

A publication of Applied Science Associates, Inc.
Vol. 18, No. 1, January 2004

Reality Check Validates Two ASA Models

Clearly, the closer a computer model approximates what actually happens, the more valuable it is as an investigatory and management tool. We recently ran extensive validation tests on two of our models and were very pleased with the outcome.

To satisfy requests for information from the Western Australian Department of Environment (DOE), a number of clients retained us to study Cockburn Sound on Australia's southwestern coast. Like many bays fringing major cities, the sound has suffered significant deterioration in water quality from excess nutrients and industrial discharges. As a result there has been a significant loss of seagrass. A vitally important habitat in that ecosystem, seagrass is a nursery for larvae and juvenile fish, a feeding ground for larger fish and invertebrates and a stabilizing influence against shoreline erosion. Recent research and management efforts have helped improve water quality and slow seagrass loss, but many threats to this important habitat remain. A number of continuous and occasional activities contribute to elevated levels of suspended sediments, which can block light seagrass needs and can also smother it. Although individual sources may be relatively small and short-lived, the DOE, as the sound's environmental manager, seeks to understand the cumulative impact.

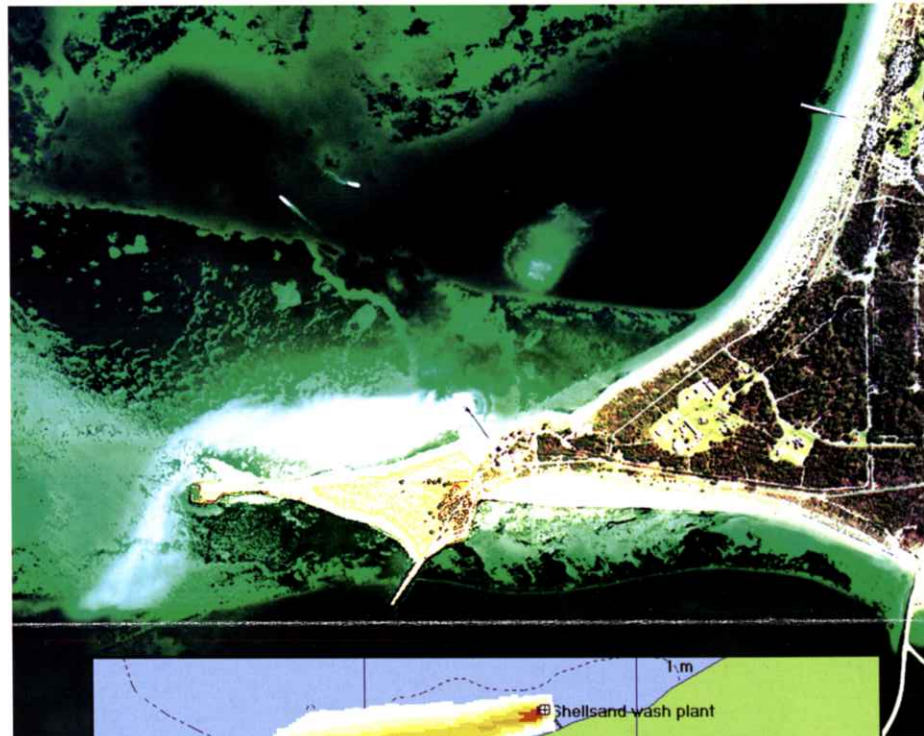
To model Cockburn Sound, we used two of our programs, HYDROMAP for a three-dimensional simulation of water circulation and MUDMAP to investigate sedimentation. Together our models support estimation of suspended solid concentrations and sedimentation patterns at fine temporal (minutes) and spatial (sub-10 m) scales. Thus our system is well suited to the patchy plumes generated by the discharges.

Working with DAL Science & Engineering, our Asian Pacific operation (APASA) has undertaken an extensive proving program for our combined HYDROMAP-MUDMAP system in Cockburn Sound. In every test our modeling system generated very close approximations to the observed distribution patterns of suspended solids and sedimentation. This demonstrates that our system may be confidently applied to predict the outcomes of future sediment discharges.

For more information on our validation studies, contact Scott Langtry, slangtry@appsci.com.

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The real-life photograph and our modeled image are nearly identical, confirming that our modeling system should be an accurate predictor of future events. The aerial photograph is part of a spatially rectified 1:25000 scale orthoimage of Cockburn Sound. The model image is for the wind and tidal conditions at the precise time the photo was made (as a hind cast using HYDROMAP for the currents and MUDMAP for the discharge).

ASA Models Integrate with the Latest ESRI Technology

For more than 10 years, we have been an international leader in integrating marine models and Geographic Information Systems (GIS). As an ESRI business partner and developer, ASA is currently using the latest ESRI GIS technology to make our models components of sophisticated GIS data applications. This allows existing ESRI GIS users to seamlessly activate complex numerical models and evaluate solutions based on existing GIS databases.

As an example, users such as state agencies with spatial data sets of environmentally sensitive areas may use our OILMAP model to evaluate potential oil spill impacts on these resources or use our AIRMAP model to evaluate health impacts to populated areas, schools and other high-priority sites. CMSMAP allows responders to integrate ICS-based deployments with critical infrastructure data and model predictions to provide a common operational picture.

Chris Galagan, our GIS manager, says, "We have had great success with the ArcGIS engine and the integration of our models because it allows us to interpret the model results in a geographic context. We're also really pleased with ESRI's technology to support our web-based applications and data distribution."

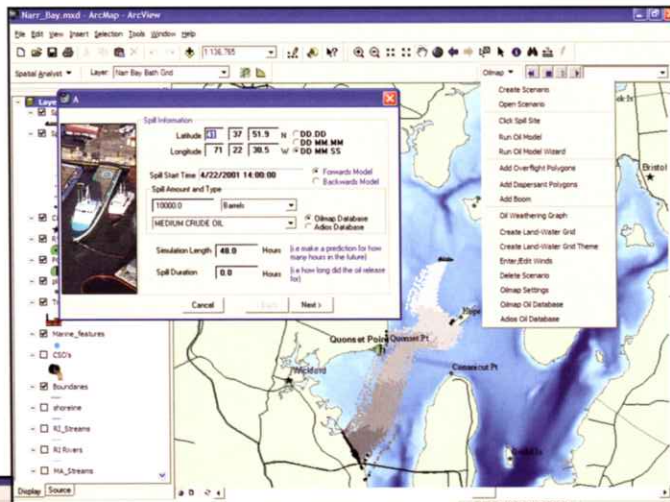
ASA products available for ESRI GIS:

- AIRMAP – Atmospheric Dispersion Model
- CHEMMAP – Chemical Dispersion Model
- CMSMAP – Crisis Management System & Incident Command System (ICS)
- COASTMAP – Real-time Coastal Ocean Monitoring and Modeling System
- OILMAP – Oil Spill Model for Marine and Freshwater
- OILMAPDEEP – Deep Water Oil Spill Model
- OILMAPLAND – Oil and Chemical Spill Model for Land
- SARMAP – Search & Rescue Model

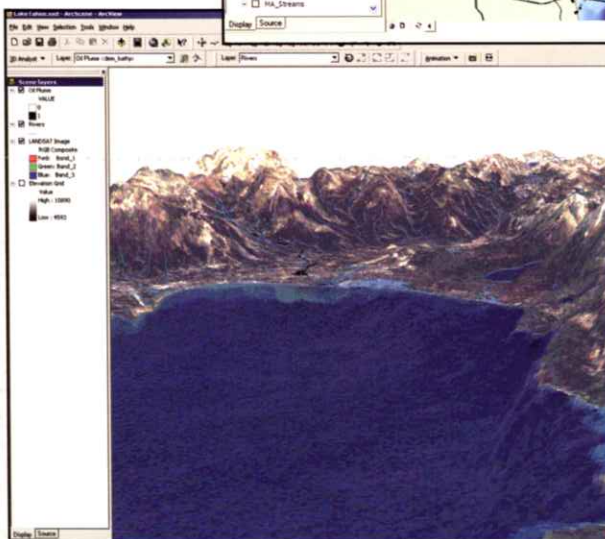
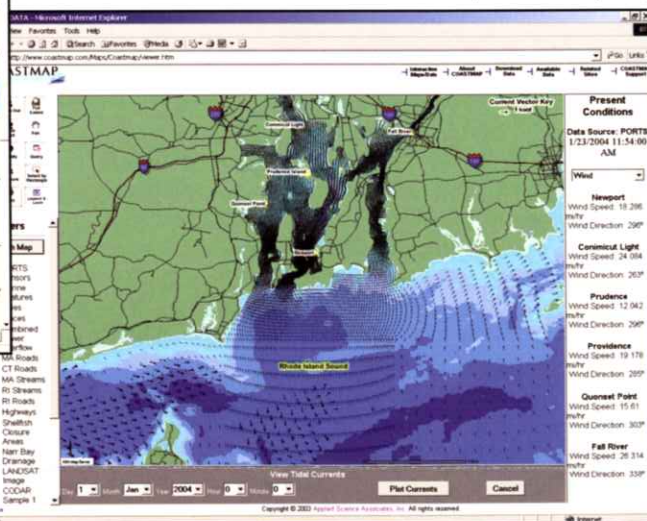


ESRI Technology
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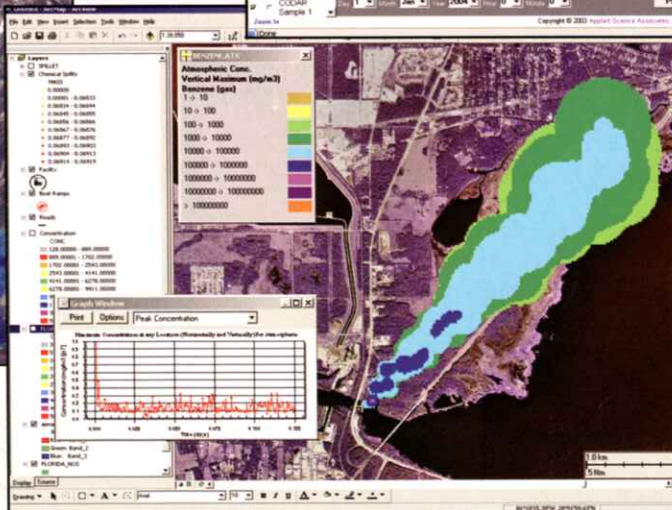
OILMAP



COASTMAP Web (www.coastmap.com)



OILMAPLAND



CHEMMAP/AIRMAP



ASA, Northrop Grumman and Metron are working on a more accurate search and rescue computer model system to be delivered to the U.S. Coast Guard in 2005.

ASA

Awarded Coast Guard Search and Rescue Contract

When the United States Coast Guard is called out for an open-water search and rescue, lives often hang in the balance. The initial problem the Coast Guard frequently faces is deciding where on a huge expanse of water to look.

The more accurately they can calculate where the object of their search is likely to be, the more lives they may save. The probable location of people and vessels adrift at sea depends on many interrelated factors, including the speed and direction of winds, tides, currents, wave action, and in the case of a vessel its size.

The rapid data handling capability and flexibility of computer modeling make it ideal to help the Coast Guard identify the most fruitful search location.

To upgrade its search and rescue capabilities, the Coast Guard has awarded ASA, Northrop Grumman Information Technology and Metron the contract to develop the next generation of search and rescue software, called Search and Rescue Optimal Planning System (SAROPS).

SAROPS integrates three main components:

- ESRI ArcGIS®-based user interface using the Commercial Joint Mapping Toolkit (C/JMTK),
- Internet-based real-time environmental data retrieval system,
- Search planning simulator.

We are scheduled to produce the prototype this year, with delivery of SAROPS to the Coast Guard in 2005.

Last year, the Coast Guard had a search and rescue budget of \$567.9 million and completed 31,562 SAR missions. Making their search location selection faster and more accurate will save money and, more importantly, lives.

For more information about SAROPS, contact Eoin Howlett, ehowlett@appsci.com.

Personnel

COPEDEC VI Conference, Colombo, Sri Lanka: **Roddy Thomas** attended the conference 14-19 Sept., the largest coastal engineering meeting outside the USA and Europe.

Argentina Oil & Gas Show, Buenos Aires: Together with **Eduardo Yassuda**, ASA's South American Manager, **Roddy Thomas** attended this conference 5-8 Oct.

Craig Swanson participated in the Electric Power Research Institute Workshop on 316(a) Issues—Technical and Regulatory Considerations, held in Columbus, OH, on 16-17 Oct. He coauthored the paper, "Probability-based impact assessment for a 316(a) demonstration—an example from Entergy Nuclear Vermont Yankee," with Mark Mattson (Normandeau Associates), Mark Hutchins (Hutchins Consulting) and Lynn DeWald (Entergy).

Malcolm Spaulding, **Craig Swanson**, and **Matthew Ward** presented papers at ECM8, the 8th International Conference on Estuarine and Coastal Modeling held in Monterey, CA, on 3-5 Nov. Other ASA staff, including **Tatsu Isaji** and **Paul Hall**, were coauthors of papers covering such topics as sediment transport modeling, hydrodynamic modeling, integrated monitoring and forecasting systems and flushing models. These papers will be published in the conference proceedings midyear 2004.

The Water Framework Directive Conference, London: **Roddy Thomas** attended this 1 day conference, 12 Nov., on the Water Framework EEC Directive; the most significant environmental directive to be published by the EEC in the last 20 years. The implications on industry, government, scientific community and the general public will be far ranging, and will entail a 16 year schedule to be fully implemented by Member States

Scott Langtry from Asia-Pacific Applied Science Associates (APASA) traveled through Papua, New Guinea, 15-22 Nov. to review fuel, oil and chemical handling procedures followed by Ok Tedi Mining Limited, who operate the Ok Tedi gold and

copper mine in the Western Province of Papua, New Guinea. APASA is applying BF-HYDRO and HYDROMAP to model water circulation along the Fly River and in the Gulf of Papua, respectively. OILMAP, SIMAP and CHEMMAP are being applied in stochastic mode to quantify social and environment risks from defined spill scenarios.

Craig Swanson testified before the Rhode Island Senate Committees on Government Oversight and Environment and Agriculture on 3 Dec. The hearing focused on Monitoring the Conditions in the Marine Environment, with speakers representing commercial, academic, state and federal government interests and was part of a set of hearings on Narragansett Bay and Marine Issues. **Eoin Howlett** presented COASTMAP, ASA's integrated modeling and monitoring software system to demonstrate how the private sector, specifically a Rhode Island-based firm, has successfully addressed the marine monitoring issue.

POLLUTEC, Paris: **Roddy Thomas** attended POLLUTE, 4-5 Dec, the largest annual Pollution, Waste Disposal and Environmental exhibition in France

10-11 Dec. **Eric Anderson** attended the IEEE Homeland Security Conference in Providence RI, and gave a presentation on the Crisis Management System, emphasizing the similarities between the oil spill response community post-Exxon Valdez and the Homeland Security community at this point in its development.

On 15-17 Dec. 2003, **Deborah French McCay**, **Nicole Whittier**, and **Jill Rowe** provided model training for Margaret Metcalf of the Minerals Management Service (MMS), U.S. Department of the Interior. MMS uses the ASA models SIMAP (oil spill analysis) and CHEMMAP (chemical spill analysis) to analyze oil and chemical spill fates and effects.

Eoin Howlett spent a week in São Paulo, Brazil, meeting with the management team (see photo) of ASA South America and discussing GIS and modeling issues to meet the specific needs of ASA's South American clients.

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From left to right, Thomas Richardson, Andrea Gallo Xavier, Jose Edson Pereira, Eduardo Yassuda, Roddy Thomas, Eoin Howlett.

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Personnel continued

Deborah French McCay presented and participate in a panel on oil spill modeling at the Electronic Technologies for Oil Spill Response in the Marine Environment Workshop sponsored by the California Department of Fish and Game's Office of Oil Spill Prevention and Response (OSPR) and ChevronTexaco. The workshop, Jan. 13-15, was at the ChevronTexaco corporate headquarters located in San Ramon, CA.

Jan. 14-15 **Eric Anderson** attended the American Meteorological Society Symposium in Seattle, WA, giving presentations on oil spill and hydrodynamics application to Jamaica Bay, adjacent to New York Harbor, and the integration of ASA's Crisis Management System with real-time data supplied by COASTMAP.

12-16 Jan. **Matt Ward** conducted training in hydrodynamic modeling using WQMAP for the Naval Post Graduate School in Monterey, CA.

Eoin Howlett has been elected to the board of directors of the Marine & Oceanographic Technology Network (MOTN) for 2004. MOTN had its annual general meeting in Taunton, MA, Jan. 15. Information on MOTN can be found at www.motn.org.

ASA Opens 2nd Office in South America

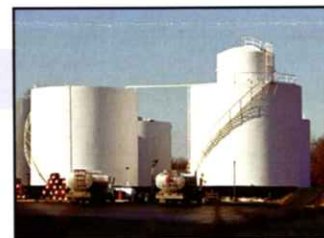
In response to growing demand for our services in South America, we have opened an office in Rio de Janeiro, our second in Brazil and our sixth worldwide.

Combined with our São Paulo office, we now have 20 professionals in South America, five with PhDs, offering a wide range of skills such as oceanography, coastal and oceanographic engineering, meteorology and geology to meet the needs of our Latin American clients. Director of Operations in our Rio office is Andrea Gallo Xavier, Thomas Richardson is VP of Marketing and Caroline Fisch and Joao Marcos Azevedo are oceanographers. Please feel free to contact our Rio office for any of our services.

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ASA and LNG

ASA can now provide liquid natural gas facilities, shippers and users with services to provide answers for security, emergency response, and environmental concerns. Contact Nicole Whittier, nwhittier@appsci.com.



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