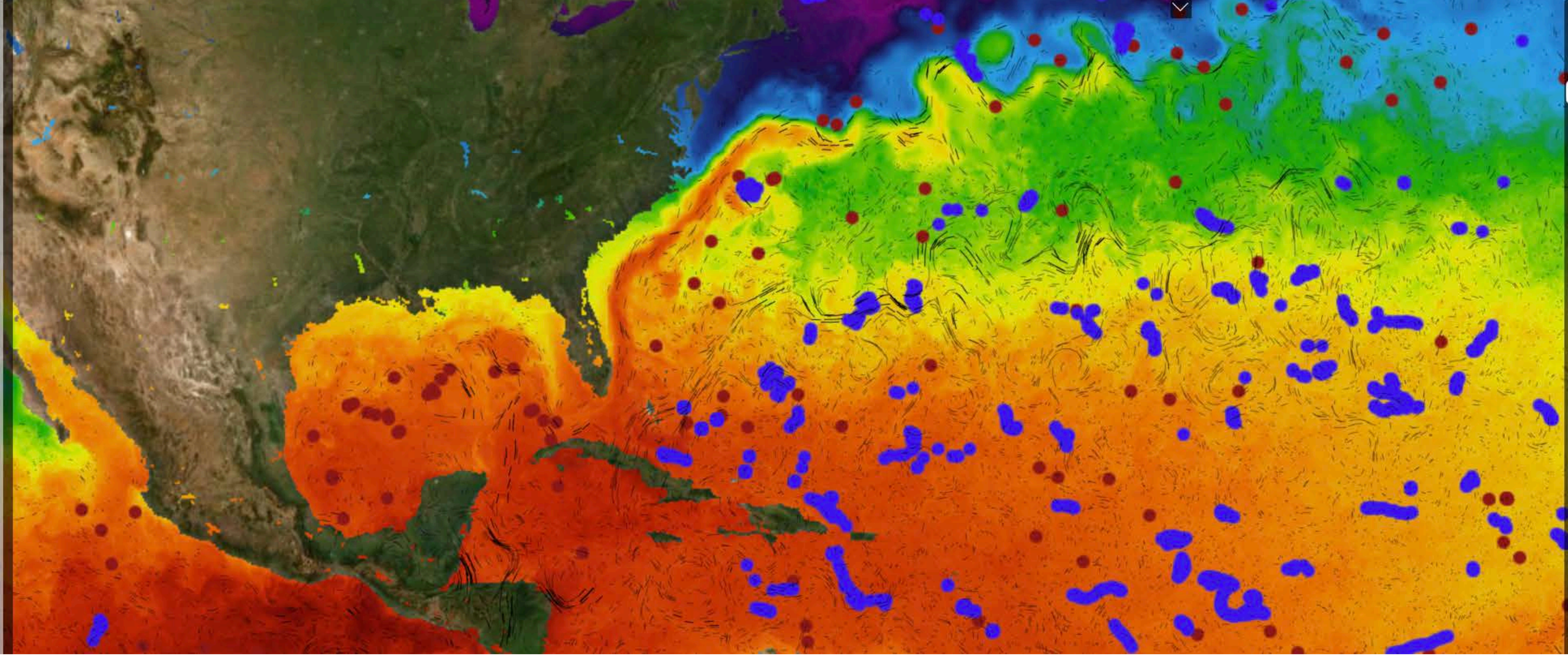




Caribbean/Gulf of Mexico Node
Physical Oceanography Division
Ocean Chemistry and Ecosystems Division

- Satellite
- Regional Sea Surface Temperature >
 - Global Sea Surface Temperature >
 - Ocean Color - AOML >
 - Ocean Color - CoastWatch >
 - Ocean Color Tile Server - NOAA >
 - GOES True Color >
 - USF Sargassum >



Tracking Sargassum in the Tropical Atlantic, Caribbean Sea and Gulf of Mexico.

Watch

Sargassum: NOAA Data Collection Tools

Joaquin Trinanes, CoastWatch CGoM & Atlantic OceanWatch Op. Manager
NOAA/AOML

01 Pelagic *Sargassum*

Floating macroalgae that forms large rafts that function as a drifting ecosystem, providing valuable habitat for diverse marine organisms

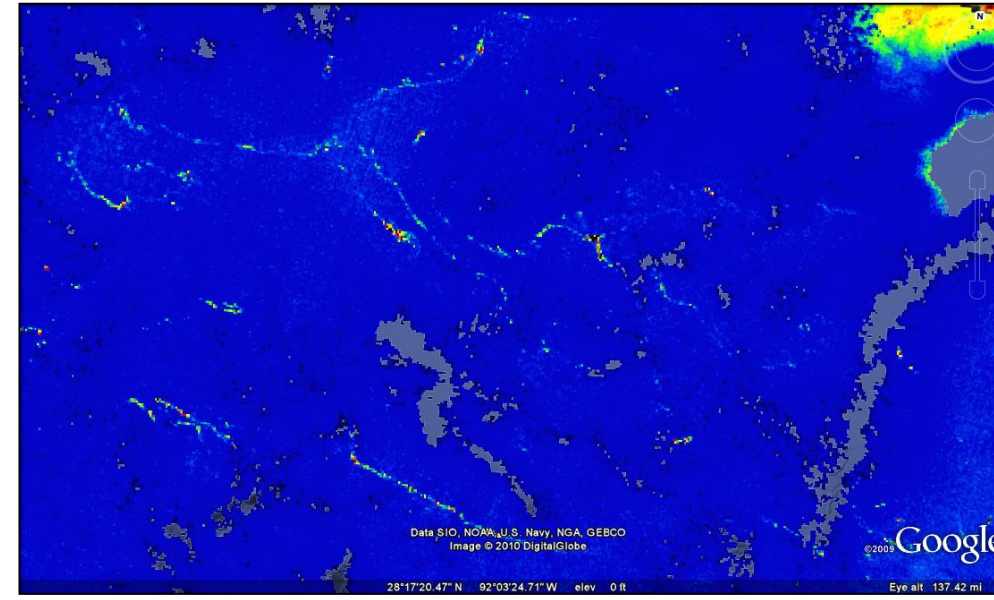
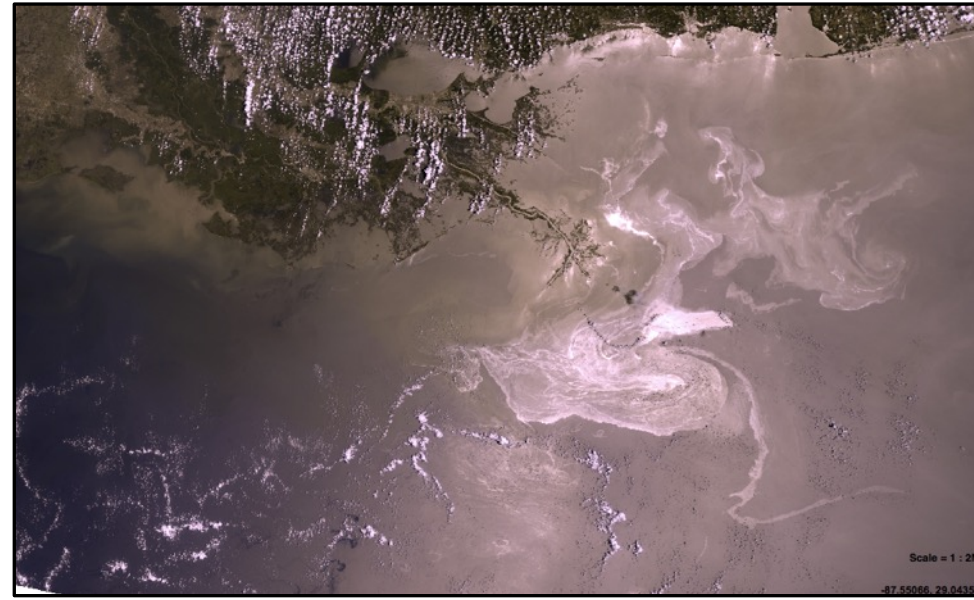
Since 2011, massive amounts of pelagic *Sargassum* algae began washing ashore throughout the Caribbean Sea and Gulf of Mexico

Disrupts shipping, tourism, fishing, industry, and coastal ecosystems.

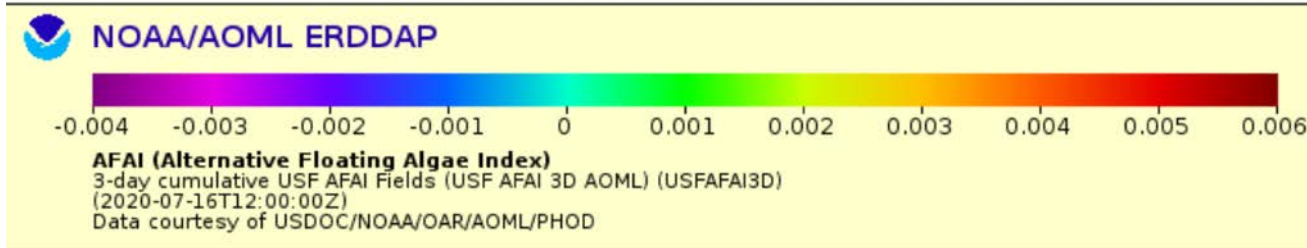
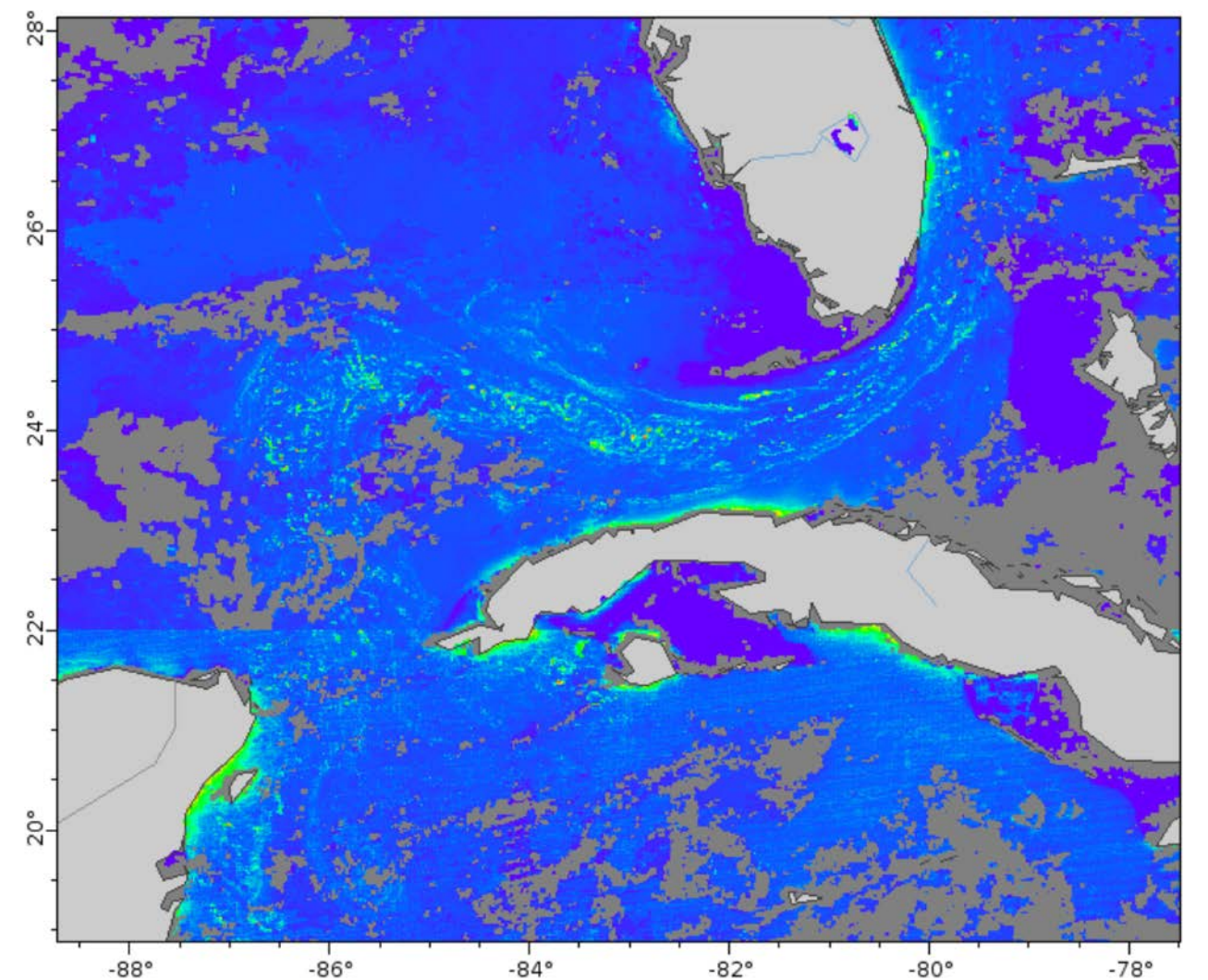
What we do? Monitor and track *Sargassum*. Trajectory modelling efforts. Operational.



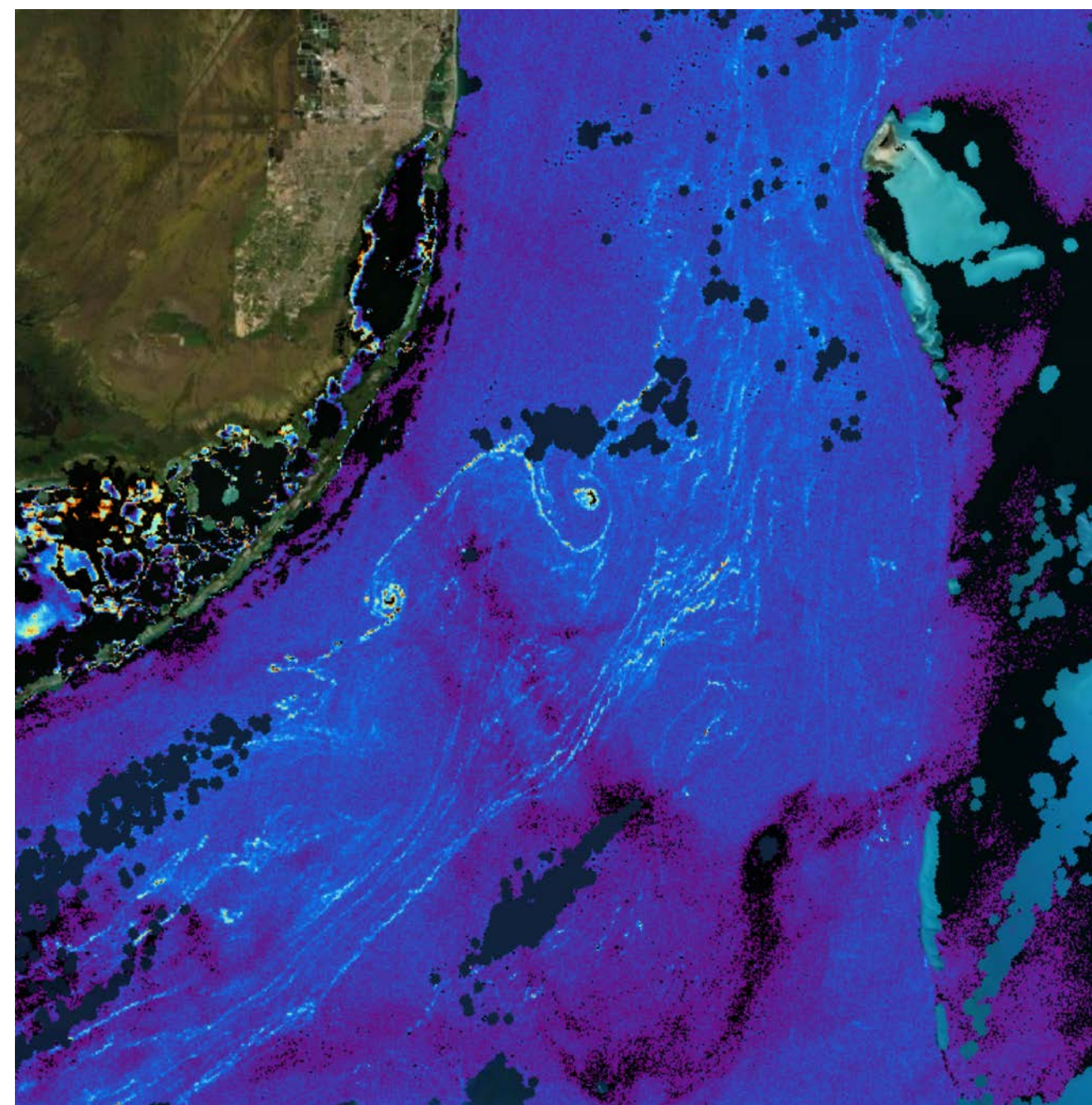
02 Sargassum satellite products



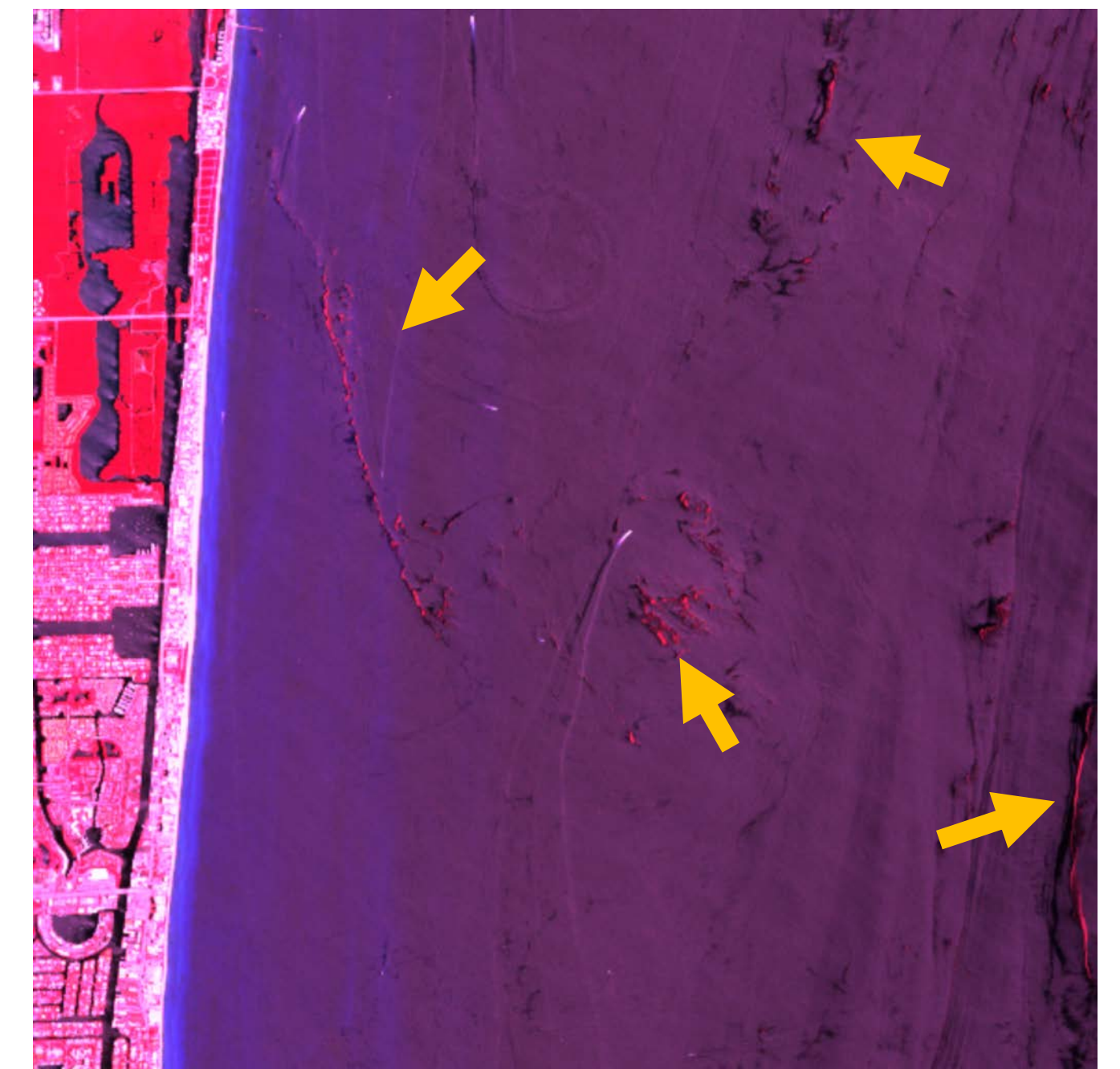
MODIS/VIIRS (source: C. Hu, USF)
Resolution: ~ 1km



OLCI (source: Copernicus)
Resolution: 300 m

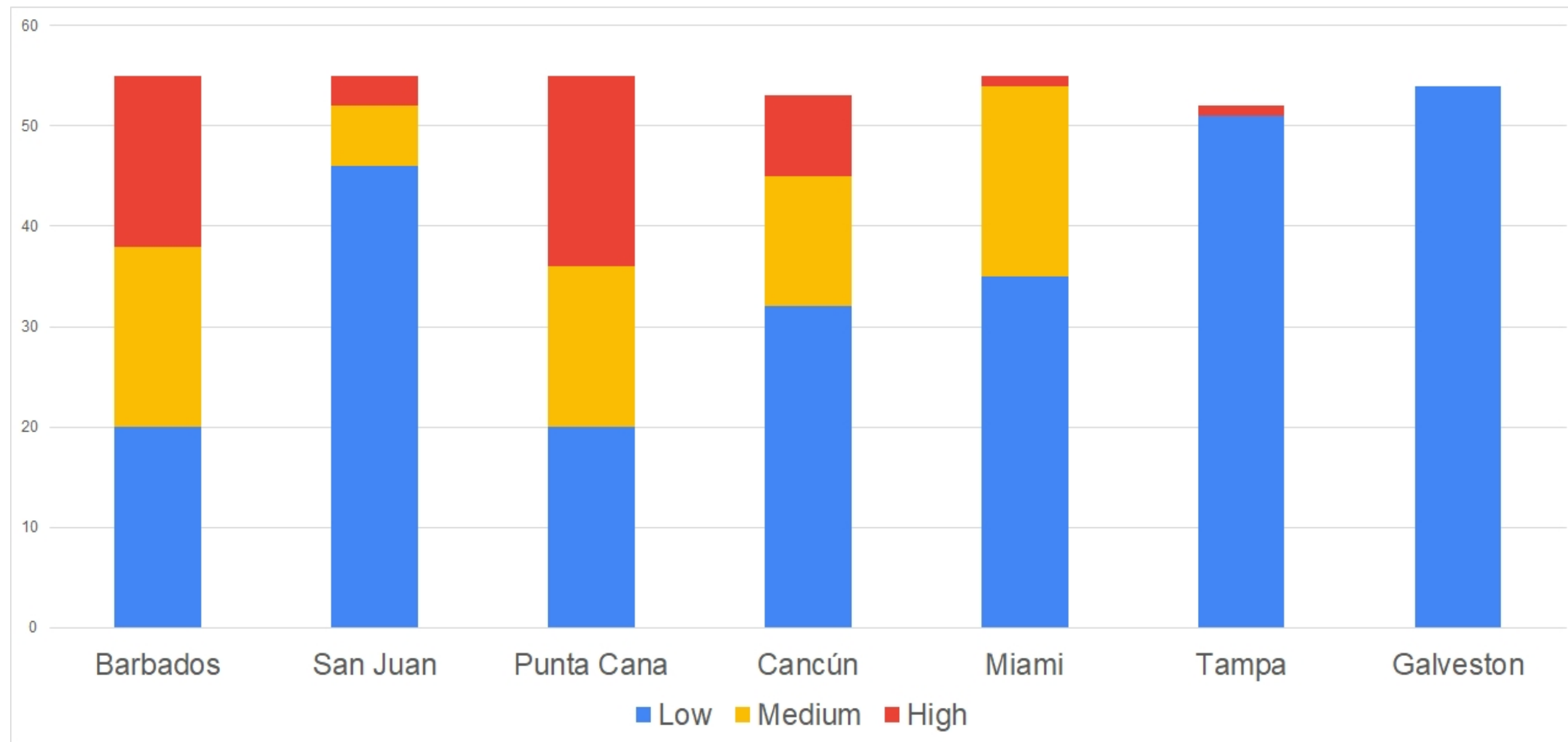


MSI (source: Copernicus)
Resolution: ~ 20m



03 Sargassum Inundation Reports

Goals: To monitor Sargassum and to provide an overview of the risk of Sargassum coastal inundation in the Caribbean and Gulf of Mexico regions.



Joaquin Trinanes, N.F. Putman, G. Goni, C. Hu, M. Wang. **Monitoring pelagic Sargassum inundation potential for coastal communities.** *Journal of Operational Oceanography* Pub Date : 2021-03-18 , DOI: [10.1080/1755876x.2021.1902682](https://doi.org/10.1080/1755876x.2021.1902682)

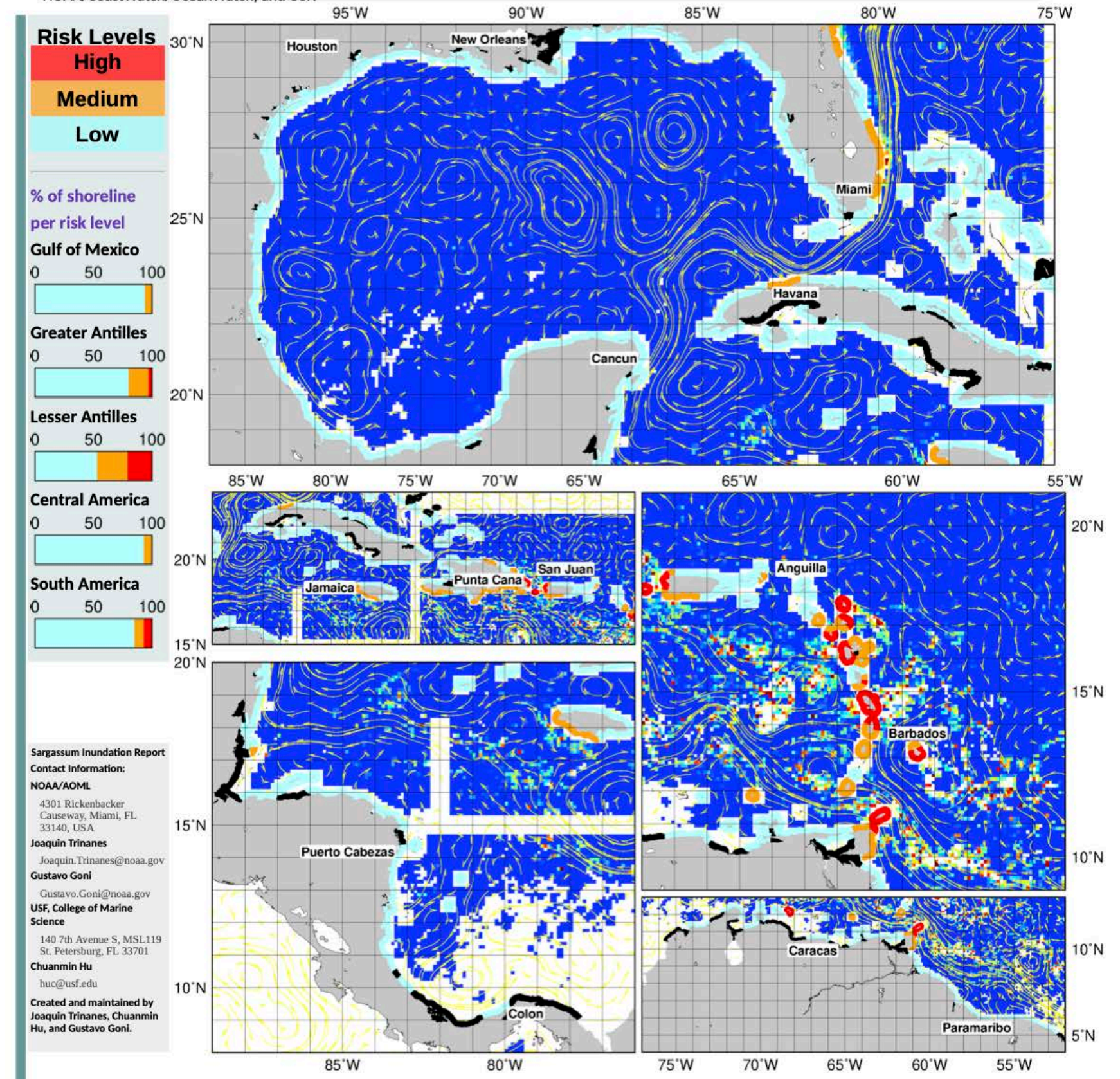


Experimental Weekly Sargassum Inundation Report (SIR v1.2)

By the National Oceanic and Atmospheric Administration (NOAA), and the University of South Florida (USF)

Status: Apr 28-May 4, 2020

Since 2011, large accumulations of Sargassum is a recurrent problem in the Caribbean Sea, in the Gulf of Mexico and tropical Atlantic. These events can cause significant economic, environmental and public health harm. These experimental Sargassum Inundation Reports (SIR) provide an overview of the risk of sargassum coastal inundation in the Caribbean and Gulf of Mexico regions. Using as core inputs the AFAI (Alternative Floating Algae Index) fields generated by the University of South Florida (USF), the algorithm analyses the AFAI values in the neighborhood (50 km) of each coastal pixel and, computing the difference between those values and a multiday baseline, classifies the risk into three categories: low (blue), medium (orange) and high (red). In black are areas with not enough data. The two ad-hoc thresholds used for classification are 0.001 and 0.003. The vectors in the images represent the geostrophic currents. SIR is the result of the collaboration between the Atlantic Oceanographic and Meteorological Laboratory (NOAA/AOML), NOAA/CoastWatch/OceanWatch, and USF.



References: [USF Sargassum Watch System](#) [Atlantic OceanWatch](#)
 Disclaimer: This is an experimental product and still subject to validation by NOAA/AOML, NOAA/CoastWatch/OceanWatch, and USF.

04 Interoperable Environment

Caribbean/Gulf of Mexico Node
Physical Oceanography Division
Ocean Chemistry and Ecosystems Division

Satellite

- Regional Sea Surface Temperature
- Global Sea Surface Temperature
- Ocean Color - AOML
- Ocean Color - CoastWatch
- Ocean Color Tile Server - NOAA
- GOES True Color
- Sargassum
 - MCI 1-day
 - none
 - AOML Daily MCI

Jan 18, 2021 12:00

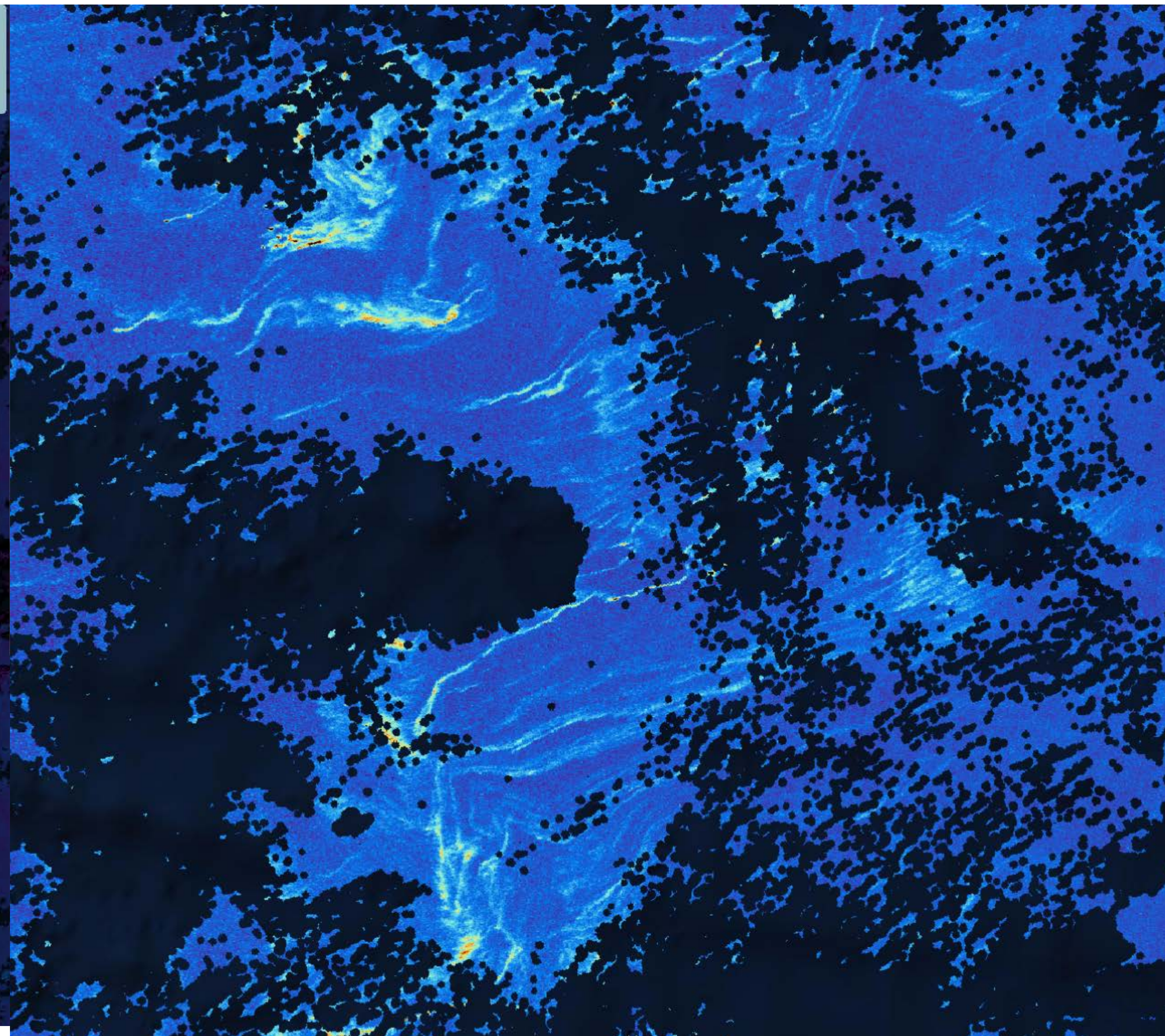
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color bands: linear

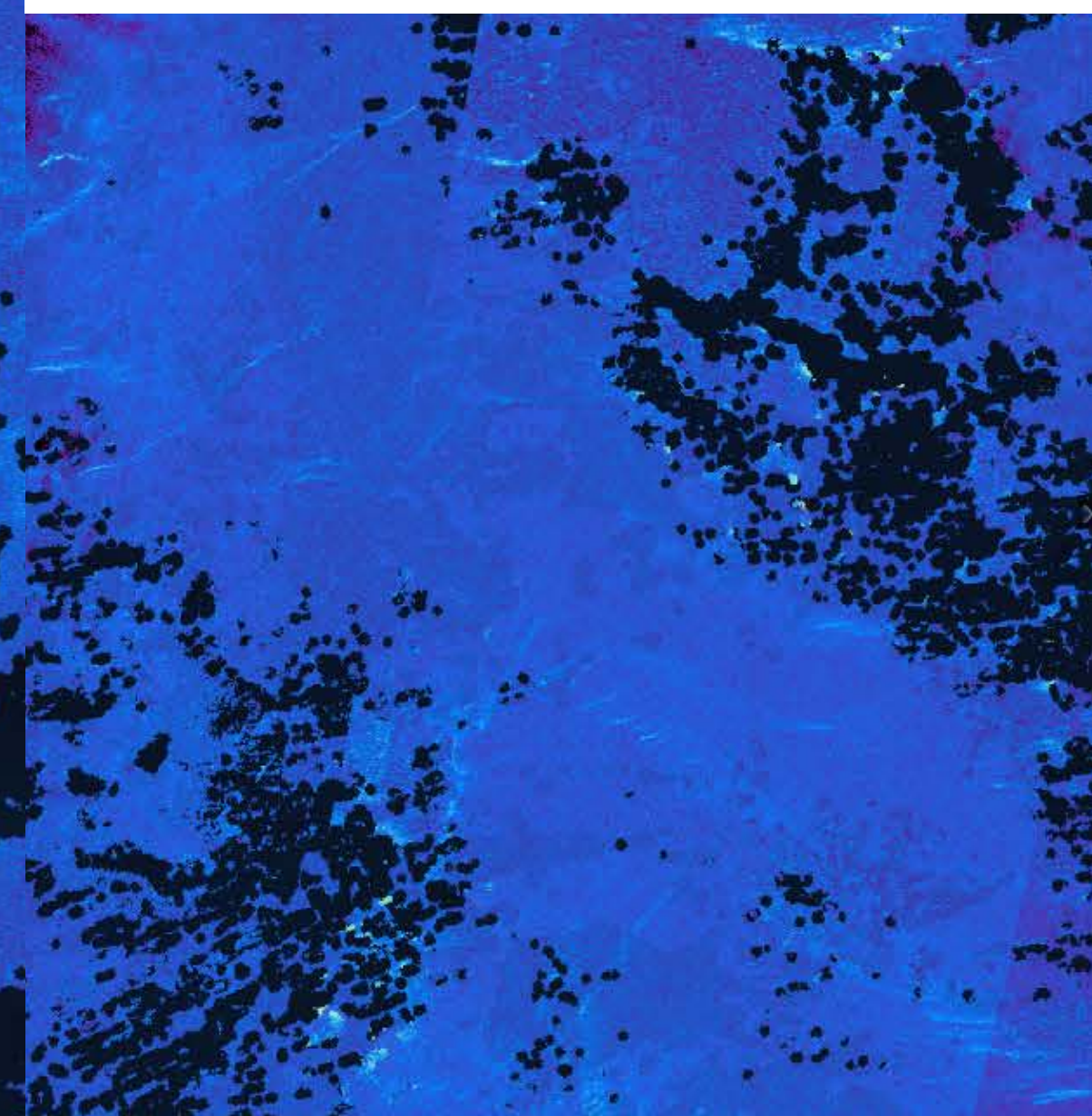
min/max: -0.1 0.6

opacity: cache:

- Regional Acidification
- Global Altimetry
- Global Carbon
- Vibrio Risk
- Global Seascapes
- Weather
- Hurricanes

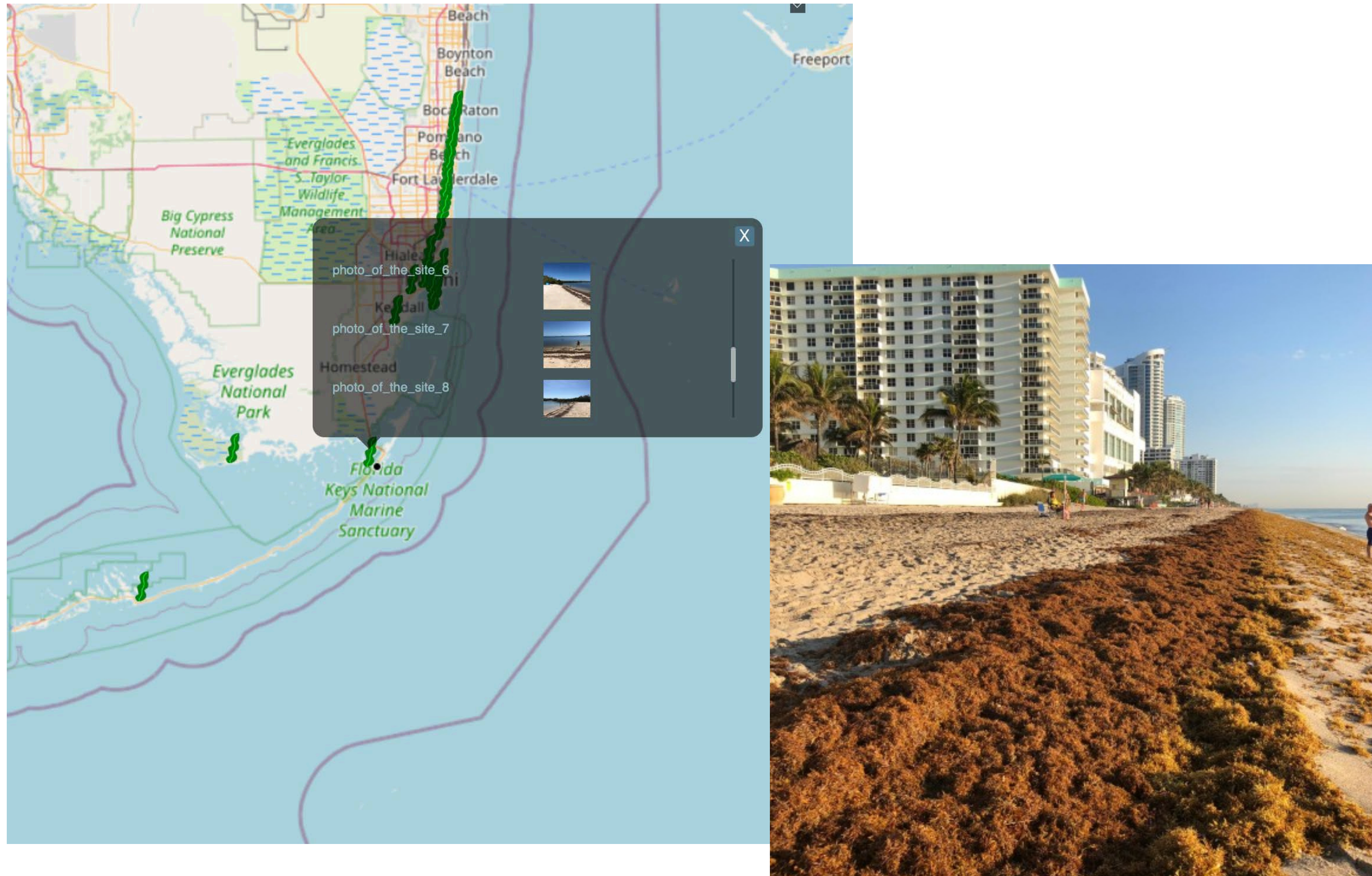


Tile Server
OCEANVIEWER
ERDDAP
TDS



05 Citizen Science

Sargassum Observations In-situ Database



Survey123 Multidevice data collection

| | | |
|---|---|--|
| <input type="checkbox"/> Washed-up on the shore | <input type="checkbox"/> Floating along the shoreline | <input type="checkbox"/> Floating in bays, channels, harbors |
|---|---|--|

| | |
|--|-----------------------------------|
| <input type="checkbox"/> Floating over reefs or seagrass | <input type="checkbox"/> Offshore |
|--|-----------------------------------|

Sargassum Observed As

| | | |
|---|-------------------------------------|---|
| <input type="checkbox"/> Line(s) of Sargassum | <input type="checkbox"/> Mats/rafts | <input type="checkbox"/> Scattered clumps |
|---|-------------------------------------|---|

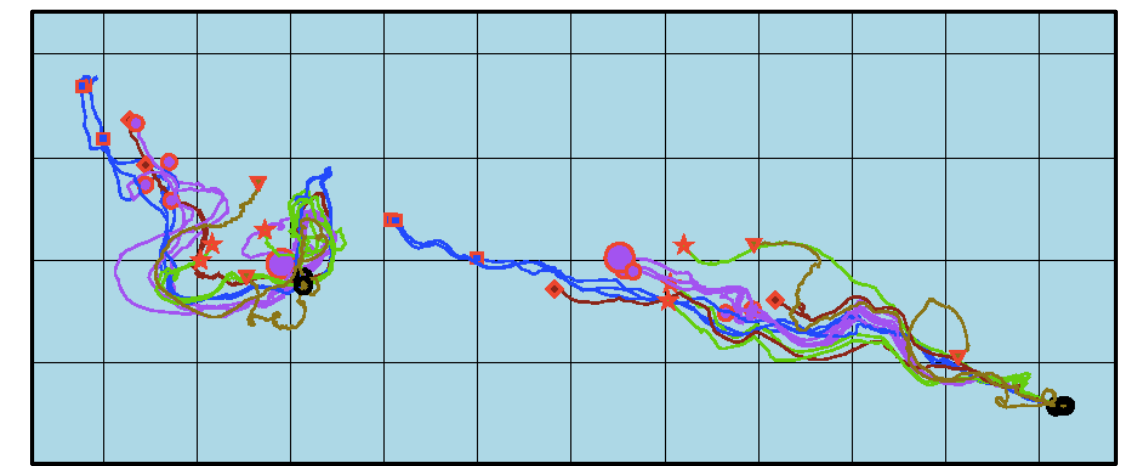
Species of Sargassum

| | | |
|--|--|--|
| <input type="checkbox"/> Natans I Sargassum natans I Spines on bladder present Narrow delicate leaves Thorns on stem absent Thorns on stem absent | <input type="checkbox"/> Natans VIII Sargassum natans VIII Spines on bladder usually absent Noticeably larger than other spp. Thorns on stem absent Thorns on stem absent | <input type="checkbox"/> Fluitans III Sargassum fluitans III Spines on bladder absent Denser wider leaves than S.natans I Thorns on stem present Thorns on stem present |
|--|--|--|

06 Trajectory Modelling

Ocean Debris Tracking

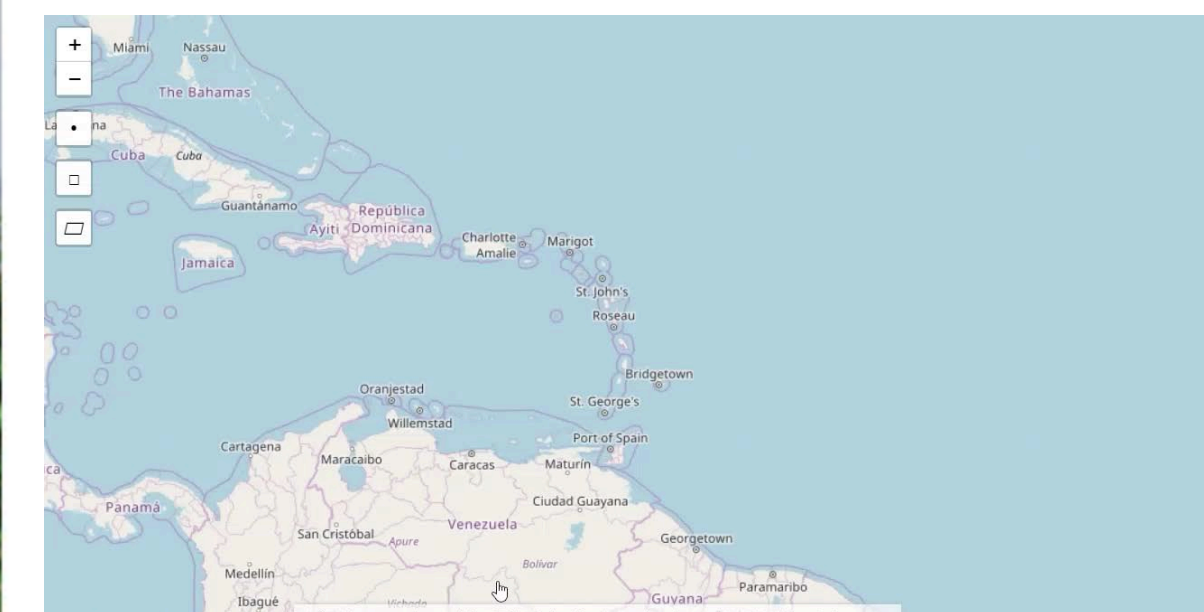
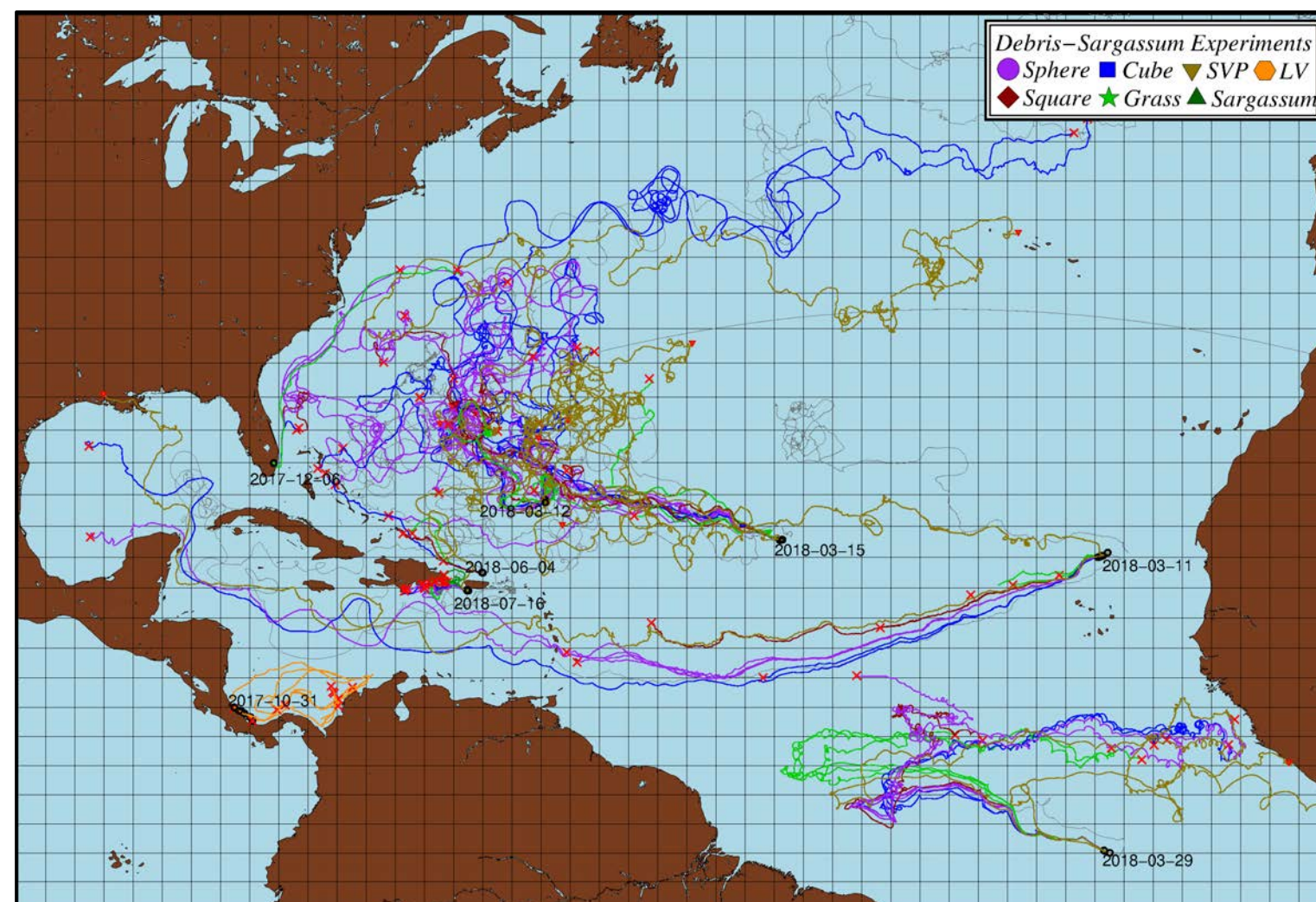
Goal: understand and assess impact of ocean dynamics and wind on sargassum (and debris in general)



Field experiments with GPS-tracked, undrogued buoys of varying shapes, simulating debris and Sargassum. This project will help us better understand the trajectories of floating debris, sargassum, and plankton including marine larva.

Putman, N.F., Lumpkin, R., Olascoaga, M.J., Trinanes, J. and Goni, G.J., 2020. Improving transport predictions of pelagic *Sargassum*. *Journal of Experimental Marine Biology and Ecology*, 529, p.151398.

Miron, P., Olascoaga, M. J., Beron-Vera, F. J., Putman, N. F., Triñanes, J., Lumpkin, R., and Goni, G. J., 2020. Clustering of Marine-Debris- and *Sargassum*-Like Drifters Explained by Inertial Particle Dynamics. *Geophysical Research L.*, 47(19), <https://doi.org/10.1029/2020GL089874>



07 Current work

Improve *Sargassum* Inundation risk model

Trajectory modelling (in general, not only for *Sargassum*). Field experiments.

Better coverage in the coastal zone:

- Ground truth (e.g. citizen science projects, beach management agencies)

- Winds

- Currents (e.g. HF radars)

- Waves

- Satellites

Sargassum growth model and local and regional engagement.

Contact: Joaquin.Trinanes@noaa.gov