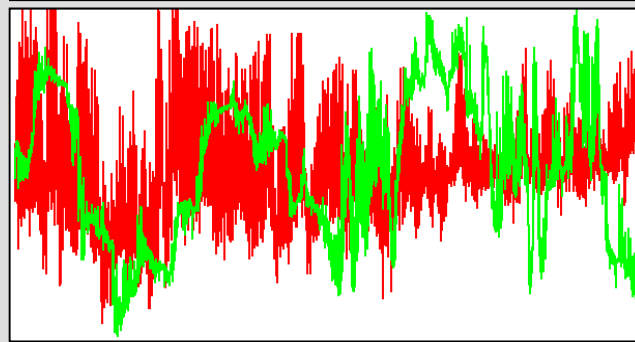


# Land/Ocean Biogeochemical Observatories (LOBO) for Intensive, Real-time Water Quality Sampling in the IRL



**M. Dennis Hanisak**  
**Florida Clam Industry Workshop**  
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**HARBOR BRANCH**

FLORIDA ATLANTIC UNIVERSITY®

# Critical Issues Facing the IRL & SLE

- Excessive freshwater release
- Degradation of water quality
- Contaminant loading
- Loss of habitat
- Decline of fisheries
- Emerging diseases in marine mammals



# Land/Ocean Biogeochemical Observatories (LOBOs)

Establishing a network of advanced observing stations

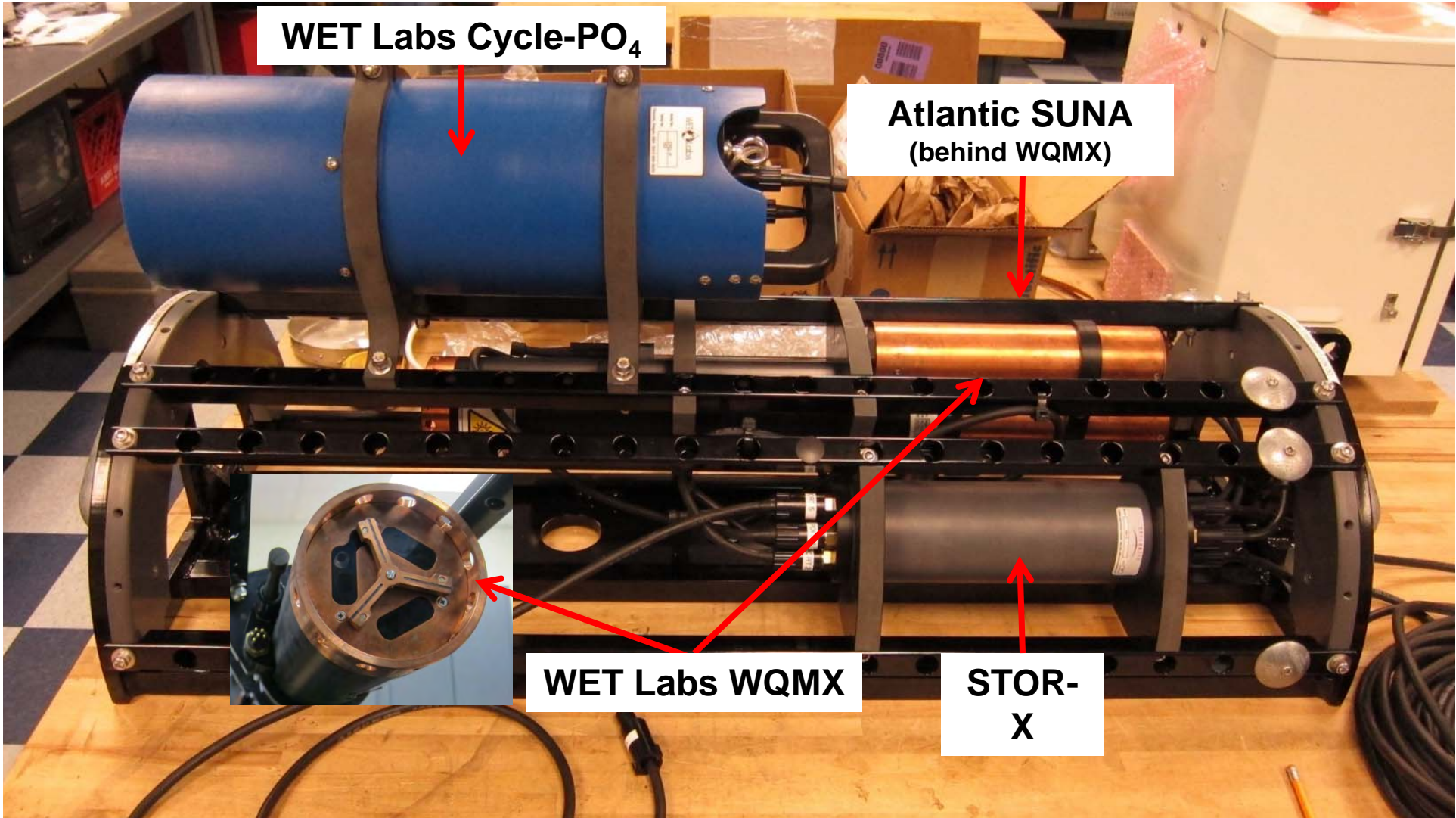


# **LOBO Overview**

**Launch a LOBO estuarine observation and prediction network in the IRL that will provide real-time, high-accuracy and high-resolution water quality data through a dedicated interactive website**

**High-resolution measurements for:**

- **Temperature**
- **Salinity**
- **Depth**
- **Current speed and direction**
- **Dissolved oxygen**
- **Turbidity**
- **Chromophoric dissolved organic matter (water color)**
- **Chlorophyll *a***
- **Nitrate**
- **Phosphate**

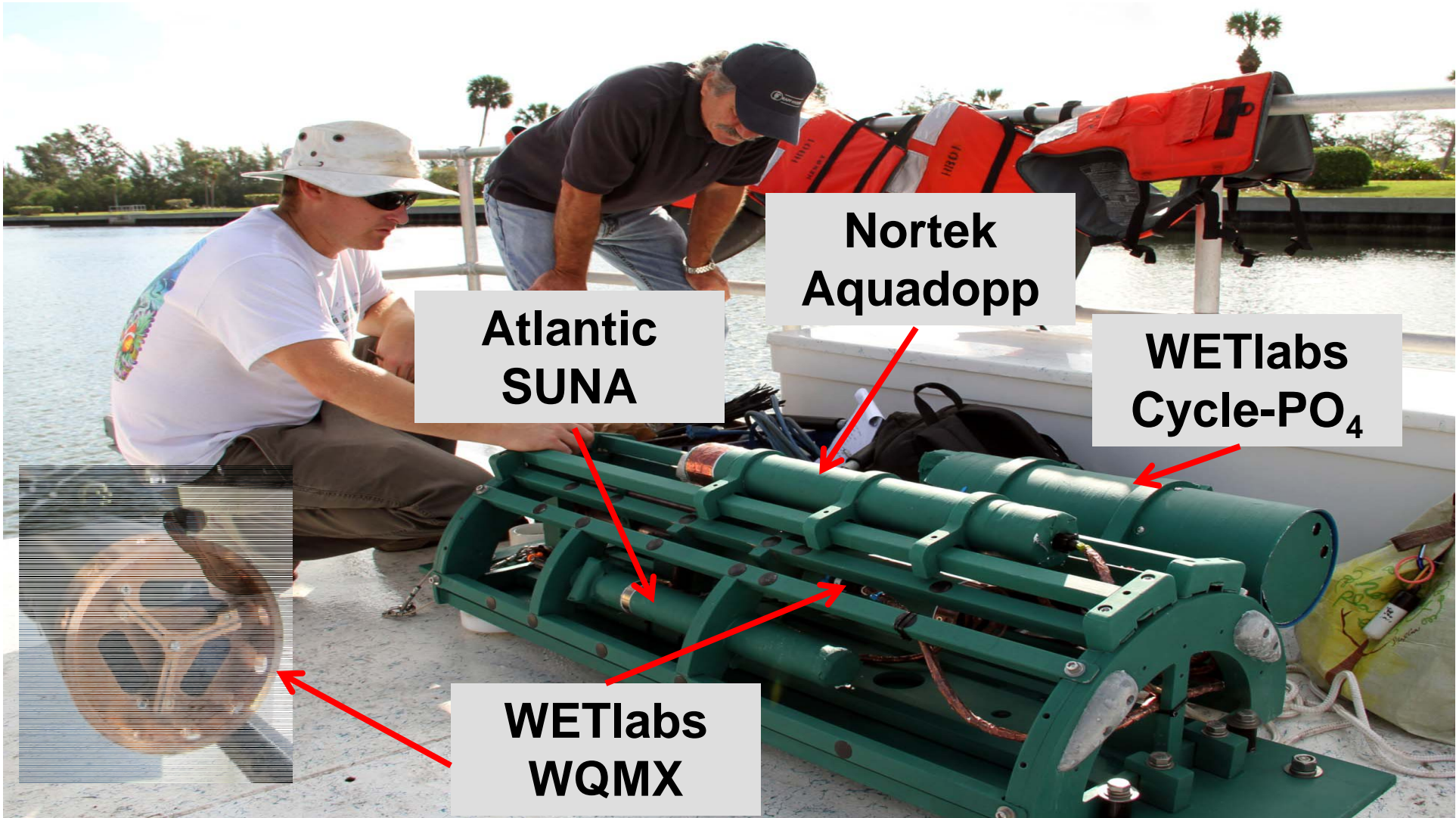


**WET Labs Cycle-PO<sub>4</sub>**

**Atlantic SUNA  
(behind WQM)**

**WET Labs WQM**

**STOR-  
X**



**Atlantic  
SUNA**

**Nortek  
Aquadopp**

**WETlabs  
Cycle-PO<sub>4</sub>**

**WETlabs  
WQMX**







# Data Access

<http://fau.loboviz.com/>

Continuous real-time, high-accuracy and high-resolution observatory data available to all through a dedicated interactive website to better quantify and model relationships between environmental factors and biological processes in the IRL





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**Latest**

Weather LOBO Site 1 Link Port  
2014-07-19 10:00:00 EST

Air Temperature	28.8 °C 83.8 °F
Barometric Pressure	1018.0 mbar 30.1 inHg
Humidity	71.7 %
Rain	0.0 mm/h 0.0 in/h
PAR (Light)	1310.0 µmol/m <sup>2</sup> /s
Wind Direction	23.4 ° NNE
Wind Gust	2.7 m/s 6.1 mph
Wind Speed	1.2 m/s 2.7 mph

LOBO Site 1 Link Port  
2014-07-19 10:00:00 EST

Temperature	30.26 °C 86.46 °F
Salinity	26.06 PSU
Dissolved Oxygen	5.51 mg/l
O <sub>2</sub> % Saturation	84.74 %
Turbidity	2.70 NTU
CDOM (Water Color)	37.52 QSDE
Chlorophyll a	3.22 µg/L
Nitrate Concentration	5.6 µM 0.079 mg/L
Phosphate Concentration	0.59 µM 0.018 mg/l
Depth (Instrument)	1.625 m 5.33 ft
Current Direction	105.6 ° ESE
Current Speed	201.4 m m/s 0.66 ft/s

**FAU Harbor Branch Indian River Lagoon Observatory**



The Indian River Lagoon is situated along 156 miles of Florida coast. The Indian River Lagoon Observatory (IRLO) Program was established by FAU's Harbor Branch to facilitate research as a long-term, multi-disciplinary, ecosystem-based approach to monitoring and studying one of Florida's most significant assets.

The Land/Ocean Biogeochemical Observatory (LOBO) network enables researchers to follow environmental changes in the IRL, assist resource and planning managers to make informed decisions, model and correlate environmental data to biological, chemical and physical phenomena, and contribute to education and public outreach on the lagoon. LOBO 1 is located in the IRL near the mouth of the Harbor Branch Channel (Link Port).

**Configuration**

Manufacturer	Instrument	Measurements
Satlantic	LOBO	Power distribution Sensor control Wireless communication Data management
Satlantic	SUNA Nitrate	Nitrate Concentration
WET Labs	WQMX Water	Salinity, Temperature, Dissolved

27° 32' N 80° 21' W

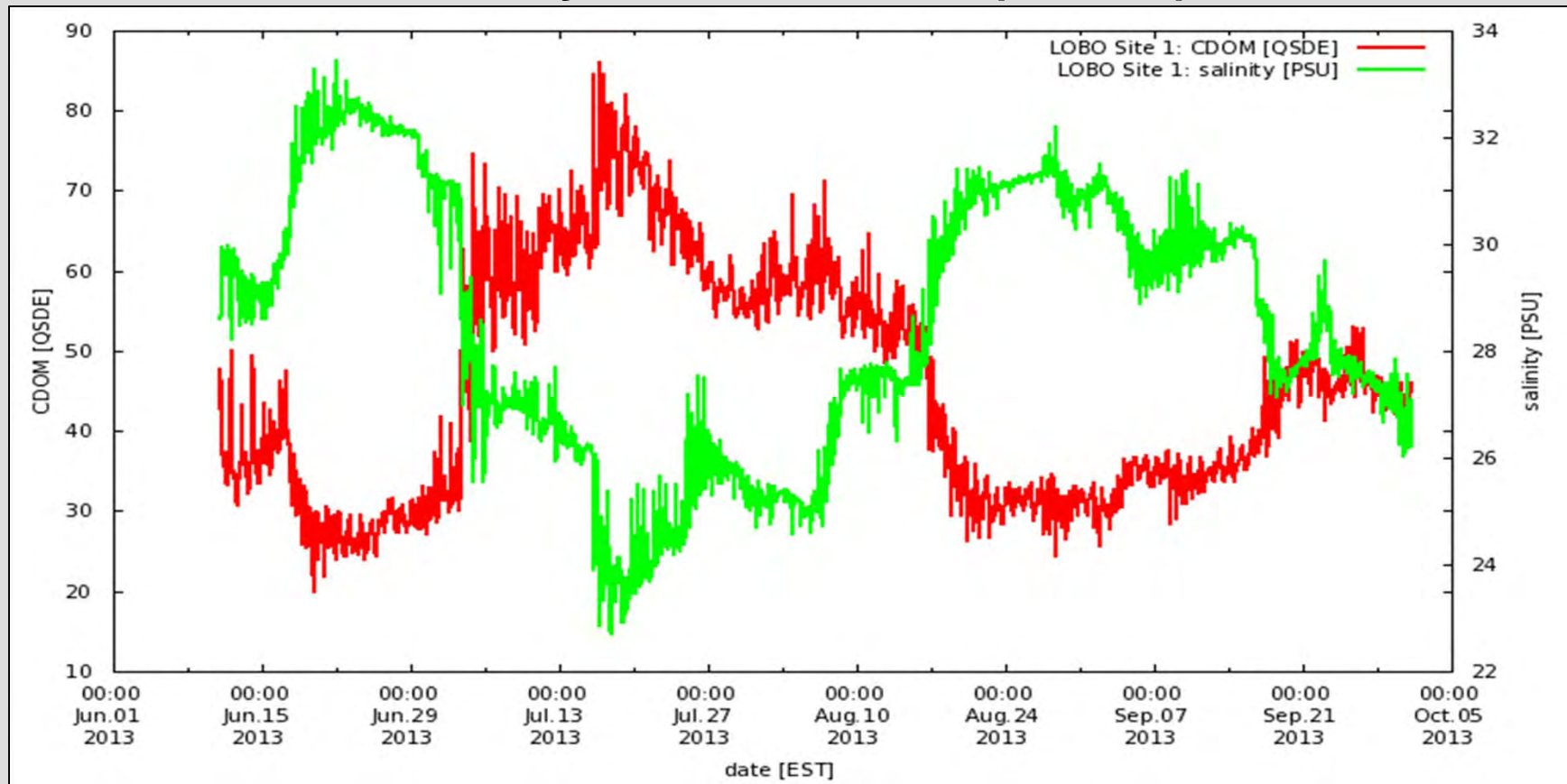


**Archived Data**  
Use **LOBoviz** to graph and download archived data from this LOBO node.

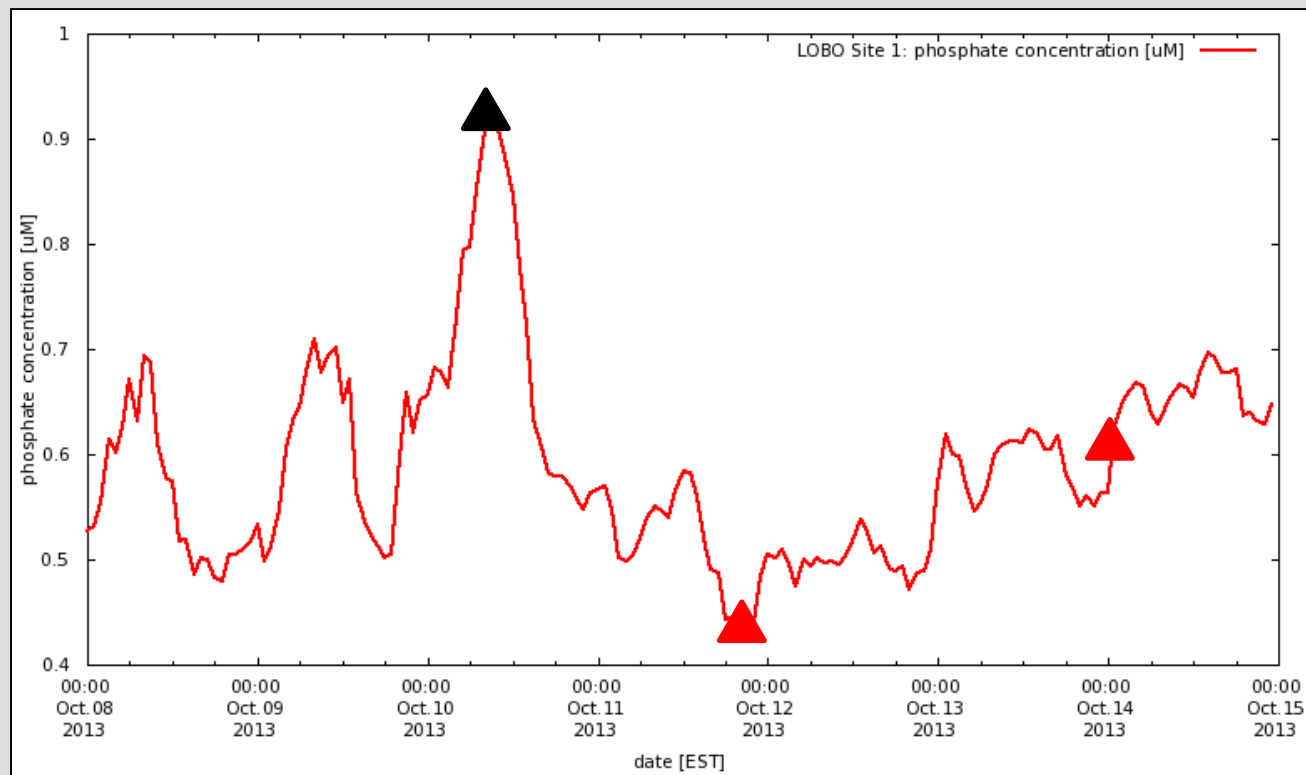


# LOBO Time Series

## Salinity & Water Color (CDOM)

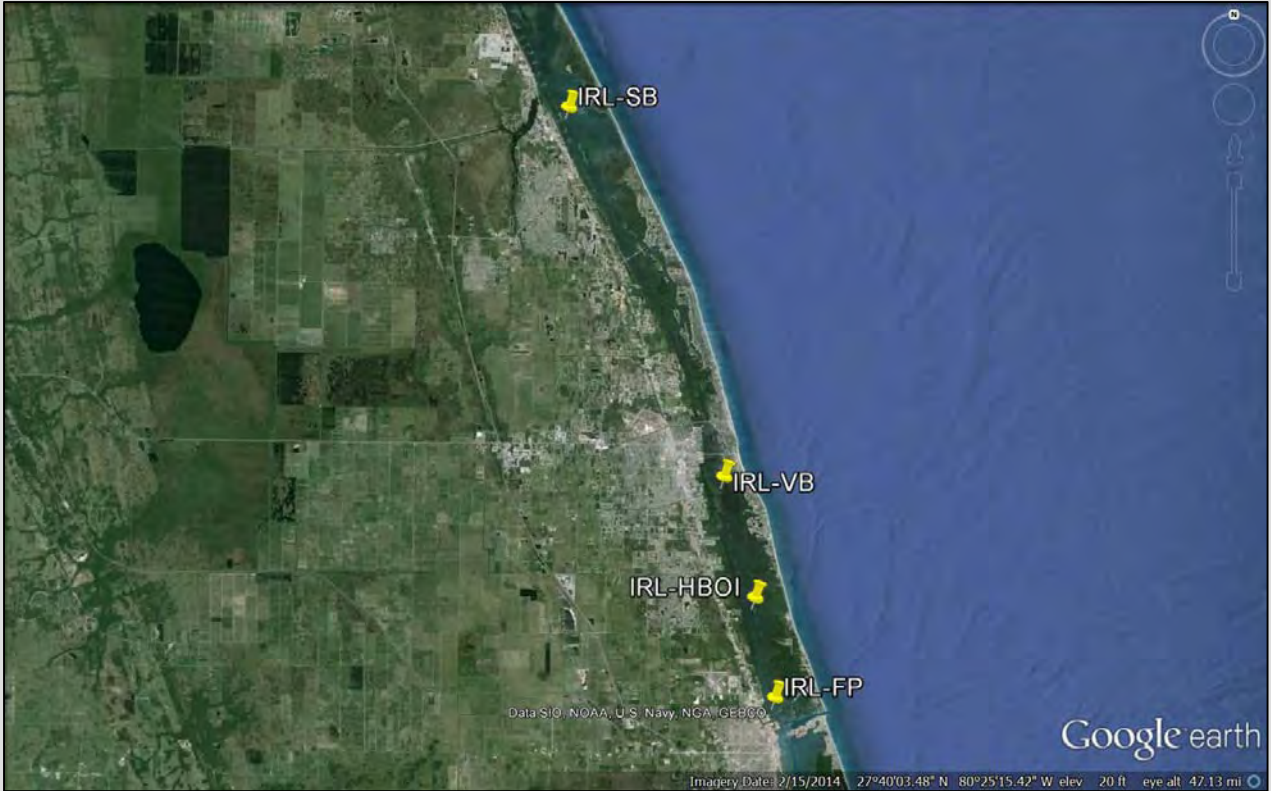
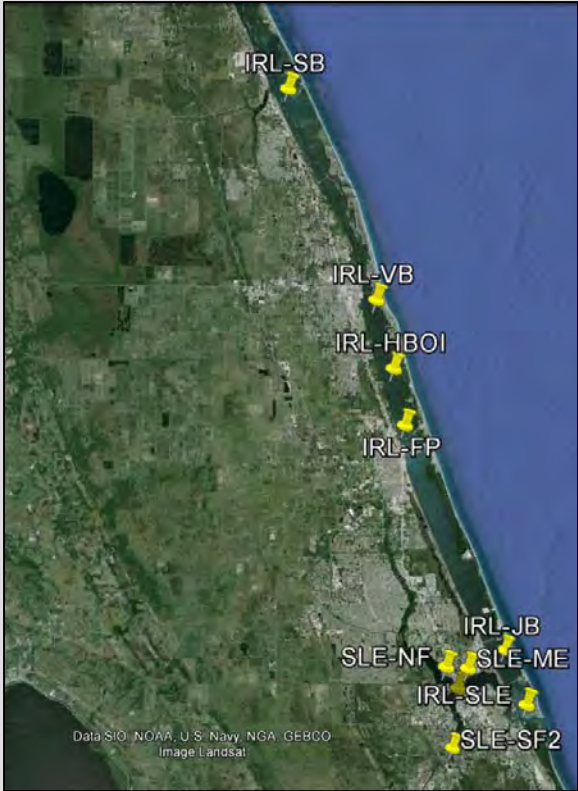


# LOBO Time Series

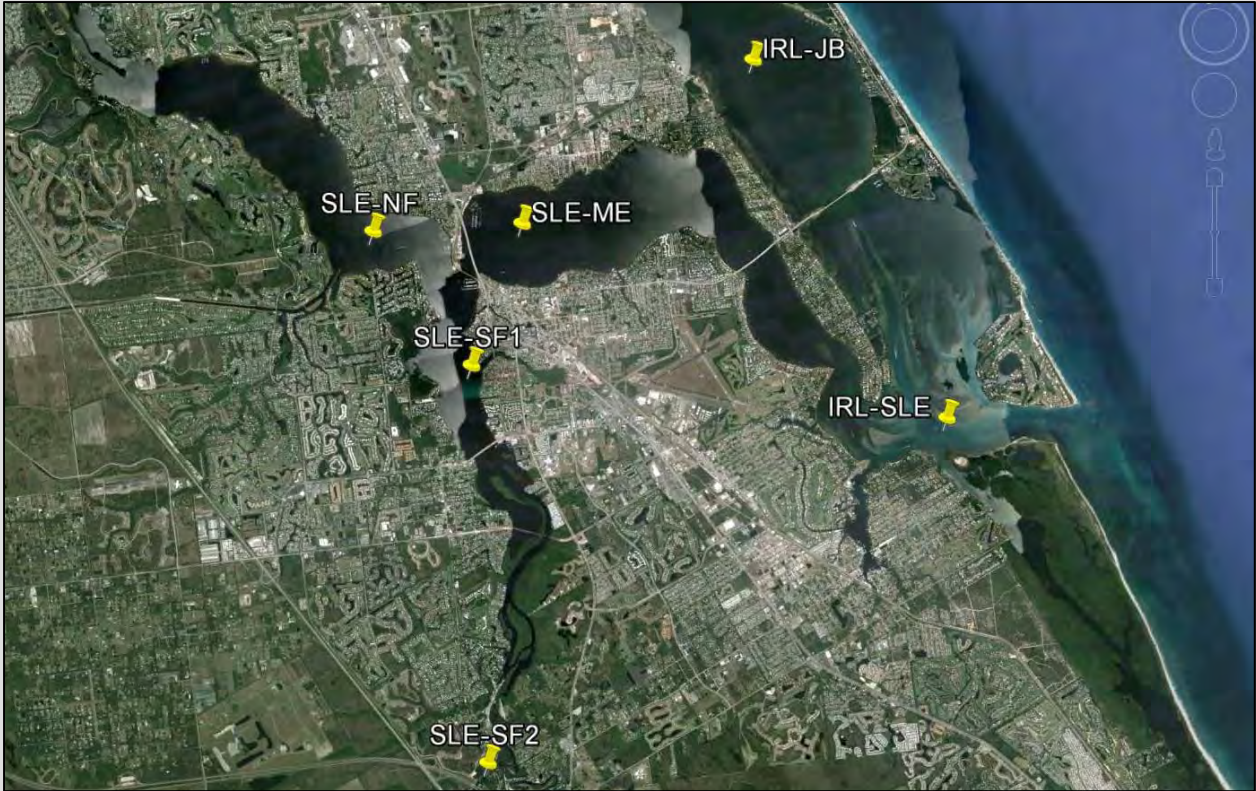
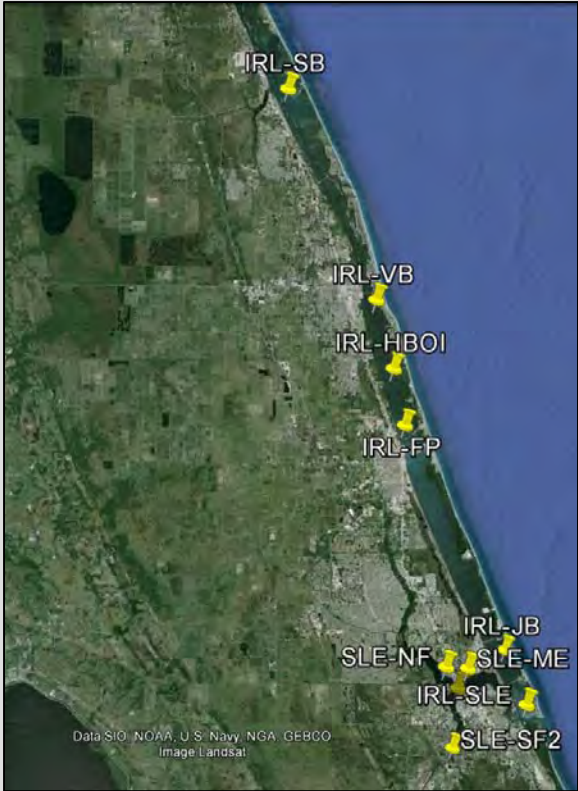


**High frequency monitoring provides much more data and captures events missed by discrete sampling**

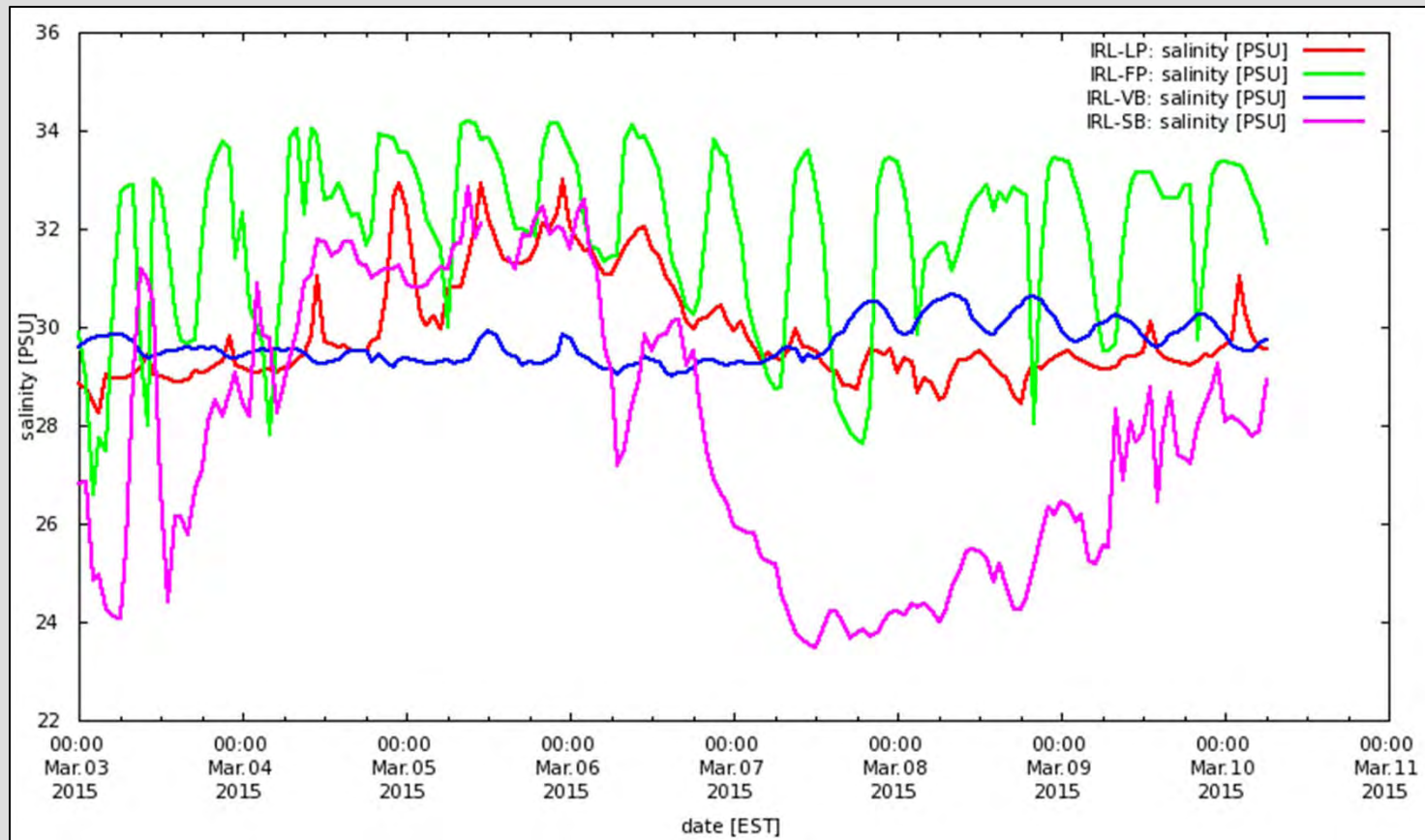
# LOBO Network



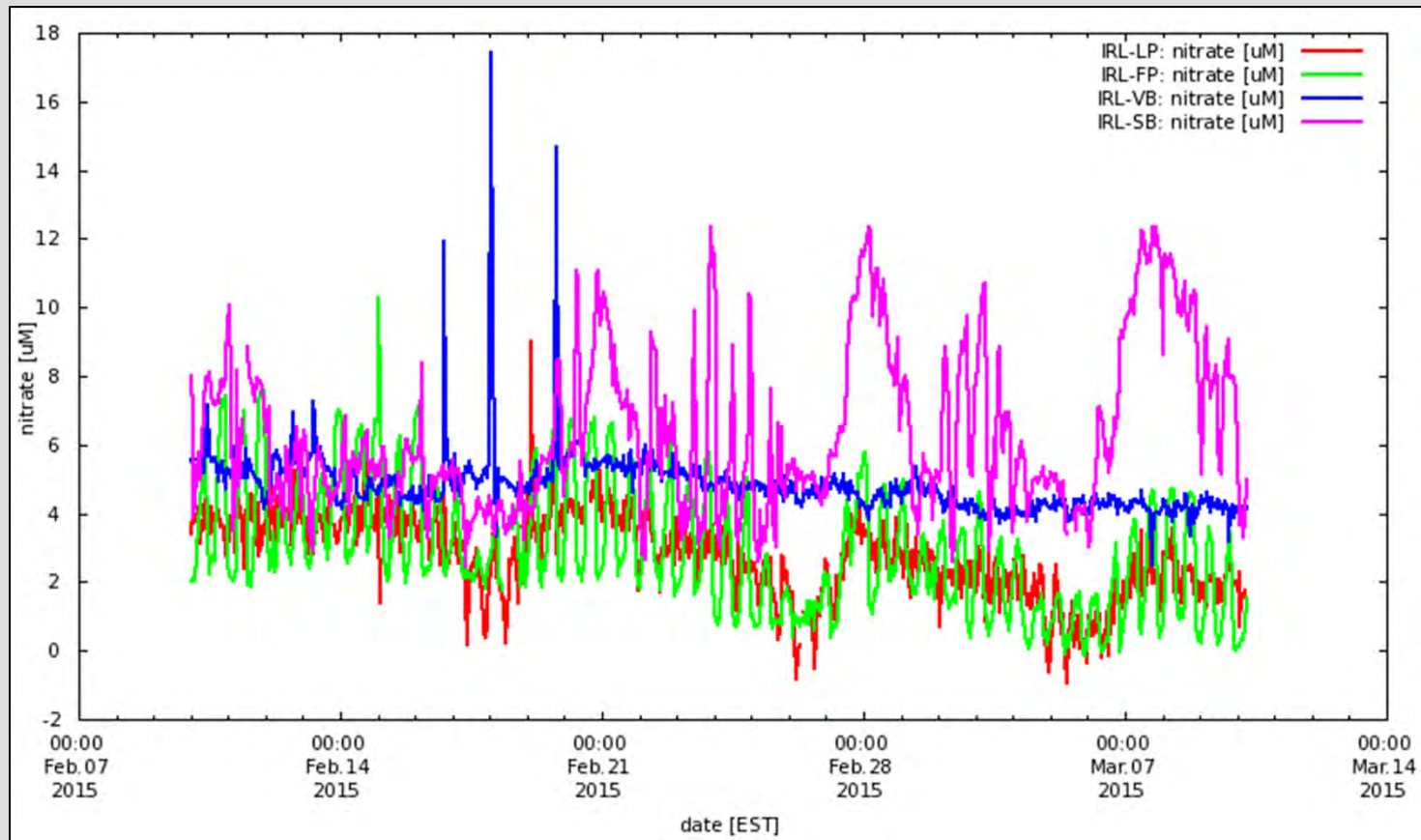
# LOBO Network



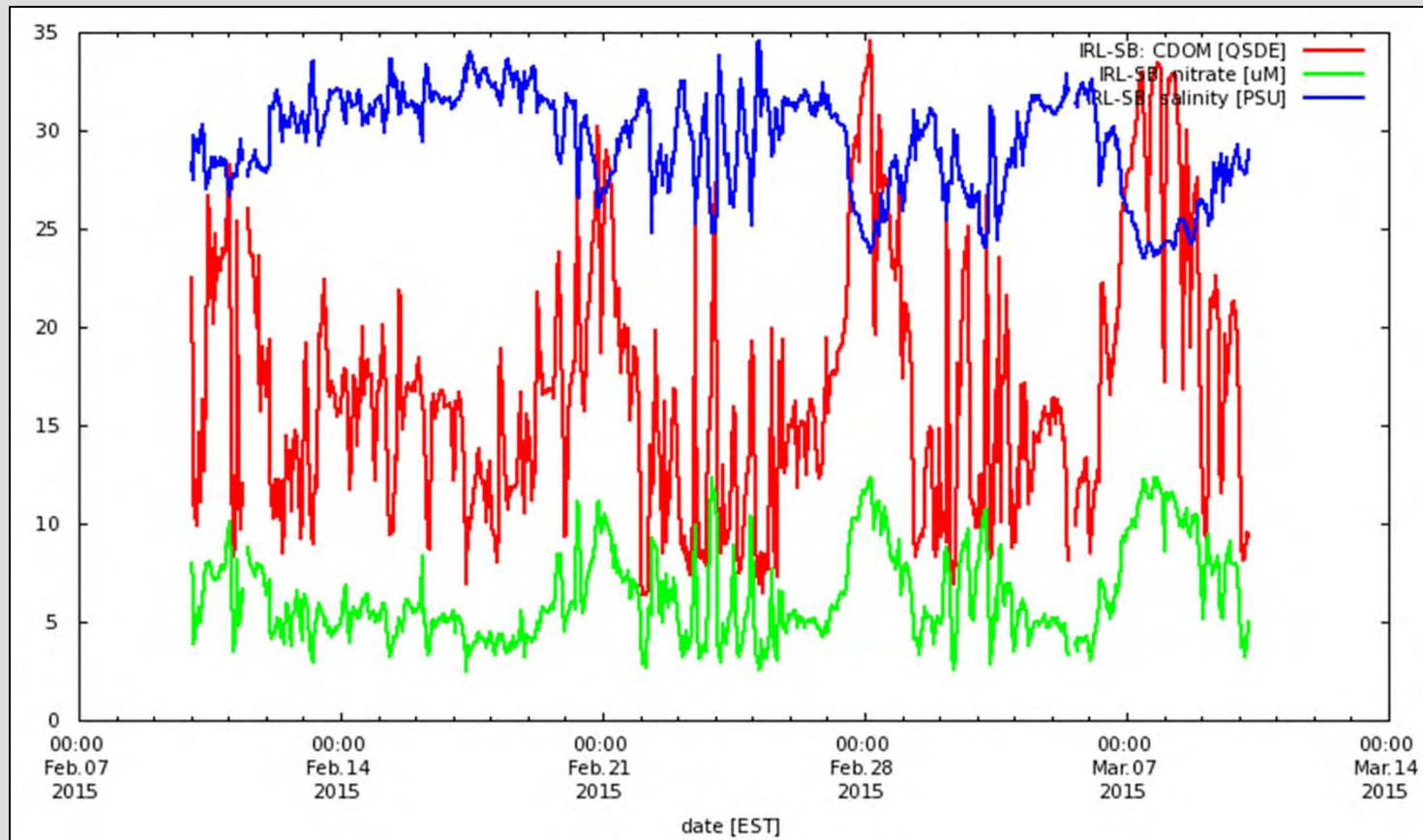
# Current Data – Just a Peak Salinity



# Current Data – Just a Peak Nitrate

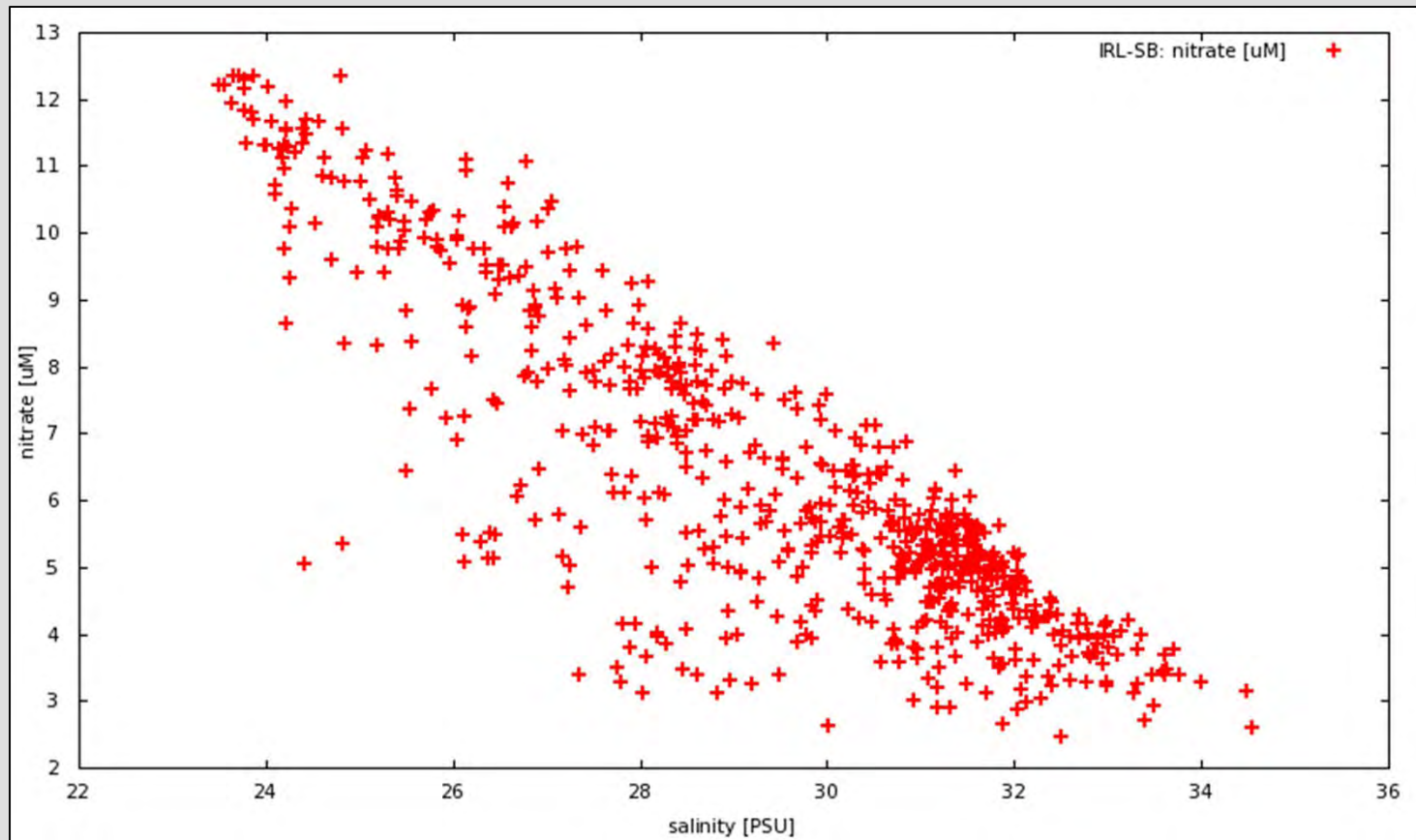


# Current Data – Just a Peak Sebastian Stations (SB)



# Current Data – Just a Peak

## Nitrate vs. Salinity





## **Questions to Address with LOBO Network**

- **How do freshwater discharges and watershed runoff impact water quality in the IRL and SLE?**
  - **What is the nutrient (nitrate, phosphate) load?**
  - **What is the impact on light attenuators (impact on seagrass)?**
  - **What is the relationship to algal blooms?**
- **How does water flowing from freshwater discharges impact water quality in the Indian River Lagoon?**
- **How does water from these freshwater discharges interact with oceanic water flowing through the inlets?**

## **LOBO – Benefits to IRL & SLE**

**LOBO technology will provide researchers, governmental agencies, students, and the public unprecedented IRL & SLE environmental data**

- Provide real-time environmental data via a publicly accessible website**
- Enable researchers to follow environmental changes in these estuaries and create the ability to do comparative studies on the east and west coasts of Florida**
- Assist resource and planning managers to make informed decisions for the good of the IRL & SLE**
- Model and correlate environmental data to biological, chemical, and physical phenomena of the IRL & SLE**
- Create a platform for education and outreach activities**

# Land/Ocean Biogeochemical Observatories (LOBOs)

Establishing a network of advanced observing stations

Stay Tuned!

IRLO/LOBO Contact:  
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