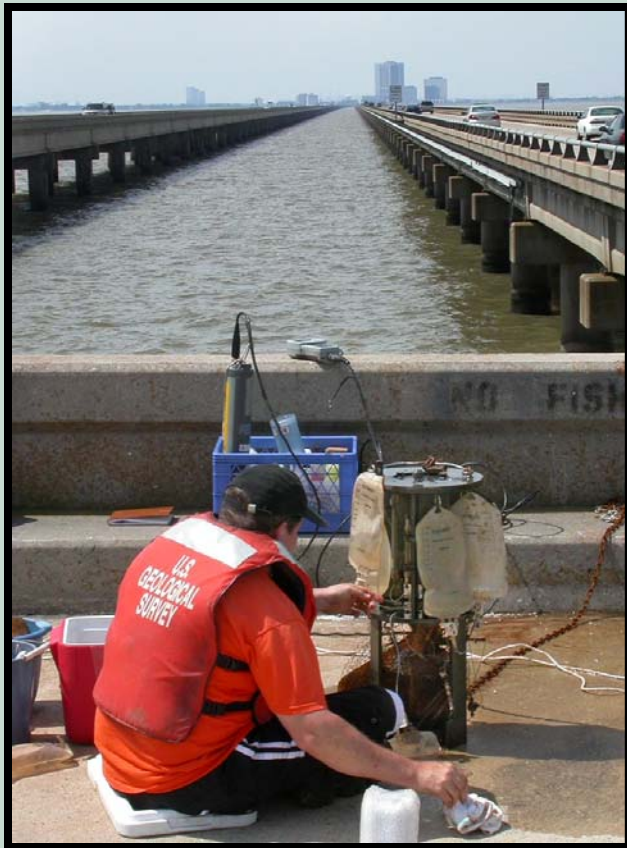
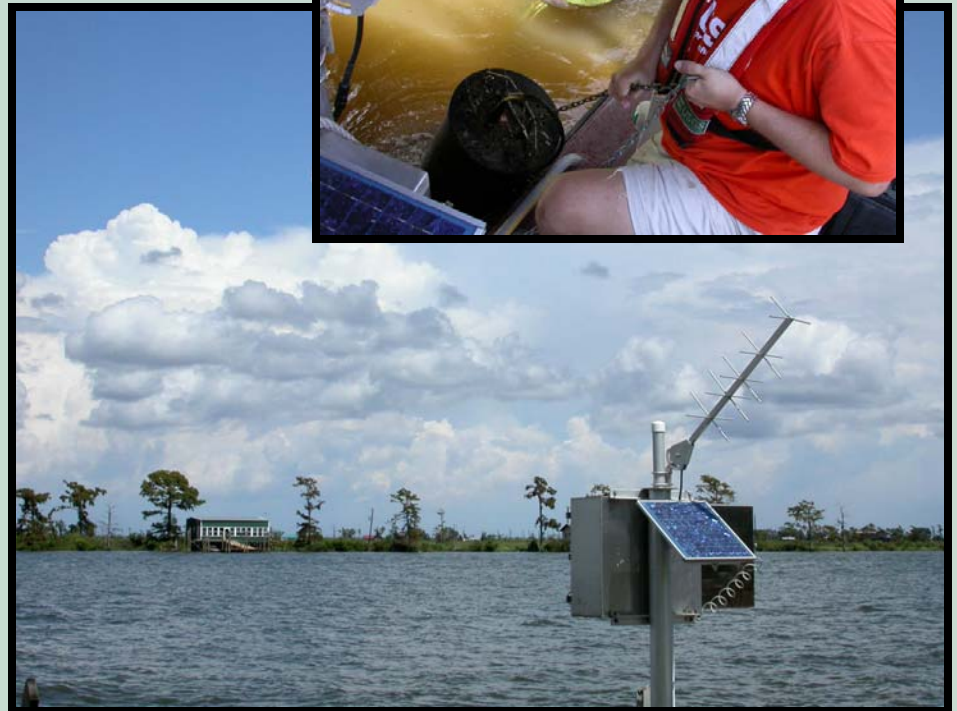


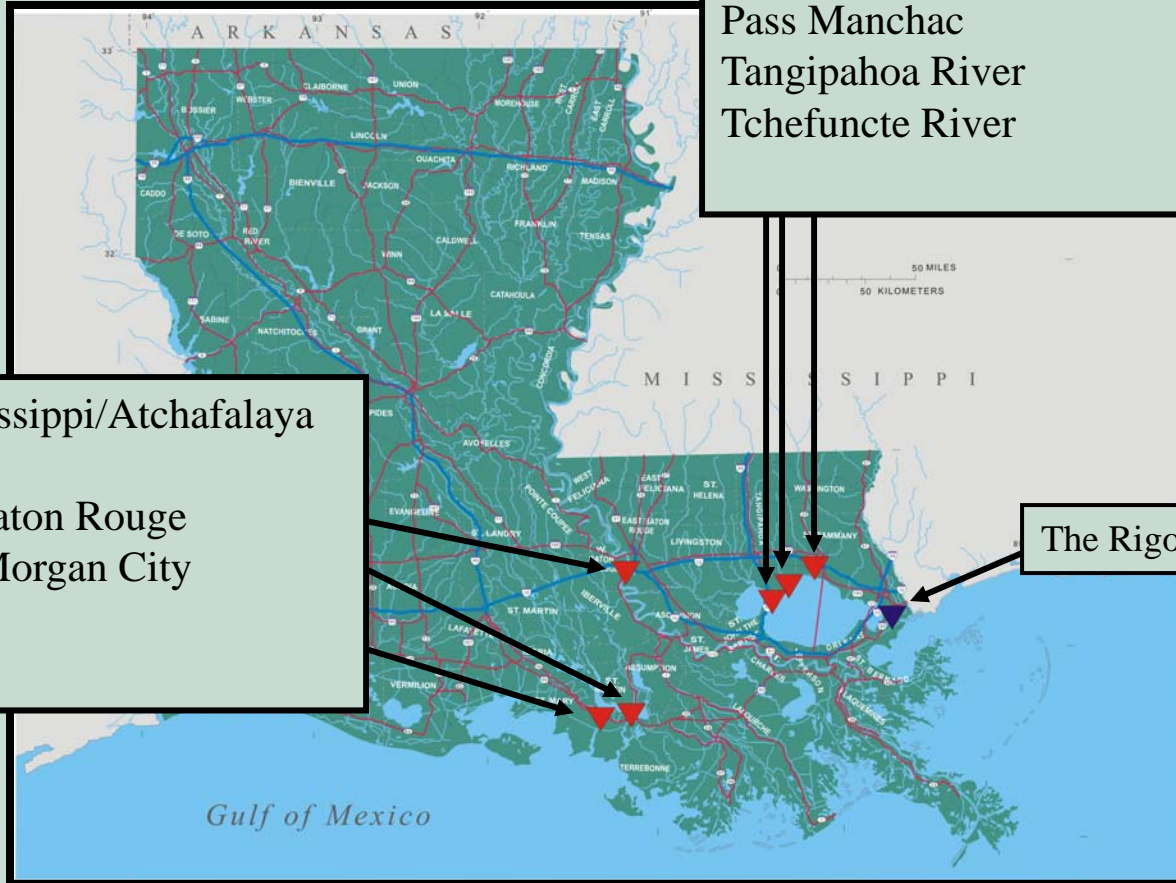
Real-time Nitrate Concentrations in the Lake Pontchartrain Basin 2004-2009: From Method Development to Investigative Tool



*Dennis Demcheck
Scott Mize*



Site locations



4 sites in the Lake Pontchartrain basin

Pass Manchac
Tangipahoa River
Tchefuncte River

3 sites on the Mississippi/Atchafalaya system:

Mississippi R. at Baton Rouge
Atchafalaya R. at Morgan City
Wax Lake Outlet

The Rigolets

Nitrate Analyzer Specifications

- Wet chemistry (cadmium reduction/colorimetry), not ion-selective probe
- Automatic calibration with internal standard every 12 hrs
- Interfaces with USGS hardware & software for real-time data transmission
- Collects cadmium waste

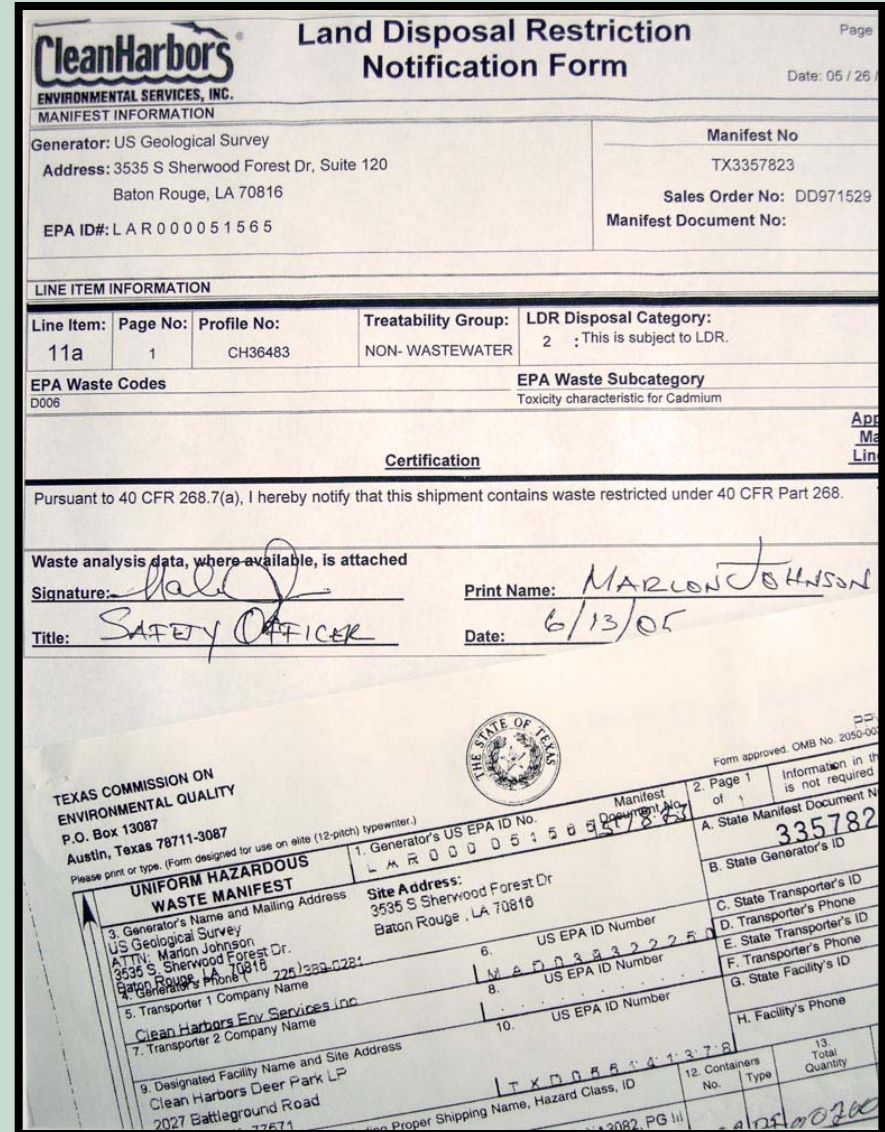


Routine operation

- Site visit every 4 weeks: analyzer can run 2 months with readings every 2 hrs.
- QC samples collected
- Nitrate monitor cleaned, restocked, and given pre-deployment test
- Cadmium column checked: usually replaced



- Waste bags drained & stored at the office for proper disposal (permit required)
- Approx. \$700/yr



Acoustic Doppler discharge measurements



Directional-velocity instruments
Can be installed on-site to enable
accurate discharge
in tidally affected areas

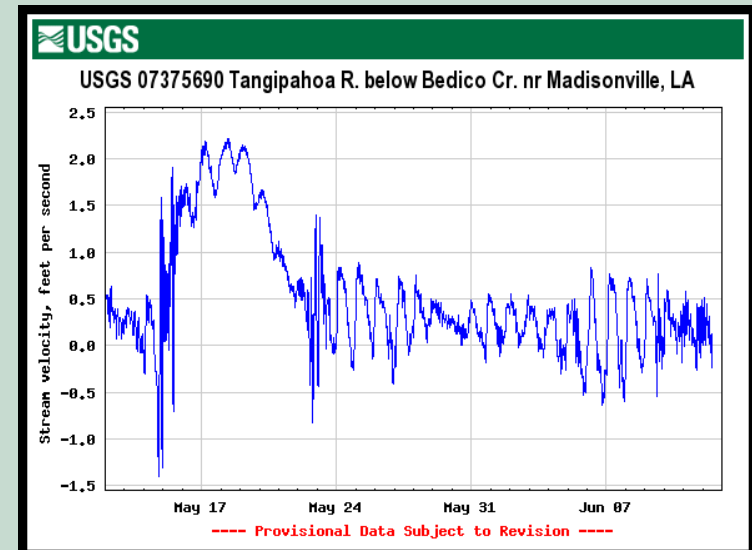
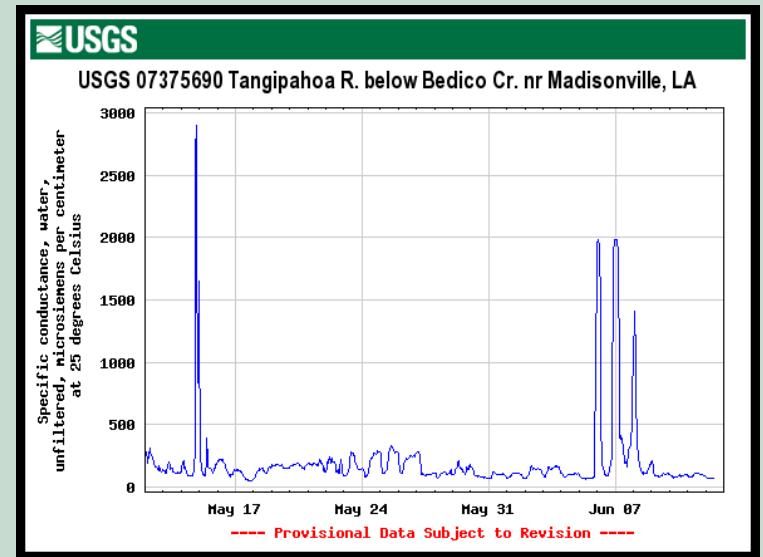
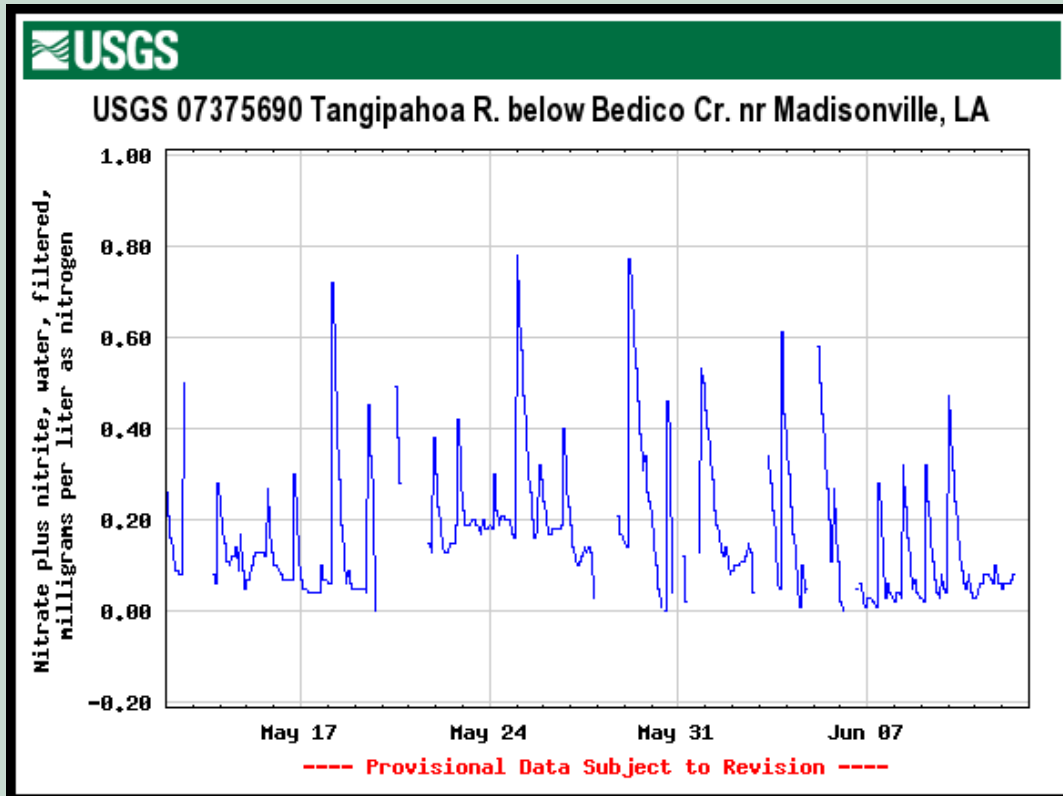


Tangipahoa River below Bedico Creek



Tangipahoa R. below Bedico Creek:

May 12-June 12, 2008

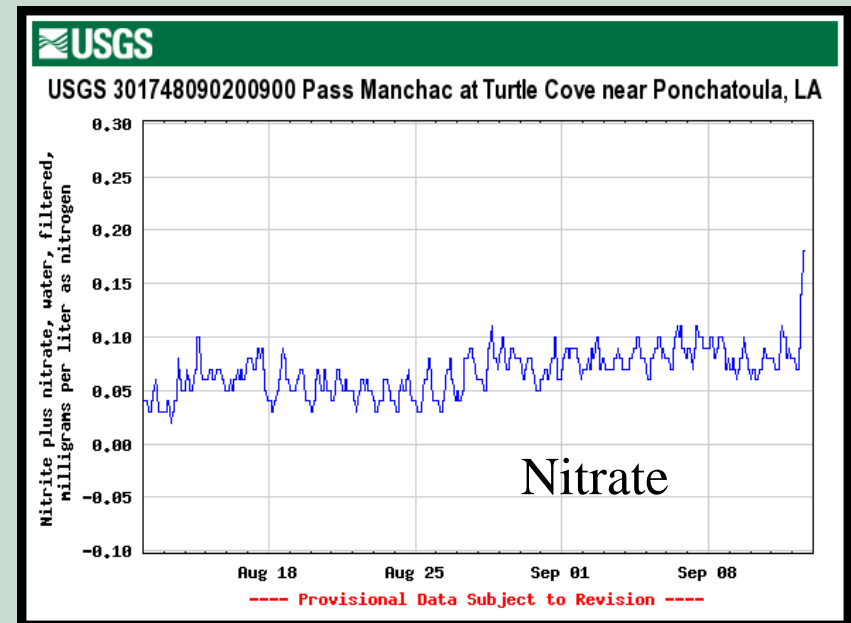
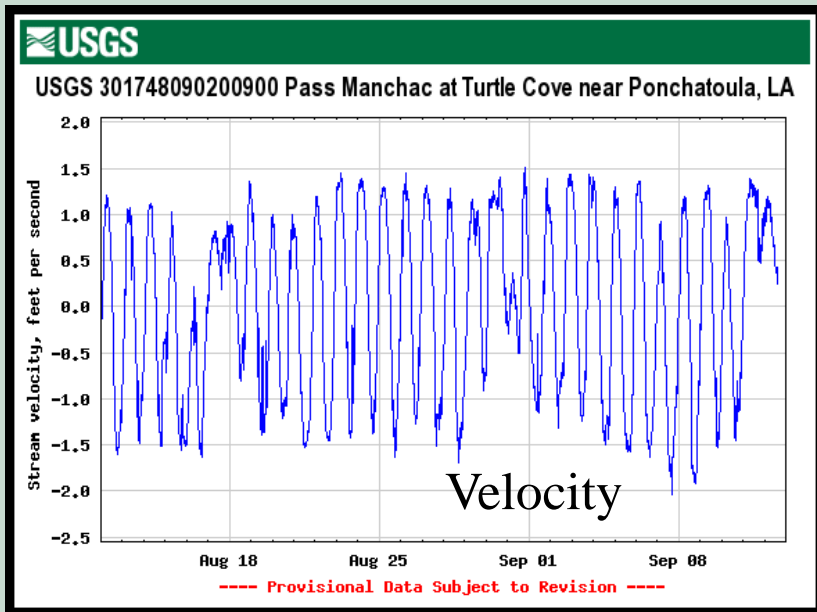
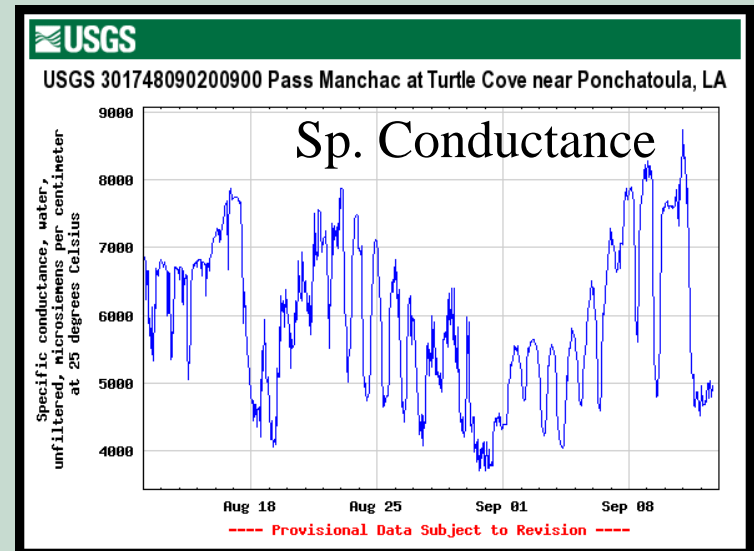
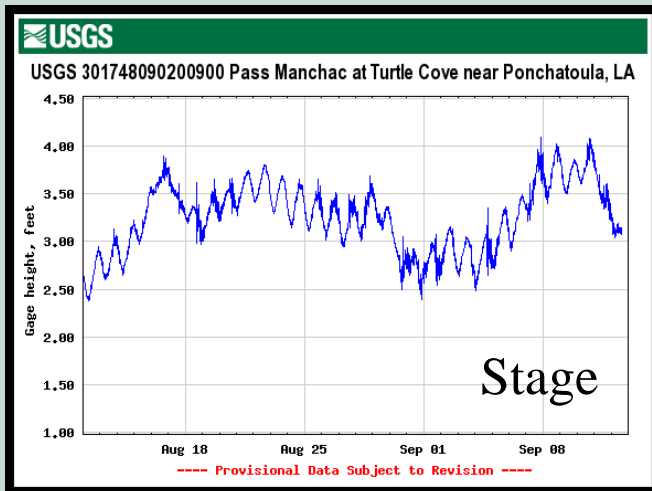


Pass Manchac

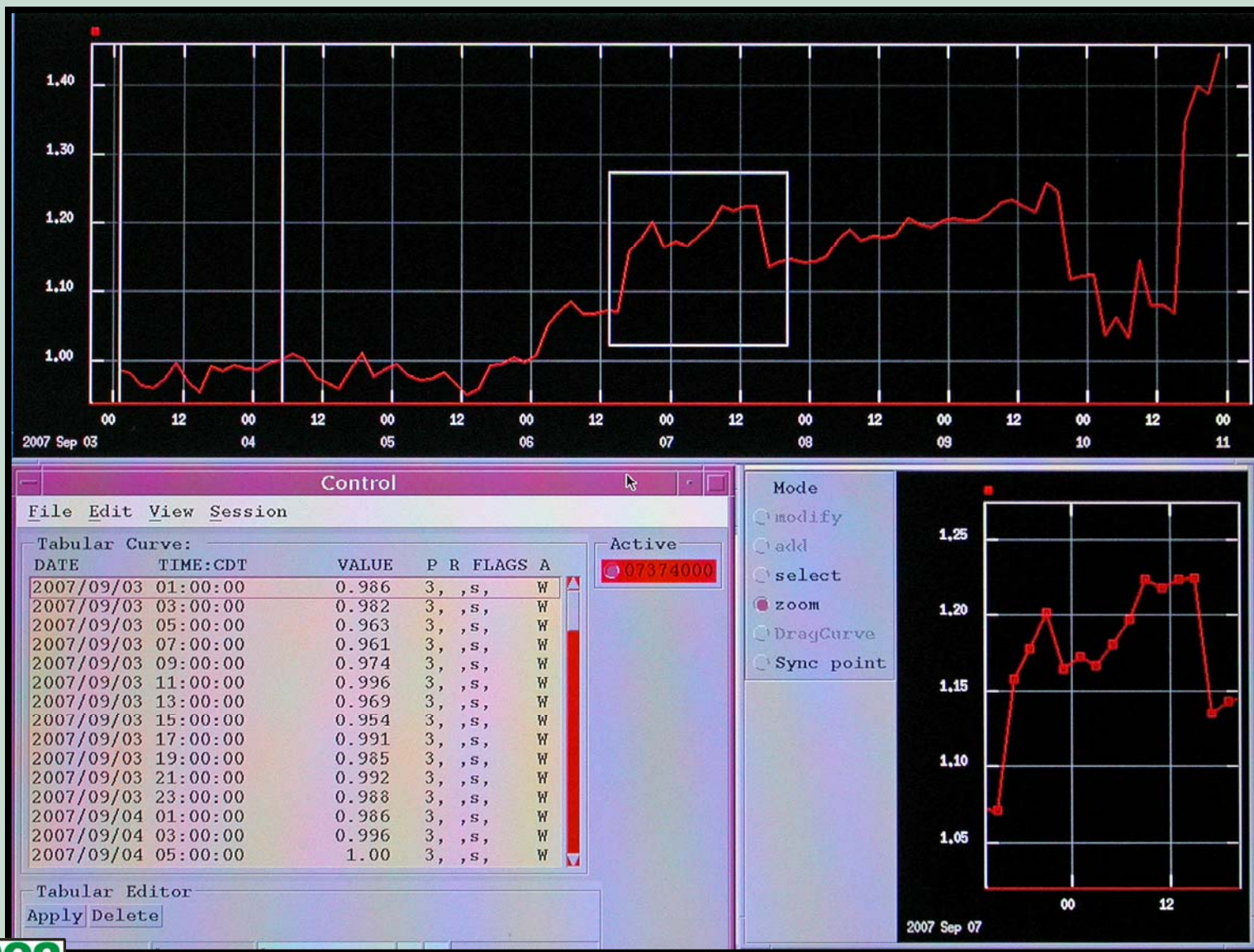


Retrieved monitor
showing partially-used reagents

Pass Manchac at Turtle Cove, 8/12-9/12/07



Data processing: Miss R. at Baton Rouge



Crossover 2



The Rigolets



Spillway at Hwy 61



Chef Menteur Pass



Nitrate analyzer at
Crossover 7/Mile 9



NASA MODIS image, 4/29/08

Miss. R. diversion into Lake Pontchartrain, 2008

April 6

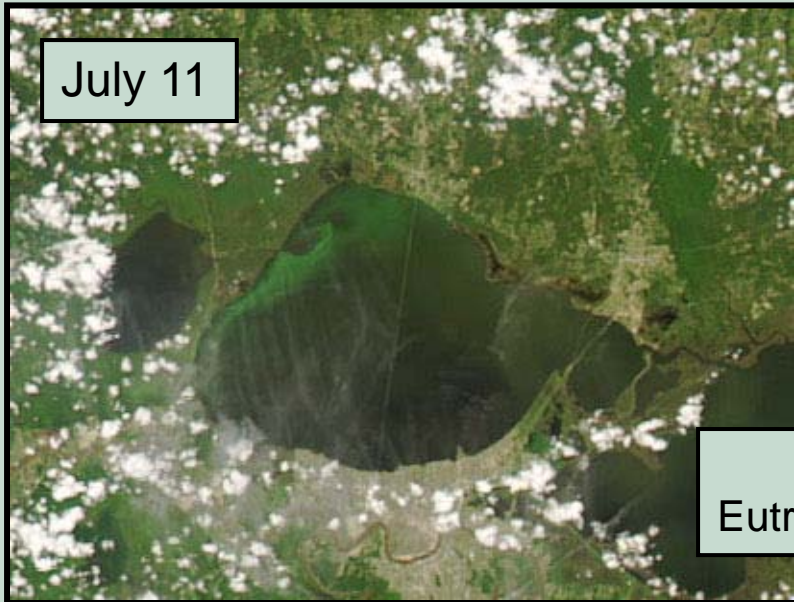


April 29



1st stage:
Freshwater/saltwater
interactions

July 11

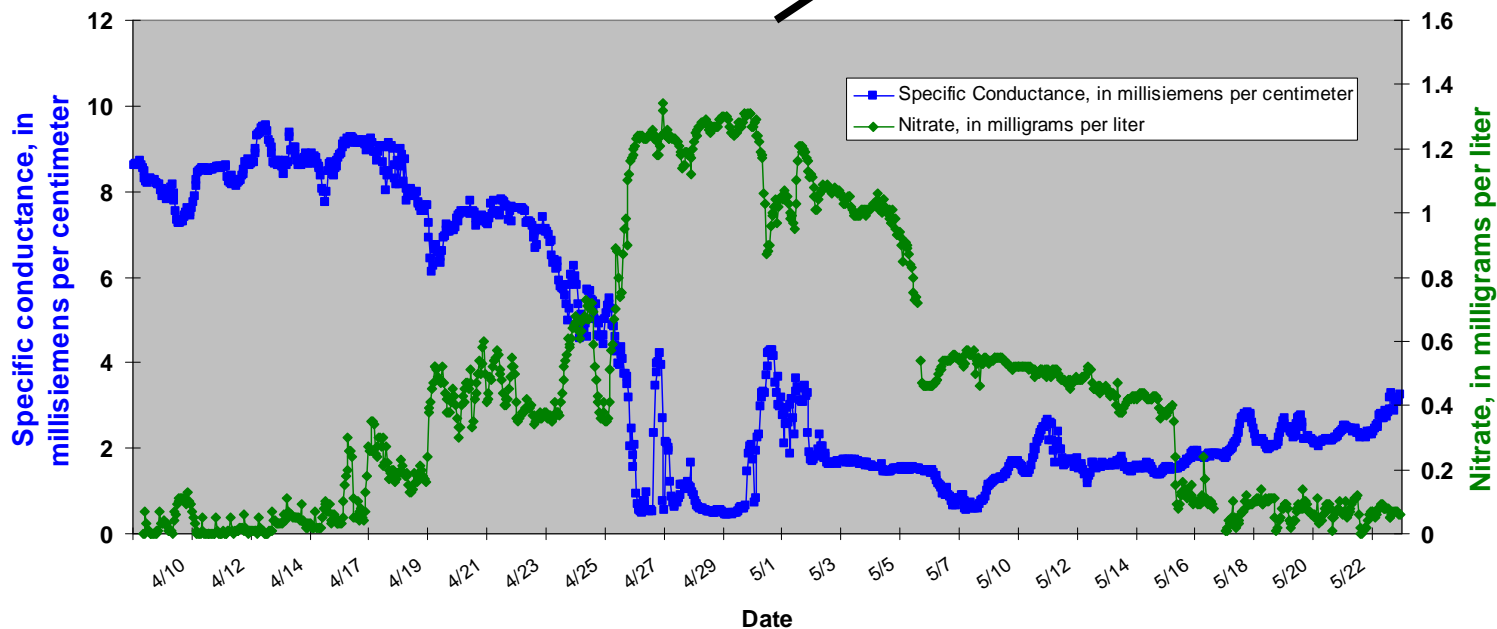
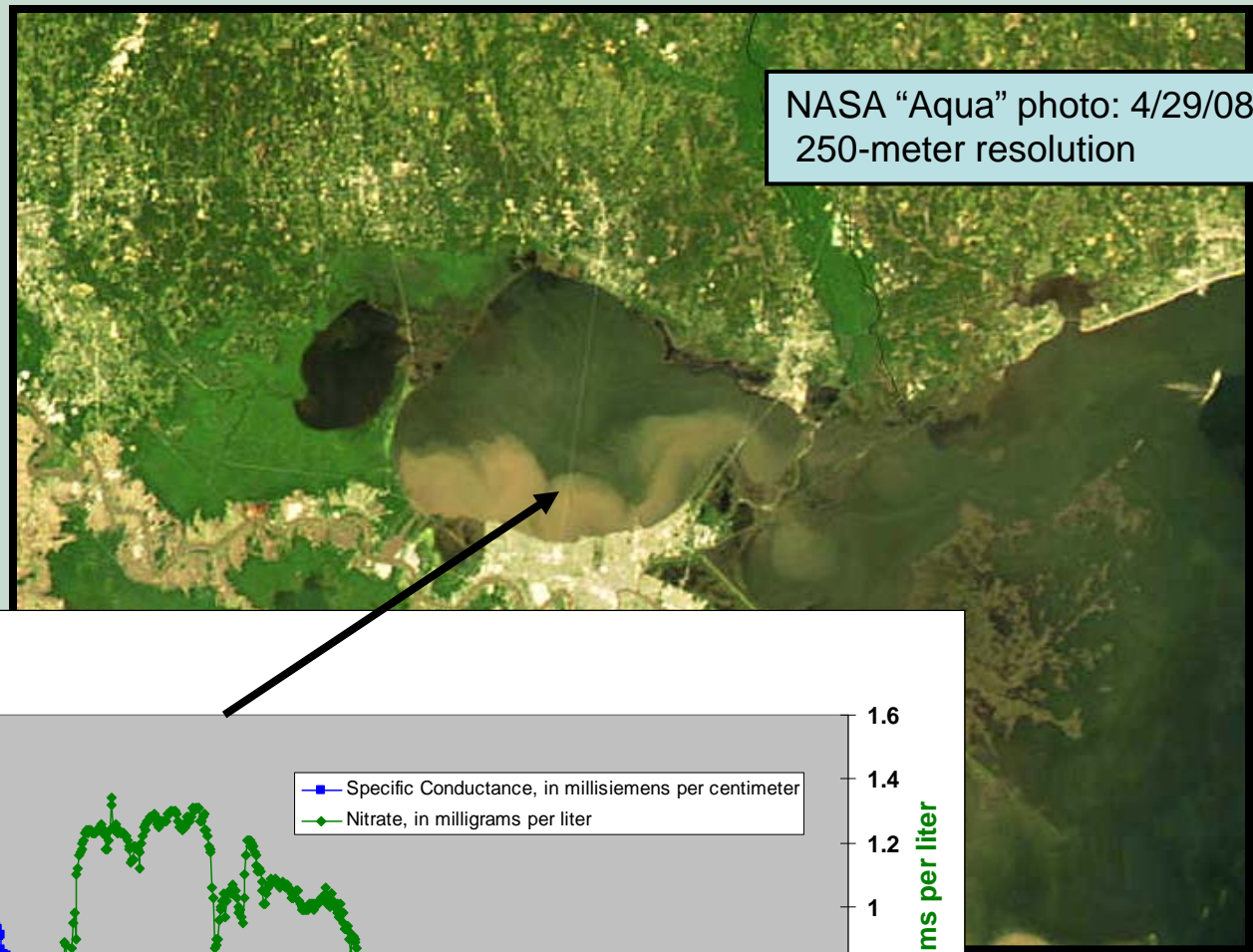


August 21

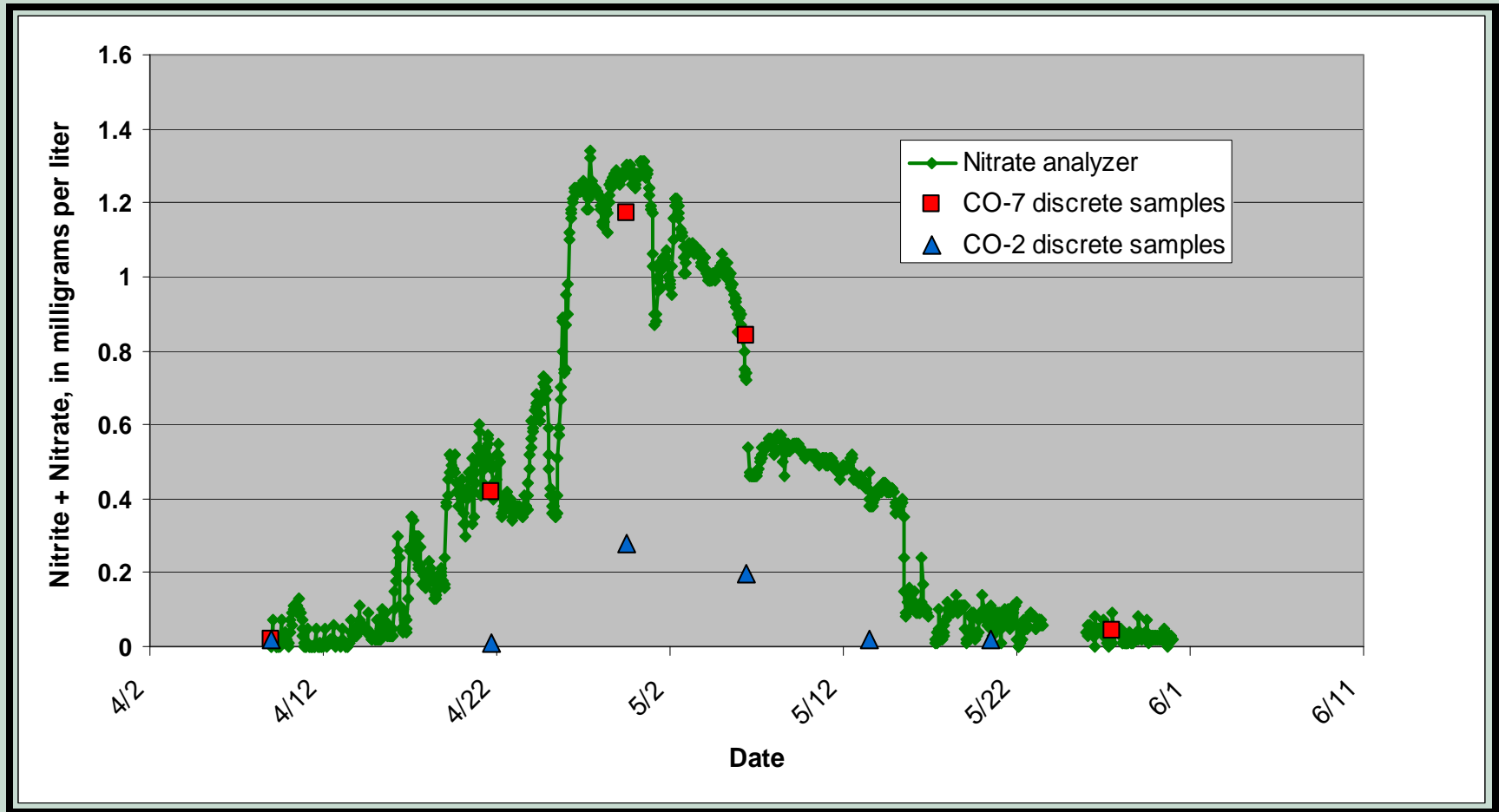


2nd stage:
Eutrophication study

Nitrate
analyzer &
Sp. Cond. results:
Apr. 8-May 23,
2008



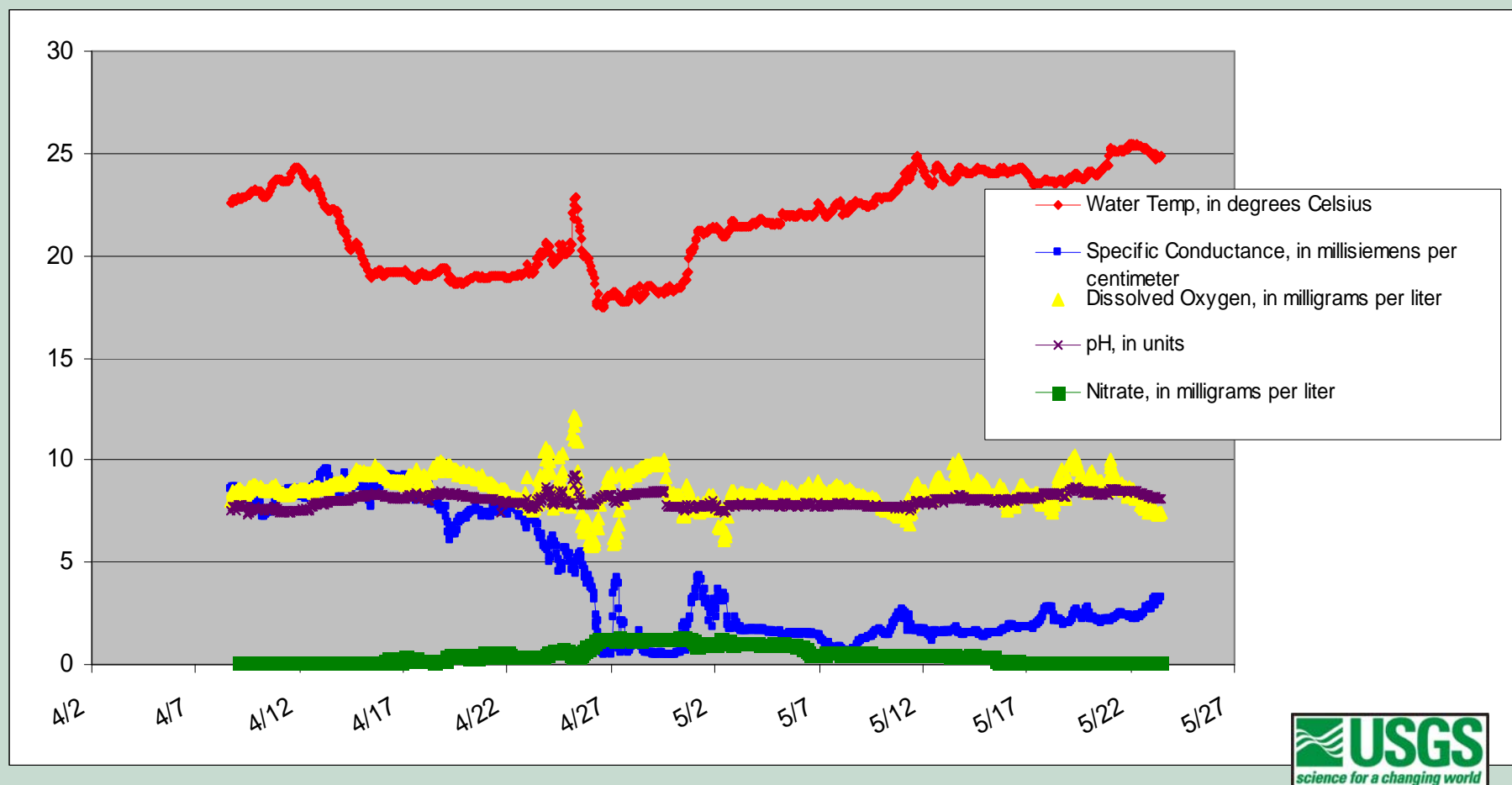
Crossover 7 hourly nitrate compared to Crossover 2 & Crossover 7 discrete (weekly) samples



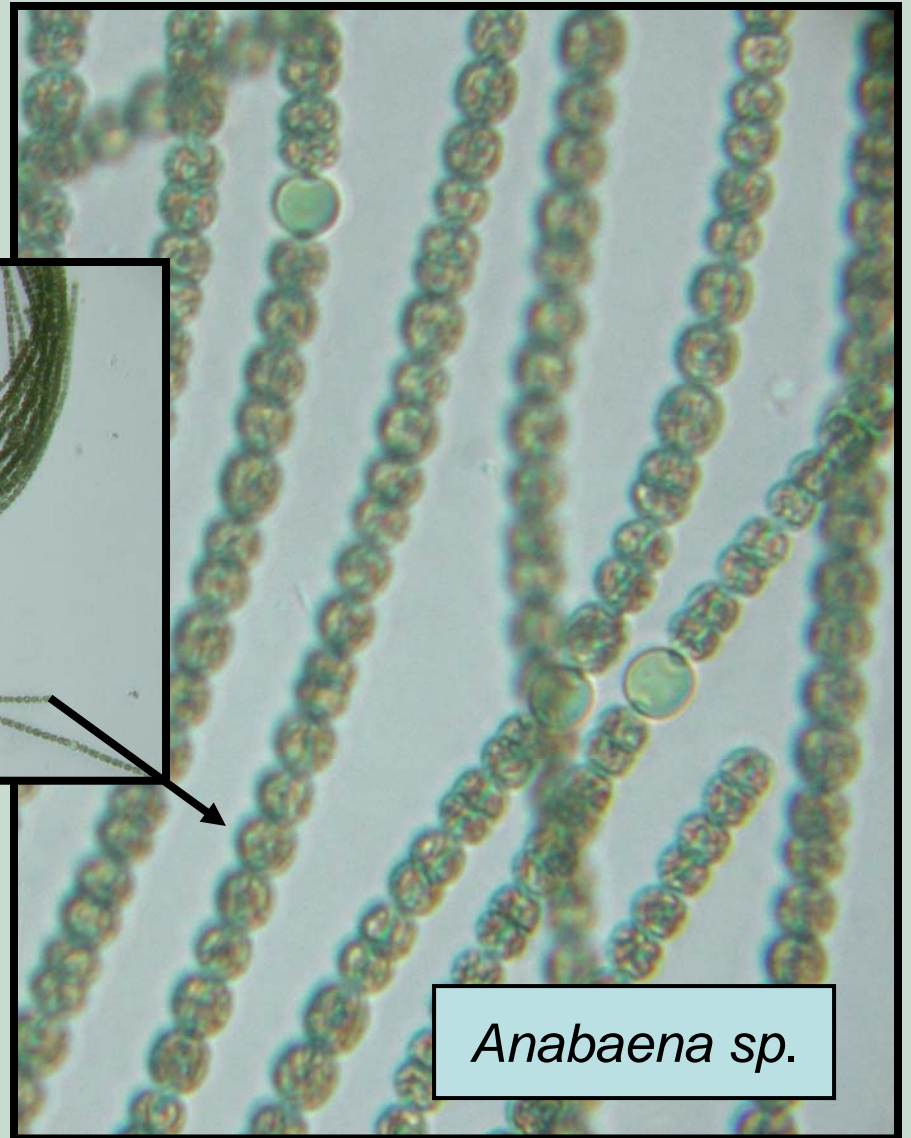
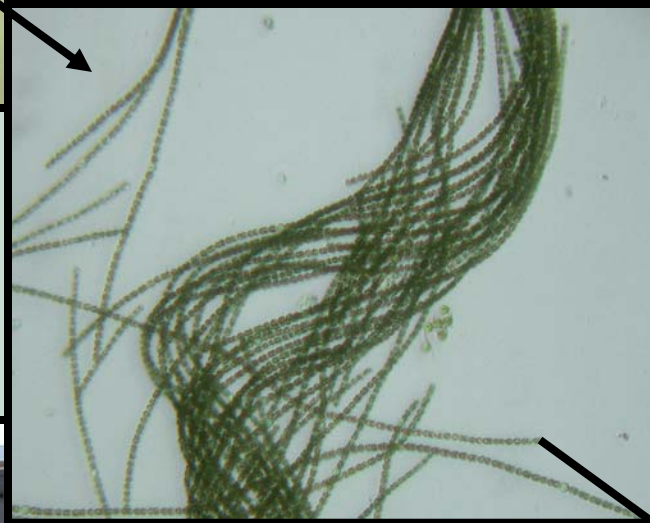
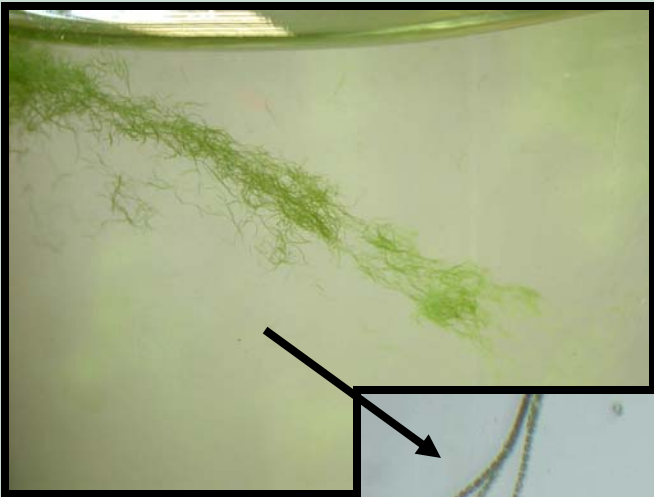
Hourly multiparameter readings at Crossover 7

4/08-5/23/08

depth: 10 ft.



Onsite investigation of algal blooms



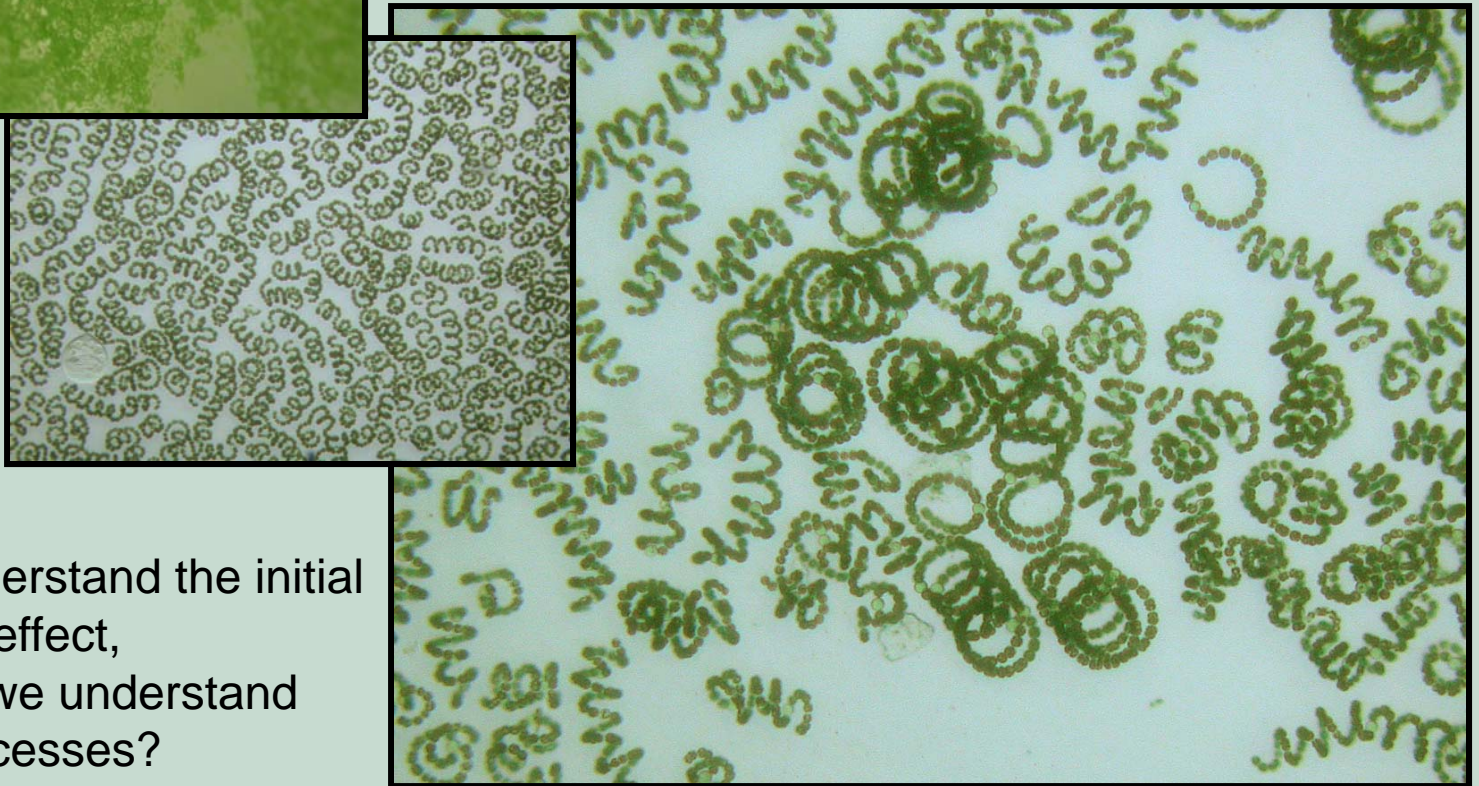
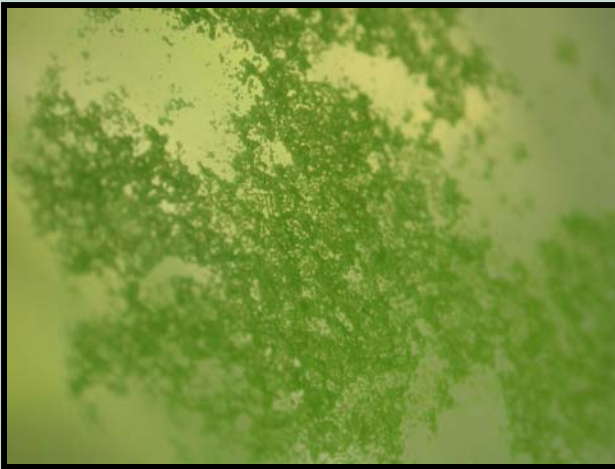
Anabaena sp.



2nd bloom?

8/21/08

Anabaena spiroides?



We understand the initial
cause/effect,
but do we understand
the processes?

Conclusions, part 1

- The hardware & software are indeed “Ready for Prime Time,” but a substantial investment in trained personnel, both office & field, should be expected.
- The overall quality of the data is good.
- Deployments greater than 2 years, especially in estuarine systems, take its toll on the hardware.

Conclusions, part 2

- The high-resolution nitrate analyzer data accurately documented the evolution of the study from an inorganic chemistry (salinity, inorganic nitrate) study from April-early May to a biological (eutrophication/algal blooms) study in Mid-May through August.
- The instruments excel at limited-duration deployments with a clear objective.

Questions? Comments?

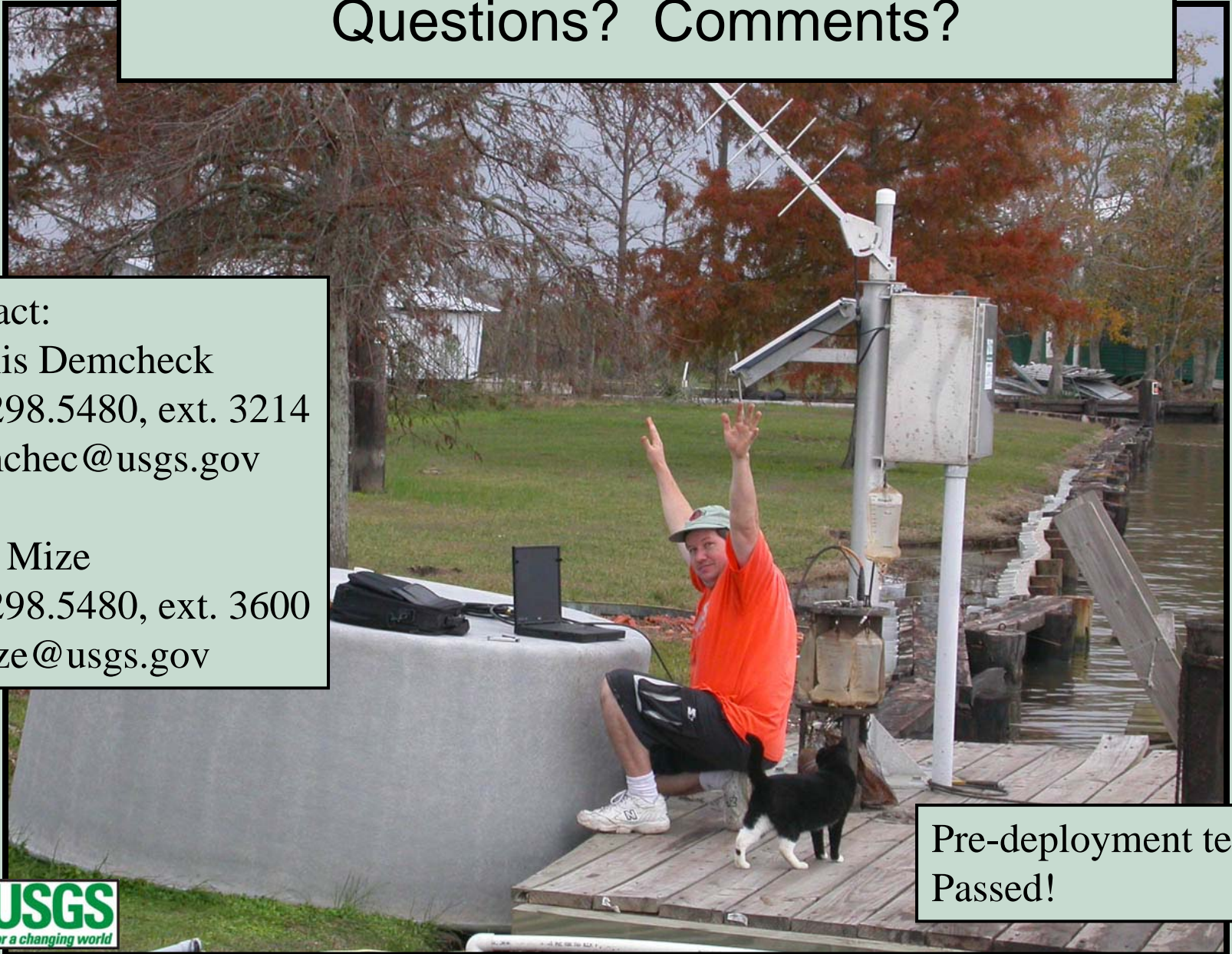
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Pre-deployment test:
Passed!





Send us in coach!