PROJECT ID:
611

Subsurface Fate and Transport of Petroleum-Based Contaminants in Naval Facilities

Camp Pendleton Beach is the site of ongoing efforts to study groundwater impacts, and is providing leveraged funding for this project.
(Photo Credit: Sergeant Maximiliano Rosas)

OBJECTIVE

This project seeks to further develop groundwater modeling capabilities to equip site/facility managers with the scientific knowledge they need for accurate research, development and decision-making.

PROBLEM STATEMENT

In the past decade, many successful studies have been conducted regarding the fate and transport of contaminants in surface water at Naval facilities. A primary reason for these successes is the use of powerful modeling tools developed with support from the NESDI program, which have been accepted by regulators to help address compliance issues.

Past groundwater-related studies have had to contract out groundwater modeling studies, which not only took extra time, but the knowledge gained did not go beyond the scope of work of the studies.

The need has become increasingly urgent that the Navy develops and owns groundwater modeling capabilities/tools so that Navy site/facility managers are able to conduct timely research and development in-house.

DESCRIPTION

The first task the team will undertake is a study of current groundwater models and the needs of Navy facilities impacted by groundwater issues. Based on the insights gained, we will develop a calibrated groundwater model toolbox designed for generic and specific applications. We will look for opportunities to link our model

with existing, regulator-approved models—specifically at facilities where surface water, groundwater and saltwater typically interact. The need for a linked model is recognized and shared by the study group, including the regulators and stakeholders. A linked model has many advantages including the reduction of numerical errors/uncertainties from the use of two or three independent models.

We aim to demonstrate the success and the superior performance of the models during the different phases of the project including annual modeling study reports containing modeling results, analysis and performance evaluation.

RETURN ON INVESTMENT

Without a groundwater model, studies would have to rely only on field data, which isexpensive and only provides limited information. A groundwater model, however, can be used to design the field data collection efforts with prioritized needs. It is estimated that a $500,000 savings would be realized for each site groundwater study—including $150,000 for field data cost, $200,000 for groundwater modeling support by commercial contractors and $150,000 for additional maintenance costs.

NAVY BENEFITS

With the capabilities and tools to be developed, we will be able to design new and more innovative modeling approaches/methods that would provide more useful and insightful information/knowledge to help Navy site managers and regulators make better science-based decisions. This would avoid the use of contractors at exceptionally high costs, and would ensure that the expertise gained from the study would be retained by the Navy. Importantly, it is expected that regulators will accept the outputs of a groundwater model, as they have accepted numerical models for surface water.

TRANSITION DESCRIPTION

The developed groundwater models will be demonstrated with the Santa Margarita Estuary Water Quality simulation study and the groundwater migration of contaminants at the Bremerton Naval Complex modeling study. Depending on the specific requirements for each study, the products, including the model, the data and model output interpretation/predictions will be delivered to the clients at these locations. With in-house modeling capabilities established, the managers of the Navy's facilities, when faced with similar tasks, can proactively conduct in-house groundwater modeling specific to sites of interest in a timely fashion. Training will be available upon request. We will also publish the study products and products in *NESDI News* and at national/international conferences, which have been demonstrated an effective avenue to wider publicity and recognition.

CONTACT

For more specific information about this project, contact the Principal Investigator at 760-807-5255.

ABOUT THE NESDI PROGRAM

The Navy Environmental Sustainability Development to Integration (NESDI) program is the Navy's environmental research and development demonstration and validation program, sponsored by OPNAV N4I Installations Division and managed by the Naval Facilities Engineering Systems Command from the Engineering and Expeditionary Warfare Center in Port Hueneme, CA. The mission of the program is to provide solutions by demonstrating, validating and integrating innovative technologies, processes and materials and by filling knowledge gaps to minimize operational environmental risks, constraints and costs while ensuring Navy readiness and lethality.

For more information, visit the program's web site at www.navfac.navy.mil/nesdi or contact Ken Kaempffe, the NESDI Program Manager at 805-982-4893, DSN: 551-4893 or kenneth.c.kaempffe.civ@us.navy.mil.