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

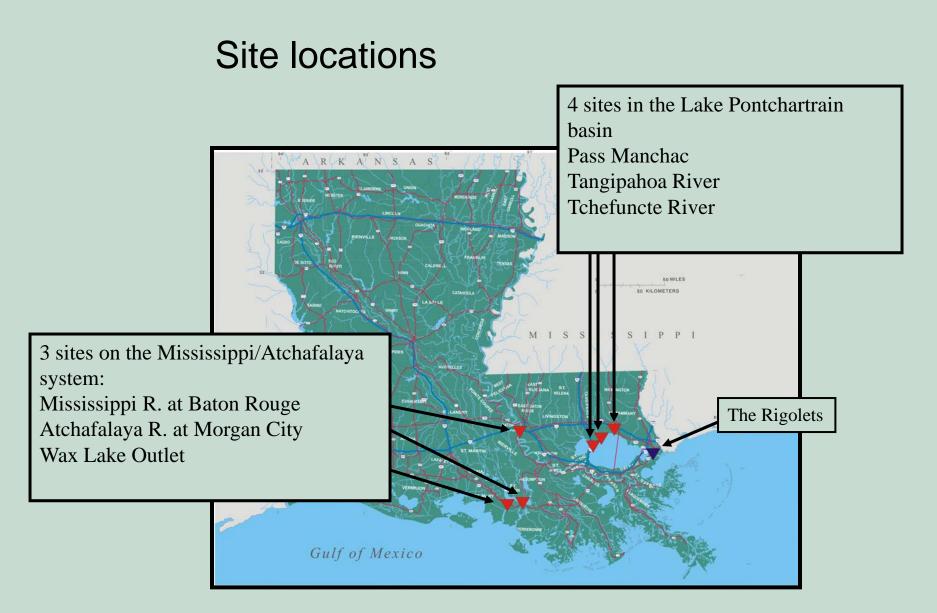


Dennis Demcheck Scott Mize





April 22, 2009





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





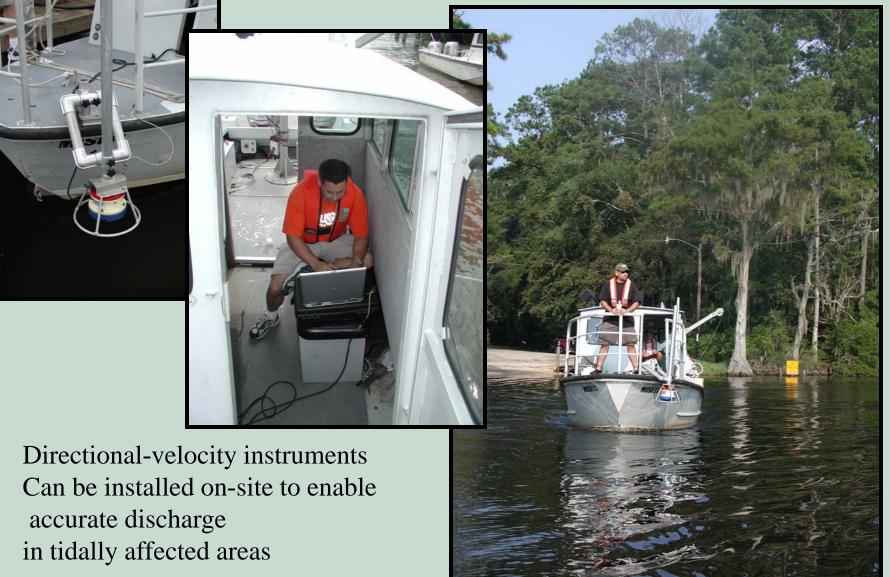
Nitrate analyzer waste disposal

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



Classifier Land Disposal Restriction Page					
CleanHarbors ENVIRIONMENTAL SERVICES, INC. MANIFEST INFORMATION					
Generator: US Geological Survey Manifest No					
Address: 3535 S Sherwood Forest Dr, Suite 120					TX3357823
Baton Rouge, LA 70816					Sales Order No: DD971529
EPA ID#: L A R 0 0 0 0 5 1 5 6 5					Manifest Document No:
LINE ITEM INFORMATION					
Line Item: Page	e No:	Profile No:	Treatability Group:		posal Category:
	1	CH36483	NON- WASTEWATER	2 :T	his is subject to LDR.
EPA Waste Codes EPA Waste Subcategory D006 Toxicity characteristic for Cadmium					
Apr Ma					
Certification					
Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268.					
Waste analysis data, where available, is attached					
Waste analysis data, where available, is attached Signature: MARLON OHNSON SIGNATURE: MARLON OHNSON SIGNATURE: MARLON OHNSON					
Title: SAFETY OFFICER Date: 6/13/05					
3. Gene US Gen ATTN: 9535 94700 5. Tr C. Tr	aransporte ean Harson	3087 HAZARDOUS EMANIFEST Jame and Mailing Address Johnson Model 225/338-028 thorest Dr. Hond (1225/338-028 thorest Dr. 1 Company Name Part Services Jon 97 2 Company Name	3535 S Sherrious Baton Rouge , LA 708 	US EPA US EPA US EPA US EPA	B. State Generator's ID D. Number C. State Transporter's Done C. State Transporter's Phone C. Transporter's Phone E. State Transporter's Phone F. Transporter's Phone G. State Facility's ID H. Facility's Phone H. Facility's Phone Total Total Total Total
1 19	Clean h	Hed Facility Name and C Harbors Deer Park LP	tion Proper Shipping Nam	Hazard C	lass, ID No. 19
1 ! 11	2027 E	Harbors Dec. Battleground Road	tion Proper Shipping Nam		12082, PG III _ A DE 00200

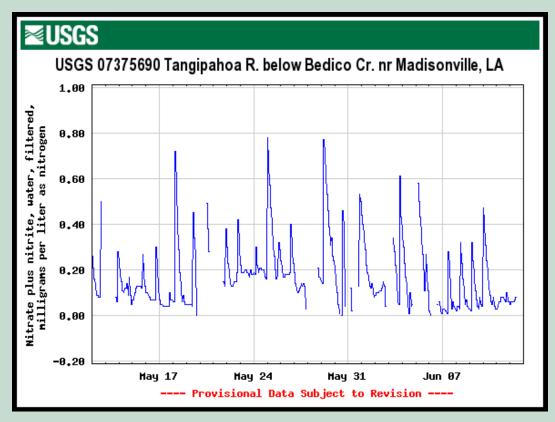
Acoustic Doppler discharge measurements

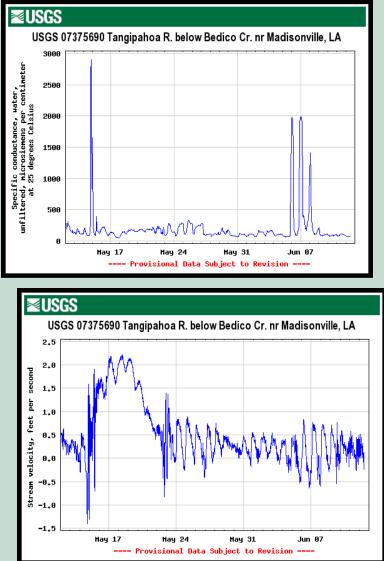






Tangipahoa R. below Bedico Creek: May 12-June 12, 2008

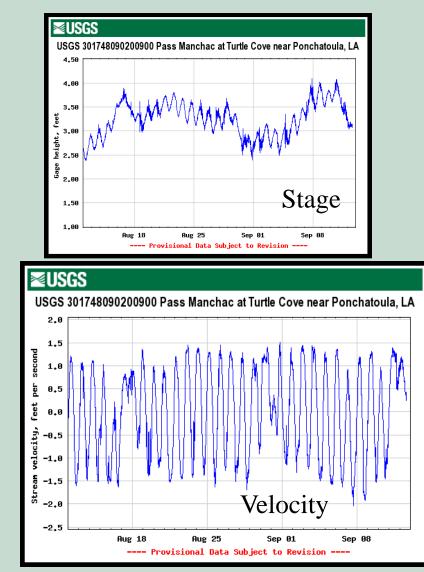




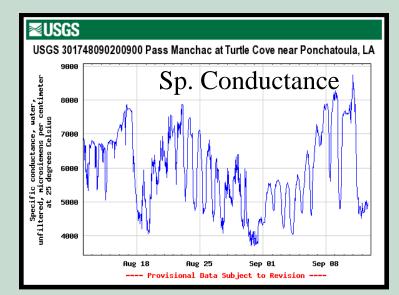




Pass Manchac at Turtle Cove, 8/12-9/12/07





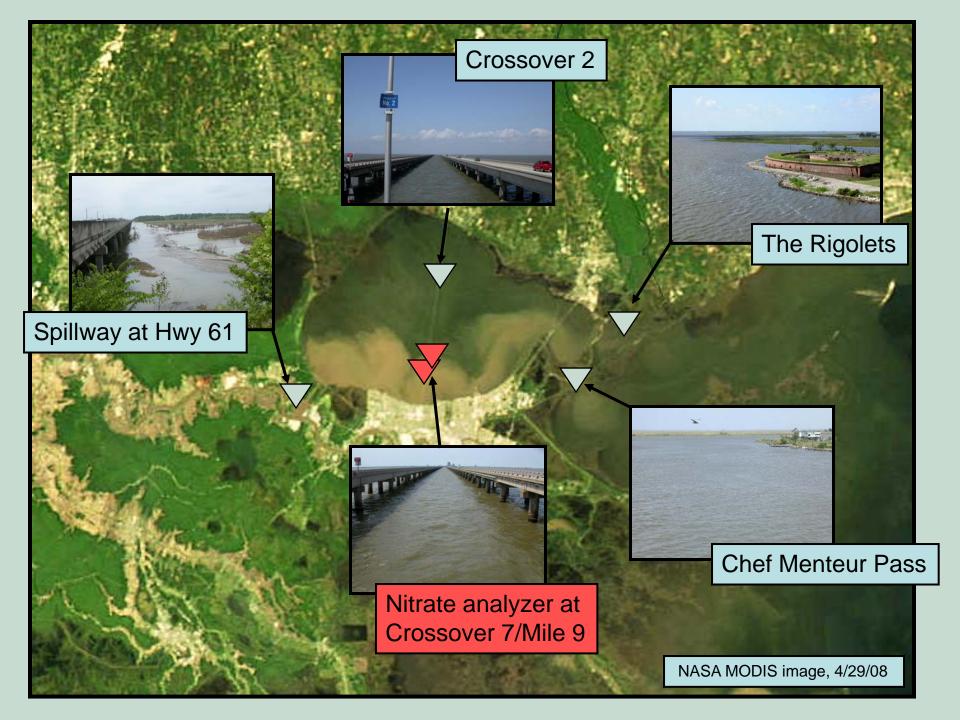


≊USGS USGS 301748090200900 Pass Manchac at Turtle Cove near Ponchatoula, LA 0.30 water, filtered, r as nitrogen 0,25 0.20 0.15 liter Nitrite plus nitrate, nilligrams per lite Mr. Jon Arran Minut 0.10 0.05 0.00 Nitrate -0.05 -0,10 Aug 18 Aug 25 Sep 01 Sep 08 ---- Provisional Data Subject to Revision ----

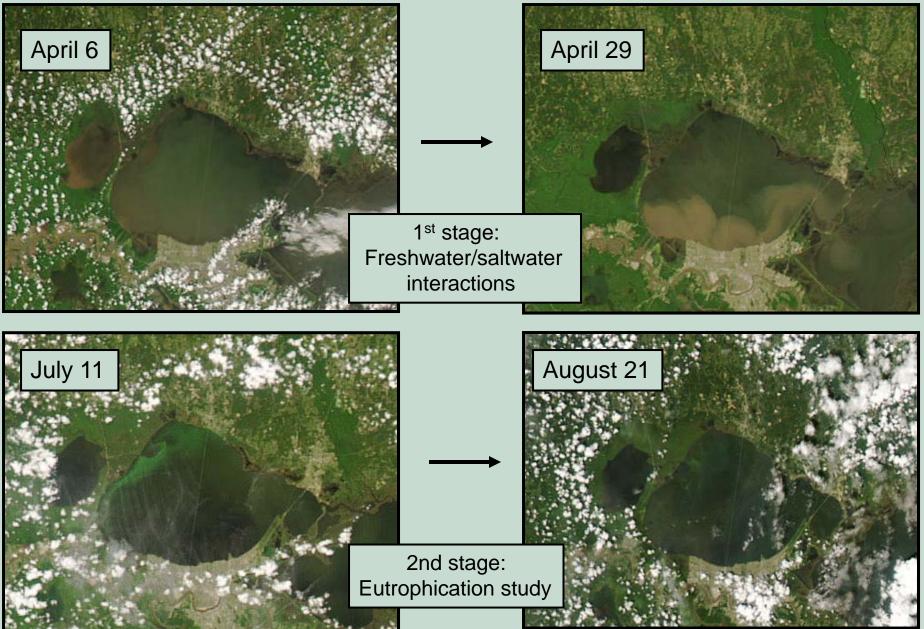
Data processing: Miss R. at Baton Rouge







Miss. R. diversion into Lake Pontchartrain, 2008



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

12

10

8

6

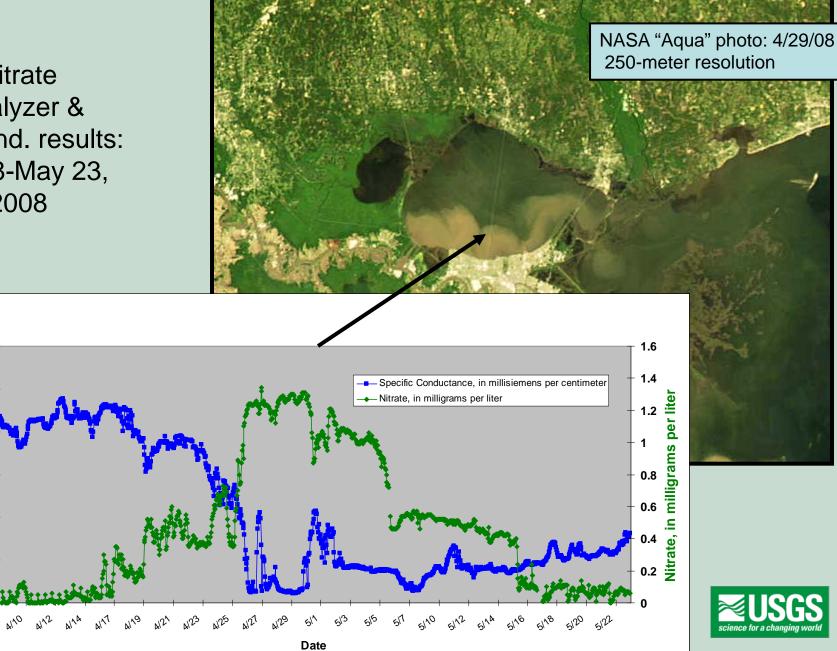
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2

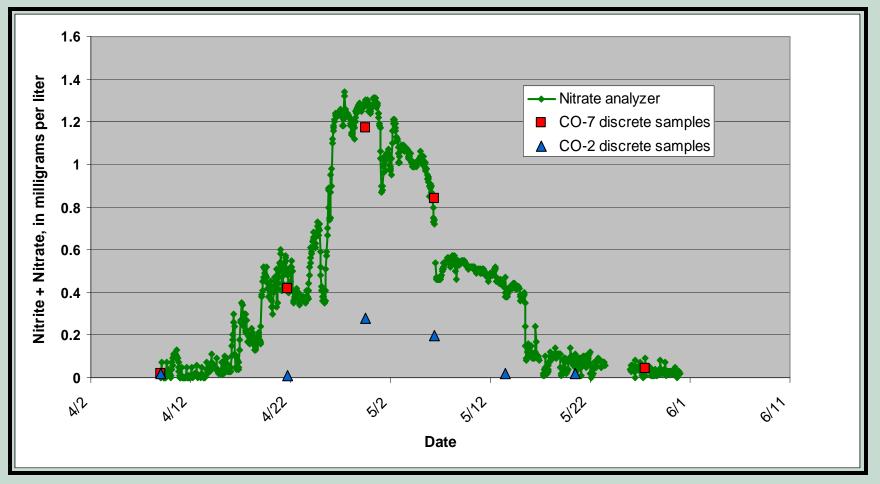
0

millisiemens per centimeter

Specific conductance, in



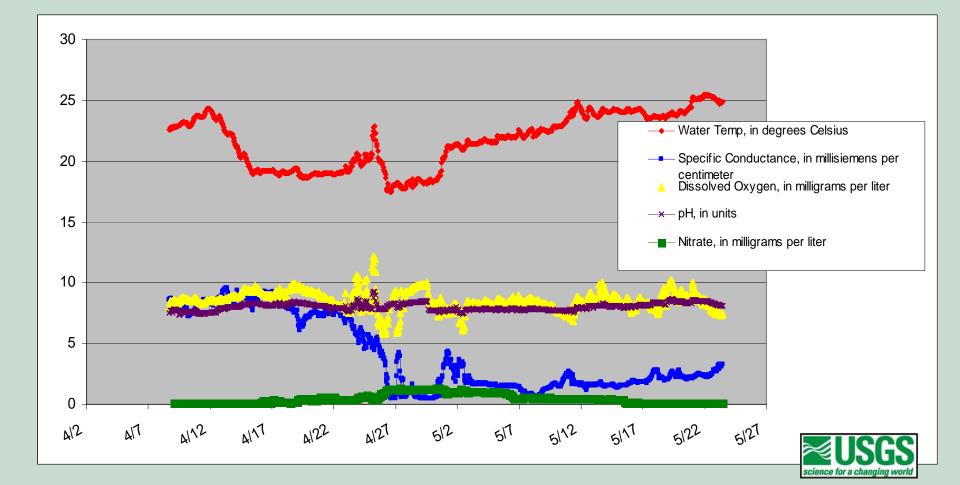
Crossover 7 hourly nitrate compared to Crossover 2 & Crossover 7 discrete (weekly) samples



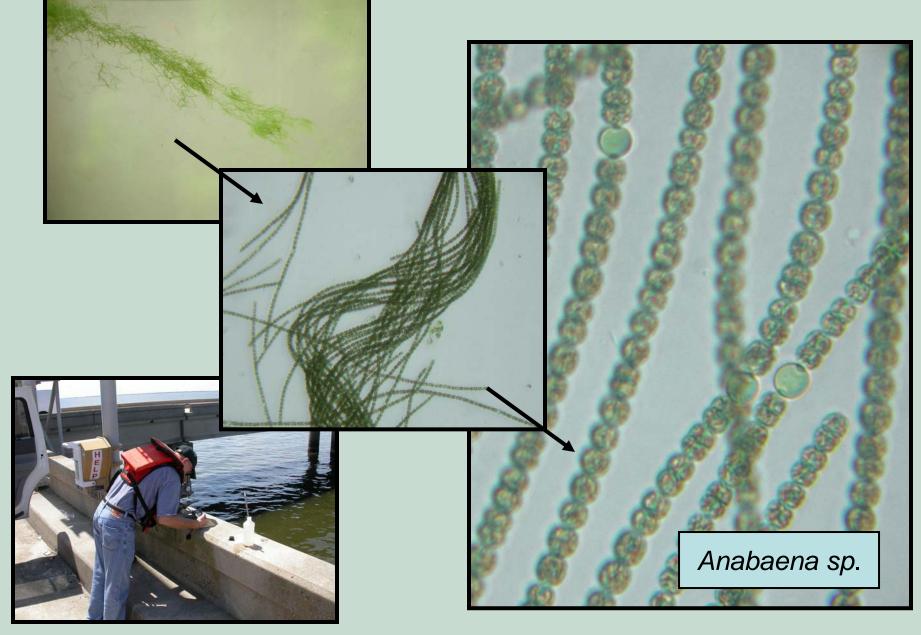


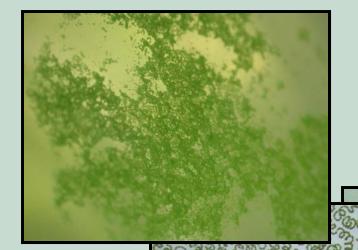
Hourly multiparameter readings at Crossover 7 4/08-5/23/08

depth: 10 ft.



Onsite investigation of algal blooms





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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Send us in coach!