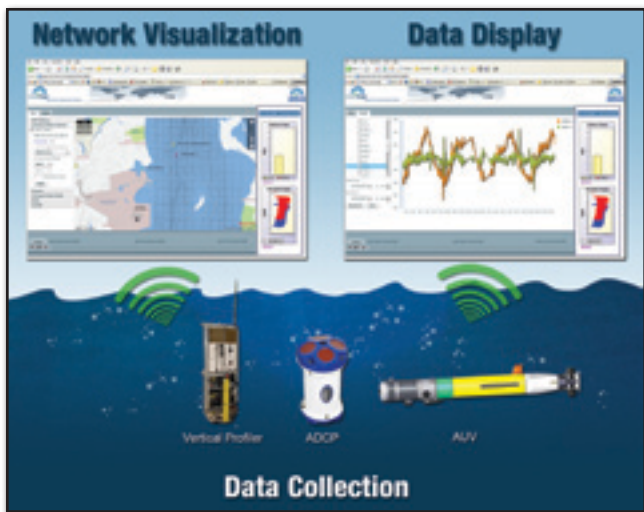


COASTMAP Used in Narragansett Bay Real-Time Observation System



Schematic of the subsea data collection equipment, ASA's network visualization interface, and Web-based graphical data display of the real-time observation system.

An almost annual phenomenon occurring in Rhode Island's Greenwich Bay may signal chronic water quality problems in this region of Narragansett Bay. The hypoxic (low dissolved oxygen) and even anoxic (no dissolved oxygen) bottom waters that typically develop during the late summer may indicate a problem for the health and fisheries of Greenwich Bay. There are a number of theories regarding the cause of the hypoxic conditions, including large freshwater inputs, solar warming of the surface layer, and poor vertical mixing in the water column. Oceanographers at the University of Rhode Island (URI) point out that the condition, though unpleasant, may not be an unnatural or unexpected occurrence.

To investigate recurrent oxygen depletion events that have resulted in fish and shellfish kills and better understand the causes, a joint academic-industry partnership was established between ASA's scientists and a pioneering team of researchers. Dr. Alfred Hanson, Principal Investigator and President of SubChem Systems, as well as scientists from WET Labs Inc., and URI's Graduate School of Oceanography teamed with ASA to develop a real-time monitoring system that utilizes multiple data collection platforms. This collaborative project was awarded funding as part of the Rhode Island Science and Technology Advisory Council's \$1.5 million research and development grant.

The data collection platforms for this project include an autonomous (robotic) underwater vehicle (AUV) with smart sampling systems, a bottom mounted Acoustic Doppler Current Profiler (ADCP), and an Autonomous Moored Profiler for vertical profiling in the water column. The collected data is transmitted via wireless modem to a shore station where it is processed and published to ASA's COASTMAP Environmental Data Server (EDS). The COASTMAP EDS manages in-situ observations and gridded data products. Using tools within COASTMAP the data is assimilated and integrated into graphical data products accessible through a suite of open standard web services. Maps and data are available through an internet Web application that integrates commercial (Yahoo!) maps with time-varying scientific data.

This application has proven the capability of COASTMAP to allow for the collection, fusion, display, and analysis of data from changing configurations of re-locatable underwater sampling systems. The integrated system of data collection platforms and COASTMAP's analysis and display tools are useful to scientists and environmental managers to study water quality changes in coastal areas. The system also has application for port security and maritime safety as well as for recreational boaters and fisherman who will be able to access real-time information on currents, water depths, and temperatures.

For more information about ASA's COASTMAP or this collaborative research project contact Mark Wholey, mwholey@asascience.com.



Deploying the ADCP

THE INSIDE STORY

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- ASA TimeSlider Release

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SSFATE Model Enhanced to Address Wave Action Sediment Resuspension

Dredging and sediment-disposal operations require careful assessment and management to avoid harmful levels of suspended sediments and prevent sedimentation from impacting sensitive habitats and facilities. Depending upon the environment, there may be concerns for benthic primary producers, such as seagrass and macrophytes which can be starved of light needed for photosynthesis, and filter-feeding organisms which can be killed or stressed due to excessive physical abrasion, blocking of feeding mechanisms or physical smothering. Quantifying the potential for harm requires good estimates of both the

likely sediment concentrations and the durations of exposure. ASA previously developed the SSFATE model in association with the US Army Corps of Engineers for this purpose and has successfully applied the model to assess dredging and disposal operations in rivers and enclosed waters.

Assessing the outcomes of dredging operations in wave-exposed coastal waters requires special consideration due to the:

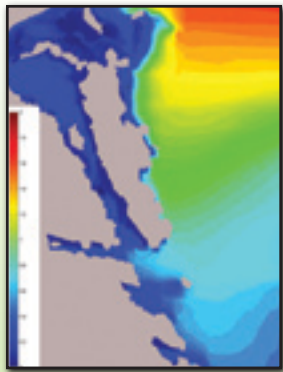
- potential for dredged sediments to be continuously resuspended by wave action, thus extending the duration of influence and potentially affecting more distant habitats - particularly when very fine sediments are disturbed;
- high variability in natural levels of suspended sediment and sedimentation that can occur in coastal waters subjected to waves and strong tides; and
- levels of tolerance displayed by organisms that are able to persist under these conditions.



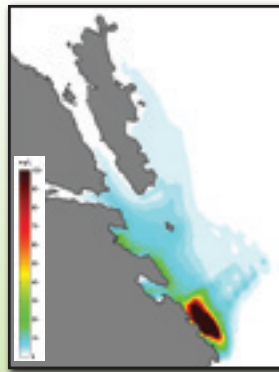
ASA enhanced the SSFATE model to better address operations in wave-affected environments. SSFATE now incorporates sediment resuspension due to wave action, with wave-fields for swells and wind-waves supplied directly from the SWAN shallow-water wave model. In addition, SSFATE produces time and space-varying estimates of seabed stress due to the combined actions of winds and waves. These estimates have been correlated to field measures of suspended sediments to predict and account for non-dredge related background sources.

The first applications of the improved SSFATE model were by Asia-Pacific ASA to a number of operations on the North West Shelf of Australia. Asia-Pacific ASA also developed post-processing tools to map zones of influence based on exposure at defined concentrations, durations, and frequencies. These procedures are used to identify situations that would exceed the conditions typically experienced by local biota.

For more information contact, Scott Langtry, slangtry@apasa.com.au.

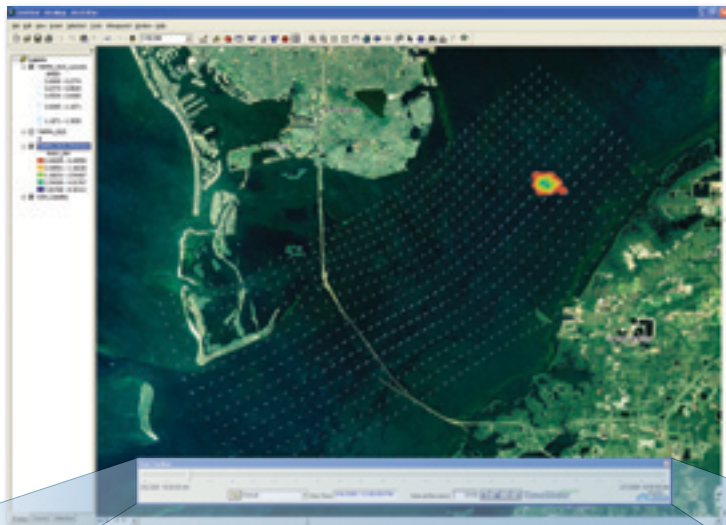


Wave spectral predictions from SWAN are input to SSFATE to estimate time- and space-varying seabed stress



Suspended solids concentrations predicted by SSFATE due to dredging and ongoing resuspension

ASA TimeSlider for ArcGIS 9.2 Release



In September, ASA released their TimeSlider™ toolbar extension for ArcGIS 9.2.

The TimeSlider extension provides functionality to animate GIS feature data that has date and time information. It has been used to manage time-varying data such as:

- Time series observation data from multiple points (e.g., current meters, wind stations, water quality sensors)
- Satellite derived observation data (e.g., sea surface temperature)
- Moving objects (e.g., drifting buoys, vehicles, vessels)
- Numerical model results (e.g., oil spills, flood inundation predictions, hydrodynamic simulations, sediment transport)
- Intelligent agent models (e.g., bird movement, pandemic outbreak, fish schooling, crowd simulation)
- Emergency personnel and resource deployments

The TimeSlider for ArcGIS 9.1 and 9.2 is available for free download at <http://www.asascience.com/timeslider>.

Personnel News

On 29-30 May **Deborah French McCay** provided oil spill modeling training for Victoria Broje and Ian Voparil of Shell Global Solutions at Westhollow Technology Center in Houston, TX. The training sessions covered oil trajectory, fates and biological effects, focusing particularly on algorithms and approaches used by ASA and in the SIMAP model.

On 1 June **Kelly Knee** presented "Integrating GIS and Internet Resources" at the 2007 Rhode Island GIS Conference. The conference focused on the many applications of GIS throughout the state of RI.

Deborah French McCay presented "Use of Field-Collected Data Measuring Fluorescein Dye Dispersion for Verification of a Dispersed Oil Transport Model" at the 30th Arctic and Marine Oil Spill Program (AMOP) Technical Seminar held 5-7 June in Edmonton, Alberta, Canada. Her talk summarized a large study involving 8 dye studies off California where transport and dye dispersion were measured to evaluate potential impacts of dispersed oil on water column organisms.

Matt Ward and **Christopher Mueller** attended the 75th MORS (Military Operations Research Society) Conference in Annapolis, MD from 10-16 June. **Matt Ward** presented a brief at the conference that demonstrated ASA's next generation waterborne chemical transport modeling capability.

Deborah French McCay presented "Modeling as a Scientific Tool in NRDA for Oil and Chemical Spills" at the Spring Conference of the North Atlantic Chapter of the Society of Environmental Toxicology and Chemistry (NAC SETAC) held 13-15 June at Roger Williams University in Bristol, RI.

Kelly Knee attended the ESRI International User's Conference in San Diego, CA from 18-22 June. The conference covered a broad range of GIS related topics both from the users' and technical perspectives.



Xiongping Zhang, joined by Benjamin Wu from HydroQual Inc., attended the China International Environmental Protection Exhibition and Conference (CIEPEC) and Eco Expo held in Beijing from 21-24 June.

On 26 June **Kelly Knee** presented "Modeling Pharmaceuticals and Organic Wastewater Chemicals" at the Summer Specialty Conference of the American Water Resources Association (AWRA) titled "Emerging Contaminants of Concern in the Environment: Issues, Investigations, and Solutions."

On 26 June **Deborah French McCay** presented at and participated in the Spill Modeling Summit in Durham, NH. The purpose of the workshop was

to evaluate the state of the art of oil spill modeling, discuss research questions, and use the input from the modeling community to develop research needs.

On 13 July **Kelly Knee** presented "Recent Technology Tools for Data Fusion and Visualization" at the 2007 Environmental Business Council Ocean Management Conference. The conference focused on demonstrating the link between marine technology and resource management in the ocean and coastal environment.



On 17-18 July **Deborah French McCay** and **Jill Rowe** participated in a meeting with Lighthouse Technical Consultants, Inc. (LTCI) and trustees from Puerto Rico and the U.S. Virgin Islands in Rockport, MA. The focus of the meeting was to discuss LTCI and ASA's evaluation of the 1991 Vista Bella oil spill that impacted the shorelines and biological resources of the U.S. Virgin Islands and the eastern coast of Puerto Rico. Jill and Deb were able to combine business and pleasure as they enjoyed an evening sail with the meeting team off Cape Ann, MA.

On 22 August **ASA** hosted the bi-annual progress meeting for the U.S. Coast Guard SAROPS development team in Narragansett, RI. Coast Guard representatives from Coast Guard Headquarters, Office of Search & Rescue, Command and Control Engineering Center, and District 1-Boston, attended the meeting to discuss feedback from the SAROPS users at approximately 430 SAR centers across the U.S. and plan for future releases.

On 27-29 August **Mark West** provided OILMAP training and implementation for Irving Oil's emergency response team in St. John, New Brunswick. Mark worked with the team on the use of OILMAP for oil spill response using regional wind and current data, as well as the OILMAP stochastic model for response planning and preparedness.



On 30 August **Kelly Knee** and representatives from Steamboat Marina in Hull, MA deployed ASA's ADCP to measure currents and waves in support of modeling for the Logan Airport runway end safety improvements project. ASA's role is to assist Vanasse Hangen Brustlin in evaluating potential marine environmental effects.



Congratulations to the **ASA South America** running group who participated in the 2007 Corporate Run in August. The event is sure to be the first of a long winning series.

Melanie Schroeder attended the American Fisheries Society's 2007 Annual Meeting in San Francisco, CA, 2-6 September. She presented her master's thesis research investigating the effects of seabed disturbance caused by bottom trawling at a symposium focusing on ecosystem-based fishery management, bycatch quantification, and gear technology. She also attended several other symposia on fisheries habitat enhancement and restoration.

ASA's New Look



ASA was founded in 1979 by four ocean engineers and scientists from the University of Rhode Island. ASA's first project was the application of newly developed hydrodynamic and water quality models to evaluate the impact of various wastewater treatment strategies on water quality in upper Narragansett Bay. Since then, ASA has evolved into an international consulting company specializing in numerical modeling, GIS, and cutting edge technology development for a wide variety of coastal and ocean projects.

In June 2007 ASA implemented a new brand architecture and visual identity to encompass the scope of ASA's current capabilities. The new identity formalizes ASA's expansion from an environmental modeling services firm to a science and technology solutions company. ASA's new Web site, re-launching this fall at www.asascience.com, will provide technical papers, software downloads and environmental data.



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Please visit our website at www.asascience.com for new ASA publications.

New Faces

Jennifer Cragan has joined ASA as a project scientist. Jennifer holds a BS in Chemistry and is completing a MS in Marine Chemistry and Geochemistry from the University of California at San Diego. She will be applying her chemistry and marine chemistry skills to chemical fate modeling at ASA.



Kevin Grunenberg has joined ASA as a software programmer. His background has been focused on developing enterprise level client-server applications, networking and technical support. Kevin, a New York-Rhode Island transplant, received a degree in Computer

Systems Technology & Programming from the State University of New York at Farmingdale. His role at ASA will be to update existing ASA applications and develop new ASA software systems.

Jennifer Read has joined ASA as a developer and systems administrator. She holds a BS in Environmental Science from the University of Rhode Island. In addition to her background in biological sciences, Jenn brings 9 years of industry experience in systems administration, support, and program development to ASA. She plans to begin a Ph.D. program in Civil and Environmental Engineering or Natural Resources Science in 2008.



Upcoming Conferences

Chris Galagan will be attending the GIS for Oil and Gas Conference sponsored by the Geospatial Information & Technology Association (GITA) in Houston, TX, 24-26 September. He will be giving a presentation on the use of oil spill models in the pipeline industry.

Deborah French McCay will present "Damage Assessment Modeling -- New Directions" at the 17th Annual Clean Gulf Conference, 15-16 November in Tampa, FL. Her talk is part of the Spill Modeling session and will provide an overview of new methods in spill modeling. Topics that will be covered in the session include interdisciplinary modeling, damage assessment modeling, integration of observations, and current research that can be applied to future modeling approaches.

The **10th International Estuarine and Coastal Modeling Conference (ECM10)** will be held at the Hyatt Regency, Newport, RI on 5-7 November. The focus of the conference is on the application of models to solve engineering and environmental assessment problems. The program includes the presentation of 110 papers in oral and poster format. There will be mini-symposia on Hurricane Storm Surge Modeling in Southern Louisiana and Modeling of Floridian Estuaries. You can register for the meeting and view the conference program and abstracts at www.oce.uri.edu/ecm10. Questions can be addressed to **Malcolm Spaulding**, Conference Chair (spaulding@oce.uri.edu) or Joe Pittle, Conference Coordinator (joepittle@uri.edu).

