



# Texas Coastal Ocean Observation Network

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Products and Services

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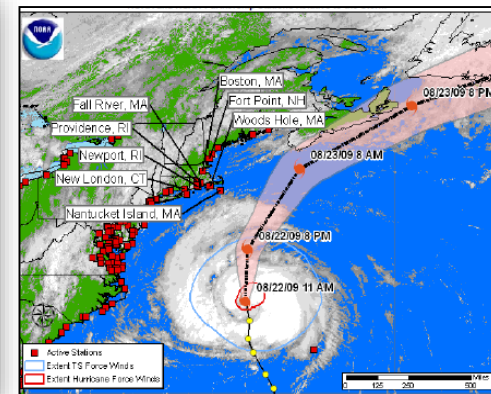
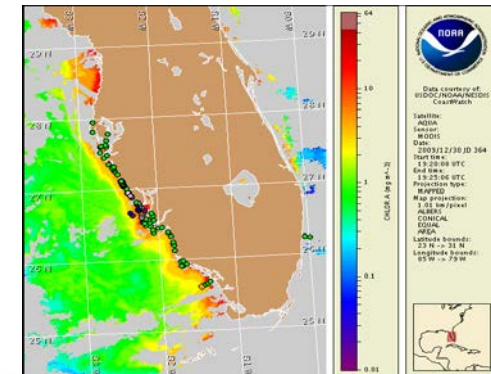
# What is CO-OPS?

## *Meaningful oceanographic data for the Nation*

CO-OPS is the authoritative source for accurate, reliable, and timely tides, water levels, currents, and other oceanographic information.

### Our work benefits:

- Safe and efficient navigation
- Mapping and charting for the nation
- Coastal resilience and planning for coastal inundation
- Ecological forecasting

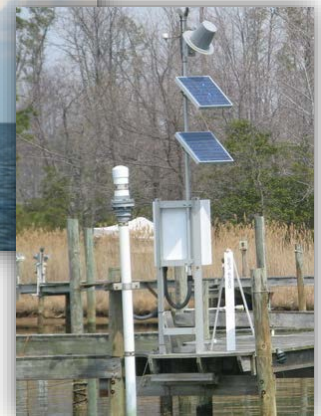
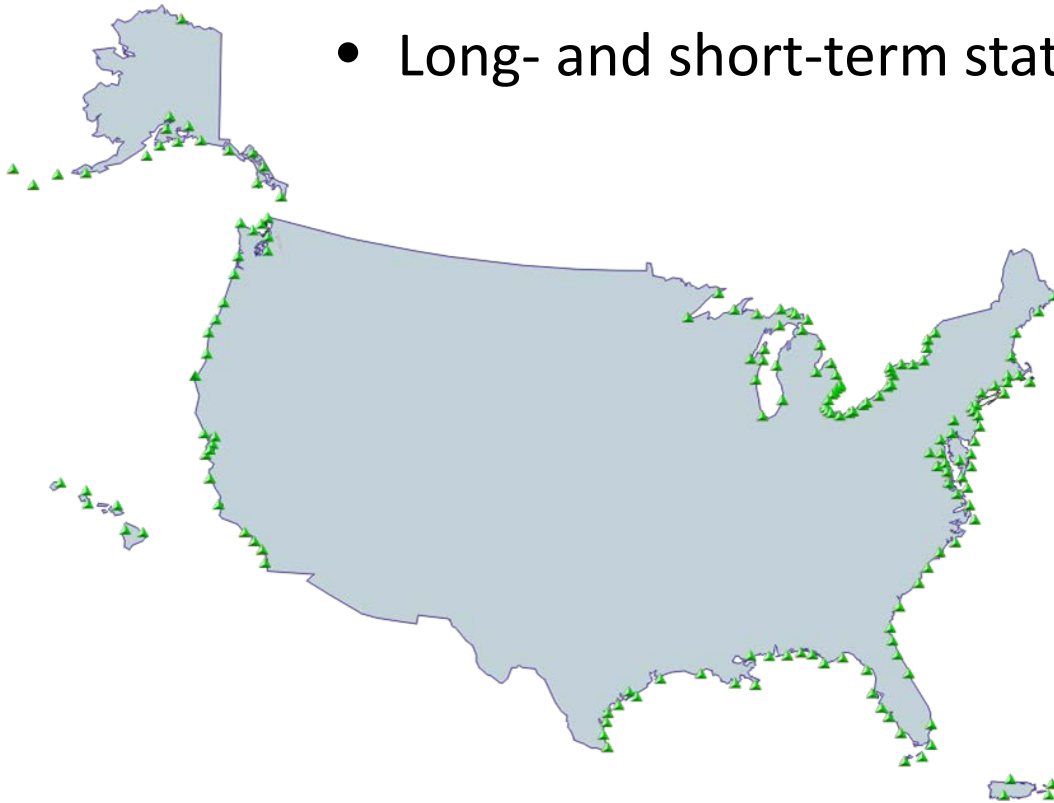




# Observations

## National Water Level Observation Network (NWLON)

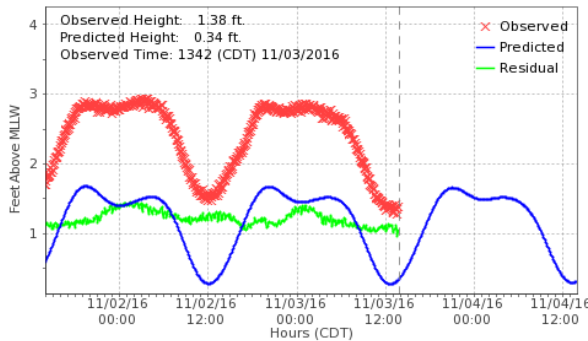
- Real-time water level, air and water temperature, wind speed/direction, barometric pressure, etc.
- Long- and short-term stations



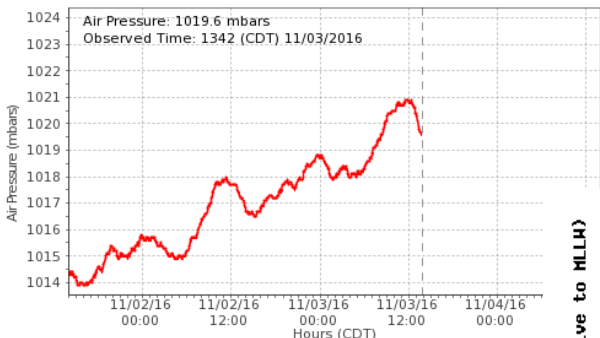


# Traditional Water Level Products

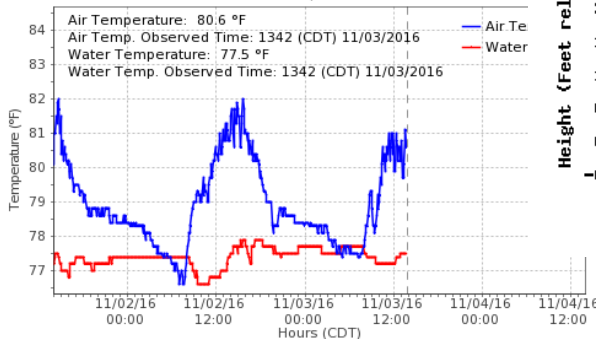
**8771450 Galveston Pier 21, TX**  
Water Levels



Air Pressure

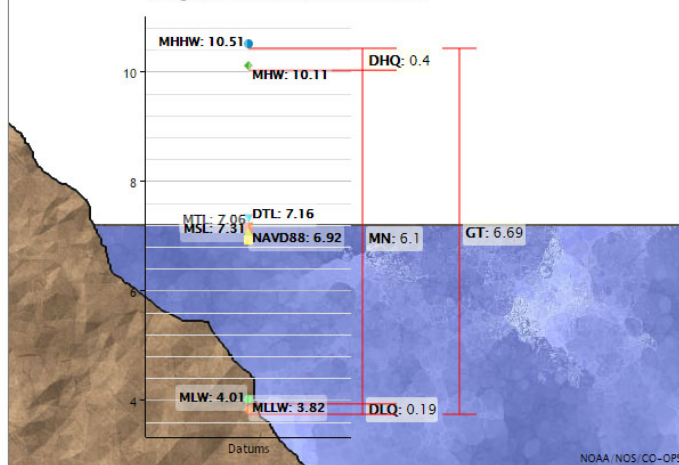


Air/Water Temperature



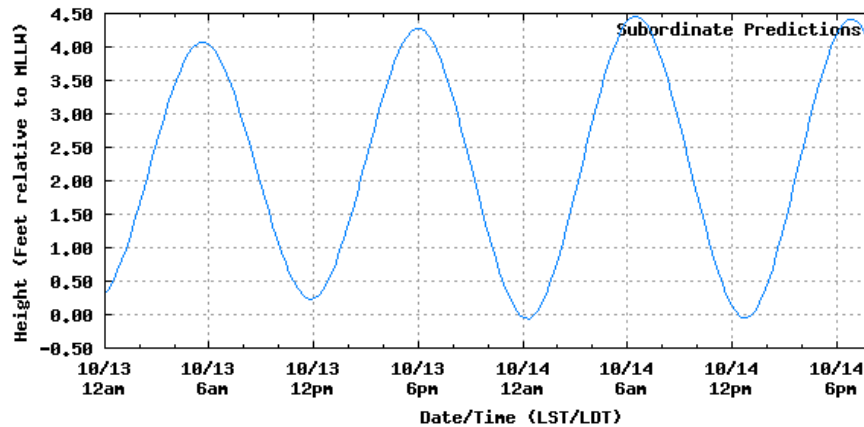
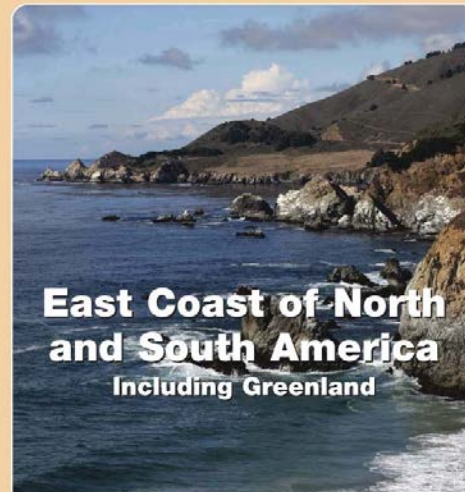
Produced by NOAA/NOS/CO-OPS

**Datums for 8545240, Philadelphia, PA**  
All figures in feet relative to station datum



## 2016 Tide Tables

HIGH AND LOW WATER PREDICTIONS



Date	Day	Time	Hgt
10/13	Thu	05:37 AM	4.07 H
10/13	Thu	11:52 AM	0.23 L
10/13	Thu	06:00 PM	4.28 H
10/14	Fri	12:16 AM	-0.06 L



# Coastal Resilience Products

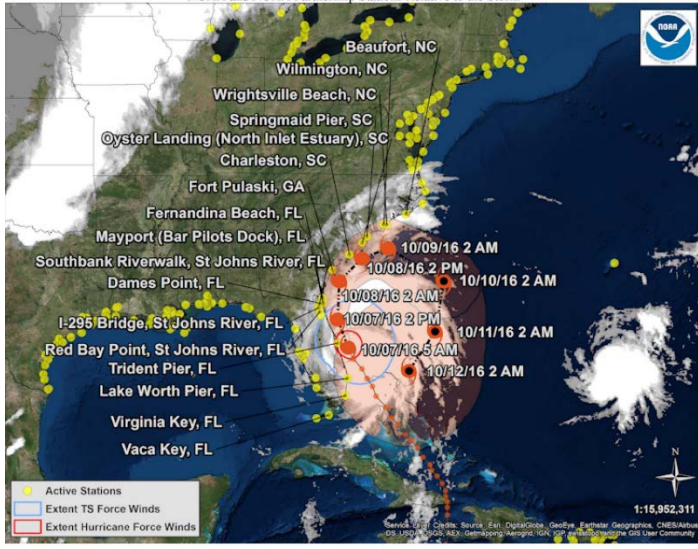


**300 and 925 percent increase since the 1960s**

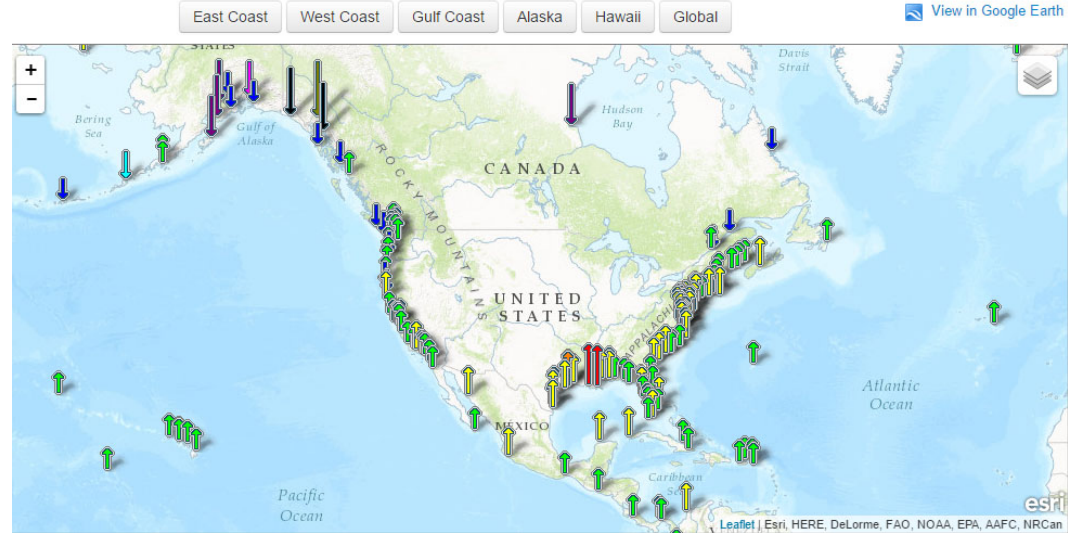


Hurricane MATTHEW QuickLook  
Posted: 06:00 EDT 10/07/2016

NOAA and NOAA Partnership Stations Relative to the Storm

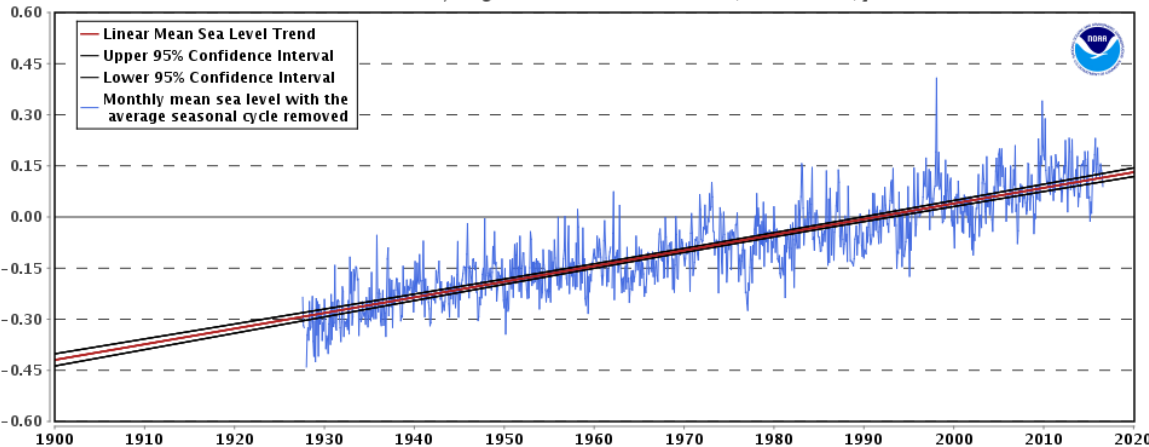


## Sea Level Trends



8638610 Sewells Point, Virginia

4.59 +/- 0.23 mm/yr

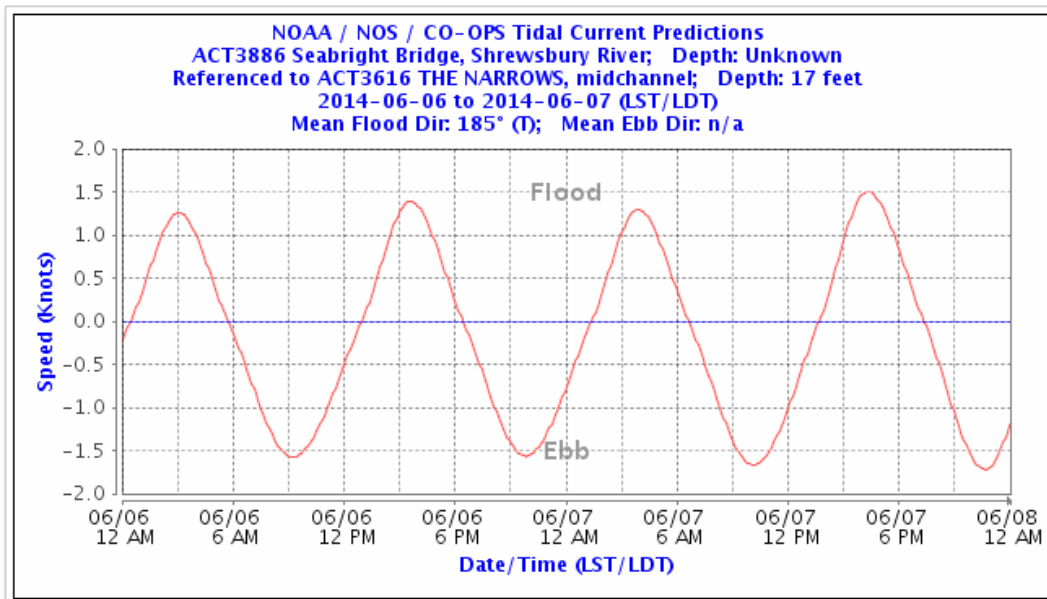




# Current Observations

## National Current Observation Program

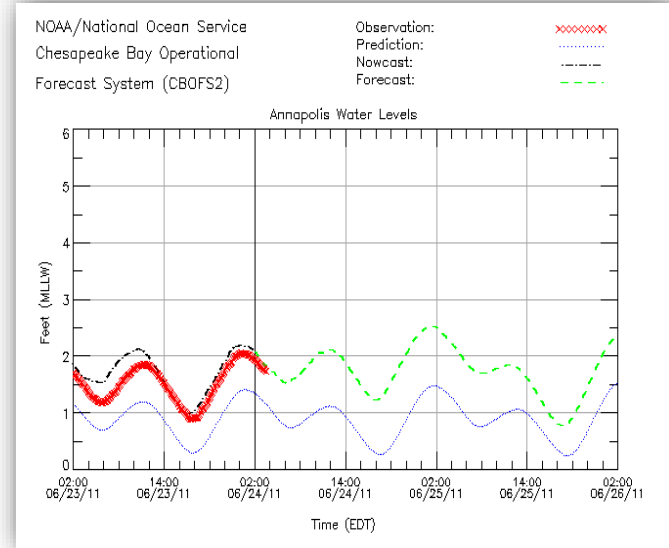
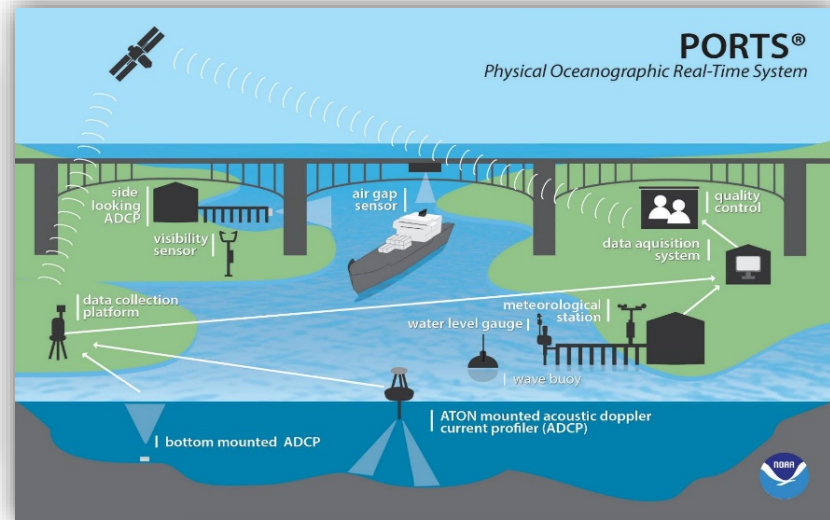
- Collect, analyze, and distribute current observations
- Generate products and information to maintain and update the Nation's Tidal Current Tables





# PORTS<sup>®</sup>

## Physical Oceanographic Real Time System<sup>®</sup>





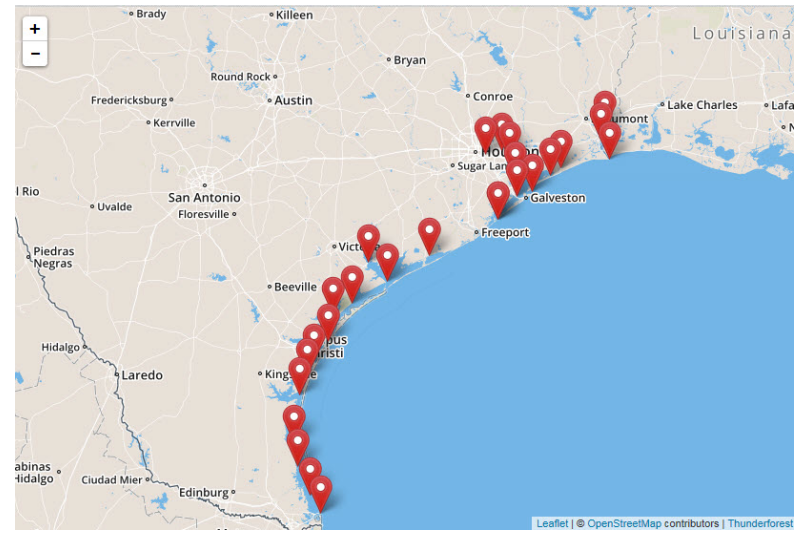
# TCOON Partnership



TCOON Sentinel Platform Survey August 2011 (Sabine Pass, TX)



TCOON 4-Pile Platform Survey November 2012 (Matagorda City, TX)



- Unique partnership since the 1980s
- Follows NOAA standards for data and tidal datums
- Thirty\* local water level stations

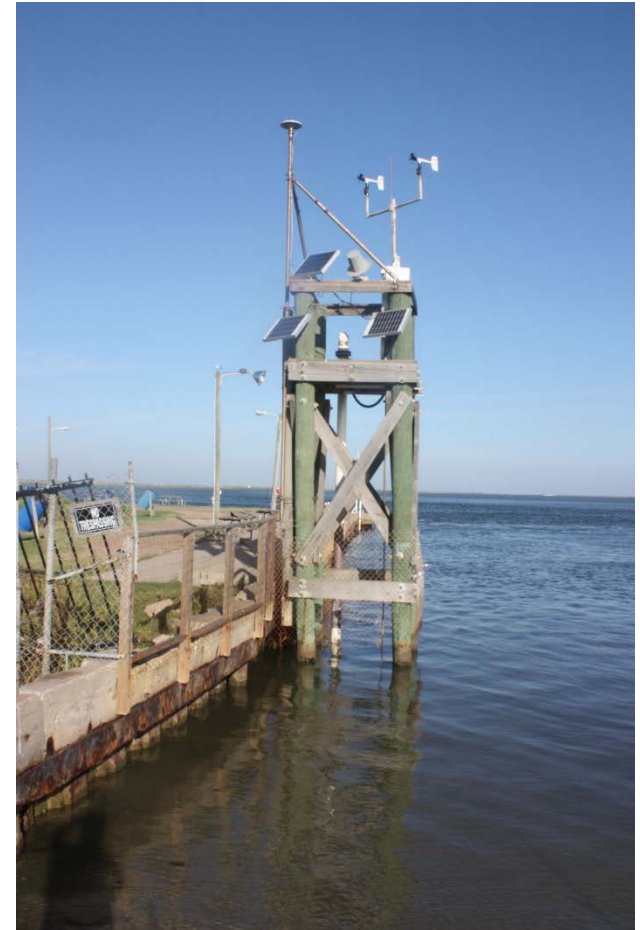






# TCOON Partnership History

- MOA with US Army Corps of Engineers signed in September 2015
- Station assessment completed in fall 2015
- Multi-year contract awarded in March 2016: Woods Hole Group/CBI
- Annual Inspections completed with one remaining
- 19 of 26 are displaying provisional data on CO-OPS website



San Luis Pass TCOON station

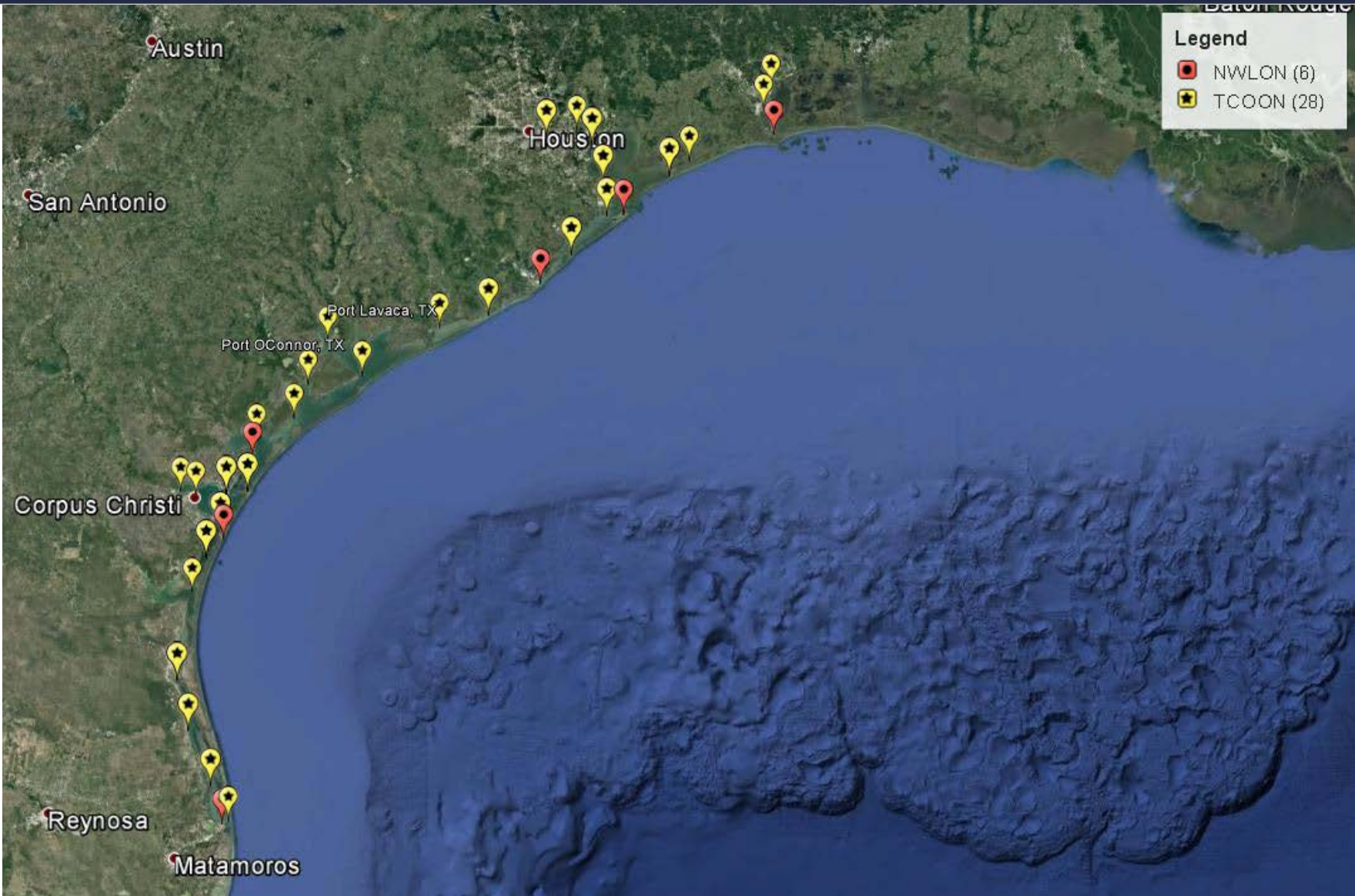


# NWLON in Texas



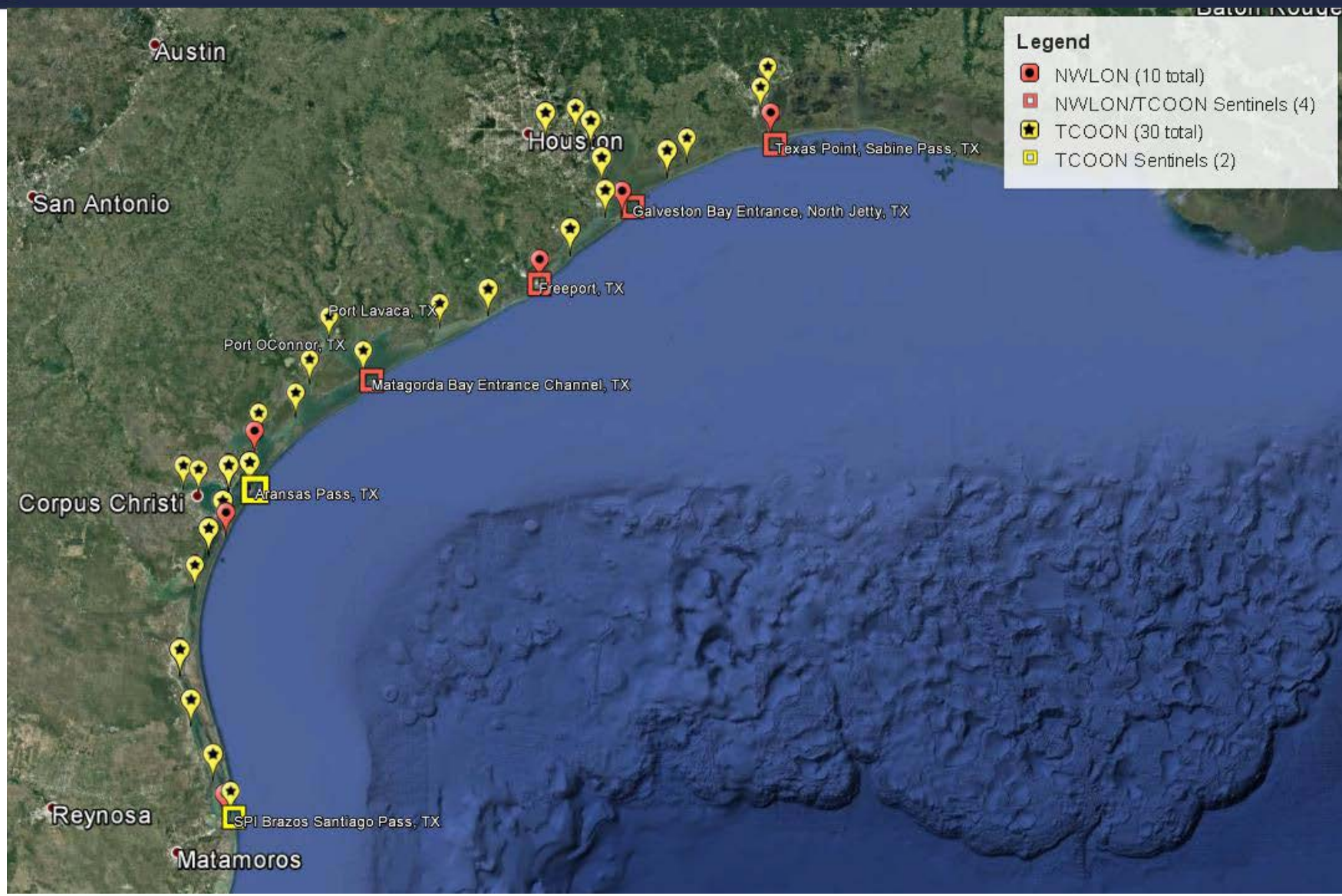


# TCOON Stations





# Sentinel Stations





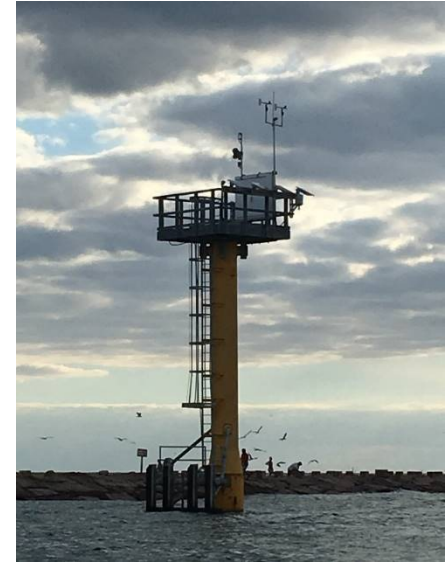
# Sentinel Stations



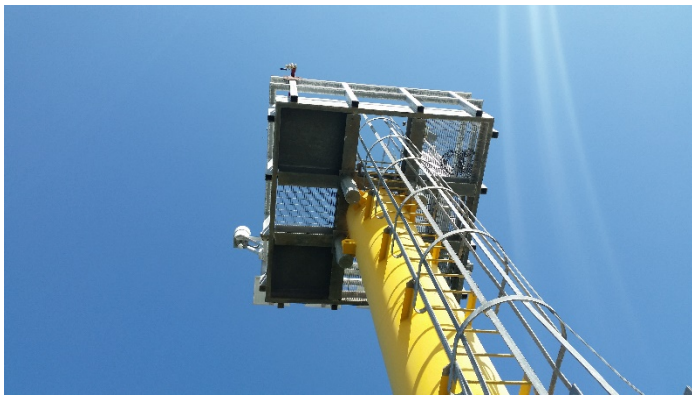
**Texas Point, Sabine Pass**



**Freeport**



**South Padre Island**



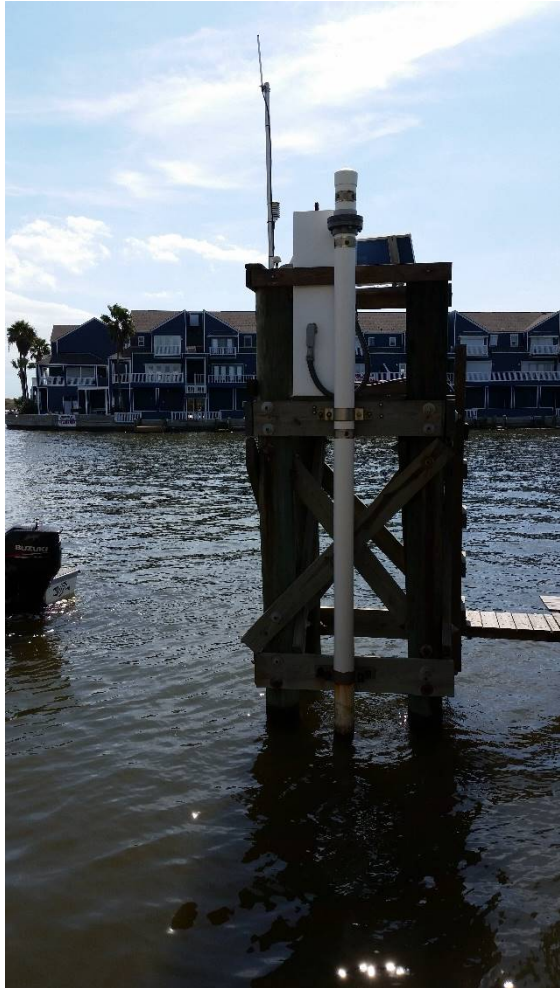
**Matagorda Entrance Channel**



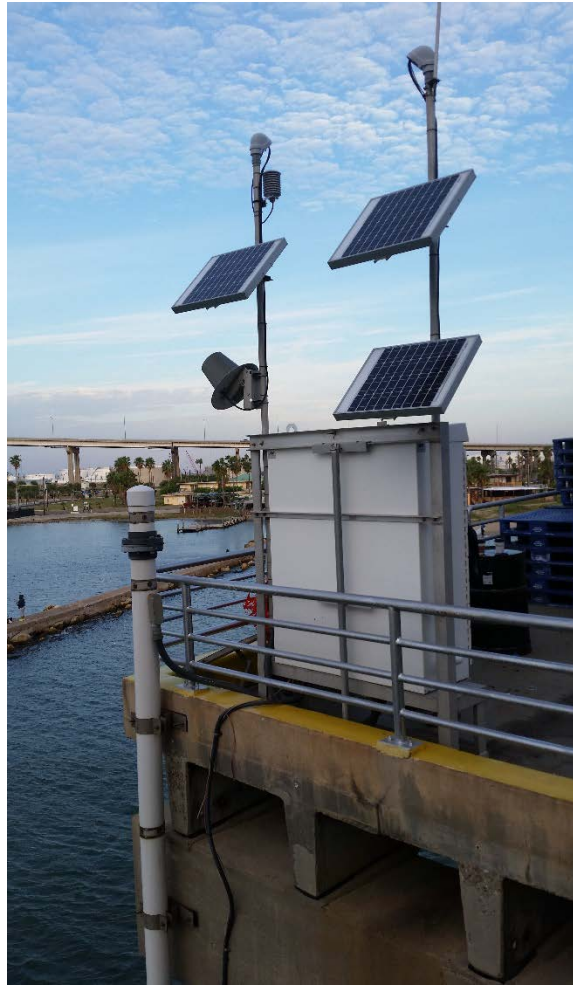
**Port Aransas**



# TCOON Stations & Benchmarks



Port Mansfield



USS Lexington



Example of benchmark



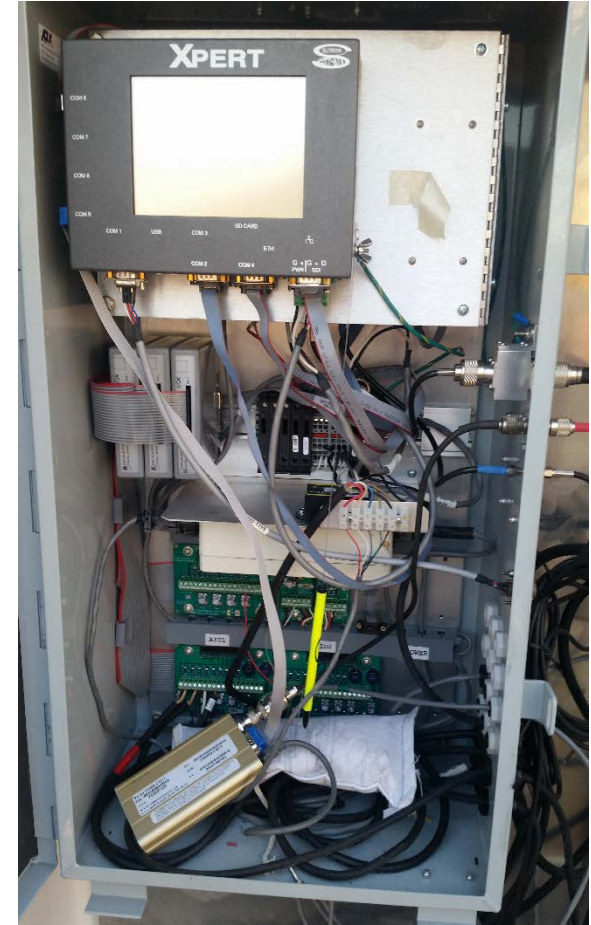
# Water Level Technology



Microwave Water Level Sensor



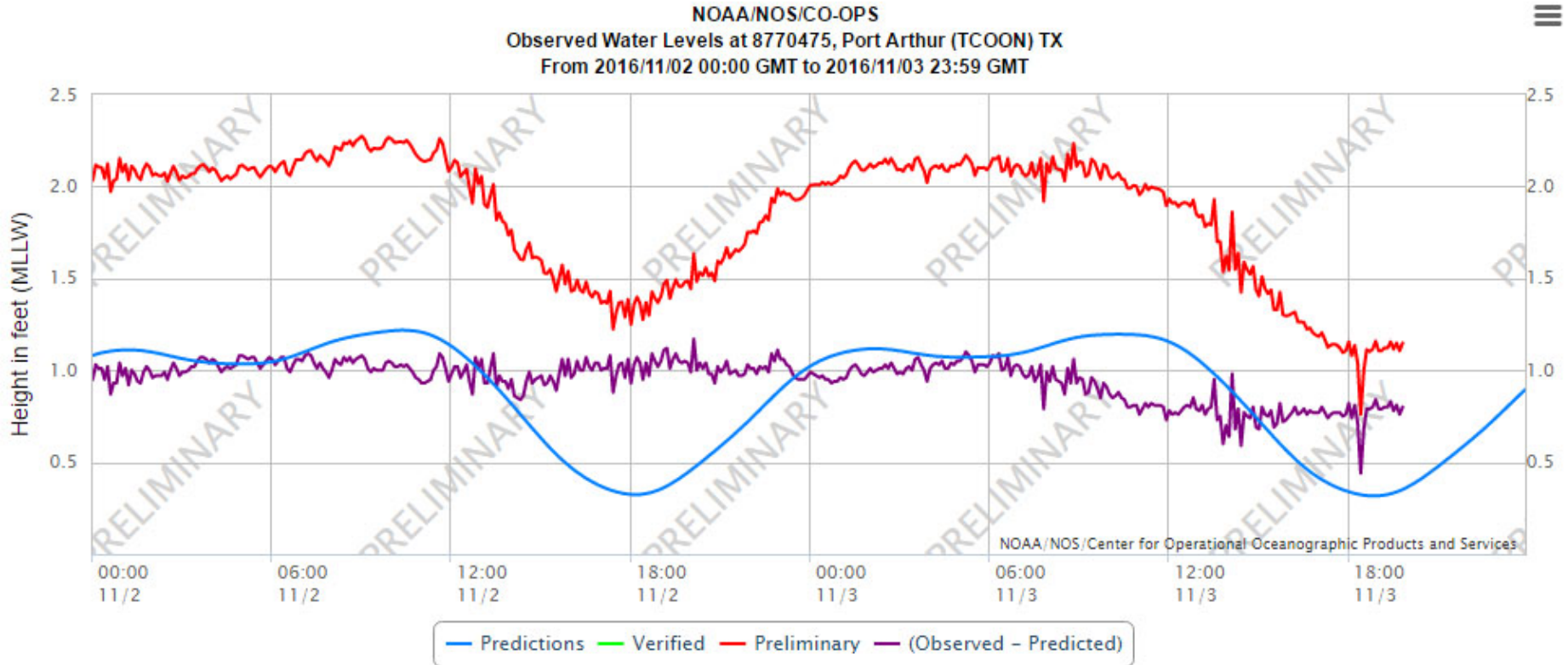
Aquatrak Acoustic Sensor



Data Collection Platform



# Water Level Data Display



**NOTICE:** These data and associated tidal datums are derived from the Texas Coastal Ocean Observation Network (TCOON), a state-wide coastal observing system. Leveling information used to verify vertical positioning for navigational purposes may not meet NOS standards. Subsequent review of these data based upon field inspections may result in revisions. Data users are cautioned before using these data for critical decisions such as those that concern physical or public safety.





# PORTS® in Texas





# PORTS<sup>®</sup> in Texas

**LEGEND**

- Water Levels Only
- Met Only
- Water Levels and Met
- Currents
- Wave Buoys

**FILTER PRODUCTS**

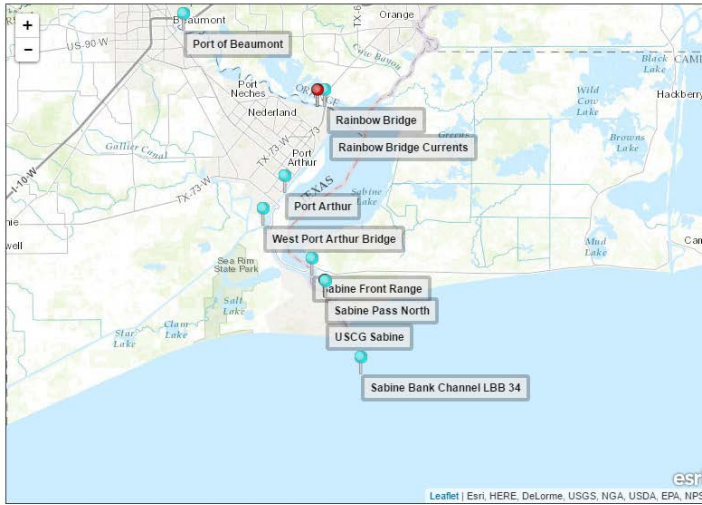
All Products

**SHOW DATA**

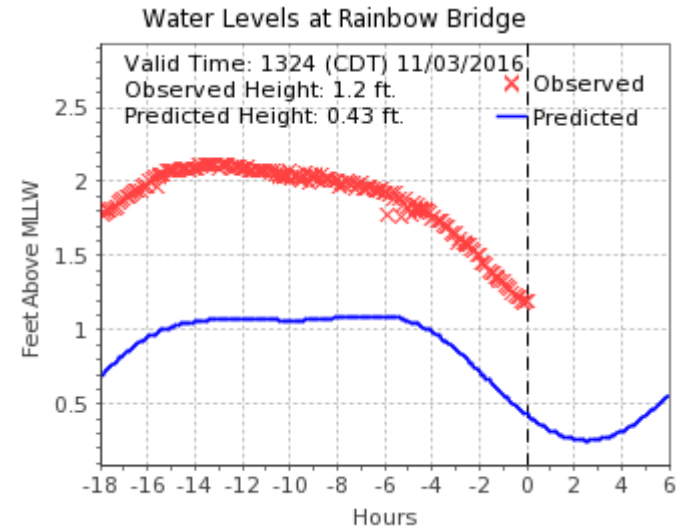
None

**STATIONS**

- Port Arthur
- Port of Beaumont
- Rainbow Bridge
- Rainbow Bridge Currents
- Sabine Bank Channel LBB 34
- Sabine Front Range
- Sabine Pass North
- USCG Sabine



## Sabine Neches PORTS<sup>®</sup>



**LEGEND**

- Water Levels Only
- Met Only
- Water Levels and Met
- Currents
- Wave Buoys

**FILTER PRODUCTS**

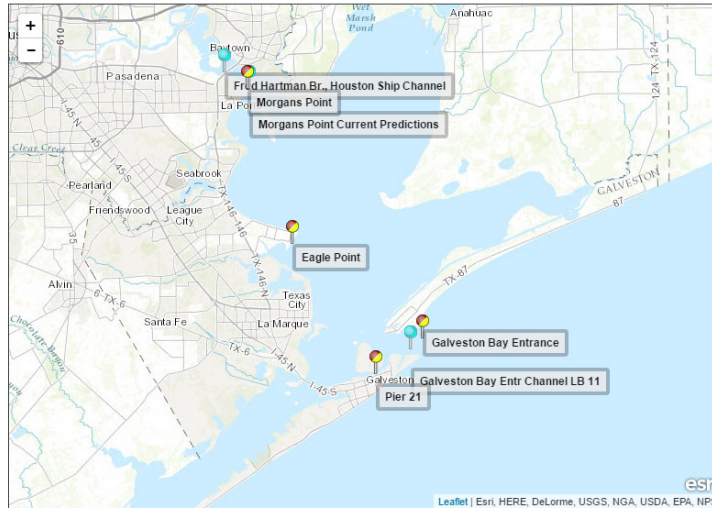
All Products

**SHOW DATA**

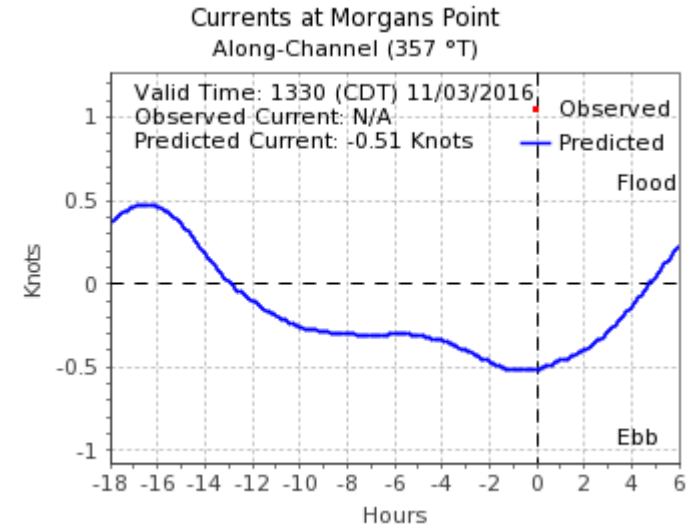
None

**STATIONS**

- Eagle Point
- Fred Hartman Br., Houston Ship Channel
- Galveston Bay Entr Channel LB 11
- Galveston Bay Entrance
- Morgans Point
- Morgans Point Current Predictions
- Pier 21

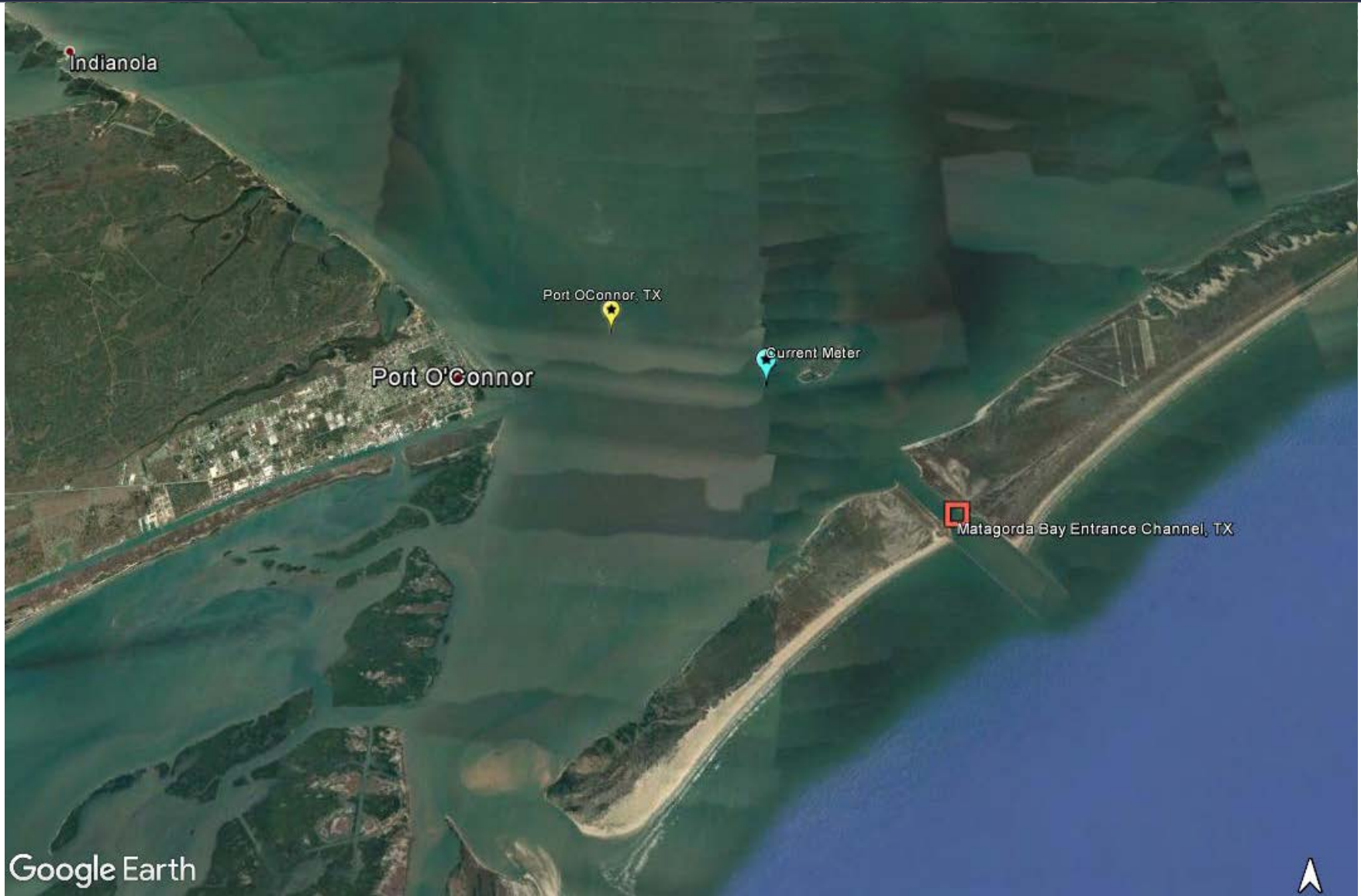


## Houston/Galveston PORTS<sup>®</sup>





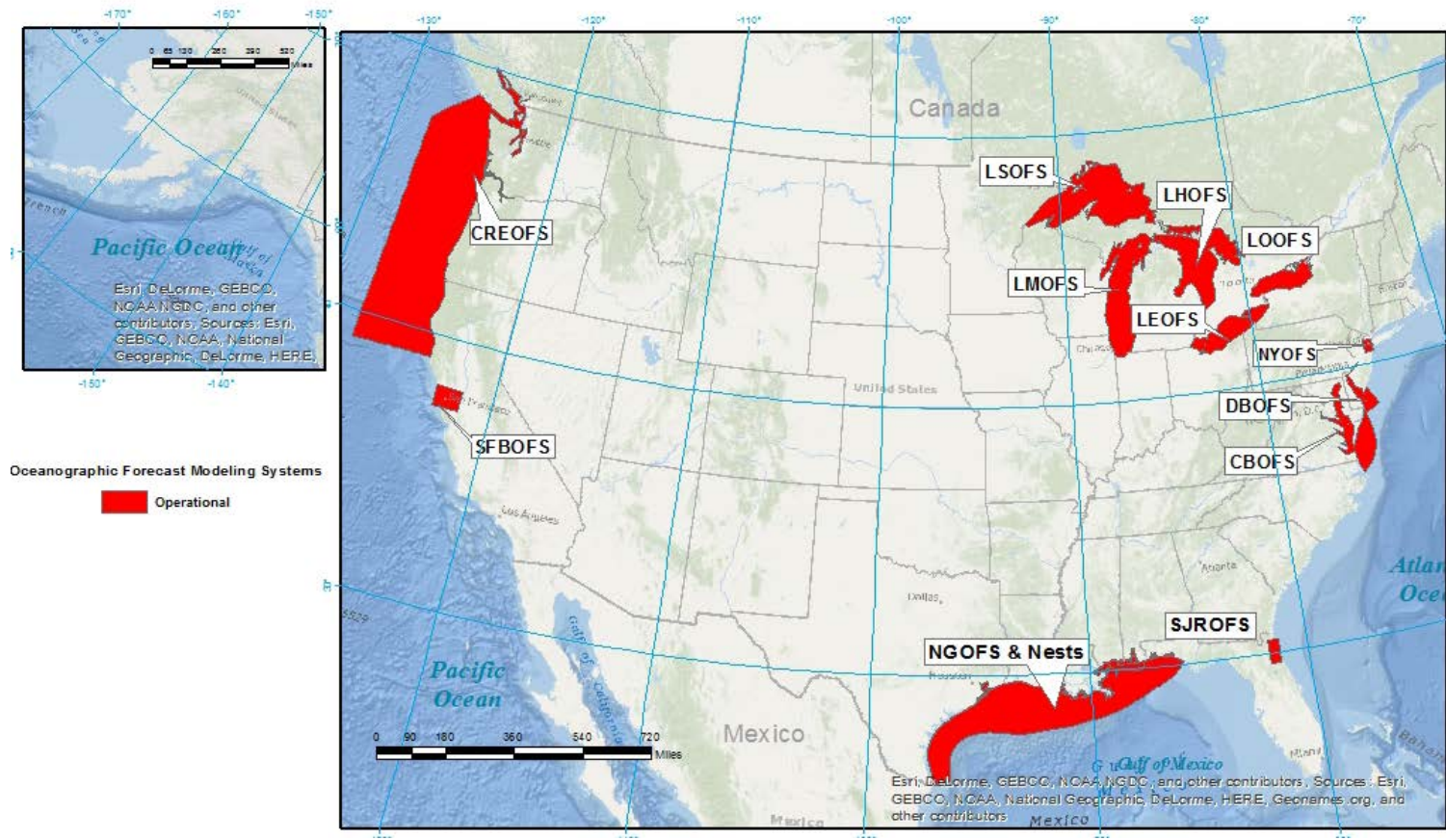
# Matagorda PORTS<sup>®</sup> Current Meter





# Modeling Coverage

**Operational Forecast System:** nowcast and forecast oceanographic and meteorological information to mariners

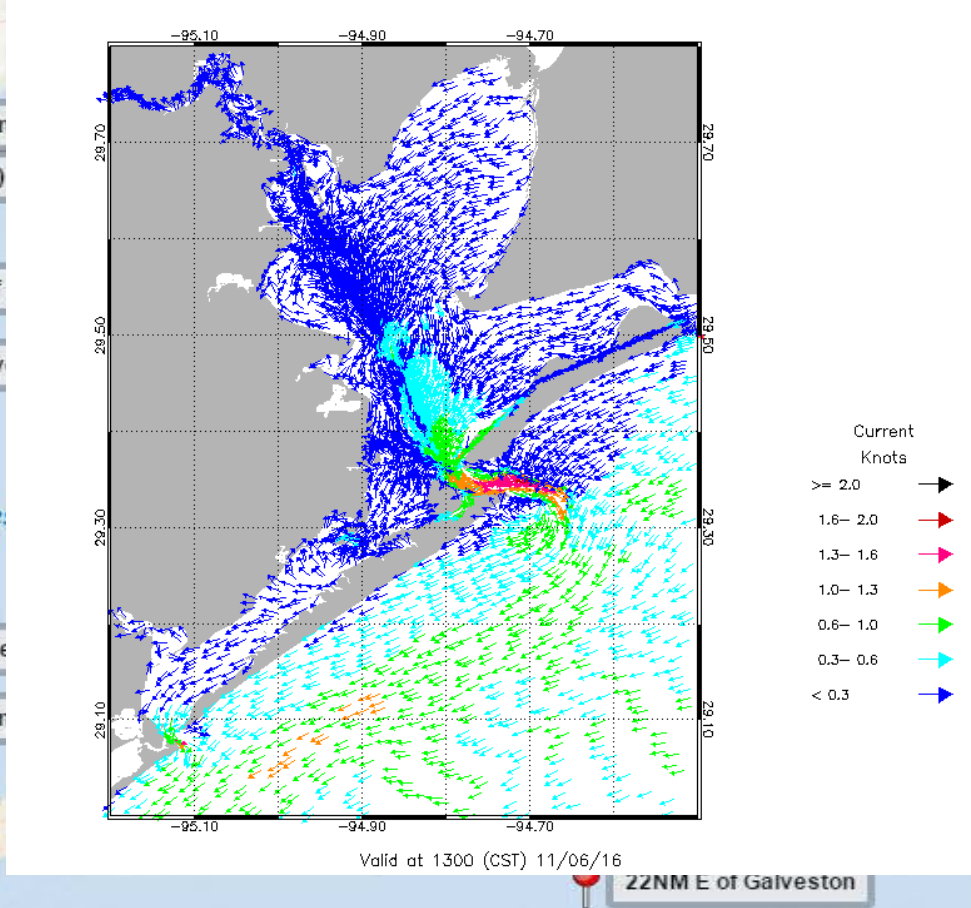
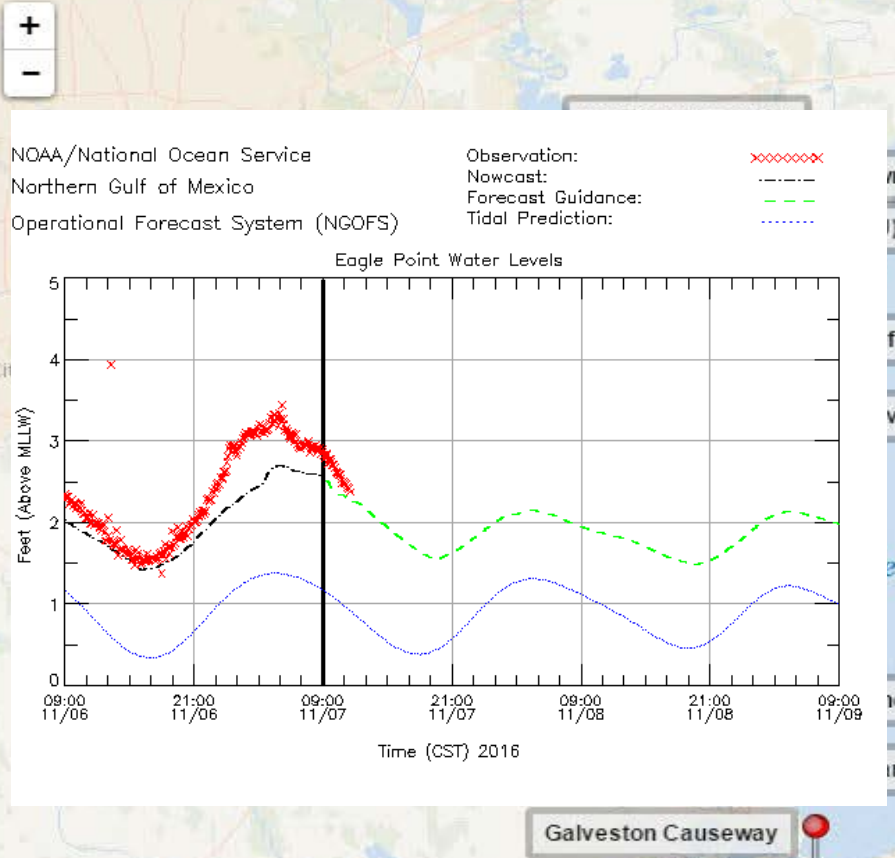




# Modeling Coverage

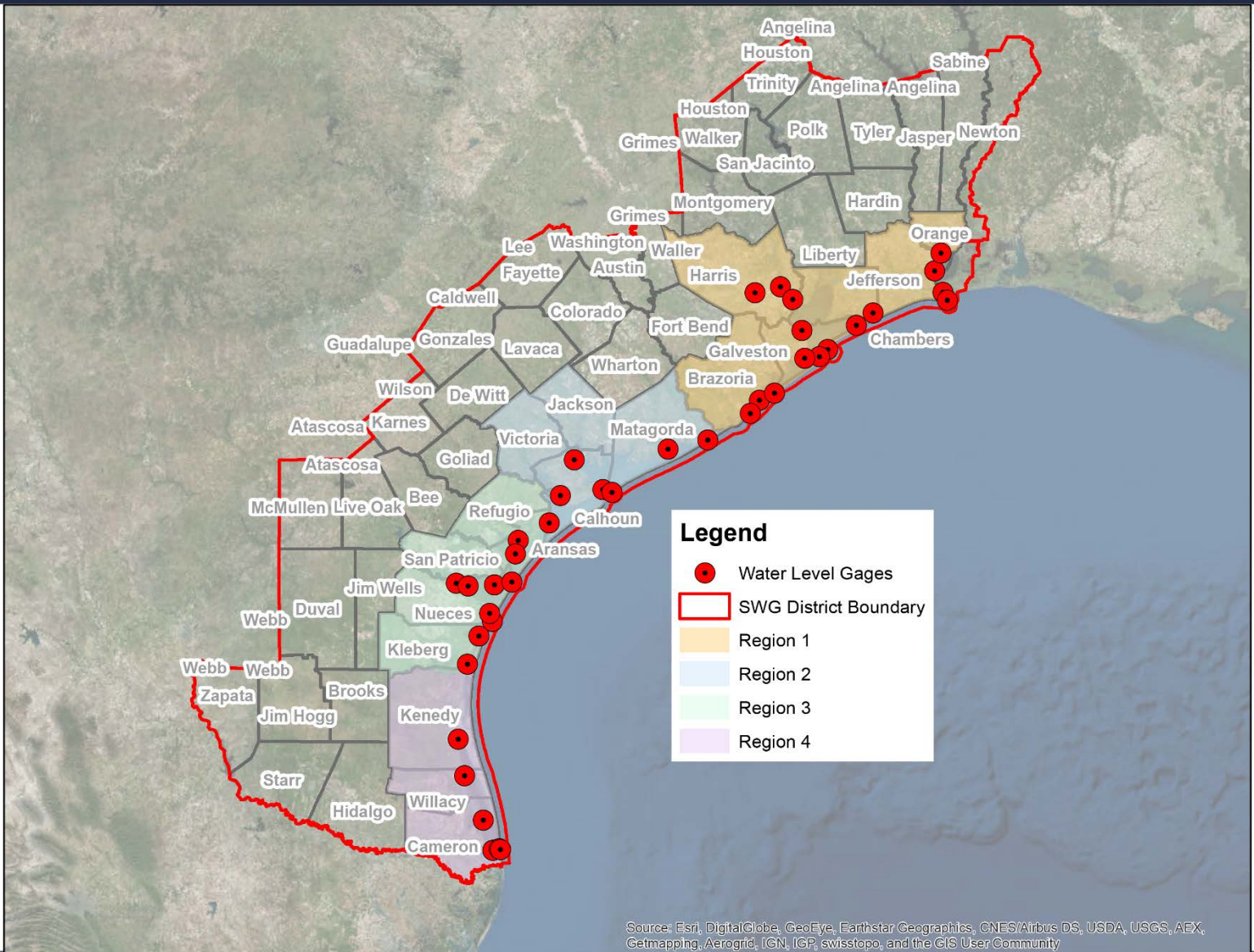
## NGOFS - Galveston Bay

(Please click on the map pins below to access the time series plots)





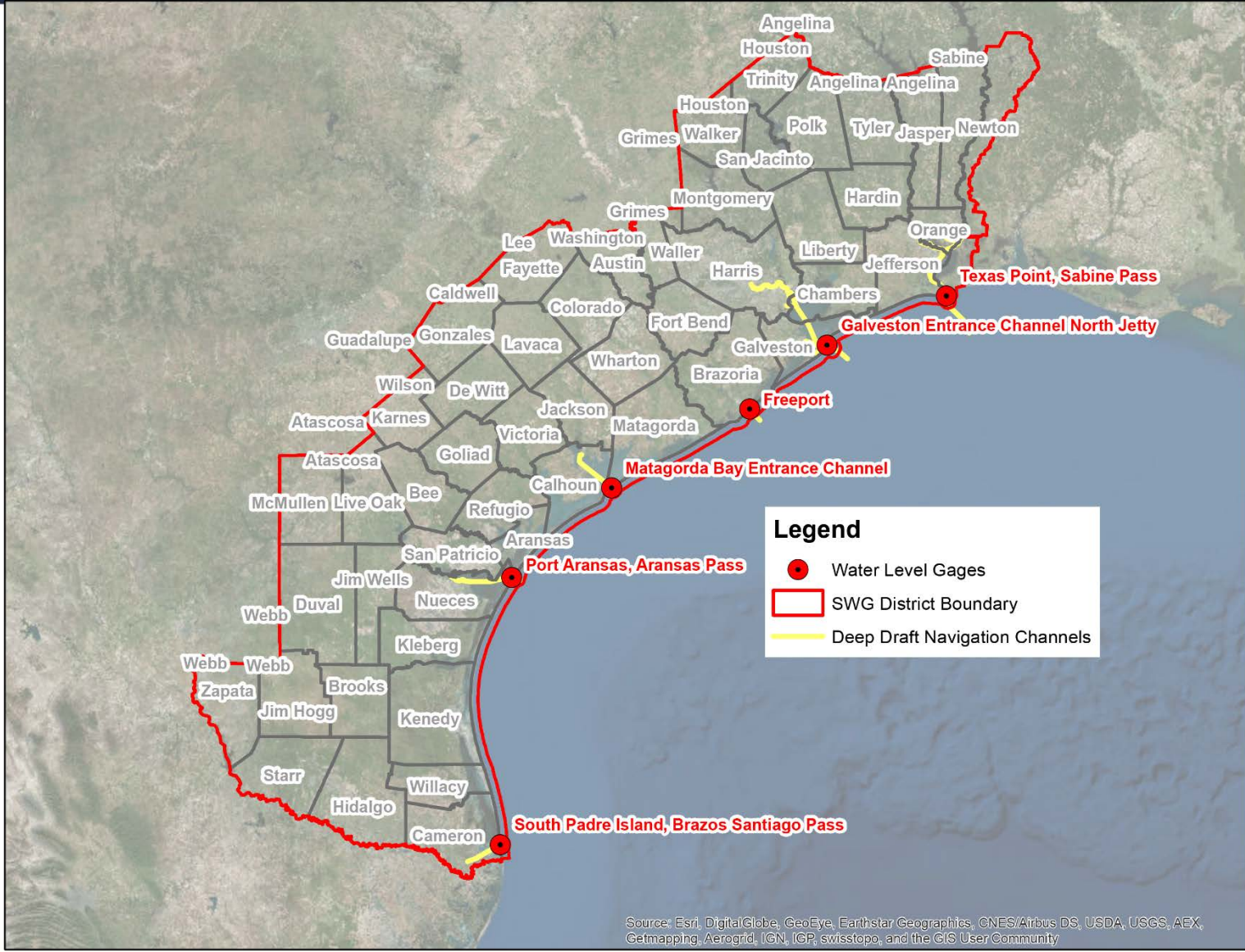
# USACE in Coastal Texas



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



# USACE Deep Draft Channels



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



# Summary: Benefits of Partnership

- A unique partnership
- Reliable, accurate and timely data
- High impact, high benefit
- Multiple societal benefits



# Questions?



[www.tidesandcurrents.noaa.gov](http://www.tidesandcurrents.noaa.gov)