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## ***Prestige—Spain's largest oil spill***

### **THE INSIDE STORY**

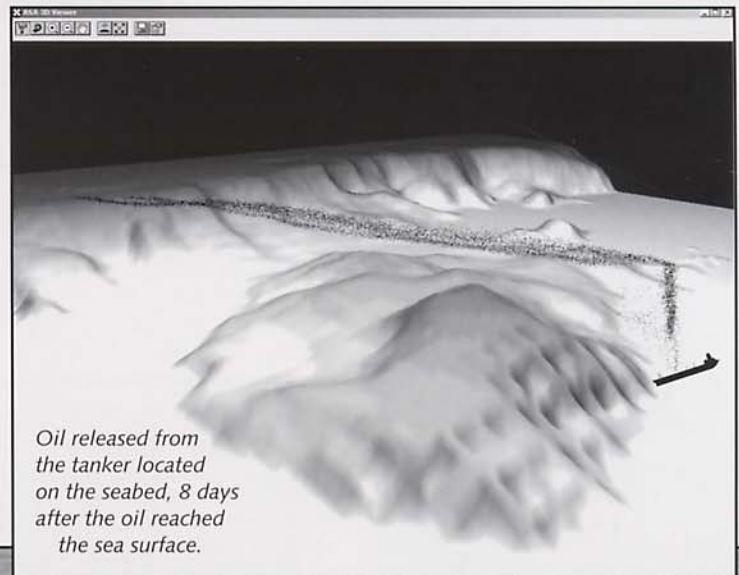
- ◆ COASTMAP Update
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On 13 November 2002 the oil tanker *Prestige* had been damaged in a storm and began to leak oil off the coast of Spain. The vessel was towed off shore, on 19 November 2002 the tanker broke in half and sank several hundred kilometers off the coast of northern Spain. Before the tanker sank approximately two million gallons of oil leaked from the vessel and about 150 miles of Spain's Galice coast have been affected by the spill. A visit to the site by the French submarine *Nautilus* showed evidence of very viscous oil leaking from numerous cracks in the sunken vessel.

ASA has been modeling where the oil will travel, the fate, and impacts from the *Prestige* oil spill using their three-dimensional oil spill impact model (SIMAP). The figure is an example of the modeling. It is a still image taken 8 days after the oil reached the sea surface from the tanker located on the seabed. A column of black dots extending from the seafloor to the sea surface shows the rising oil. The spill site is to the west of the Spanish coastline and southwest of the top of the sea mount.

The focus of ASA's modeling has been on where the released submerged oil will travel. As a result of this modeling it has been determined that it would take approximately 5 days for the oil to reach the sea surface, and then about one week for the surface oil to reach shore.

ASA's efforts have not gone unnoticed. On 13 December 2002 Peral Daniel from TV Spain USA and Dave Grunebaum from ABC 6, conducted an on camera interview with Dr. Deborah French McCay and Dr. Malcolm Spaulding. The focus of the interviews were on the release, movement of oil in the water and impacts of the *Prestige* oil spill.



*Oil released from the tanker located on the seabed, 8 days after the oil reached the sea surface.*



*Photo courtesy: AP/Wide World Photos*

# ASA SOFTWARE NEWS update

# COASTMAP

ASA is continuing its development of Coastmap as a real-time data-management and monitoring tool with a specific focus on linking data with a range of numerical models.

COASTMAP can be employed as a framework customized for each client for any monitoring and modeling project by providing direct links to oceanographic and meteorological sensors, large-scale models, as well as localized models. This

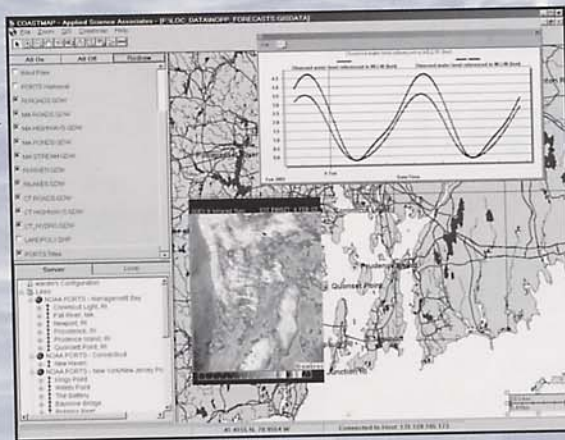
framework allows scientists, modelers and responders to share information efficiently for research, preparedness, and emergency response.

COASTMAP is currently linked to **pollutant, marine spill, atmospheric plume** and **water quality models** in support of **spill response** and **homeland security**.

## Available Data

- Sensor data from the client's deployed instruments
- Meteorological and oceanographic data from government programs such as NOAA's PORTS and NOS
- Weather data from the national weather service
- Model data from large scale meteorological or oceanographic models

## COASTMAP

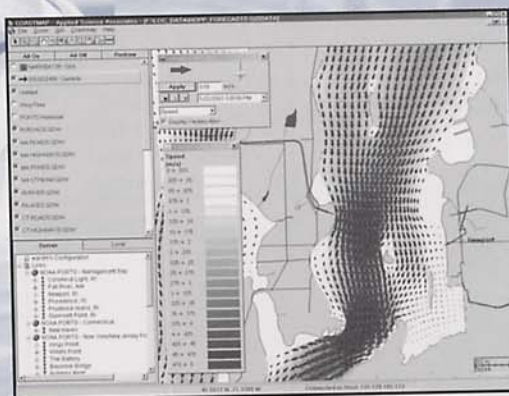


## COASTMAP Features

- Perform a suite of common data analysis functions:
  - Filtering
  - Power spectrum
  - Demeaning
  - Removal of spurious data
  - Harmonic analysis
- Data tree structure of available data.
- Qualitative and quantitative time series analyses

## Hydrodynamic Model

Boundary conditions  
Environmental conditions (winds, temperature, salinity, water level)

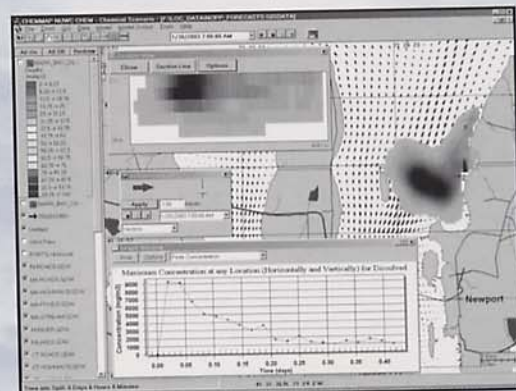


## Hydrodynamic Model Features

- Visualize model output and data simultaneously
- Hydrodynamic file

## Dispersion Model

Environmental Conditions (winds, currents, temperature, salinity)



Oil Spill, Chemical Release, Atmospheric Plume, and Search & Rescue Models

## Dispersion Model Features

- Time-varying contaminant transport and fate animation
- Mass balance of contaminant
- Evacuation zones

## Inputs

- Duration of spill
- Amount of contaminant released
- Contaminant type and characteristics
- Geographical data (shoreline and habitat type, depth)
- Human population data



OIL & GAS  
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# Personnel

Polaris Applied Sciences Inc. and ASA are working together on a joint project for Qatar Petroleum. Polaris is reviewing the current oil spill preparedness in Qatar, developing state-wide and facility plans, and making recommendations for the future. ASA is supplying oil spill model results and first GIS-based response technology in support of this effort. **Eoin Howlett** and **Elliott Taylor** from Polaris Applied Sciences Inc. visited Qatar in January to provide a project status presentation to Qatar Petroleum and members of the Supreme Council for the Environment. *Photo below:* Eoin Howlett (ASA), Elliott Taylor (Polaris), Ali Rajab Ashkanani (Qatar Petroleum) and Eduardo Padero (Qatar Petroleum).



**Craig Swanson** attended the recent National TMDL (Total Maximum Daily Load) Science and Policy Conference in Phoenix, AZ from 13-16 November. ASA co hosted, as part of the Parsons National Watershed Protection Program Team, a reception for conference attendees to alert them of the recent US EPA contract award to fund TMDL studies around the United States.

On 18 November, **Deborah French McCay** presented a paper entitled: "Probabilistic Bio-economic Modeling of Oil Spill Impacts in San Francisco Bay" at the 23<sup>rd</sup> Annual Meeting of the Society of Toxicology and Chemistry (SETAC) in Salt Lake City, Utah. The objective of this study (performed for the Army Corps of Engineers San Francisco District) was to estimate potential biological impacts and natural resource damage costs of oil spills resulting from groundings on rock pinnacles in the vessel traffic lanes of San Francisco Bay.

**Claudia Santos** and **Eric Anderson** traveled to Cd. Carmen and Villahermosa, Mexico in November to present a course to PEMEX PEP personnel on SIMAP. Our agent in Mexico is Miguel Palet, with GDS de Mexico. During the trip Claudia and Eric got the chance to see the 20<sup>th</sup> November Revolution Day parade in Villahermosa. A highlight of the parade for them was seeing Miguel's wife, Tania, with her Escaramuza Charra group. The picture below shows (left to right) La Coneja, Tania, Miguel, and Claudia.



**Matt Ward** trained the US Naval Oceanographic Office (NAVO) at Stennis Space Center on 4-8 November in the use of WQMAP, OILMAP and COASTMAP. NAVO will be incorporating the software in their operational coastal models to support homeland security activities within the US waters.

**Hyun-Sook Kim** and **Craig Swanson** presented the results of ASA's recent study of the Acushnet River Estuary to a multi-agency (federal, state and local) update meeting on 21 November held at SMAST in New Bedford, MA. The study integrated several analytic, modeling and field techniques to estimate flushing times in the estuary.

**Matthew Ward** and **Craig Swanson** participated in the kickoff meeting for the Integrated Ocean Observing System for the Southern New England Bight (IOOS-SNEB) at the Ocean Technology Center at the University of Rhode Island on 2 December. This initiative, begun by **Malcolm Spaulding**, was designed to gather those researchers and engineers interested in developing and implementing a marine observing system for the Long Island and Rhode Island Sounds and Narragansett and Buzzards Bay area along the south coast of New England.

**Malcolm Spaulding** was recently selected as a member of the US Oceans, Data and Communications, User Outreach Team (Ocean US). Ocean US is leading an initiative, on behalf of the principal federal government agencies interested in the ocean, to develop a plan for an "Integrated and Sustained Ocean Observing System" (IOOS) for the US. As part of his work on this team, Dr. Spaulding organized a workshop in December 2002 at URI, to plan the development and implementation of an "Integrated Coastal Ocean Observing System for Southern New England Bight" (IOOS-SNEB). The workshop included researchers from URI, Brown University, Naval Undersea Warfare Center, University of Massachusetts-

*Continued on page 4*

## PEMEX Makes Marine Pollution a Priority

PEMEX is the national oil company in Mexico. A majority of its oil production comes from extensive offshore fields in the Gulf of Campeche, the southeast portion of the Gulf of Mexico, west of the Yucatan Peninsula. Over two hundred offshore platforms support the extraction of the oil, which is transported ashore by underwater pipelines. The center of the operations, logistics and maintenance for these offshore facilities is in Ciudad del Carmen. The production area is separated into two sections, one termed "North East" and one termed "South West". Each of these operational sections operates ASA's SIMAP, WQMAP, and MUDMAP applications.

- SIMAP, the oil trajectory, fates, and impact assessment software system, is used to assess the potential for impacts from accidental releases of oil from the exploration and production infrastructure and from shipping releases.

- WQMAP is used for the modeling of the movement and dispersion of longer-term chronic inputs to the waters around both the production areas offshore and the estuaries and rivers near the shore based reception and distribution facilities.

- MUDMAP is used to model the movement and deposition of drilling muds in the productions areas.

PEMEX and the Brazilian national oil company, Petrobras, are developing several joint projects in the area of remote sensing and environmental protection. Both companies are using ASA's SIMAP software. In November they met to compare notes on the optimization of their SIMAP data support implementation.



*Photo courtesy: Arturo Mendoza from PEMEX.*

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## PERSONNEL Continued

Dartmouth, Woods Hole Oceanographic Institution, Applied Science Associates, Inc., University of Connecticut, and SUNY Stony Brook. Dr. Spaulding has recently been nominated to represent the southern New England area for a National Summit (April 2003) planned by Ocean US to discuss the formation and policies of a national federation of regional observing systems.

Chris Galagan attended the Coastal GeoTools conference in Charleston, South Carolina on 6-9 January. This is a semi-annual conference hosted by the NOAA Coastal Services Center that focuses on the application of remote sensing and GIS technologies to solve problems in the coastal zone.

Eric Anderson and Craig Swanson met with U.S. Army Corps of Engineers, U.S. EPA, U.S. Minerals Management Service, and other experts from academia and the consulting community in Washington, D.C. to review sediment resuspension from dredging topics. The meeting, held on 22-23 January, included a presentation on the latest SSFATE (Suspended Sediment FATE) implementation, which has been jointly developed by ASA and the ERDC (Engineering Research Development Center) of the Corps in Vicksburg, MS. Dr. Billy Johnson of CHT (Computational Hydraulics and Transport), who works closely with ASA on dredging software applications, also participated in the meeting.

Claudia Santos and Eric Anderson traveled to Mexico City, Mexico in late January. They had the opportunity to visit "La Ciudad Universitaria de la UNAM" where Eric and Claudia met with Dr. David Salas de León and his colleagues from the

Physics Oceanography Laboratory, as well as Dr. Arturo Mendoza from PEMEX PEP and Miguel Palet from GDS de Mexico. Discussion centered on the currents fields of the Gulf of Mexico and planned interactions between UNAM and ASA to supply an improved oil spill simulation capability to PEMEX.

Claudio Ultra, Anna Scofano, and Renato Parkinson from PETROBRAS visited ASA South America office to discuss with Jose Edson Pereira the application of OILMAP to contingency planning along the Brazilian Coast.

## NEW FACES

Neya Ly is Applied Science Associates, Inc. new Information Technology Specialist and Web Developer. She received her Bachelor of Science in Management Information Systems in May 2002 from the University of Rhode Island. Ms. Ly conducted an internship at ASA prior to graduation where she completely revamped the ASA website. She is continually working on improving the website while serving as a great resource with technical help. Ms. Ly's tasks will also include working with ASA's GIS and incorporating better database technology.



## CONFERENCES

Eric Anderson, Deborah French McCay, Eoin Howlett, Roddy Thomas, Eduardo Yassuda, and Brian King will be attending and presenting papers at the 2003 International Oil Spill Conference. The conference will be held at the Vancouver Convention and Exhibition Centre, Vancouver, British Columbia, Canada on 6-10 April. The conference theme for 2003 is: *Prevention, Preparedness, Response and Restoration—Perspectives for a Cleaner Environment*. The theme includes a view toward the future with special emphasis on appropriate strategies for improvement. ASA will be located at booth 427.

ASA South America started 2003 with a new office layout and a lot of new faces. On top left to right: Agata, Mauricio, Roberta, Marco Antonio, Jose Edson, Carol, Ronaldo, Andre. On the bottom, Roderick, Eduardo, Ricardo, Joao Marcos, and Rafael. With this team, ASA South America has now the capability to respond to a variety of services in Coastal, Oceanographic, and Environmental Engineering in South America.



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