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OILMAP, CMS, WQMAP and COASTMAP developed for the *"Plataforma Continental Patagónica Argentina"*

The Argentinian Federal Government is implementing a series of far reaching protection measures of one of the world's largest continental shelfs; La Plataforma Continental Patagonica Argentina. This vast water body, approximately one million square miles, includes the jurisdictional waters of the Provinces of Chubut, Rio Negro, Santa Cruz and Tierra del Fuego, Antártida e Islas del Atlántico Sur and other waters under Argentinian state control. The anticipated increase in shipping and offshore exploitation activities require that these measures include the protection of both domestic and adjacent international waters, with particular emphasis on reinforcing the government's pollution preventative systems and capabilities.

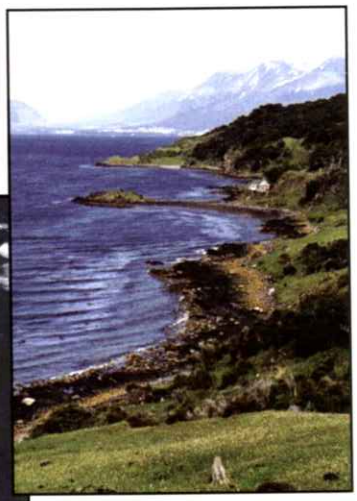
To assist in this task, the World Bank, an implementing agency of the Global Environment Facility Program (GEF), has provided a grant to the Argentinian federal government to develop suitable operational response tools to help manage the protection of this important marine resource. As part of this process, ASA is implementing a suite of ASA's software, including; **OILMAP**, **CMS**, **WQMAP**, and **COASTMAP**. ASA South America (ASASA), together with ASA Inc and ASA's agent in Argentina (Morken AS), are working closely with a team of modeling experts from the *Prefectura Naval Argentina (PNA)* and *Servicio de Hidrografía Naval (SHN)* to implement the systems and a series of software training programs.

OILMAP the oil spill trajectory and fates model, together with an interactive GIS and environmental data tools predict the surface trajectory of spilled oil for either instantaneous or continuous release spills and is used to assess the potential for impacts from accidental releases of oil. The *CMS* (Crisis Management System) module allows the user to manage personnel, response equipment and other resources during training or an actual incident. *WQMAP*, an integrated modeling system designed to study surface water quality issues allows the user to develop computational grids, and perform hydrodynamic simulations, and *COASTMAP* provides environmental data management and analysis.

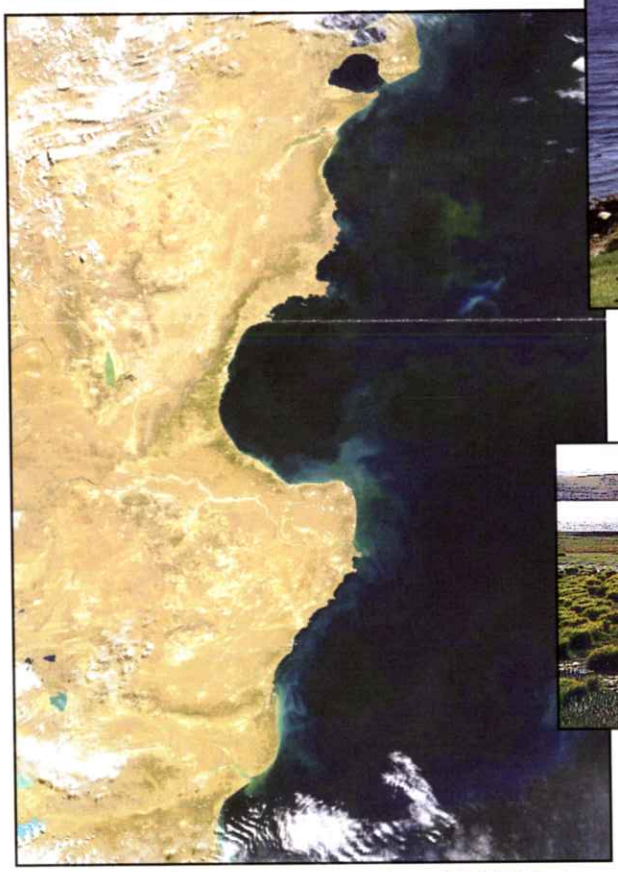
For more information contact Eduardo Yassuda, eyassuda@appsci.com.br.

ASA South América, la Oficina Principal de ASA en U.S y el Agente de ASA en Argentina estarán trabajando con expertos del modelaje de la *Prefectura Naval Argentina (PNA)* y el *Servicio de Hidrografía Naval (SHN)* para implementar los softwares de ASA: OILMAP, CMS, WQMAP y COASTMAP. Estas herramientas ayudarán a la protección de aguas internacionales, y el refuerzo de sistemas preventivos de contaminación de aguas debido al tráfico de embarcaciones y actividades de explotación. El ámbito geográfico de este proyecto es la plataforma continental patagónica argentina, zonas costeras y aguas bajo la jurisdicción del estado argentino.

THE INSIDE STORY



View of Argentinian coast. Photo courtesy of Phil Endecott.



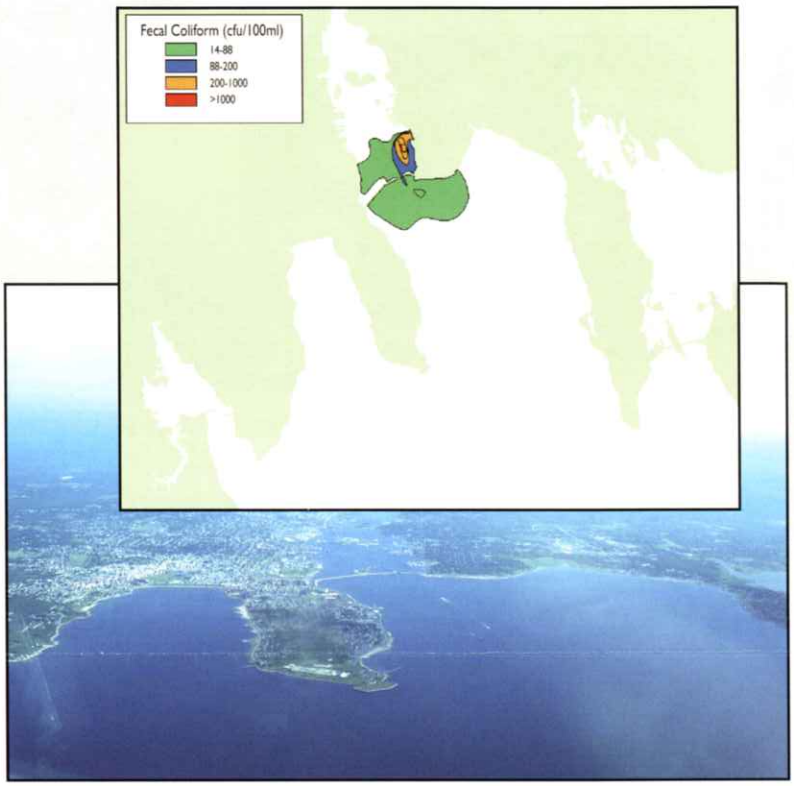
Satellite image of Patagonia. Image courtesy of MODIS Rapid Response Project at NASA/GSFC.

Lagoon along the southern shore. Photo courtesy of Phil Endecott.

Water Quality Study Combines Modeling and DNA Fingerprinting

For years, people have been concerned about pollution in New Bedford Harbor, with a "red flag" raised over what human beings and water treatment plants might be dumping into the bay. A recently completed study of water quality in New Bedford Harbor, commissioned by the New Bedford Harbor Trustee Council and conducted by Applied Science Associates (ASA), took a new approach to evaluate sources contributing pollution to the harbor. The study combined a field sampling program and computer modeling with DNA fingerprinting analysis to identify and quantify sources contributing fecal coliform (FC) to the waters of Outer New Bedford Harbor.

The study began with a field survey conducted by EA Engineering, Science and Technology, Inc., under the direction of ASA, to characterize the FC sources contributing to and resulting FC levels found in the harbor. Water samples were collected at 21 stations in and around New Bedford Harbor. These stations were carefully selected so as to adequately characterize the origins and magnitudes of the FC sources. Sampling began in April 2002 and continued until July 2003. The field program included intensive sampling of two storm events. Water samples from the field program were then subjected to two different DNA fingerprinting analyses (DNA Ribotyping and the F-Specific [F+ or FRNA] coliphage analysis) to determine the biological origin of the FC at each of the identified sources. Finally, a modeling study was undertaken to evaluate the effect of each of the identified sources on the distribution of FC in the outer harbor. Hydrodynamic modeling of Outer New Bedford Harbor was performed to obtain detailed currents in the harbor using ASA's Boundary Fitted Hydrodynamic (BFHYDRO) model. Results from the hydrodynamic model were then used in conjunction with data on FC source concentrations from the field survey to conduct a series of pollutant fate and transport simulations using ASA's Boundary Fitted Mass Transport (BFMASS) model.



Above image: modeling of SC in New Bedford Harbor during November and December. Below image: Aerial photo of New Bedford Harbor and Sconticut Neck.

The conclusions from the computer modeling, combined with the DNA fingerprint analysis, indicate that humans are a minor source of FC relative to other animals for New Bedford Harbor. DNA fingerprinting techniques indicate that birds are the dominant source of FC in the harbor, with rodents and raccoons also significant contributors. Humans were found to account for only a small fraction (~7-15%) of the total FC entering the outer harbor. The study was able to distinguish fecal coliform from humans, goose, rats, deer, seagulls, raccoons, horses and cows in the New Bedford area. Overall, FC concentrations were found to be relatively low throughout most of the harbor, with higher concentrations limited to near-shore areas. FC counts during the storm events were significantly higher than those observed during dry periods.

For more information on this project contact Paul Hall, phall@appsci.com.

BHP Billiton Commissions Asia–Pacific ASA To Prepare Standardized Oil Spill Response Plan Manual For Their Global Operations

BHP Billiton Ltd is a global company with assets based in the UK, Middle East, Africa, Australia and the Americas. These global activities are managed from four centres and include oil and gas exploration, drilling, construction, production and transport operations. As such, a need was recognised within the organisation to standardise each operations approach to emergency response management.

BHP Billiton commissioned Asia-Pacific ASA (APASA) to prepare an Oil Spill Response Manual to be used by all their management centres as a guideline to writing and maintaining Oil Spill Contingency Plans. The guidelines manual was not designed to be used in the event of a spill, but to ensure that all of the company's oil spill contingency plans are standardized for each global operation. The manual is broad in scope to cover the geographic diversity of their operations and provides check lists to meet a variety of preparedness and response considerations.

The guidelines manual includes:

- BHP Billiton's organisational structure and management processes.
- Explanation of the roles in an emergency response situation, following the Incident Command System (ICS) structure.
- Step by step checklists for each Oil Spill Response Team role.
- Forms used by emergency response personnel to assist in the flow of information, resource management and incident status.
- Toolkits to assist in decision making.

The ICS structure is a flexible system, which provides for rapid expansion or reduction in the size of the response team according to different response needs. This has been adopted throughout BHP Billiton, ensuring an integrated company-wide response.

For more information contact Brian King, bking@apasa.com.au.

Personnel News

Sasha Zigic and **Brian King** were keynote speakers at an "Offshore Drilling Workshop" organized by International Environmental Management Co. Ltd in Bangkok, Thailand. The purpose of the workshop was to provide a forum in which personnel from government agencies and the oil industry could raise and address questions about ASA's sediment and solute model, MUDMAP, which is used extensively to simulate mud and cuttings discharges into the Gulf of Thailand.

Thailand's Pollution Control Department (PCD) and Chulalongkorn University recently purchased ASA's oil spill model, OILMAP for Arcview, to assist in planning and emergency decision making for the Gulf of Thailand. Ten of the PCD staff underwent an intensive three-day training course carried out by members of the Asia-Pacific office, **Sasha Zigic** and **Brian King**. The training course provided a thorough understanding of how the OILMAP for Arcview system in conjunction with PCD's extensive Arcview GIS database can be used for spill exercises, response and as a prosecution tool in the event of a spill. The Gulf of Thailand is a semi-enclosed sea, measuring approximately 400km by 800km, covering an area of about 320,000 square kilometers. Millions of people derive their livelihood from fish and mineral resources produced from the Gulf, and millions more can/are affected by changes in the environment of the Gulf.

Sasha Zigic and Brian King with senior staff from PCD and Chulalongkorn University.

Ana Carolina Da Rocha, an oceanographer from the ASA South America office, visited ASA headquarters 9-20 February. While in the states Ana worked on oil spill, produced water, and drill cutting projects using OILMAP, CHEMMAP and MUDMAP. She also received training in SSFATE and STFATE. It was a great visit, she was able to meet and work with the technical staff and observe the operations of ASA headquarters.

Ana Caroline Da Rocha enjoying the New England winter.

In February 2004, **Nicole Whittier** and **Roddy Thomas** completed a 2-day OILMAP training course for 20 Oil Spill Response Limited (OSRL) staff members. Based in Southampton, England, OSRL is the world's largest international oil spill response provider and is wholly owned by 26 of the most responsible and environmentally committed oil companies. OSRL uses OILMAP, as well as other oil spill modeling systems, in support of their consultancy, training and emergency response services.

David White and Rob Holland from OSRL operating OILMAP.

Sasha Zigic participated in the National Environmental and Scientific Coordinators (ESC) workshop in Tasmania, Australia, 10 & 11th March, 2004. ESC's from around Australia attended the workshop along with other environmental personnel from the department of defence, the oil industry and other government agencies, to address various issues relating to marine incident response, including advances in modelling tools. As part of the workshop, Sasha also presented a paper on the various ASA commercial hydrodynamic (HYDROMAP & BFHYDRO) and spill (OILMAP, SIMAP & CHEMMAP) management tools available to an ESC, to address issues relating to marine incident response with a view to minimizing damage to the coastal and marine environments.

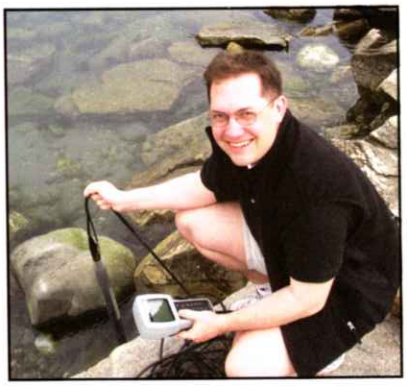
Eoin Howlett was invited to speak at the RI Harbor Masters Association meeting where participants from the Harbor Masters, Governor's Office, Law Enforcement, and the U.S. Coast Guard met to discuss issues related to Port and Harbor Security. Eoin presented some of ASA's technology that is in use for search & rescue, oil spill response and ICS-based command and control.

Craig Swanson made a presentation titled "Hydrodynamic and Bacteria Transport Modeling System" at the New England Association of Environmental Biologists conference held 17-19 March in Hancock, MA. The talk presented ASA's use of its well developed backward tracking oil spill model (from resource to spill site) to the problem of identifying likely sources of bacterial contamination to shellfish resource areas in Southport Harbor located in Fairfield, CT.

Matt Ward and **Nicole Whittier** delivered and provided training for CHEMMAP, COASTMAP, OILMAP and WQMAP to the Naval Oceanographic Office (NAVO) at the Stennis Space Center in Mississippi on 5-9 April. The data collected by COASTMAP is being used to develop initial conditions and environmental forcing for operational coastal models, such as CHEMMAP, OILMAP and WQMAP, to support homeland security activities within US waters and coastal warfare and environmental response activities outside of the US.

Matt Ward with NAVO modeling experts.

Paul Hall received his Ph.D. in Oceanography from the University of Rhode Island's Graduate School of Oceanography in December 2003. Paul used a combination of laboratory tank models and computational fluid dynamic models to investigate the behavior of buoyant plumes in the presence of ambient shear flows. The title of his dissertation was "Free and Forced Convection in Earth's Upper Mantle".



Paul Hall testing field equipment.

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New Face

Kelly Knee is a scientist with Applied Science Associates, Inc. She received her Master's degree in Water Resources Engineering from Tufts University in January 2003 and her Bachelors in Environmental Engineering from Tufts University in August 2001. Last year, Ms. Knee studied the impacts of climate change in the coastal zone in the Republic of Mauritius on a Fulbright Fellowship. Ms. Knee has been working on a number of tasks including pollutant transport modeling, fieldwork, and instrument data analysis.

Founded in 1979, ASA helps clients understand and manage marine and freshwater environments worldwide. Combining proprietary computer modeling tools with the consulting capabilities of an exceptionally diverse technical staff, the firm provides a broad range of services to international, national and local government agencies, private industry and educational institutions. ASA has extensive experience with clients involved in oil and gas, power generation, ports and harbors, wastewater, coastal management and crisis response, ecological risk assessment, hydrodynamics, dredging, water quality and coastal engineering.

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Upcoming Conferences

Craig Swanson, Matthew Ward, Eoin Howlett and **Malcolm Spaulding** are authors of a presentation titled Application of a Monitoring and Modeling System to Narragansett Bay and Rhode Island Waters" at the EMAP 2004 Symposium held 3-7 May in Newport, RI. The presentation will describe ASA's COASTMAP application to Narragansett Bay.

Nicole Whittier and **Roddy Thomas** will attend the upcoming OCEAN OPS workshop, 10-15 May in Toulouse, France. Ms. Whittier will present a paper "Chemical Spill Modeling and Spill Hazard Evaluation of the Most Frequently Spilled Chemicals", coauthored by **Deborah French McCay** and **Matt Ward.** A poster titled "An operational integrated data collection and modeling system", authored by Matt Ward, will be displayed.

Craig Swanson, Malcolm Spaulding, Bernward Hay (The Louis Berger Group) and David Tremblay (Governor's Office, Rhode Island) are scheduled to present "Circulation and Water Quality Assessment at Quonset-Davisville, Rhode Island" at the Coastal Society conference held 23-26 May in Newport, RI. The presentation will focus on the field study and modeling to assess the effects of potential channel deepening as part of proposed improvements to the port at Quonset-Davisville.

Roddy Thomas and **Eduardo Yassuda** will attend Interspill 2004 in Trondheim, Norway 14-17 June. ASA will exhibit at the conference and anticipates to be present a number of poster displays. Interspill is the principal meeting place in Europe for all who share a professional concern for environmental issues related to oil production and oil pollution.

Craig Swanson and **Tatsu Isaji** will present a paper "Modeling Dredge-Induced Suspended Sediment Transport and Deposition in the Taunton River and Mt. Hope Bay, Massachusetts at the upcoming WEDA XXIV / 36th TAMU Dredging Seminar to be held 7-9 July in Orlando, FL. The paper will focus on modeling the effects of channel deepening for a proposed LNG facility.