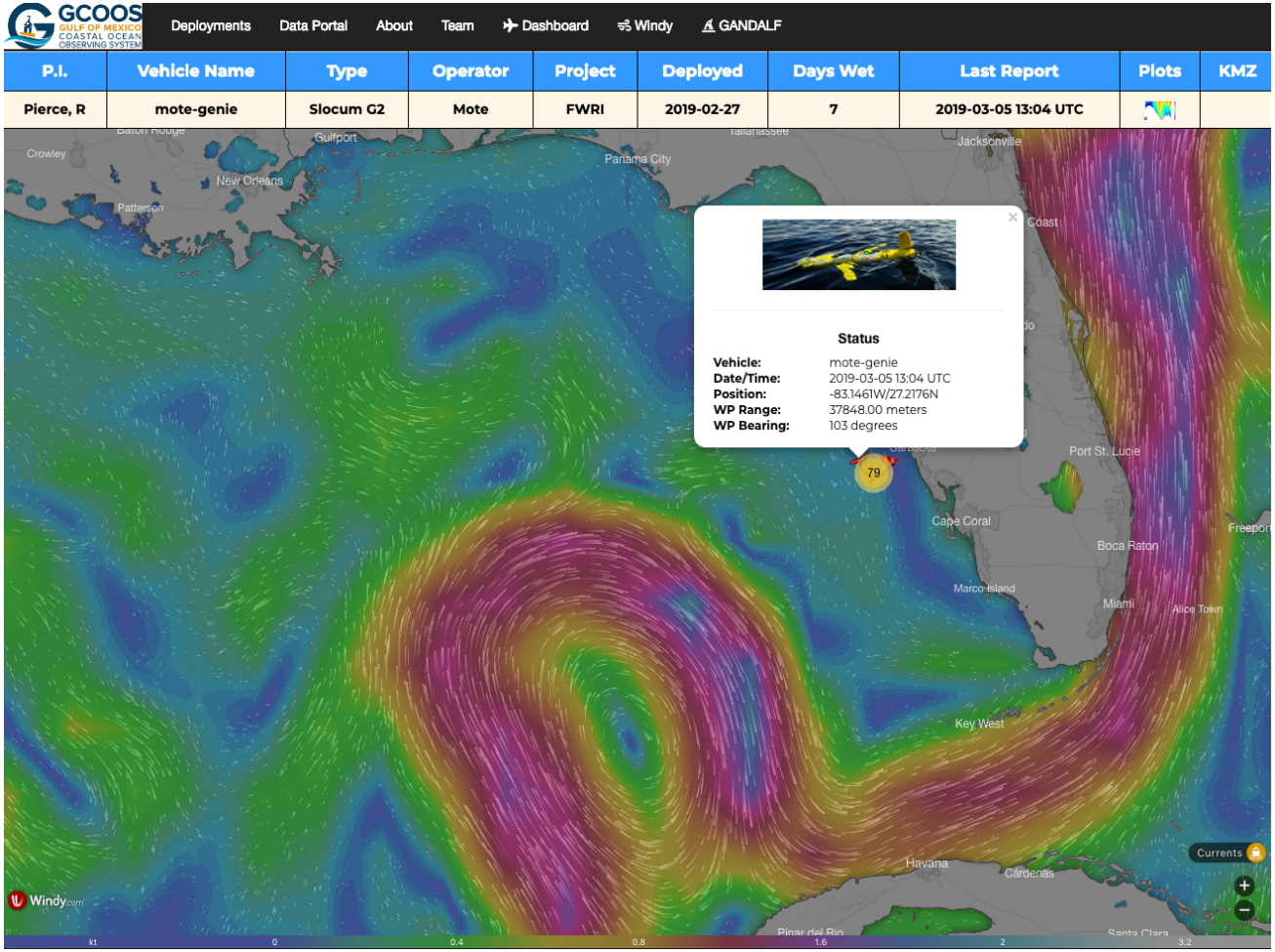
GULF OF MEXICO
COASTAL OCEAN
OBSERVING SYSTEM

IOOS
Integrated Ocean
Observing System

Design Considerations

- GCOOS does not run dockservers
- We might not have logins on partner's dockservers
- Must have multiple methods of harvesting data
- Must have real-time plots
- Retain 'Dashboard' from Mote version
- Display waypoints without access to goto_l10.ma file
- Eventually support multiple vehicle types
- Listen to the operators and give them what they want!

GANDALF



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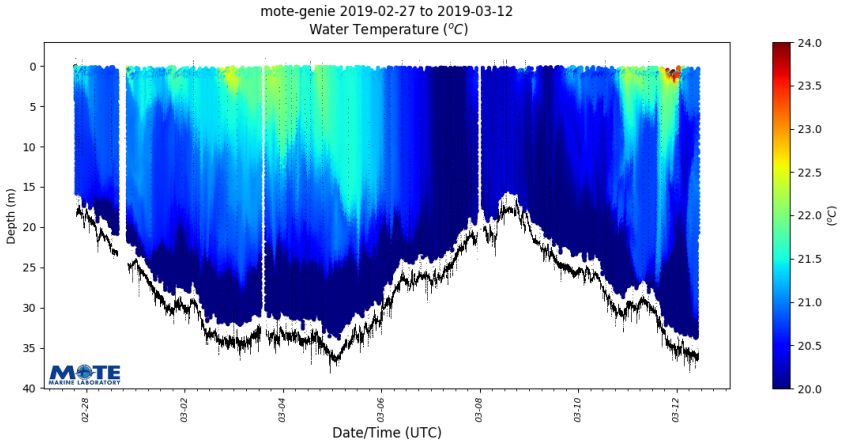
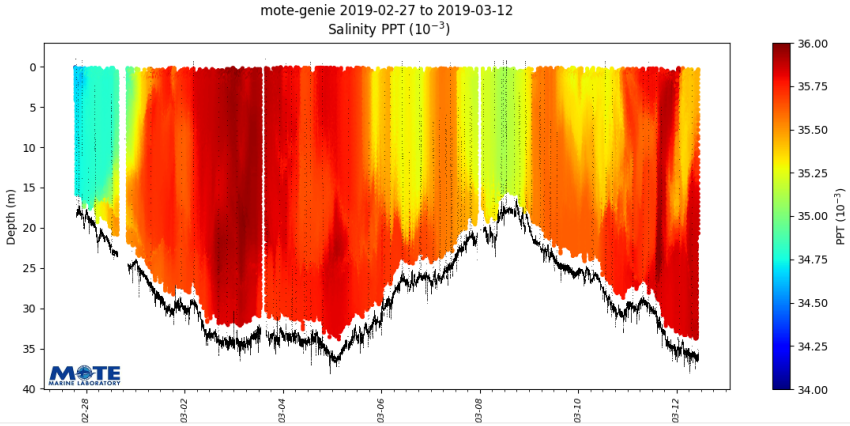
Plots





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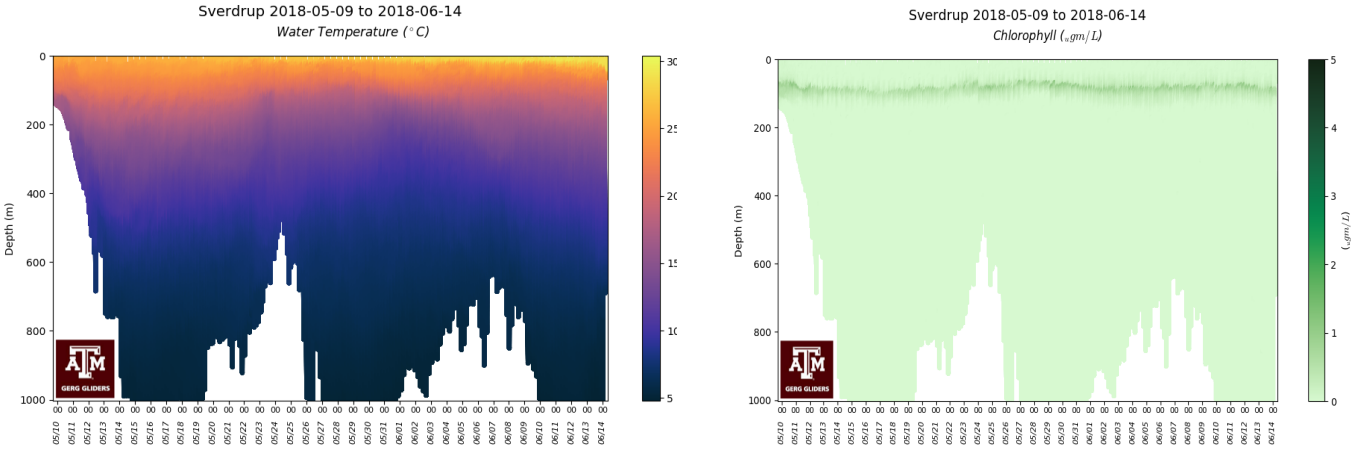
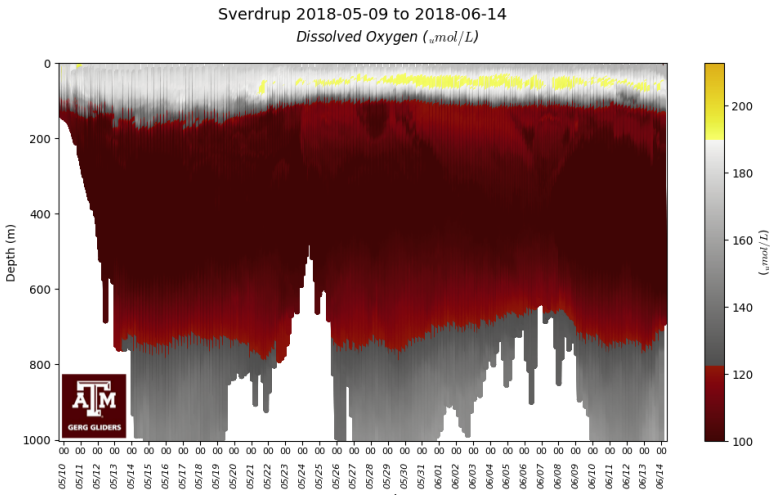
CMOCEAN Color Maps





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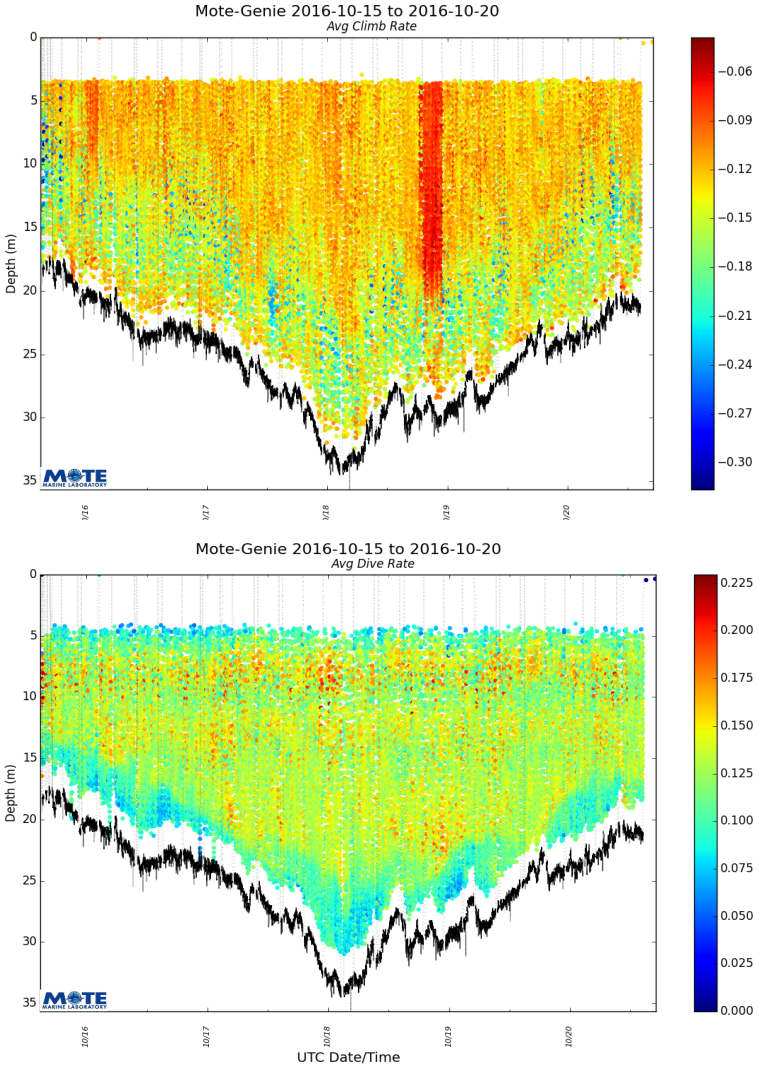
Unique Sensors



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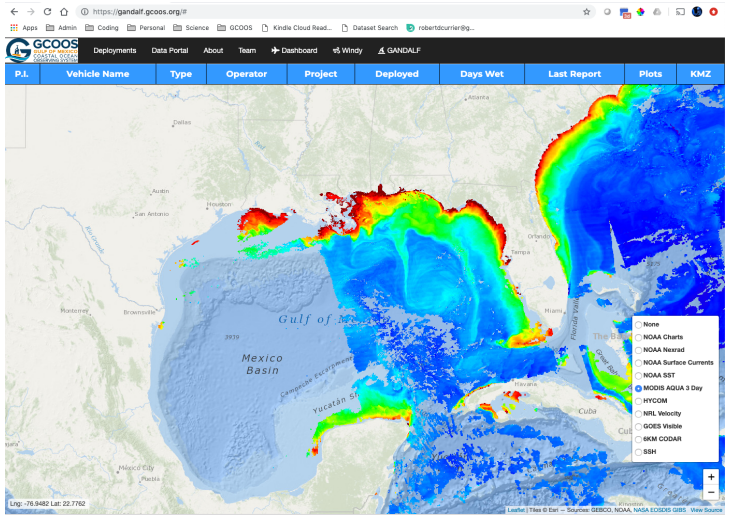
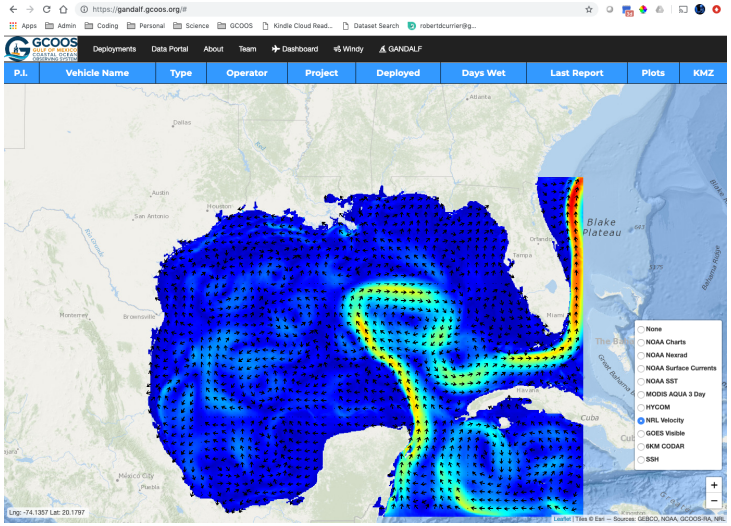
Layers





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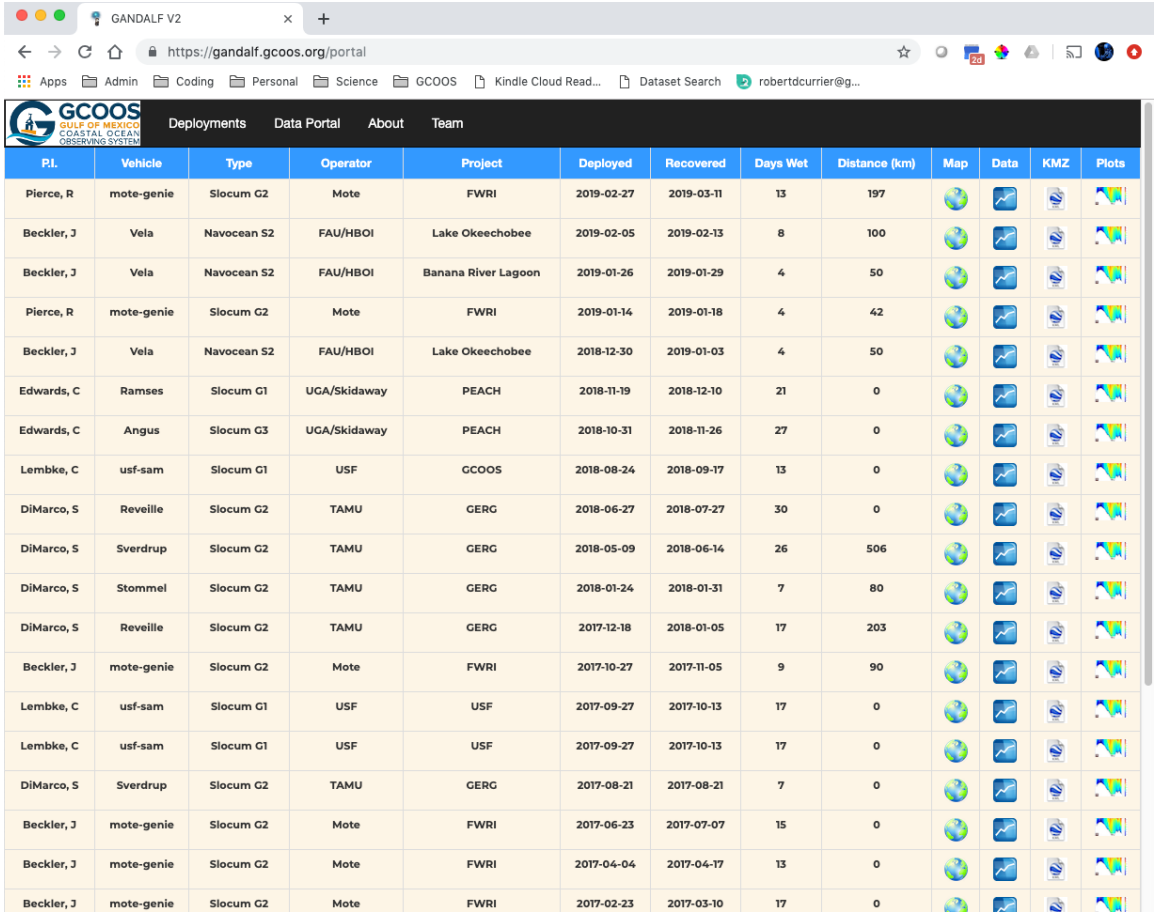
Data Portal



P.I.	Vehicle	Type	Operator	Project	Deployed	Recovered	Days Wet	Distance (km)	Map	Data	KMZ	Plots
Pierce, R	mote-genie	Slocum G2	Mote	FWRI	2019-02-27	2019-03-11	13	197				
Beckler, J	Vela	Navocean S2	FAU/HBOI	Lake Okeechobee	2019-02-05	2019-02-13	8	100				
Beckler, J	Vela	Navocean S2	FAU/HBOI	Banana River Lagoon	2019-01-26	2019-01-29	4	50				
Pierce, R	mote-genie	Slocum G2	Mote	FWRI	2019-01-14	2019-01-18	4	42				
Beckler, J	Vela	Navocean S2	FAU/HBOI	Lake Okeechobee	2018-12-30	2019-01-03	4	50				
Edwards, C	Ramses	Slocum G1	UGA/Skidaway	PEACH	2018-11-19	2018-12-10	21	0				
Edwards, C	Angus	Slocum G3	UGA/Skidaway	PEACH	2018-10-31	2018-11-26	27	0				
Lembke, C	usf-sam	Slocum G1	USF	GCOOS	2018-08-24	2018-09-17	13	0				
DiMarco, S	Reveille	Slocum G2	TAMU	GERG	2018-06-27	2018-07-27	30	0				
DiMarco, S	Sverdrup	Slocum G2	TAMU	GERG	2018-05-09	2018-06-14	26	506				
DiMarco, S	Stommel	Slocum G2	TAMU	GERG	2018-01-24	2018-01-31	7	80				
DiMarco, S	Reveille	Slocum G2	TAMU	GERG	2017-12-18	2018-01-05	17	203				
Beckler, J	mote-genie	Slocum G2	Mote	FWRI	2017-10-27	2017-11-05	9	90				
Lembke, C	usf-sam	Slocum G1	USF	USF	2017-09-27	2017-10-13	17	0				
Lembke, C	usf-sam	Slocum G1	USF	USF	2017-09-27	2017-10-13	17	0				
DiMarco, S	Sverdrup	Slocum G2	TAMU	GERG	2017-08-21	2017-08-21	7	0				
Beckler, J	mote-genie	Slocum G2	Mote	FWRI	2017-06-23	2017-07-07	15	0				
Beckler, J	mote-genie	Slocum G2	Mote	FWRI	2017-04-04	2017-04-17	13	0				
Beckler, J	mote-genie	Slocum G2	Mote	FWRI	2017-02-23	2017-03-10	17	0				

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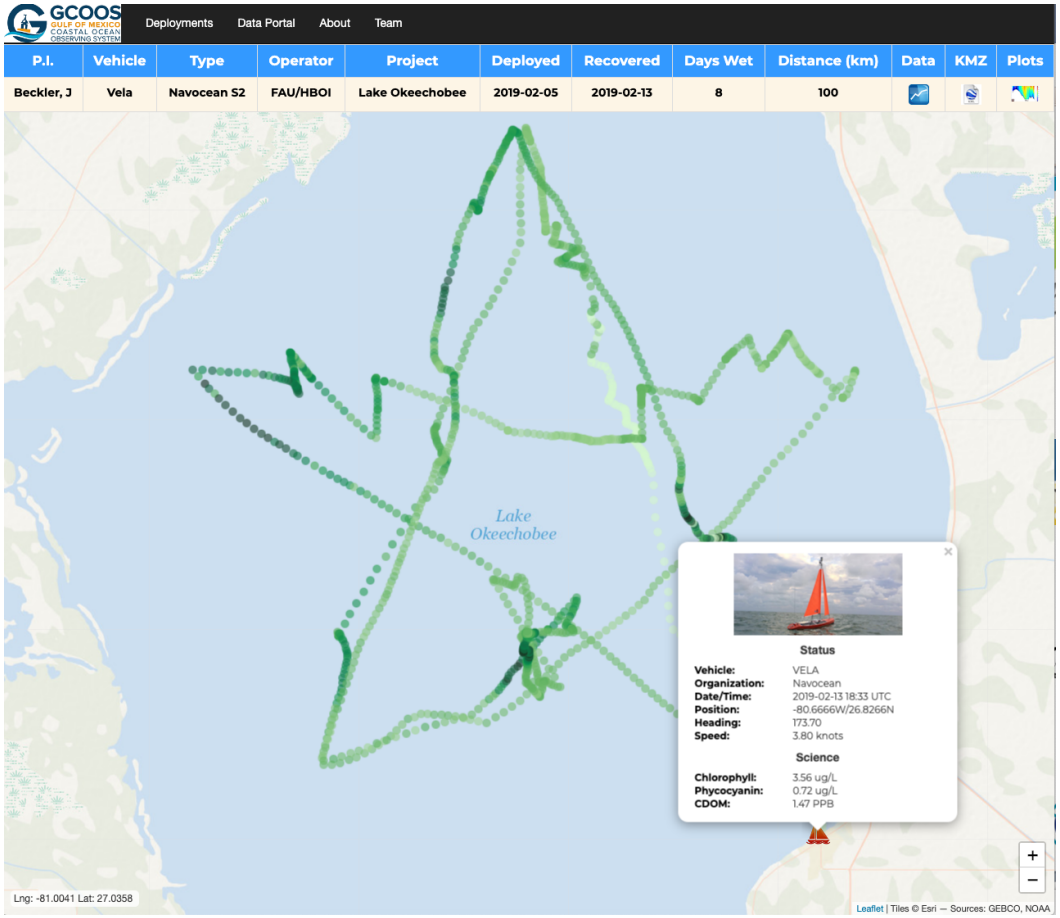
Navocean ASV



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Architecture

- 100% Dockerized
- Three containers: Web, Tools and GNCutils
- 100% Python server-side
- All JSON data: no database
- Config is addition to Kerfoot's deployment.json
- Individual vehicle flight and sensor config files
- Flask for web templates
- Apache/mod_wsgi for httpd
- Leaflet for maps
- Bootstrap for UI
- Highcharts for live charting
- Matplotlib for static plots

Main Loop: gandalf_mcp.py

- Runs hourly via Python timer
- Get all deployed vehicles from gandalf.cfg
- Process local, ERDDAP and Navocean vehicles
- Generate GeoJSON feature collections
- Generate plots for local vehicles
- Generate KML for local vehicles
- Does not run gncutils

GNCUTILS

- Awesome package by J. Kerfoot
- Creates individual ‘Yo’ profiles
- Builds IOOS-compliant NetCDF files of profiles
- We run gncutils every 12 hours via cron
- Cron runs on Docker host, NOT in container

Usage: docker exec gandalf_gncutils_1 /gandalf/tools/gandalf_build_nc.sh usf-bass

In The Future

- Add support for more vehicle types
- Get live plots working
- Automate GDAC file submission process
- More model outputs and overlays
- Historical model/observation overlays
- Predictive waypoint generation
- Restore ARGOS

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