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Water-Borne Studies

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BY ERIN SEMPLE

Stevens Institute and the U.S. Navy have worked together to create a new model for Homeland security technology applications after Sept. 11, 2001.

A high-tech research center on the Hoboken waterfront campus of the Stevens Institute of Technology will help secure New York's ports from a terrorist attack and serve as a model for port and border security nationwide, says Dr. Harold Raveché, Stevens Institute president. The college has been studying the Port of New York and New Jersey, which is a mixed-use port for government, industry and tourists, for the past two years by using sensors to collect environment data in order to forecast future data. The Office of Naval Research funds the project.

The research facility, the Secure Infrastructure Technology Laboratory (SINTEL), created in partnership with the U.S. Navy, demonstrates one of the ways technology is being used to prevent terrorist attacks since Sept. 11, Raveché says. The technology works to detect objects under water, track them and predict where they are going in order to protect vessels and waterfront facilities. Dr. Michael Bruno, director of Stevens Institute's maritime research facility, is building water-borne platforms, which will be tested in December. Sensors in the Hudson River and on the waterfront will allow staff to evaluate new technologies to support force protection. The staff will combine sensors looking at hazards and ocean and weather conditions in order to help access the level of threat, Bruno says.

Principal investigator for background environment Dr. Alan Blumberg predicts how water moves and mixes with information from tides, currents, salt levels, temperatures and organic matter, using models similar to what is used to predict weather. This ocean forecasting provides predictions of currents and surface waves, which will help emergency management and the safety and recreation of the port.

Creating a new enterprise architecture for security, Stevens Institute is leveraging several existing research centers and existing naval anti-terrorism work and infrastructure security research under one roof, and applying new technologies for data collection and response, allowing for real-time systems development and data analysis to protect the maritime infrastructure, Raveché says.

Using a range of new threat detection and emergency response technologies, many of which were designed at Stevens, SINTEL is equipped to detect and respond to threats in a matter of seconds.

“SINTEL is an interdisciplinary laboratory for real-time systems development for the protection of maritime infrastructure. It tests and
analyzes threat scenarios in the realistic environment of the New York Harbor,” says Dr. Helena S. Wisniewski, Steven's vice president for University Research and Enterprise Development.

Among the technologies used at SINTEL are real-time mobile and remote ocean sensor capability, ocean forecast models and secure wireless networking. “Protection of Naval infrastructure against terrorist attack is extremely critical,” Raveché says. “Defending against the asymmetric threats to our Navy forces at home and abroad constitutes the primary research, modeling and development business of SINTEL. We are proud to have the opportunity to contribute to such an important area involving our nation's security.”

The New York Harbor Observing and Prediction System (NYHOPS) was established to permit an assessment of ocean, weather, environmental and vessel traffic conditions throughout the New York Harbor region. The system is designed to provide knowledge of meteorological and oceanographic conditions both in real-time and forecasted up to 48 hours in the Hudson River, the East River, New York/New Jersey Estuary, Raritan Bay, Long Island Sound and the coastal waters of New Jersey. In this Web site (www.stevens.edu/engineering/cms/), one can see graphic images of water level, surface and bottom temperature, surface and bottom salinity, surface and bottom currents and NOAA meteorological predictions. Real-time data is only available in the New York and New Jersey Estuary.