

NJWMCC Meeting Update on the National Water Quality Monitoring Council Meeting

Salt Lake City

March 10-12, 2009

<http://acwi.gov/monitoring/minutes/index.html>

Eric Vowinkel

U.S. Geological Survey Water Science Center
New Jersey Water Monitoring Coordination Council

May 20, 2009



Main Topics at Meeting

<http://acwi.gov/monitoring>

- **Panel Presentations and Discussion on State and Regional Monitoring Councils**
- **Panel Presentations and Facilitated Discussion on the National Monitoring Network**
- **Update on National Environmental Status and Trends (NEST)**
- **National Monitoring Conference (NMC) Update/Discussion**



Panel Presentations and Discussion on State and Regional Monitoring Councils

- **Goals and expected outcome** – To exchange information on the benefits and challenges of initiating and implementing a State or Regional Monitoring Council – and to discuss how the national Council can serve to guide and promote initiation in other states and sustainability of existing councils.
- **Panelists (in attendance):**
 - Leslie McGeorge (New Jersey Council)
 - Jeff Frey (Indiana Council, Indiana Board)
 - John Hummer (Lake Michigan Council)
 - Tamim Younos (Virginia Monitoring Council)
 - Karl Hermann (Colorado; EPA regional monitoring perspective)
 - Steve Wolfe (Florida Council)
- **Panelists (on phone):** Dan Boward from Maryland; Val Connor and John Marshack from California

Panel Presentations and Facilitated Discussion on the National Monitoring Network

- The expected outcomes are to identify intersections between Network and NOAA goals (such as common interests in comparable data management of discrete data and real-time data; sensors; quality assurance and control; and support for regional issues on inland-to-ocean connections), and to develop “next steps” for enhancing collaboration. Ideas for additional refinements and future directions of the Network will also be outlined and discussed by the Council.
- **Presenters/Panelists (in attendance):**
 - Tracy Hancock (USGS – National Monitoring Network Overview)
 - **Eric Vowinkel (USGS, DE Bay Pilot)**
 - John Hummer (Great Lakes Commission, Lake Michigan Pilot)
 - Katie Harrold (SFEI, SF Bay Pilot)
- **Presenters (by telephone):**
 - Dwayne Porter (Univ. of South Carolina)
 - Whitley Saumweber (NOAA, NERRS)
 - Zdenka Willis (NOAA, IOOS)
 - Josie Quintrell (NOAA, NFRA)
 - David Schoellhamer (USGS, SF Bay Pilot)
 - Kevin Richards (USGS, Lake Michigan Pilot)
 - **Josh Kohut (Rutgers University)**

National Monitoring Network for Coastal Waters and Their Tributaries: the Delaware River Basin Pilot Inventory and Demonstration Projects

National Water Quality Monitoring Council Meeting
March 10, 2009

Eric Vowinkel

USGS New Jersey Water Science Center

USGS Acting Executive Secretary

National Monitoring Network for Coastal Waters and Their Tributaries

of the National Water Quality Monitoring Council

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Josh Kohut

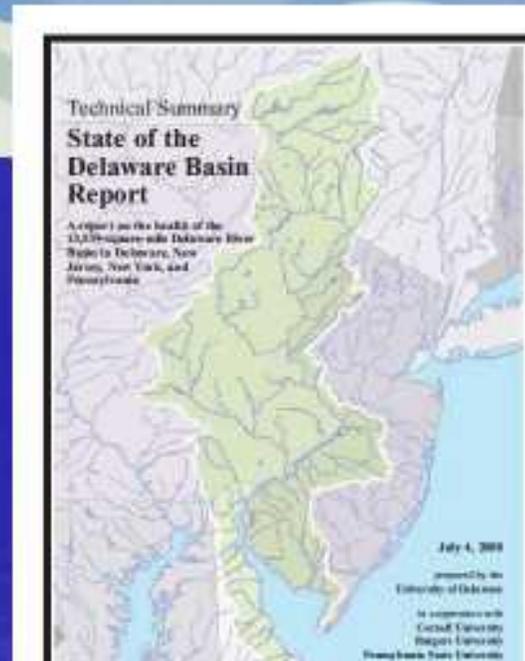
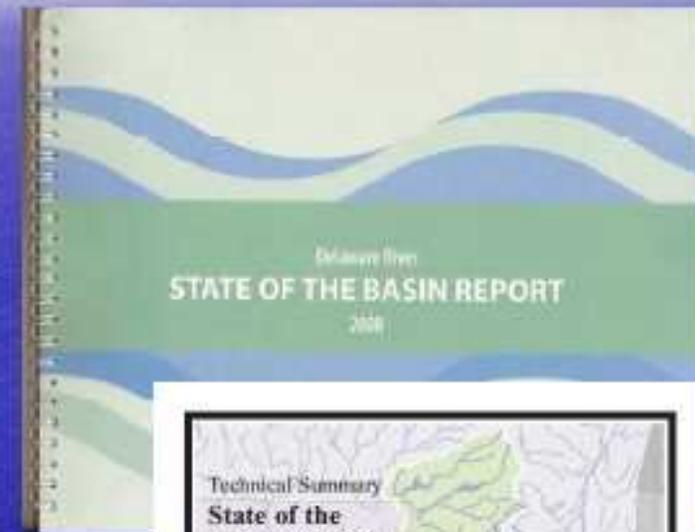
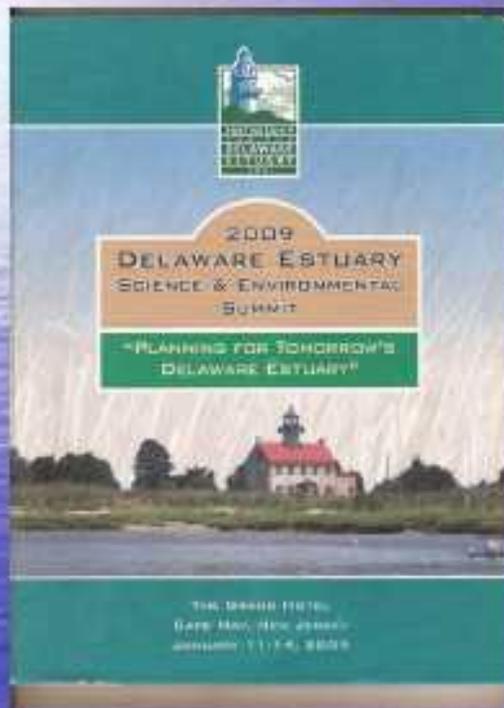
Rutgers University Institute of Marine and Coastal Sciences

kohut@marine.rutgers.edu

Delaware River Basin and Estuary recent reports and conference highlights

<http://www.state.nj.us/drbc/SOTB/index.htm>

<http://www.delawareestuary.org/>



<http://dspace.udel.edu:8080/dspace/bitstream/19716/3808/1/StateoftheDelRiverBasin08.pdf>

NOAA Grant Proposal related to real-time monitoring and data management in the Delaware Basin

Monitoring Infrastructure

The Delaware Estuary Watershed to Ocean Observing System (DEWOOS)

A Pilot Integrated Observing System Linking Monitoring of Watershed, Estuary and Coastal Ocean

A Planning Concept from:
Delaware River Basin Commission
University of Delaware
Rutgers University
US Geological Survey
NOAA
States of New Jersey and Delaware
Partnership for the Delaware Estuary
DE, NJ and PA Sea Grant



- **Upgrades to USGS real-time sites**
- Delaware Memorial Bridge (UDel)
- Buoys for oyster beds (NJDEP)
- Cape May Ferry (UDel)
- AUV for shallow estuary (UDel)
- Moorings lower estuary (UDel)
- **AUV for offshore (RU/UDel)**
- **CODAR for Delaware Estuary (UDel/RU) to complete RCOOS**
- Atmospheric (RU)
- **Wetlands (PDE)**
- DEWOOS Data Management

PROPOSAL COVER SHEET

Development of a Delaware Basin Watershed to Ocean Water-Quality-Data Exchange Portal and Upgrades to Real-Time Observation Systems as Part of the National Monitoring Network for Coastal Waters and Their Tributaries

December 3, 2007

Principal Investigator: Robert Tudor
Deputy Executive Director
Delaware River Basin Commission
25 State Police Drive
P.O. Box 7360
Weymouth, NJ 08028-0360
(609) 863-9500
(609) 863-9511 (FAX)
rtudor@drbc.com

Additional sensors such as nitrate, chlorophyll, carbon, and PARS planned at selected sites

Water issues being addressed in the Delaware Basin Demonstration area

Environmental Indicators

- Land-use/landscape
- Water quantity/hydrology
- Water Quality
- Living resources

Water Quality concerns

- Oxygen depletion
- Nutrient enrichment
- Toxic contamination
- Sedimentation
- Harmful algal blooms
- Habitat degradation
- Invasions by exotic species
- Pathogens (indicator bacteria)

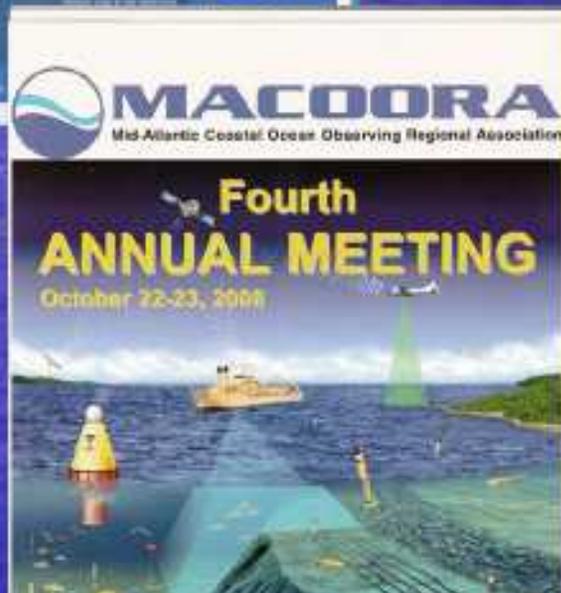
Indicators: water quality

<http://dspace.udel.edu:8080/dspace/bitstream/19716/3808/1/StateoftheDelRiverBasin08.pdf>

Delaware River Basin Indicator	Report Card	Trend
Water Quality		
Dissolved Oxygen	DO has improved or remained constant since 1990 at 11/12 stations along main stem and at 14/20 tributary stations.	▲
Nitrogen	N has remained constant since 1990 at 7/7 stations along the river and bay and at 15/16 tributary stations.	●
Phosphorus	P has improved or remained constant since 1990 at 7/7 stations along the river and bay and at 20/20 tributary stations.	▲
Total Suspended Sediment	TSS has remained constant since 1990 at 5/6 stations along the river and bay and at 19/19 tributary stations.	●
Copper	Cu has remained constant since 1990 at 5/5 stations along main stem and at 19/19 tributary stations.	●
Lead	Pb has remained constant since 1990 at 2/2 stations along main stem and improved or remained constant at 19/19 tributary stations.	▲
Zinc	Zn has improved or remained constant since 1990 at 5/5 stations along main stem and at 18/18 tributary stations.	▲
Mercury	Hg improved at Delaware R. at Trenton and EB/WB Delaware River and Neversink subwatersheds. Miles of Hg fish consumption advisories.	●
PCBs	PCBs detected in 84% of fish samples. PCBs in fish tissue declined over 25 yrs in basin.	●
Atrazine	95 of 100 streams in Delaware River Basin had detectable levels of Atrazine.	▼
Metolachlor	83 of 103 streams in Delaware River Basin had detectable levels of Metolachlor.	▼
Water Temperature	Water temperatures constant since 1990 at 10/13 stations. Summer median and peak water temperature declined in EB/WB and Neversink River.	●
Fish Consumption Advisories	3,935 miles (17%) of Delaware River Basin streams have full/limited fish consumption advisories in 2006.	▼
Sec 303(d) Designated Uses /Impaired Streams	1,493 miles (11%) of Delaware River Basin streams are impaired according to the USEPA in 2004.	▼
Salt Line (chlorides)	Salt line fluctuates annually in the Delaware River between the mouth of the Schuylkill at Philadelphia and the Christina River at Wilmington.	●

Mid-Atlantic Coastal Ocean Observing Regional Association (MACOORA)

<http://www.macoora.org/>



- Formed to integrate observations from Cape Hatteras to Cape Cod
- Four Themes identified at Annual Meeting October 22-23, 2008
 - Coastal Inundation
 - Maritime Safety
 - **Water Quality**
 - Ecosystem Based Management—Fisheries
- Water-quality workshop in March 11-12, 2008 in Philadelphia, PA

What are we doing now and why?

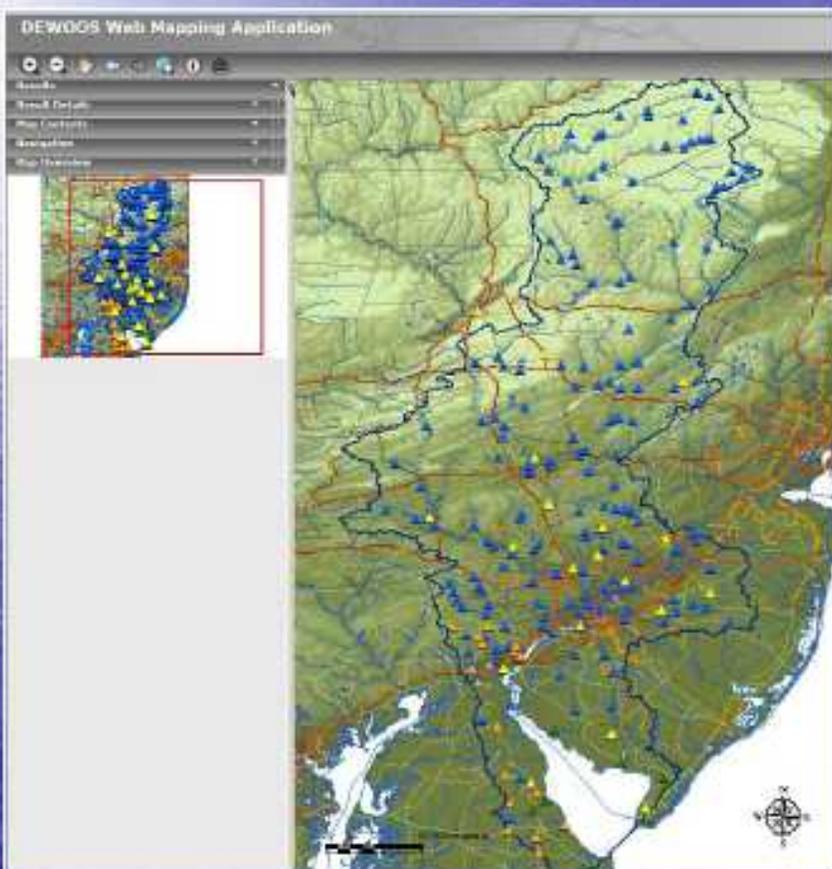
- USGS monitoring
- NOAA monitoring
- USEPA monitoring
- DRBC and DNREC Estuary Boat Run
- Selected State Monitoring
- MACOORA and Universities

Monitoring Organizations and Resource Components Monitored

Org	Estuary/ Embayment	Nearshore Coast	Offshore Coast	Rivers	Ground Water	Atmos. Depos.	Wetlands	Beaches
USEPA	✓	✓✓	✓	✓✓				✓
NOAA	✓	✓	✓✓				✓	
USGS	✓			✓✓	✓✓		✓	
COE	✓			✓	✓			
DE DNREC	✓	✓		✓	✓	✓✓	✓	✓
PA DEP	✓			✓	✓✓	✓	✓	✓
NI DEP	✓✓	✓		✓✓	✓	✓		✓✓
UDEL	✓✓	✓	✓			✓		
RUTGERS	✓	✓✓	✓✓	✓		✓✓		
DRBC	✓✓			✓✓	✓	✓		
Estuary Program	✓			✓			✓	
Philadelphia	✓			✓✓	✓	✓	✓	
Camden				✓✓	✓	✓		
Power Utilities	✓✓			✓✓			✓✓	

DEWOOS

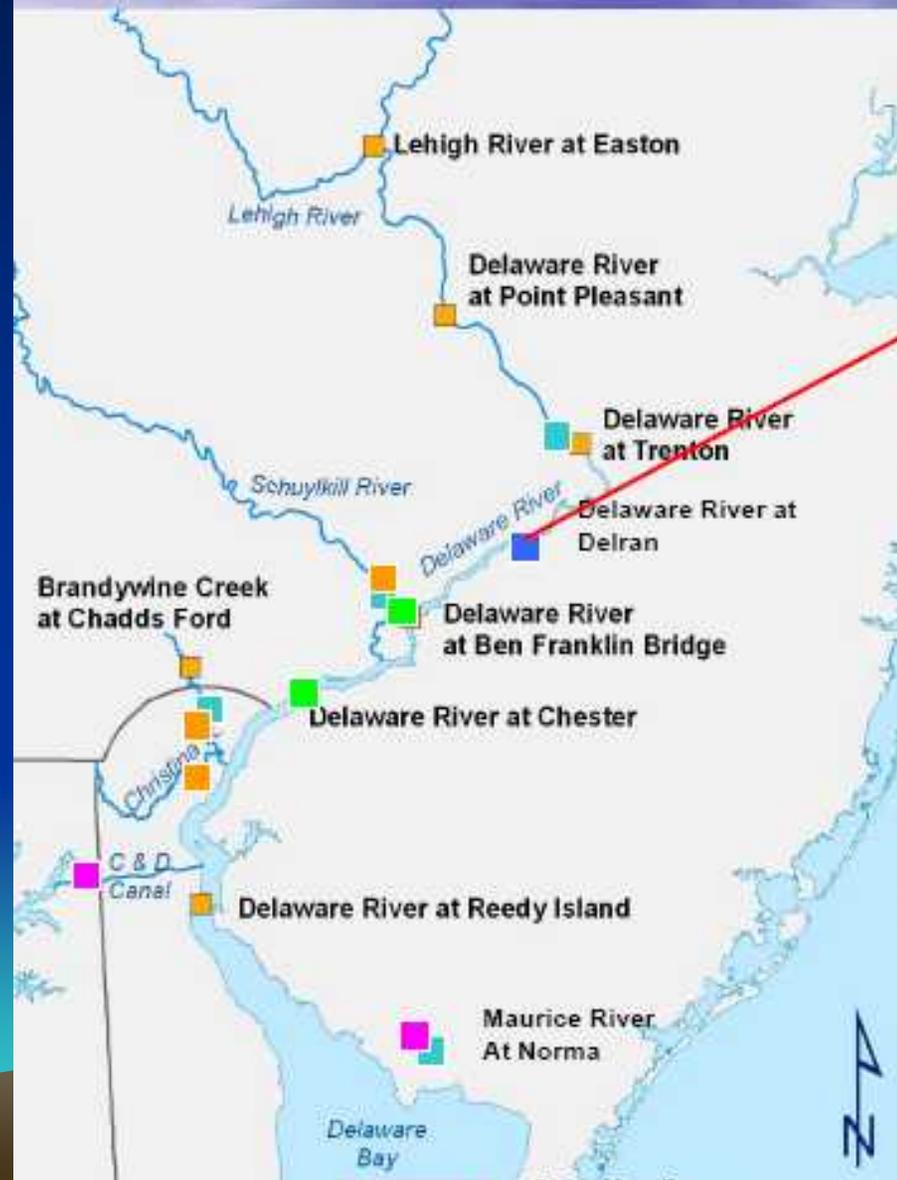
Delaware Estuary-to-Watershed-to-Ocean Observing System



<http://www.dewoos.udel.edu/>

- Proposed **integrated watershed and coastal environmental data-management system** that can be applied to a variety of watersheds across the nation—**“use the data we already have”**.
- Initially based on DEOS concept
- MACOORA provided seed money to start project to David Legates at UDEL
- Demonstrate how a cooperative regional monitoring system can be linked to and enhance the National Water Quality Monitoring Network
- One-stop shopping web site for data in the DRB

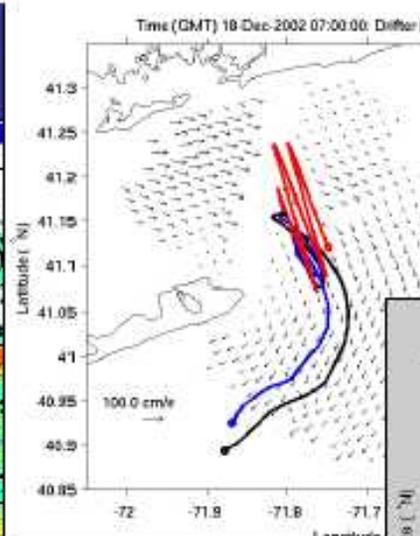
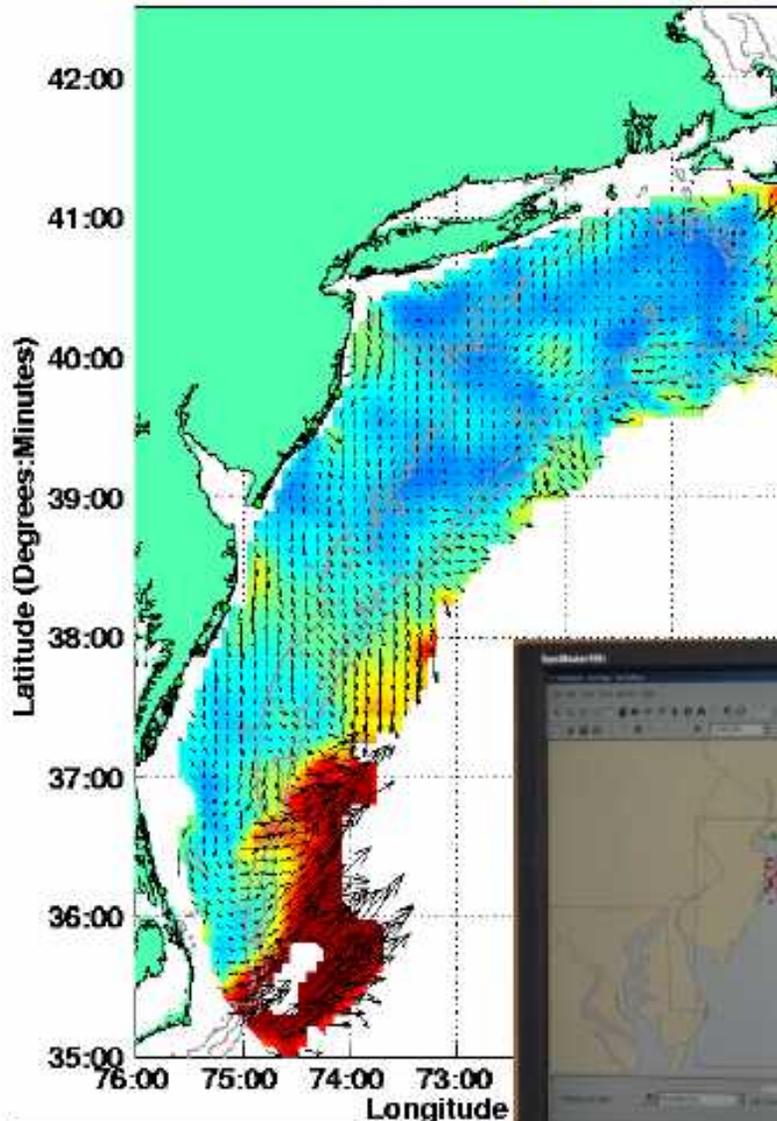
USGS NWQMN Sensor and Discrete Monitoring Network in the Delaware Demonstration area



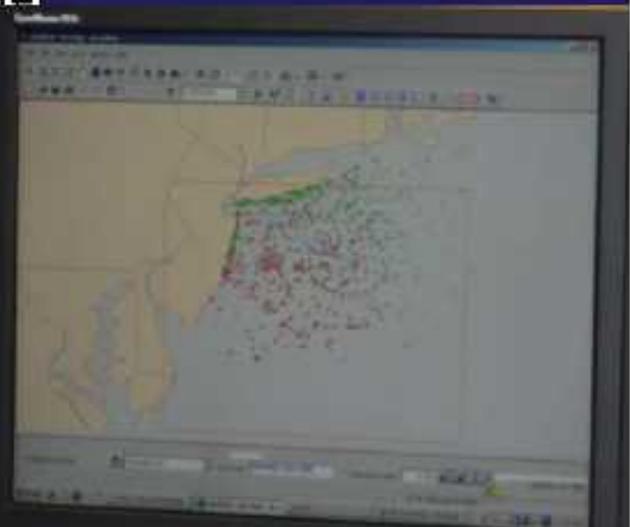
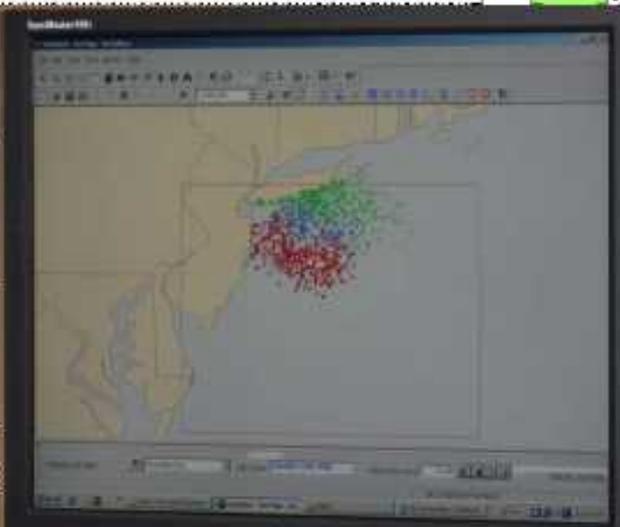
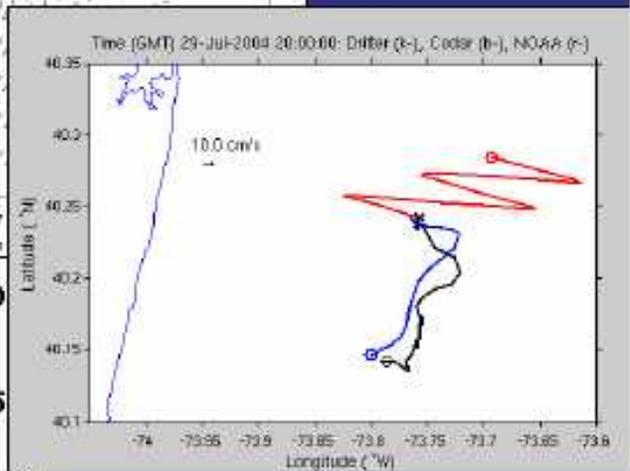
- Existing 4 or 5 parameter real-time sensors
- New 5 parameter real-time sensor
- Upgraded to 5-parameter real-time sensor with turbidity
- Possible real-time sensors
- DEL-NMN discrete monitoring sites for nutrients and carbon

Theme 1: Maritime Safety

Mid-Atlantic Raw Velocities (1 Day Avg) 200

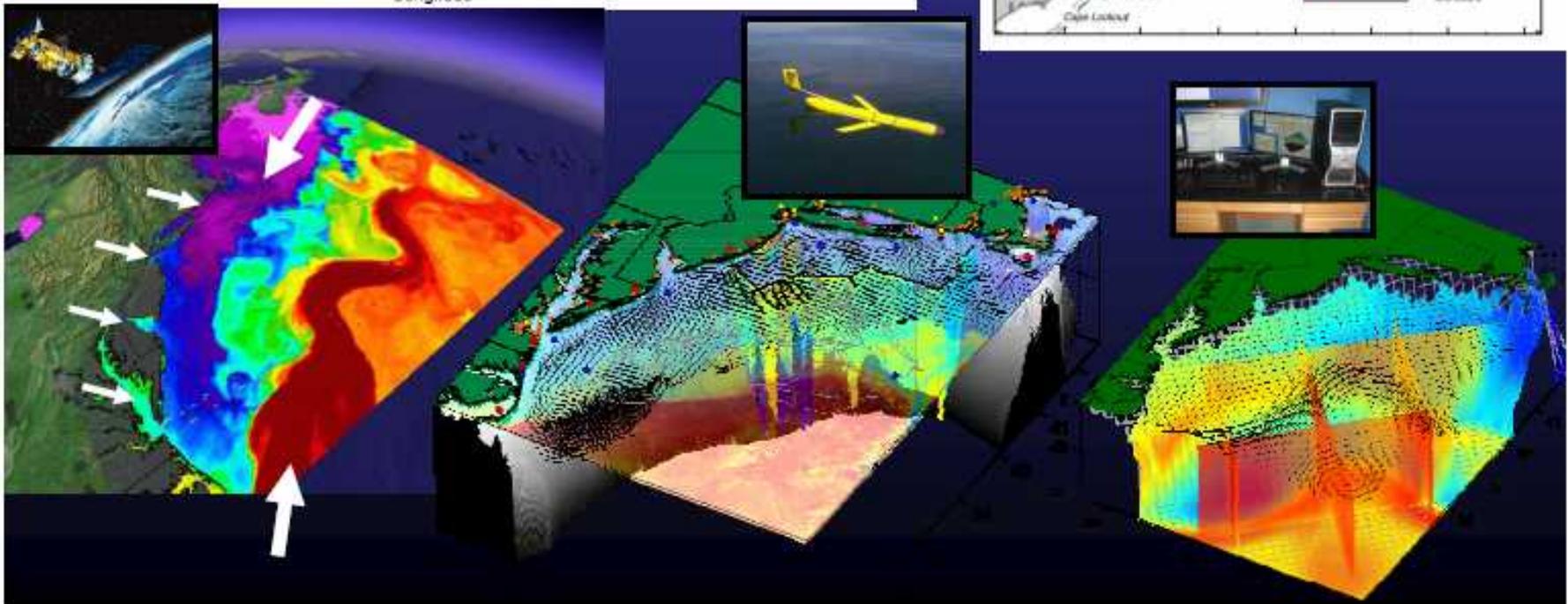
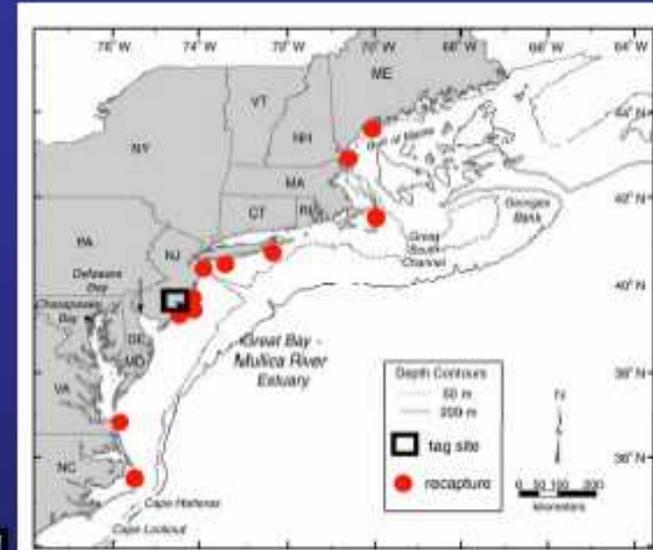
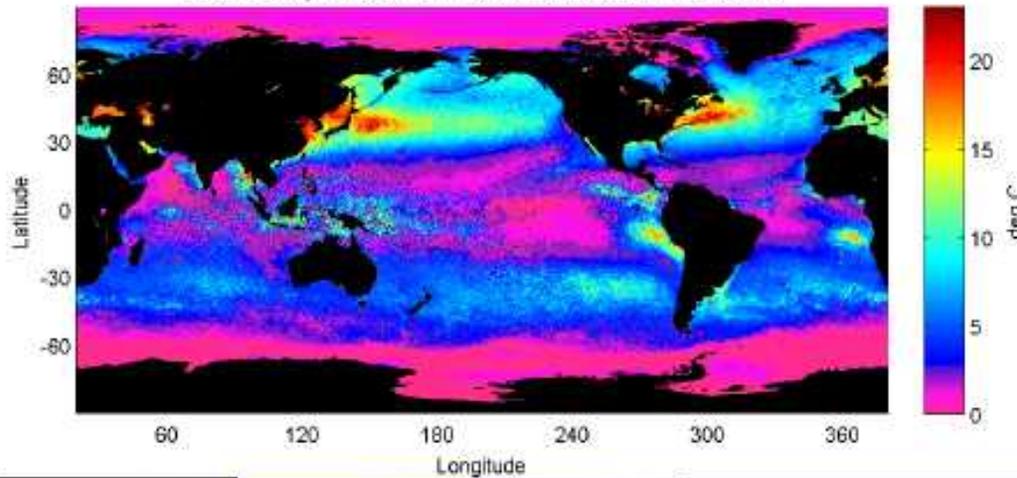


NOAA Coastal Site
CODAR Currents
SLDMB Drifter



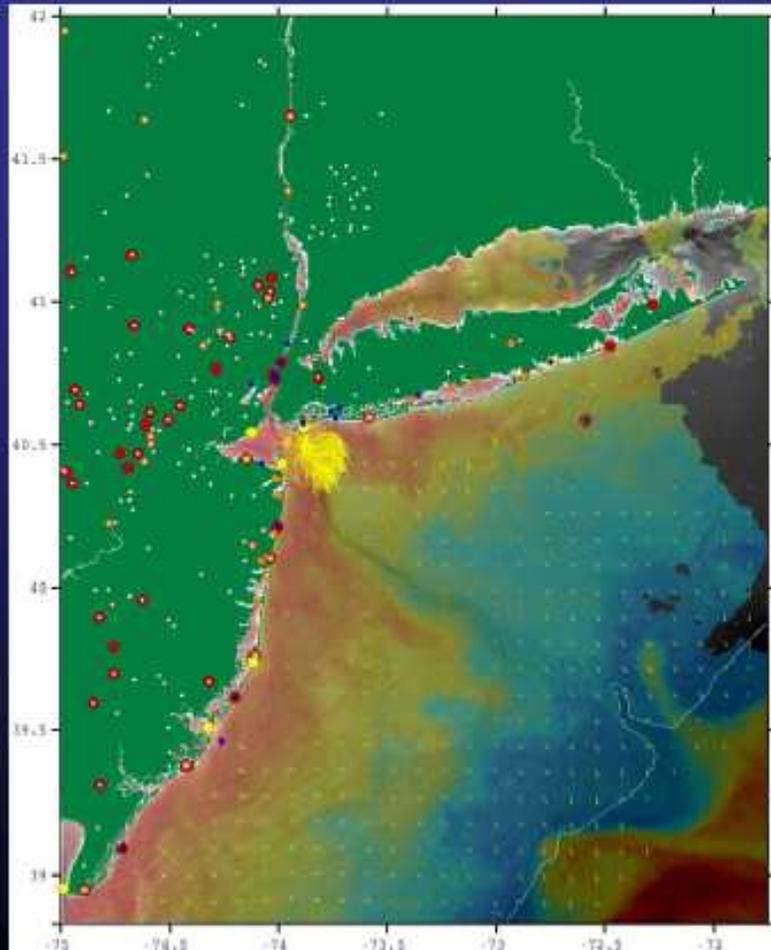
Regional Theme 2: Ecological Decision Support - Fisheries

11 Year Composite SST Summer/Winter Difference 1995-2005

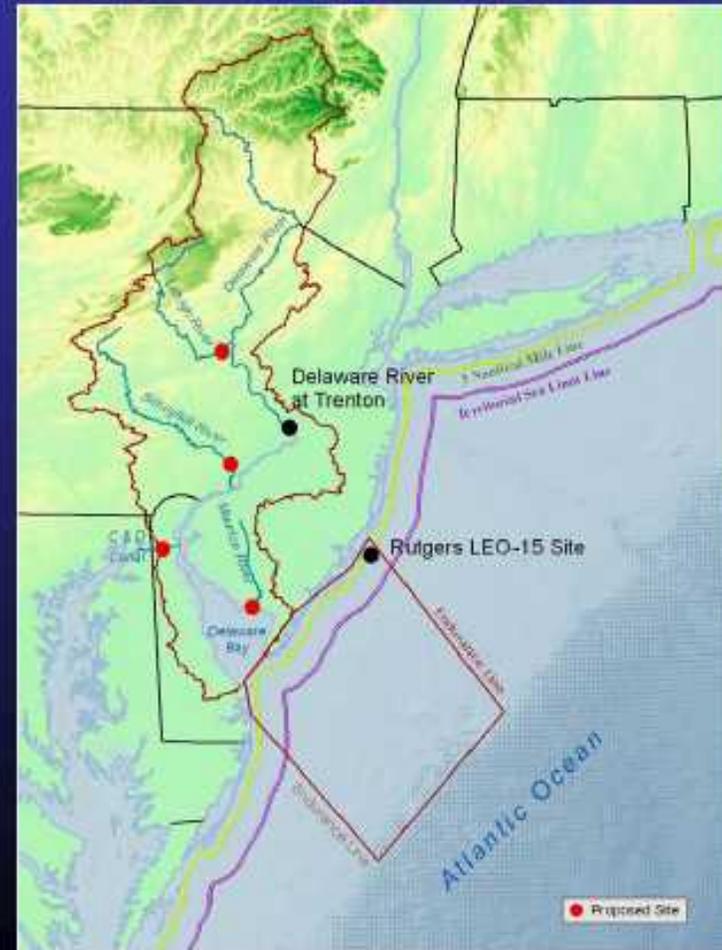


Sub-regional Themes: Coastal Inundation and Water Quality

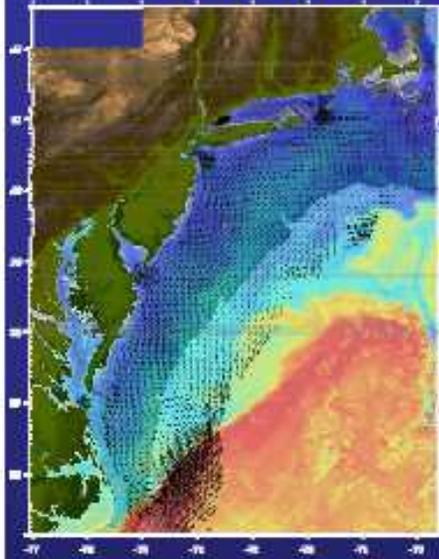
New York Bight



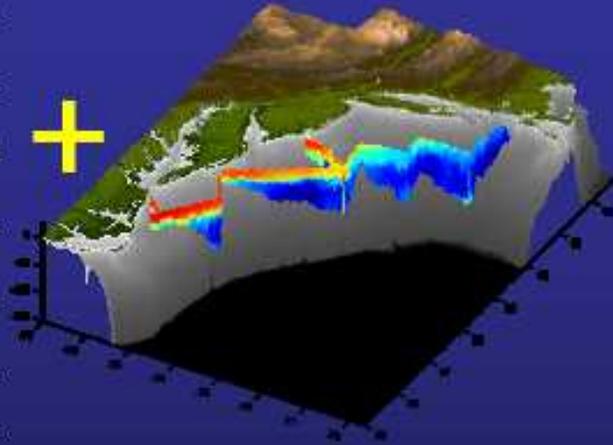
Delaware Bay



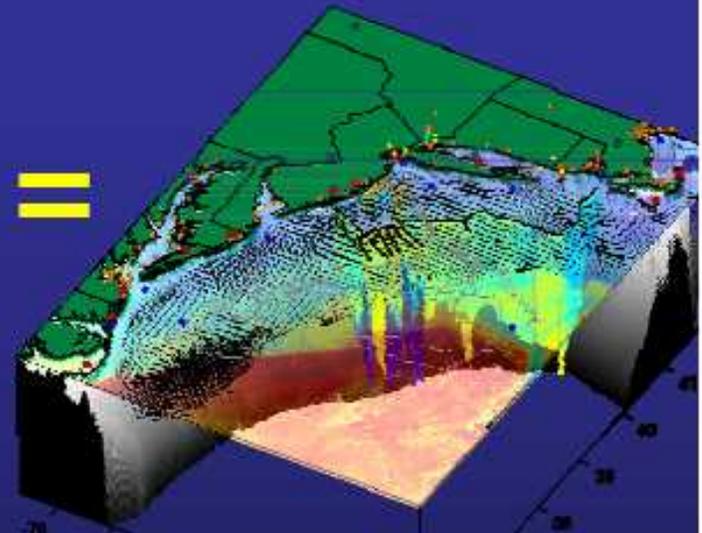
Composite Data & Forecast Products



Remote Sensing



Gliders



3-D Nowcasts



Nested Models

+

34DVAR procedure

Legend: $\mathbf{z} = \mathbf{z}(t) = \sum_{i=1}^N \mathbf{z}_i(t) - \mathbf{N}(t) - \mathbf{E}$ $\mathbf{F}_i = \mathbf{F}(t) \quad \mathbf{A}_i = \mathbf{A}(t)$
 Legend: $\mathbf{z}_i = \mathbf{z}_i(t) = \sum_{j=1}^N \mathbf{z}_{ij}(t) - \mathbf{N}_i(t) - \mathbf{E}_i$ $\mathbf{F}_{ij} = \mathbf{F}(t) \quad \mathbf{A}_{ij} = \mathbf{A}(t)$

Minimize \mathbf{J} w.r.t. \mathbf{z} and \mathbf{z}_i

$$\frac{\partial \mathbf{J}}{\partial \mathbf{z}} = 0 \Rightarrow \frac{\partial}{\partial \mathbf{z}} (\mathbf{z} - \mathbf{N}) - \mathbf{E} = 0 \quad \text{ADVAR}$$

$$\frac{\partial \mathbf{J}}{\partial \mathbf{z}_i} = 0 \Rightarrow \frac{\partial}{\partial \mathbf{z}_i} (\mathbf{z}_i - \mathbf{N}_i) - \mathbf{E}_i = 0 \quad \text{ADVAR}$$

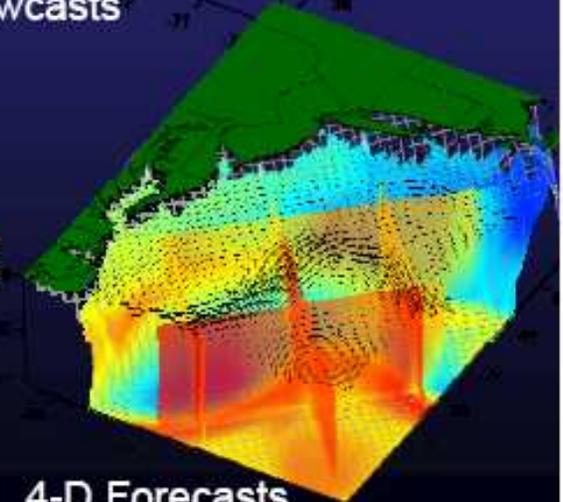
$$\frac{\partial \mathbf{J}}{\partial \mathbf{z}_i} = 0 \Rightarrow \mathbf{F}_i^T (\mathbf{z}_i - \mathbf{N}_i) - \mathbf{E}_i = 0 \quad \text{coupling of ADVAR}$$

$$\frac{\partial \mathbf{J}}{\partial \mathbf{z}_i} = 0 \Rightarrow \mathbf{A}_i^T (\mathbf{z}_i - \mathbf{N}_i) = 0 \quad \text{coupling of ADVAR}$$

ADVAR solution:

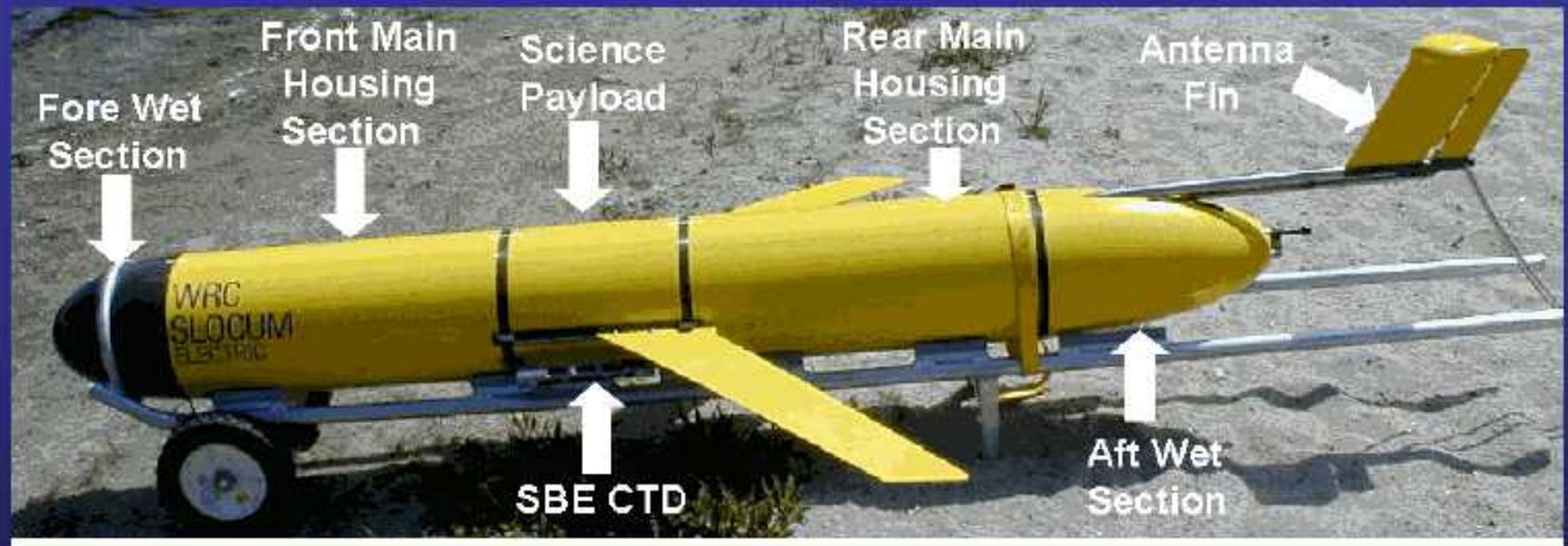
- (1) Choose $\mathbf{z}_i = \mathbf{z}_i$
- (2) Iterate (1) until \mathbf{z}_i and \mathbf{z} converge
- (3) Iterate (2) until \mathbf{z}_i and \mathbf{z} converge

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4-D Forecasts

Slocum Coastal Glider



Glider Specs.

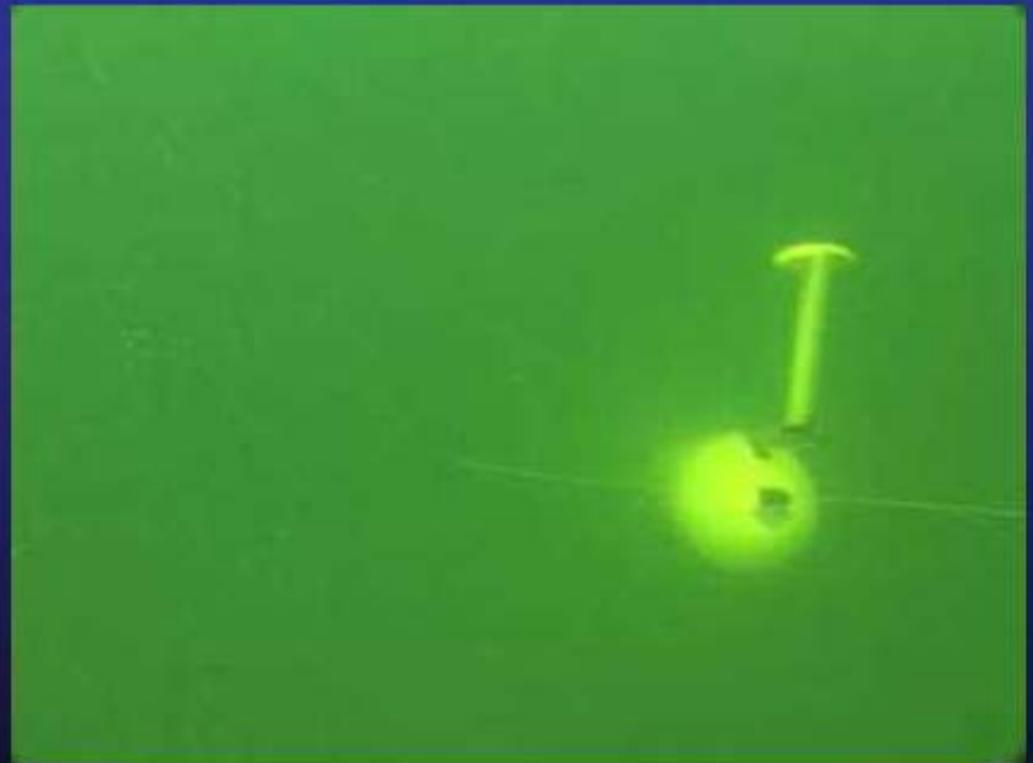
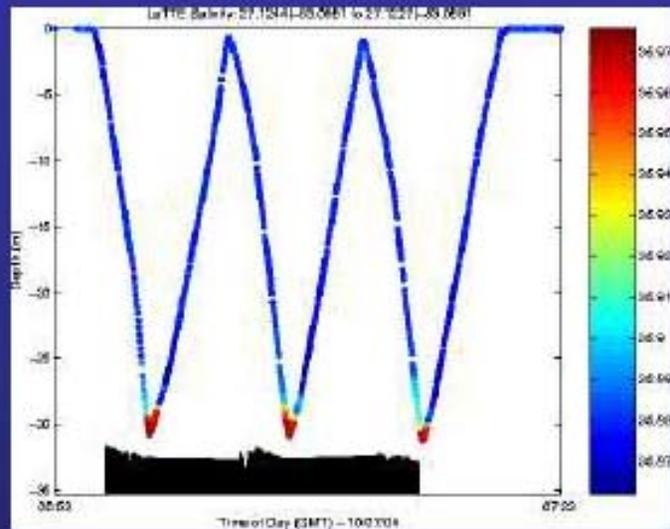
Length: 1.5 m Hull Diameter: 21.3 cm
Weight: 52 kg

Science Bay Specs.

Length: 30 cm Diameter: 21.3 cm
Max. Payload Weight: 4 kg



The Glider "Flight"



2010 National Conference

<http://acwi.gov/monitoring/conference/2010/index.html>



Seventh National Monitoring Conference - Monitoring From the Summit to the Sea

April 25-29, 2010

Denver, Colorado

The [National Water Quality Monitoring Council](#) (NWQMC) will host its Seventh conference, **Monitoring From the Summit to the Sea**, April 25-29, 2010 in Denver, Colorado. The conference will focus on the many facets of water quality and quantity monitoring for improved understanding, protection, and restoration of our natural resources and communities. Especially integral to effective monitoring networks are the “3C’s” of the [Council’s Framework for Monitoring](#) – Communication, Collaboration, and Coordination.

- [Call for Abstracts](#)
 - [Abstract Submittal](#)
- 2010 Conference Information will be available soon

Conference Themes -

- Applying Innovative Monitoring, Assessment, and Modeling Tools and Approaches
- Integrating Monitoring to Cost Effectively Support Water Resource Management
- Exploring New Technologies and Analytical Methods
- Addressing Climate, Energy, Water Availability, and other Emerging Water Issues
- Communicating Science to Decision Makers and the Public
- Strengthening Collaboration and Partnerships at all Scales



CALL FOR ABSTRACTS



Seventh National Monitoring Conference: Monitoring From the Summit to the Sea

April 25-29, 2010 – Denver, Colorado

The National Water Quality Monitoring Council (NWQMC) is proud to host its *Seventh National Monitoring Conference—Monitoring From the Summit to the Sea*—to be held in Denver, Colorado from April 25-29, 2010. The conference will focus on the many facets of water quality and quantity monitoring for improved understanding, protection, and restoration of our natural resources and communities. It will also provide a unique forum for water practitioners from all backgrounds—including governmental organizations, volunteers, academia, watershed and environmental groups, and the private sector—to exchange information, develop skills, and foster collaboration and coordination. USGS, EPA, NOAA, and state scientists and others will showcase new findings on the quality of the Nation's estuaries, lakes, streams and groundwater, and highlight recent innovations and cutting-edge tools in water-quality monitoring, assessment, and reporting. The conference location in Denver, Colorado will provide an ideal venue to showcase western water monitoring issues, including sustainable water management, effects of wildfires, and efforts to evaluate the effects of climate change on water quality, quantity, and aquatic ecosystems.



Instructions for Submitting Abstracts

Abstracts should be submitted via the Internet by logging onto acwi.gov/monitoring/ and clicking on “2010 National Monitoring Conference.” Follow the instructions provided on the abstract-submittal page.

All abstracts must be received no later than September 19, 2009.

Authors of abstracts accepted for oral and poster presentations will be notified by January 8th, 2010 and will receive further guidelines for preparation of presentations, papers, and posters. All presenters must register for the conference.

Registration Information

Registration includes breakfasts and lunches and one evening reception. Attendee scholarships may be available.

- Attendee: \$400 (early registration); \$450 after February 15th, 2010
- Oral or Poster Presenter: \$350 (early registration); \$400 after February 15th, 2010

For exhibitor and sponsorship information please contact surbas@nalms.org. For questions related to programming or to be placed on a NWQMC conference mailing list, please contact the 2010 National Monitoring Conference Coordinator at gglysson@usgs.gov. For more information on the NWQMC, this, and previous conferences please visit: <http://acwi.gov/monitoring/>.



Other Themes of National Council

- **National Monitoring Conference (NMC) Update/Discussion**
 - David Tucker, Jeff Schloss, and Doug Glysson
 - **Goals and expected outcome** – To gather ideas for possible “theme-building,” workshops, sessions and other venues for the National Conference (before the workgroup breakouts).
- **Update on National Environmental Status and Trends (NEST)**
 - Mary Skopec, Greg Petit, Paul Currier and Co-Chairs
 - **Expected outcome** – To provide feedback to the NEST leadership team on state interests and possible roles in defining and implementing a national set of indicators. (Note: Discussion to be continued in Water Information Strategies workgroup)

