



Dispersal of Produced Formation Water from an Oil Production Facility

The environmental effects of Produced Formation Water (PFW) discharged from offshore oil production platforms into the marine environment is of growing concern among environmental regulators and industry. Analyses of PFW discharges have found various concentrations of hydrocarbons, which are potentially toxic to marine organisms. Environmental agencies require petroleum companies to carry out predictive dispersion modeling to determine the likely distribution and concentration of PFW after discharge from a platform and its toxicity to surrounding marine ecosystems.

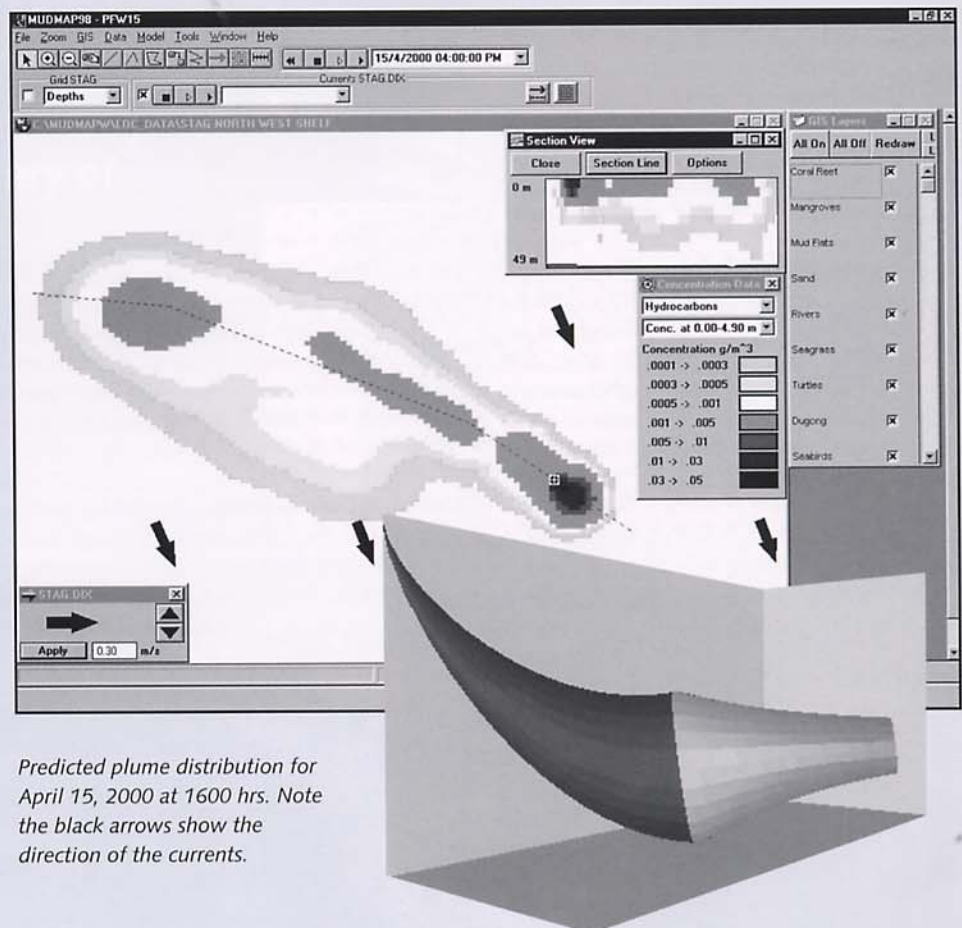
Asia-Pacific ASA (APASA) were commissioned by Apache Energy to forecast the dispersal of PFW from the 'Stag' oil production platform on the Northwest Shelf, Australia. To simulate the PFW release under environmental conditions, APASA applied numerical models to describe two important processes. Firstly, the hydrodynamics of the receiving waters was simulated by Mr Scott Langtry of GEMS (WA) using the three-dimensional circulation model, GCOM3D. Secondly, the mixing and dispersion process was simulated using the subsurface plume model, MUDMAP. MUDMAP was used to assist in understanding the dilution, mixing and ultimate fate of PFW when discharged from 'Stag'. Included were estimates of the excursion of the plume until concentrations were mixed to levels well below those of likely environmental concern.

The information was used by John Nielsen and Shane Chaplin, scientists from

International Risk Consultants (IRC), to select appropriate sampling sites for testing seawater concentrations of hydrocarbons arising from discharged PFW. The results provided by APASA assisted the IRC scientists in locating and sampling within the plume at different times during the day and during different stages of tidal water movement. IRC's field observations confirmed the MUDMAP predictions of plume dynamics under average prevailing conditions

experienced in the region during autumn.

Finally, peak concentration levels attained from both the simulations and the laboratory analysis from the field sampling, were used by the Apache Energy environmental managers to demonstrate that the total oil concentrations are well below the Statutory Release Concentration for platform PFW discharge in Western Australia.



Predicted plume distribution for April 15, 2000 at 1600 hrs. Note the black arrows show the direction of the currents.

Eoin Howlett, Sasha Zigic and Brian King travelled to Perth, Western Australia in early May for a SIMAP training session with environmental managers Libby Howitt from Apache Energy and Scott Langtry from GEMS (WA). Shown (from left to right) are trainers and intrepid SIMAP trainees: Libby, Sasha, Brian, Eva Stejskal (environmental manager for Apache), Scott and Eoin.



Craig Swanson participated in the North Kingstown High School Career Day 2000 on 12 April. Although he was not able to convince any students to take up hydrodynamic modeling as a career during his presentations he did discuss the type of work that computer modelers (of all kinds) do, what sorts of background education is needed and examples of the jobs these student can expect.

Craig Swanson and **Matthew Ward** participated in Narragansett Bay Summit 2000 held 24-25 April. They hosted the ASA display booth and participated in various sessions on research, transportation, industrial development, tourism and fisheries. The summit was designed to bring the diverse stakeholders together to discuss the state of the bay, multiple uses and how competing interests can come together to ensure that the bay remains a unique resource.

Craig Swanson presented a talk entitled Pollutant Fate and Transport Model of Salem Sound at the State of the Sound: Current Knowledge and Future Directions symposium held 25 May. The purpose of the symposium was to communicate to stakeholders the present state of research about the sound and included discussions about future issues to be addressed.

Eric Anderson traveled to Buenos Aires in April to deliver OILMAP training to Total Argentina personnel, together with Sergio Wojda of Morken, S.A. who distribute ASA's software in Argentina and Luis Vila, who assists in the training and application of these applications.

Eoin Howlett visited with Alan Hutchings, Emergency Planning Officer for Dorset County Council, UK. Dorset County Council use OILMAPX, the Mapinfo version of OILMAP to integrate pollution planning with ARCS charts, UK Ordnance Survey charts, Vertical Aerial photographs and high resolution vector GIS information. Alan Hutchings and Steve Spring worked with Eoin to customize the system to meet Dorset's specific needs.



Steve Spring and Alan Hutchings



Eoin Howlett travelled to the lovely Isle of Man in the Irish Sea in May to deliver a SARMAP upgrade to the Isle of Man Coast Guard. Captain Colin Finney and Erica Kermode were trained on allocating response resources for Search & Rescue operations using SARMAP.

Eric Anderson and **Malcolm Spaulding** attended the 2000 Arctic and Marine Oilspill Program (AMOP) in Vancouver, British Columbia in June. They presented a paper on deep water oil spill blowout modeling which demonstrated ASA's integration of gas hydrate formation in several deep water blowout sensitivity studies.

June 14-16 **Deborah French** presented her work on oil toxicity at the 23rd annual Arctic and Marine Oilspill Program (AMOP) Technical Seminar in Vancouver, BC. She has developed and validated an additive model for the toxicity of the aromatic components of oil.

Dr. Deborah French was a co-presenter of a workshop in Kuwait April 28-May 3 on marine NRDA procedures and practices. She provided an overview of methods for assessing damages to marine biota and habitats, including the use of modeling to evaluate oil fates, impacts, and damages. The models included in NRDA regulations in the United



States were described. The workshop participants worked through modeling of case examples, both historical and for an existing nearby site in Kuwait.

In the light of the recent ERIKA spill incident offshore France, IFREMER recently invited **Dr. Deborah French** to their Brest office to present ASA's spill impact analysis model system, SIMAP. IFREMER is a public company under the administrative supervision of various French Ministries including Education, Research and Technology, which particularly focuses on agriculture and fisheries. Debbie French and Roddy Thomas conducted a one day SIMAP workshop with IFREMER and other agencies, and included a detailed overview of the system's science, its validation, capabilities and range of potential applications, including to the ERIKA spill.



Roddy Thomas recently attended Environment and Water Quality India 2000, in Delhi, a conference specializing in a wide range of marine and fresh water quality problems presently being addressed by both industry and government in India. A number of ASA's model systems were demonstrated at ASA's booth including a number of WQMAP applications covering industry and domestic effluent discharge dispersion, dredging and thermal discharge dispersion studies.

New Faces

Colleen Dalton is a scientist/ programmer with Applied Science Associates, Inc. She received her Bachelor of Science in Geology-Physics/Math from Brown University in May, 2000. Ms. Dalton brings a broad scientific background that includes experience with remote sensing, computer modeling and environmental geophysics. At Brown, she used seismic data from earthquakes to model the earth's interior beneath eastern North America.

Tim Giguere is a software developer at Applied Science Associates. He received his bachelor's degree in Computer Engineering from The University of Rhode Island in 2000. Mr. Giguere has used a variety of tools to develop Windows-based programs. He is currently working on a number of OILMAP and WQMAP tasks, including integration of additional models, new GIS functionality and data analysis tools.

Scott Veitch is currently a second semester senior at The University of Rhode Island. He is working towards a bachelor's degree in Ocean Engineering with an emphasis in instrumentation. Courses of study have included instrument design, mechanical and geotechnical studies emphasizing mechanical engineering and design. Scott is kept busy on a number of tasks including fieldwork,

instrument data analysis, computer model input data construction, GIS work, and managing ASA's computer technology management and supervision.

Nicole Whittier is a junior engineer with Applied Science Associates, Inc. She will be receiving a Bachelor's of Science degree in Chemical Engineering in December 2000 from The University of Rhode Island. Ms. Whittier is involved in environmental studies at URI's Pollution Prevention Center where her focus is the environmental effects of chemical pollutants. Ms. Whittier is currently evaluating chemical processes and the fates of chemical pollutants in aquatic systems as part of ASA's continued development of ChemMap.

Dr. Hyun-Sook Kim, an oceanic dynamics modeler with Applied Science Associates, holds a Ph.D. in Physical Oceanography from the University of Rhode Island. Since joining ASA, she has been working on circulation and water pollutant transport simulations in coastal areas. Hyun-



Scott Veitch



Colleen Dalton



Nicole Whittier

Sook has extensive experience in development and application of a barotropic model in the Gulf Stream and a coupled Physical and Biological model in Georges Bank. She also specializes in data assimilation, data collection and analysis.



Dr. Hyun-Sook Kim

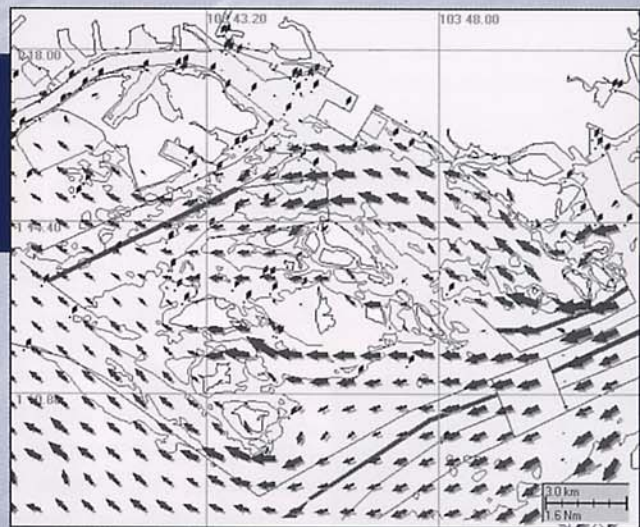


Tim Giguere

The Maritime and Port Authority of Singapore Takes Delivery of OILMAP

ASA recently secured a contract from the Maritime and Port Authority of Singapore (MPA) to deliver the latest version of our oil spill trajectory and fates model; OILMAP. As well as regulating and managing the busiest port in the world in terms of shipping tonnage, the MPA has responsibility for a wide range of marine environmental programmes and maritime contingency plans in Singapore. Being at the cross-road of international shipping routes and near one of the busiest waterway in the world, MPA has an important national responsibility for responding to all spill incidents in and around Singapore waters. In support of this requirement, MPA has decided to upgrade their existing spill response software systems among other plans to help meet both their future maritime technical and operational needs. Eoin Howlett and Roddy Thomas recently visited Singapore to deliver OILMAP and completed a comprehensive training programme for key model users in MPA's offices. The contract includes the latest version of OILMAP's multiple spill prediction trajectory and back tracking models, and the integration of a range of comprehensive environmental databases.

Dr Song, who heads Planning, Hydraulics and Simulation section of Engineering Department, Technology Division, MPA together with technical and operational colleagues.



MPA developed high resolution current data for the region which was integrated into OILMAP.



Applied Science Associates, Inc.
70 Dean Knauss Drive
Narragansett, RI 02882-1143

Phone: (401) 789-6224
Fax: (401) 789-1932
Email: asa@appsci.com
URL: <http://www.appsci.com>
ADDRESS CORRECTION REQUESTED

FIRST CLASS
U.S. POSTAGE
PAID
SAUNDERSTOWN, RI 02874
PERMIT NO. 15

Weddings at ASA

Our warm congratulations to Roddy Thomas, ASA's UK director with responsibility for our international sales and marketing, and his wife Victoria, who recently celebrated their wedding in Chelsea, London on 27 May. After a short honeymoon on the Mediterranean island of Corsica, they are setting up home in St Andrews, Scotland.



There must have been something in the air, another big ASA wedding occurred on April 22 when our accounting manager, Linda Nolan married Gary Gagne. Despite stormy winds and torrential rain, they happily tied the knot at 6am on Narragansett Beach.

ASA homepage
visit us at <http://www.appsci.com>



The ASA newsletter is printed on recycled stock.