WATER CLARITY ASSESSMENT ALONG THE FLORIDA KEYS REEF TRACT USING OCEAN COLOR SATELLITE DATA

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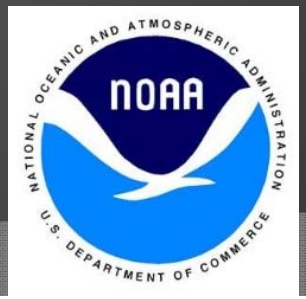
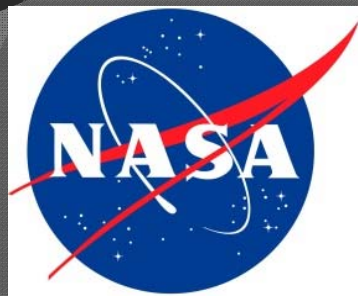
26 September 2012



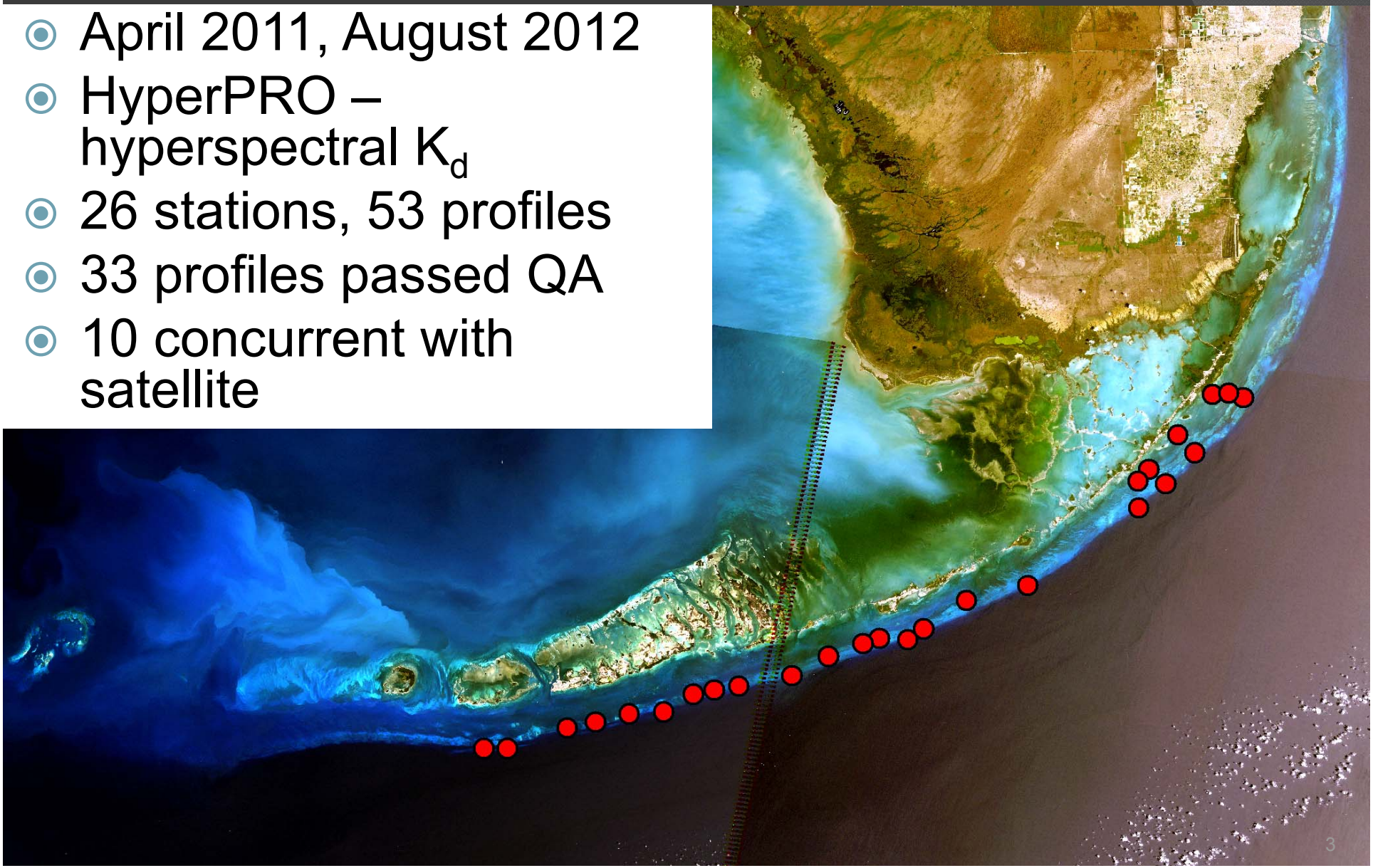


Objectives

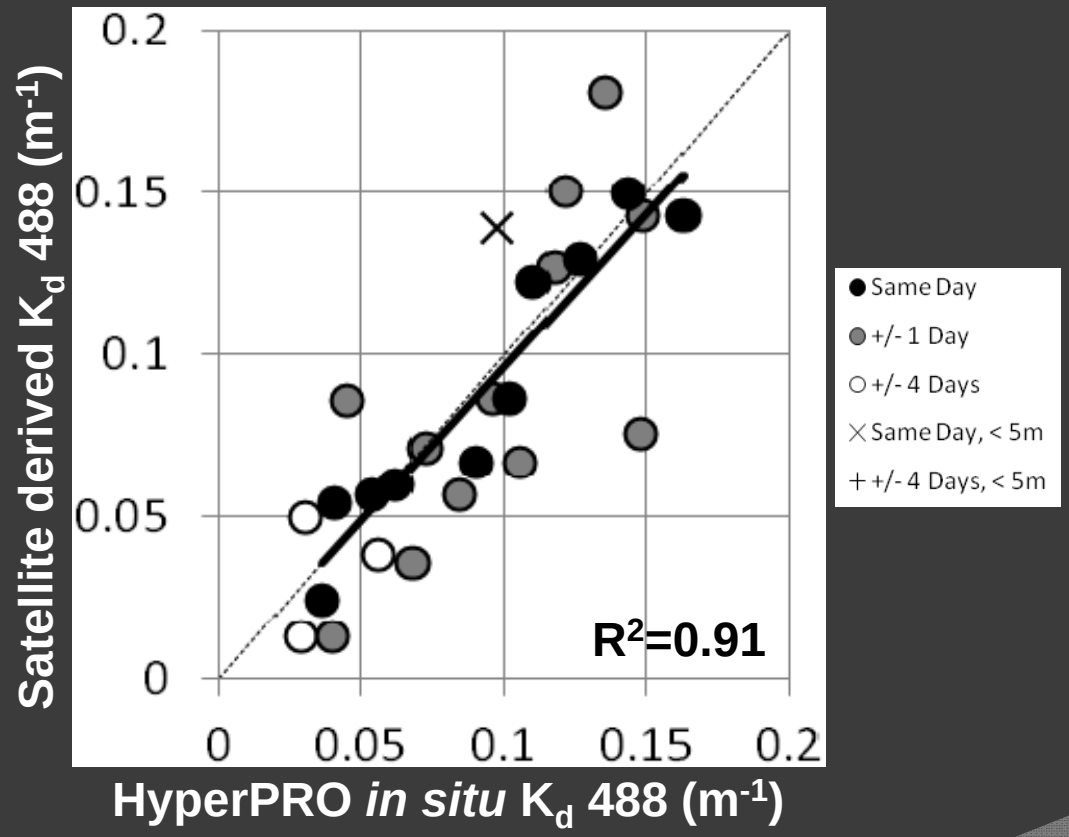
- Describe new satellite products
- Applications of satellite data products in FKNMS Rezoning Effort
  - Ecological Research and Monitoring (W.33)
  - Florida Bay influences (W.24)
  - Researching Water Quality Issues (W.32)
- Provide FKNMS with satellite data products
- Discussion
  - Assess utility of data products as part of FKNMS Rezoning Effort

In situ water clarity measurements

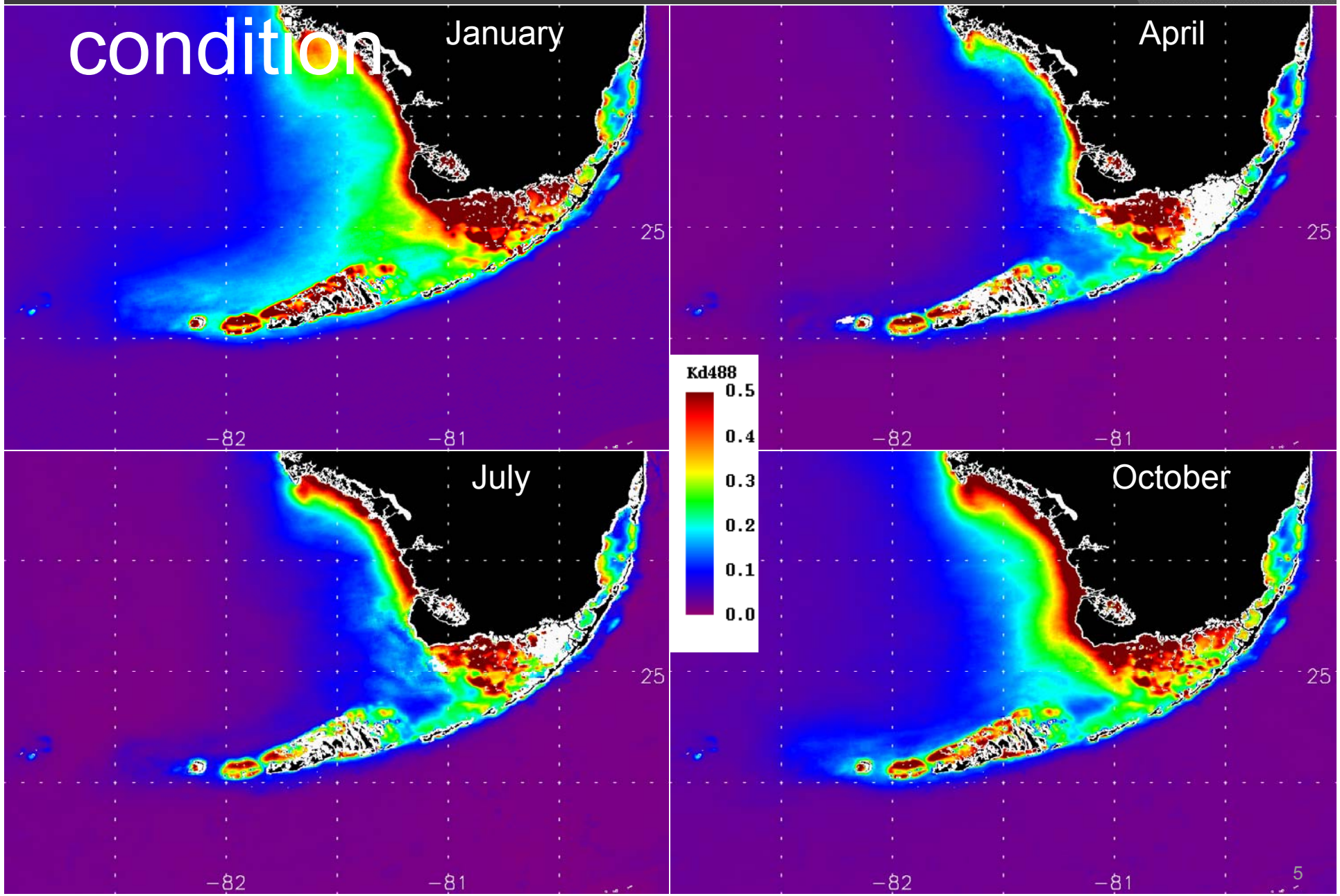
- April 2011, August 2012
- HyperPRO – hyperspectral K_d
- 26 stations, 53 profiles
- 33 profiles passed QA
- 10 concurrent with satellite



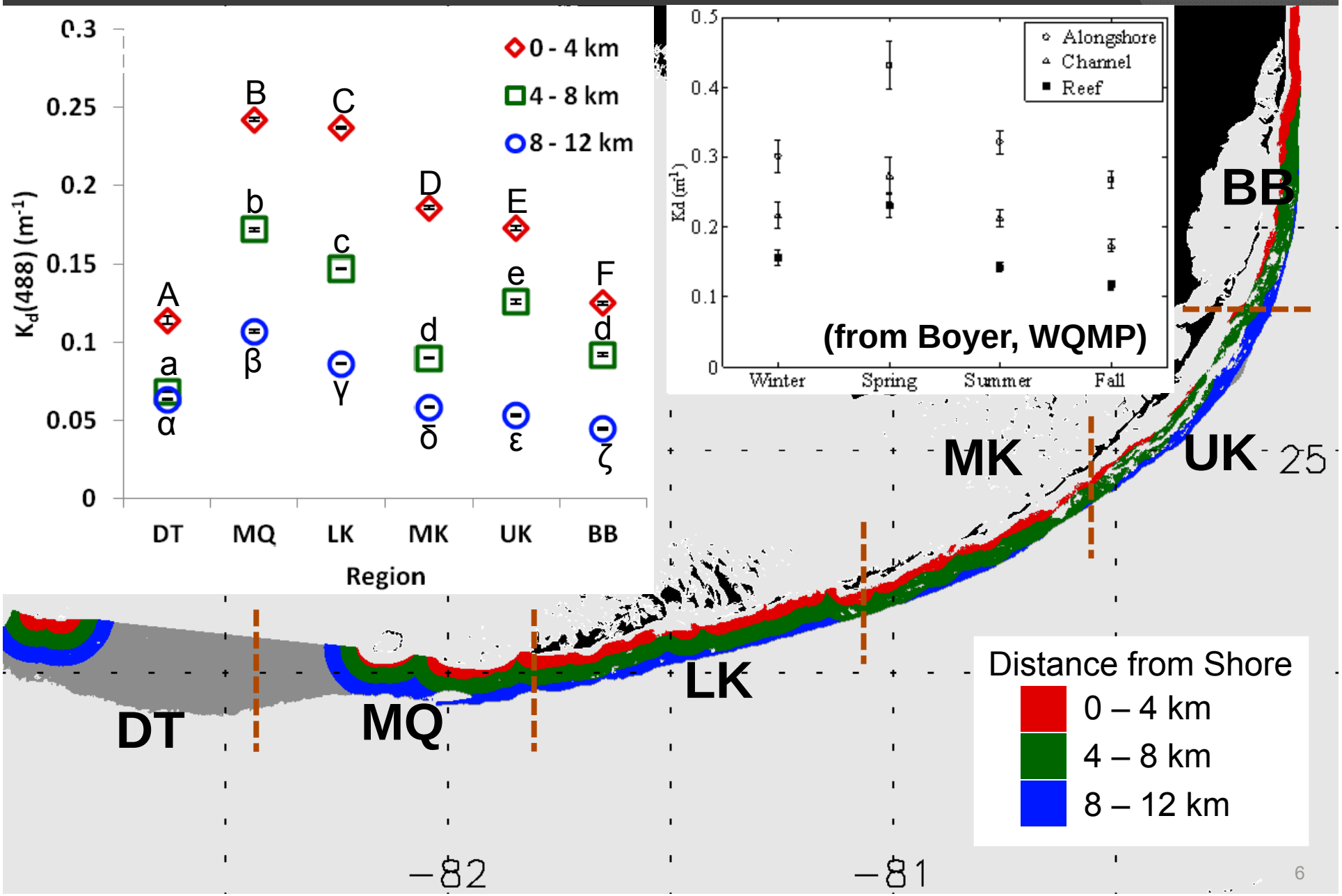
Validation of satellite water clarity



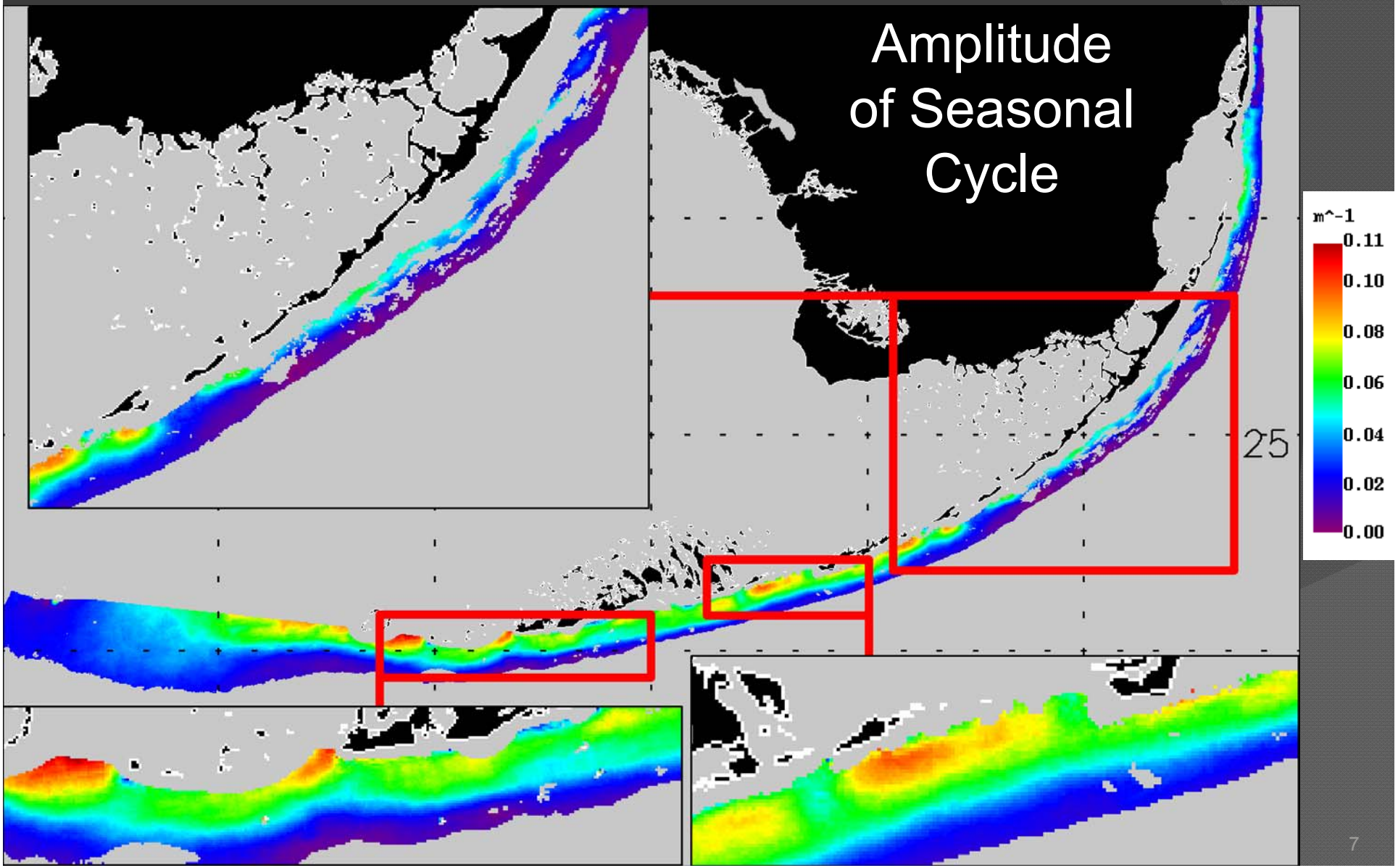
Status & Trends: average condition



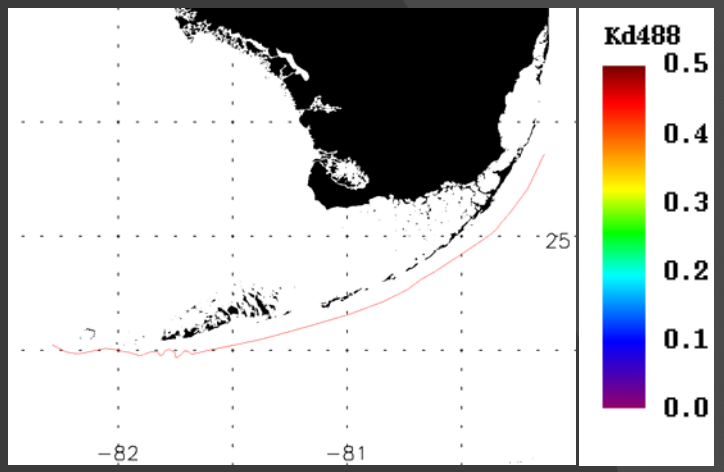
Status & Trends: regional

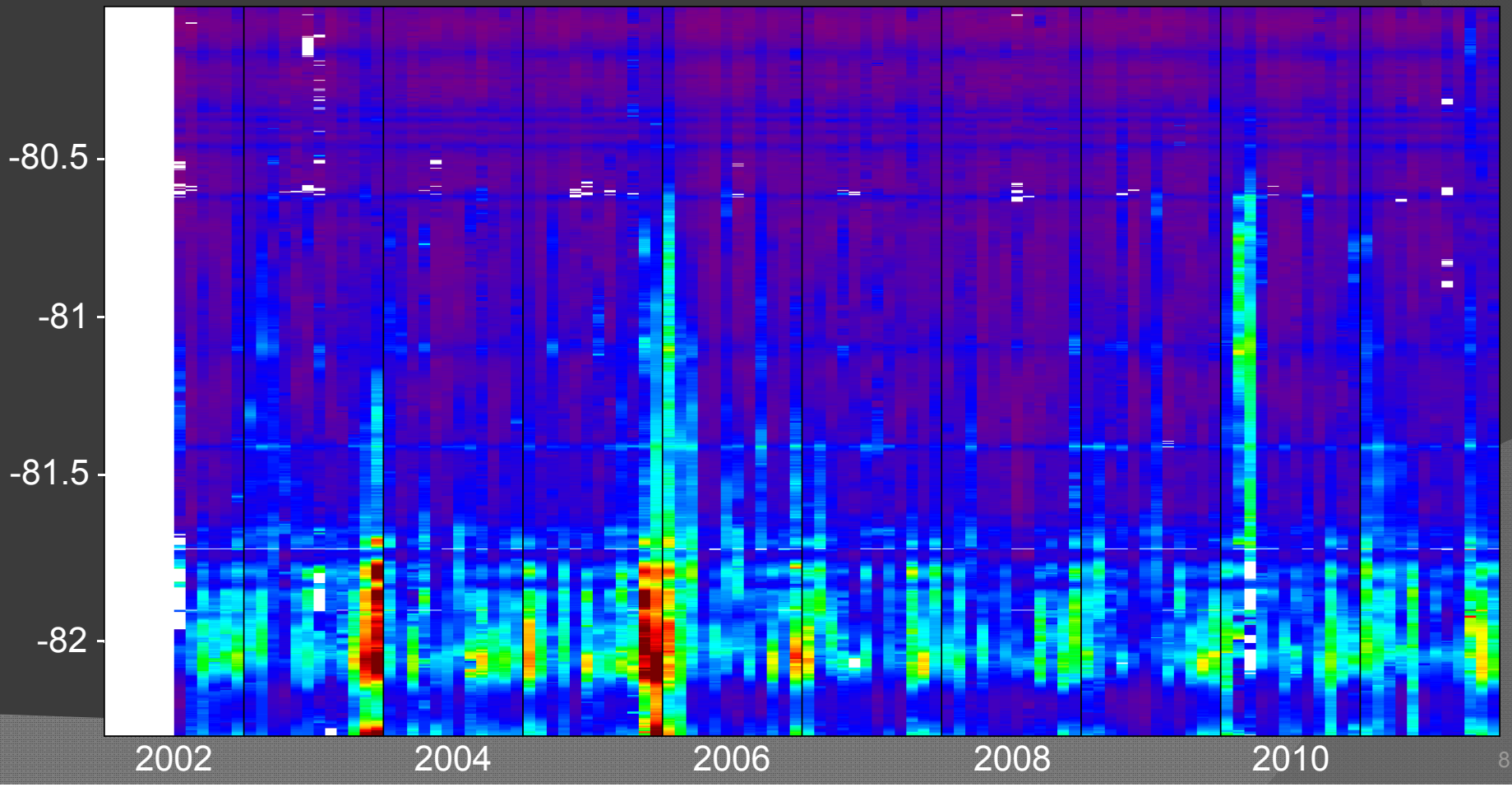


Status & Trends: seasonal variation

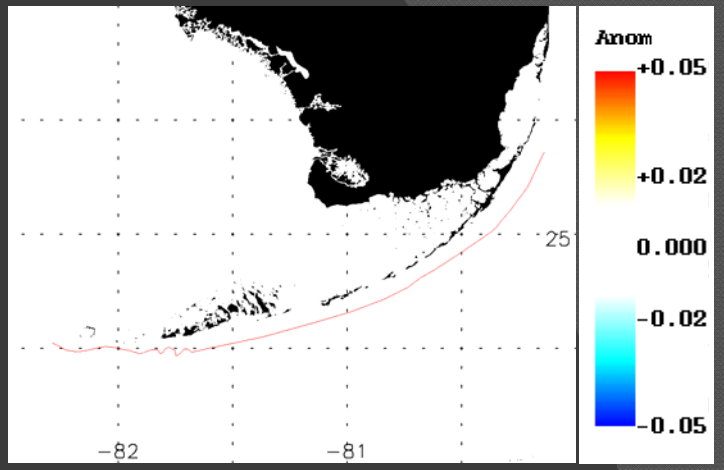


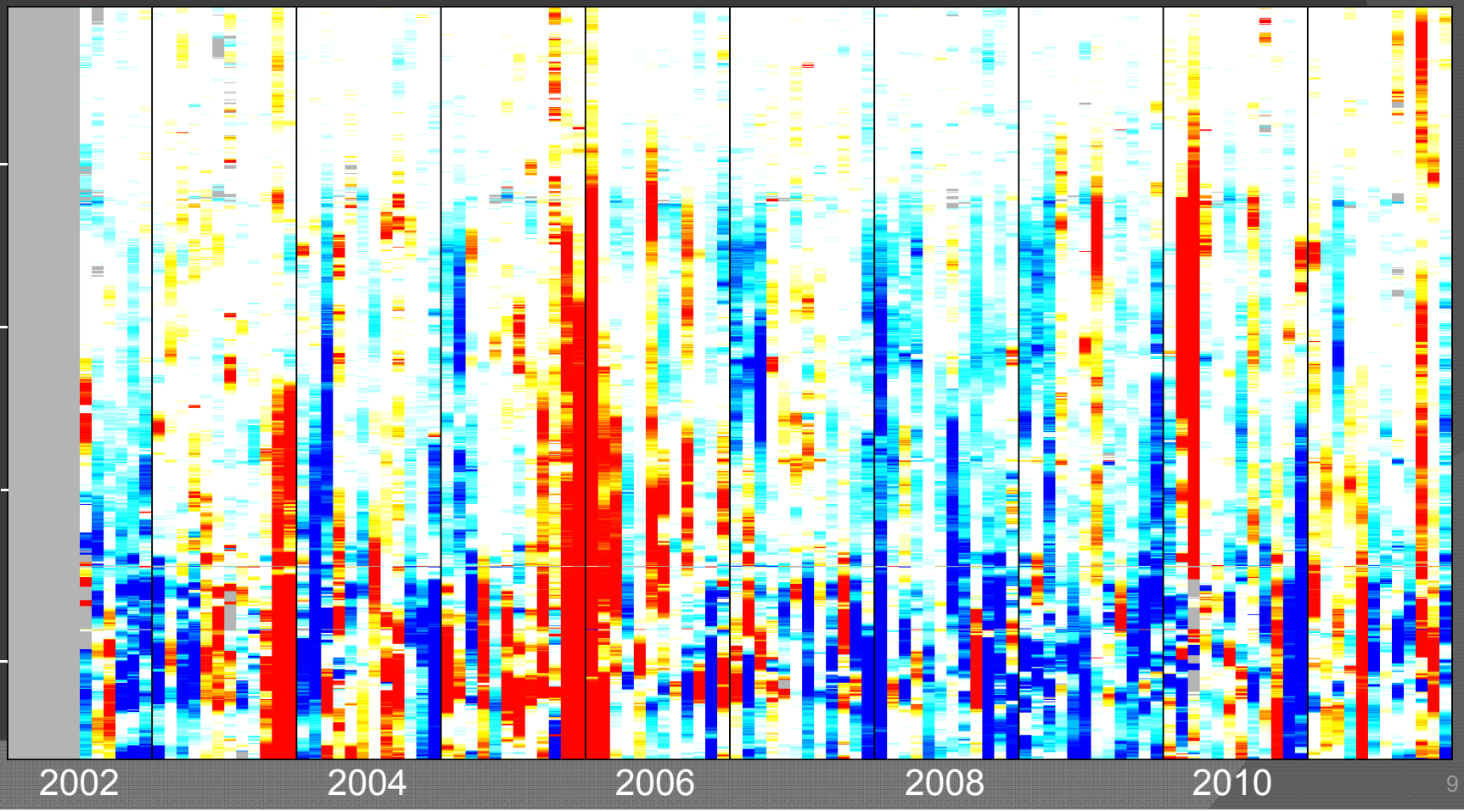
Episodic events: Monthly mean



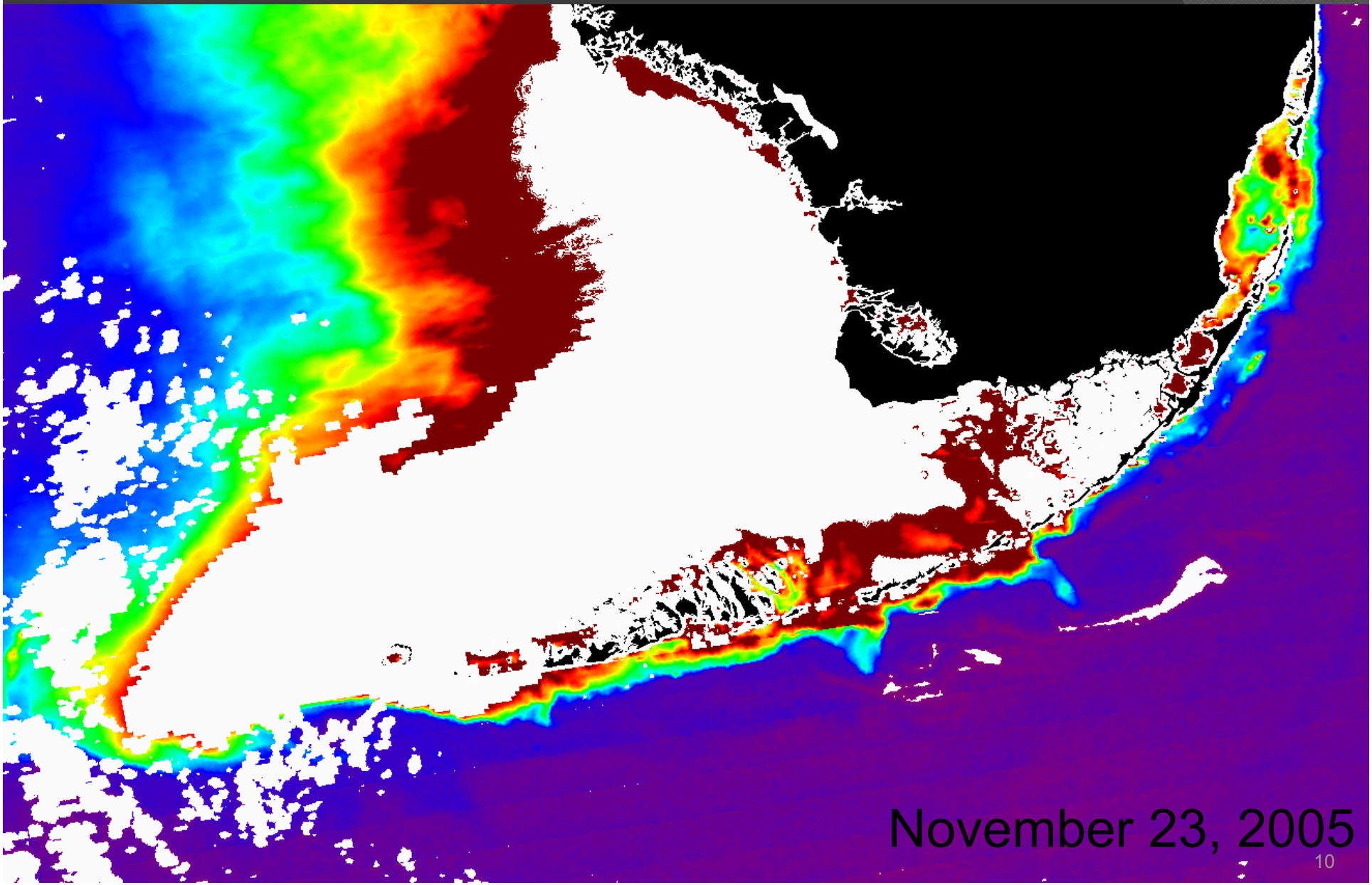


Episodic events: Monthly anomaly





Florida Bay Influences



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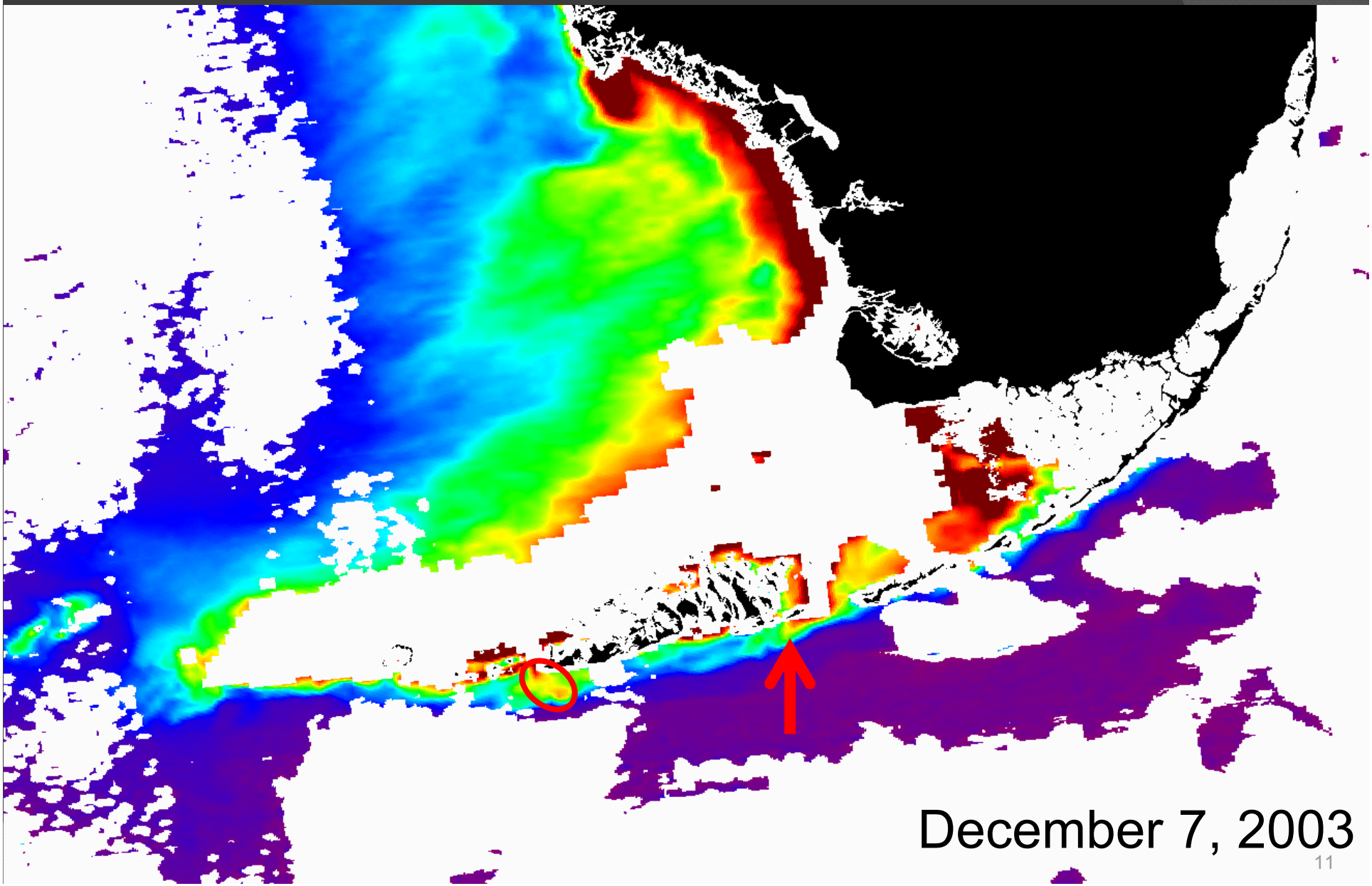
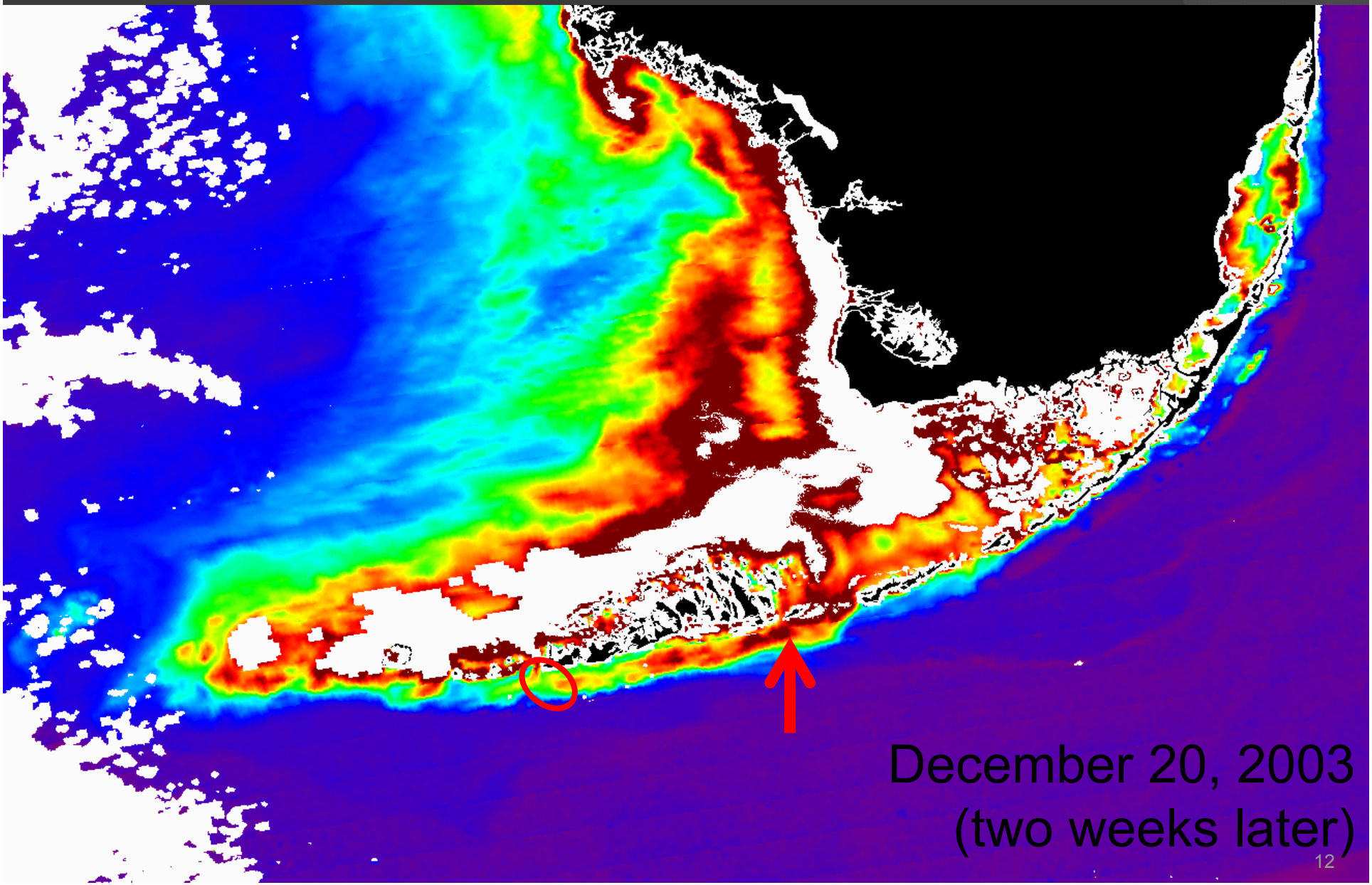
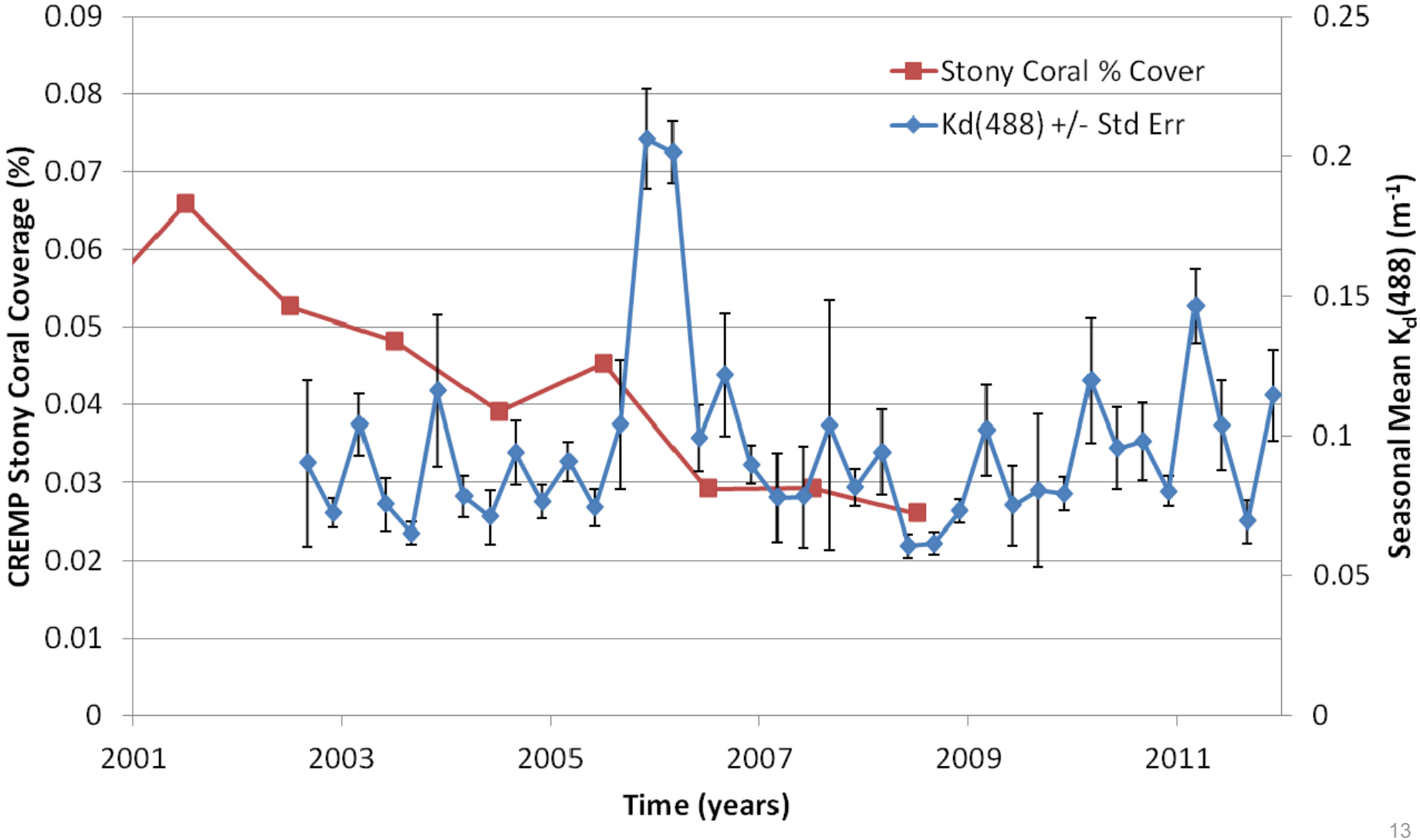


Monitoring: track water masses



Ecological Research and Monitoring

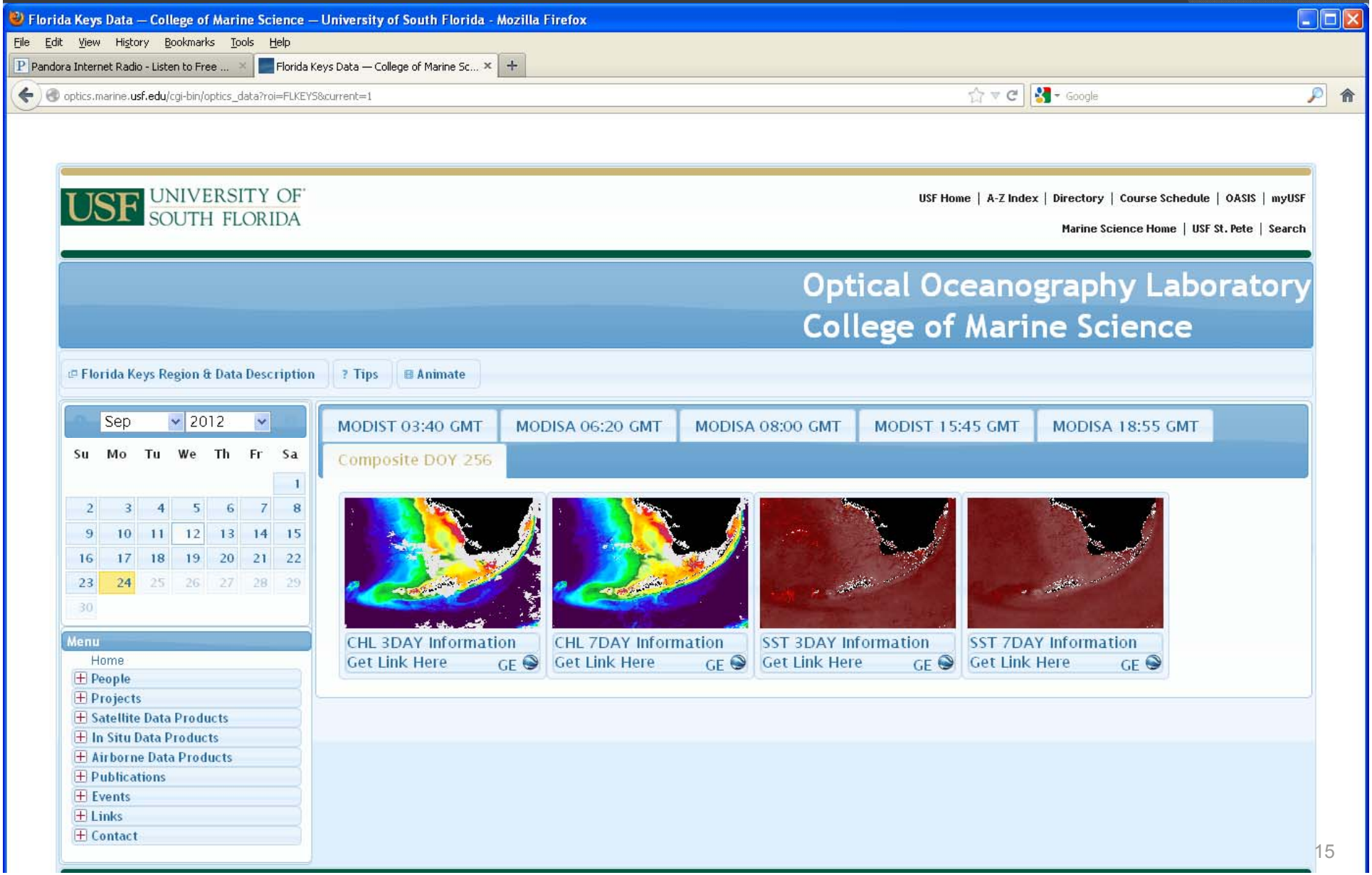
Looe Key CREMP Station



Other remote sensing data sources

- Temperature (MODIS, AVHRR)
  - Satellite overpasses several times daily
- Chlorophyll, CDOM concentrations
  - Satellite algorithms in validation stage

Distribution mechanisms



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optics.marine.usf.edu/cgi-bin/wqsd_rivers?river=Su&station=22

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Florida Fish and Wildlife Conservation Commission

Optical Oceanography Laboratory College of Marine Science

Optical Water Quality and Seagrass Data for the Suwannee River Estuary

Station SU 22 | Kd(488) Explanation | Suwannee River Estuary Clickable Map

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Location / Bottom | Kd488 Weekly Mean | Kd488 Time Series | Seagrass Data

Station Name: SU 22

Latitude: 29.3878133054

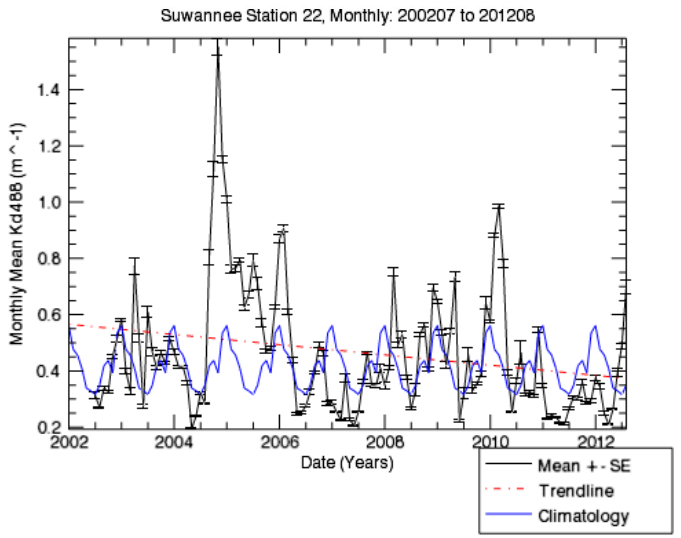
Longitude: -83.4573115914

Current Imagery:
http://optics.marine.usf.edu/cgi-bin/optics_data?roi=BIGBEND&current=1

This graph shows mean monthly Kd(488) for a 2km^2 region with the station at the center. Data are derived from the entire time series of MODIS/Aqua measurements (2002-present). A new data point is added on the 5th day of each month, characterizing the mean water clarity condition for the previous month. Error bars represent one standard error above and below the mean.

The climatology shown is a static montlhy mean of all MODIS/Aqua Kd(488) monthly data from 2002-2011. This represents the normal condition, and large deviations from this climatology represent anomalous events. The trendline shows the linear best fit of the monthly mean data.

Kd488 Time Series



Monthly mean values for Kd488 at this site are shown above.
These estimates have been extracted from Modis satellite imagery.
You may click on the image to open it in a separate tab or window.

If you would like to see the data expressed in a more real-time basis, click the "Kd488 Weekly Mean" tab above.

Discussion

- Use for zoning decision making
  - Temporal zoning
    - Based upon seasonal events
  - Zone specific regulations
    - Size, resource protection
  - Protect and preserve coral reefs
  - Minimize adverse socioeconomic impacts
- Socioeconomic considerations
  - Provide water clarity for divers
- Assess rezoning performance results based upon data products provided
  - Solicit feedback from WQPP, SAC