

The Center for Maritime, Island and Port Security

A DHS Center of Excellence

CO-LED BY THE UNIVERSITY OF HAWAII IN HONOLULU FOR MARITIME AND ISLAND SECURITY AND STEVENS INSTITUTE OF TECHNOLOGY IN HOBOKEN, N.J. FOR PORT SECURITY, THE CENTER WILL STRENGTHEN MARITIME DOMAIN AWARENESS AND SAFEGUARD POPULATIONS AND PROPERTIES UNIQUE TO U.S. ISLANDS, PORTS AND REMOTE AND EXTREME ENVIRONMENTS.

National Center for Secure and Resilient Maritime Commerce (CSR) – Stevens Institute of Technology

Recent Successes

CSR successfully demonstrates its passive acoustics detection system. In August 2009, Stevens Institute of Technology (and other participants) were invited to field demonstrate their passive swimmer detection systems. As part of the ongoing research on passive acoustics at CSR, the Stevens system was built for detection, localization, and classification of various acoustic sources present in shallow water and estuary environments. During the field demonstration the system was capable of successfully detecting swimmers, underwater vehicles, and small vessels under various test conditions and parameters.

CSR Director and others aid in the recovery of the accident over the Hudson. On Saturday August 8th, 2009, a small plane collided with a sightseeing helicopter carrying Italian tourists above the Hudson River, scattering debris into the water. The plane was carrying a pilot and two passengers, while the helicopter was part of 'Liberty Helicopter Sightseeing Tours' and carried the pilot and 5 passengers. Within an hour of the accident, CSR personnel from Stevens were called to the scene for analysis of currents and the proposed search area. The CSR forecast model indicated that the currents were incoming for the first hour after impact and then strongly outgoing.

This helped the NYPD, NJ State Police, FBI Dive teams, and the USCG aerial search teams to plan the search. Over the next 3 days, the ocean forecasts proved invaluable to the search and recovery.

Three days after the collision, the search continued for the plane wings, the helicopter rotor assembly and other critically-important pieces of the wreckage. This search was aided by the Stevens ocean forecasting system. Special drogue simulations were conducted based on two scenarios: A surface drift showed a wide search and recovery area extending from Monmouth County, NJ to Orange County, NY, while a sink-and-drift pointed to a much smaller area a few miles radius around the impact location.

The National Transportation Safety Board (NTSB) enlisted the Stevens research vessel, the 'R/V Savitsky', as a staging platform for dive operations to locate, identify and recover wreckage. The Stevens team successfully recovered a windshield frame and a portion of the fuselage, and inspected various location targets as advised by the NJ State Police.

Stevens contribution to the response and recovery efforts was greatly appreciated by **Deborah A. P. Hersman**, the Chairman of the NTSB, in a letter that stated:

"I am writing on behalf of the NTSB investigative team to express our gratitude for the assistance offered to us by the Stevens Institute of Technology during the on-scene portion of the investigation of the mid-air collision over the Hudson River that occurred on August 8. The contribution and professionalism of the men and women of the Stevens Institute that assisted our team during the initial hours and days after the accident was crucial to our ability to conduct a thorough and timely accident investigation."

Announcements

CSR will host its first Annual Review in January 2010. Federal officials interested in attending this review should contact the Program Manager at Theophilos.Gemelas@dhs.gov by 15 November 2009 due to limited capacity.



National Center for Island, Maritime & Extreme Environment Security (CIMES) – University of Hawaii

Project Spotlight: Satellite and Tracking of Ships

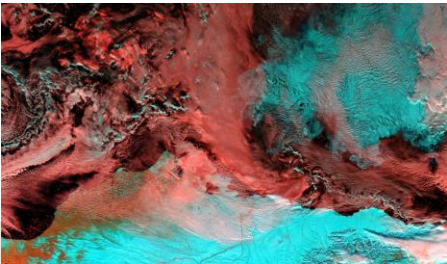
Objective:

In order to successfully exploit optical and infrared remote sensing data for ship tracking, it is necessary to understand critical times during the year data can be utilized due to environmental factors such as cloud cover, sea ice, sea state, darkness, and lighting geometry.

Several additional properties of the ocean surface, including suspended particulates, surface currents, and variations in ocean surface winds conspire to make reliable ship tracking a challenging task. Therefore, the objective of this project is to identify areas where “ocean environmental background” is most suitable for the efficient allocation of limited satellite resources.

Research Accomplishments:

The first year research effort was



The processed image indicates clouds in red and ice in blue-green. Imagery is from the MODIS sensor (Moderate Resolution Imaging Spectroradiometer) flying on NASA satellites.

devoted to gathering a suitable suite of satellite sensors to apply to the problem being studied and to the production of a sea ice image product that can be utilized in the field.

In partnership with NOAA, the University of Alaska, Fairbanks (UAF) received a suite of satellite data streams directly transmitted to ground facilities in Fairbanks and Barrow, Alaska. UAF worked with the NASA Jet Propulsion Laboratory to implement a software code to produce sea ice concentration information in near-real-time for the Arctic Ocean and Bering Sea.

UAF produced a sea ice image product that is being tested by an industrial surveying ship for transit of the north coast of Alaska to the Canadian border and for offshore survey work. Several different spectral band combinations are being tested on an operating ship. UAF has also worked to optimize transmission of data to the ship via low-bandwidth satellite data links.

Next Steps:

Research efforts in year 2 include refinement of existing sea ice product streams. Additionally—now that the products are established and proven—aggressive outreach to both DHS and non-DHS users will be performed. Future efforts will also include additional attention to ship detection products and high frequency (HF) radar support. Specifically, as the University of Hawaii team captures detailed hyperspectral ocean imaging products

using their airborne sensors, UAF will analyze contemporaneous satellite data sets to determine if useful information can be derived from lower spatial resolution satellite data.

Recent Successes

University of Puerto Rico at Mayaguez (UPRM) Summer Pre-engineering Camp. As part of the CIMES education activities at the K-12 level, CIMES partner in Puerto Rico organized student activities aimed at 60 11th graders from various schools in Puerto Rico interested in entering the College of Engineering at UPRM.

The activity had three main objectives: (1) to inform students about what homeland security is, and why it is important; (2) to describe CIMES purpose, what research is and will be conducted; and what opportunities they might have as undergraduates working with the Center, and; (3) to demonstrate tools and research that UPRM researchers are using to support CIMES projects.

Announcements

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Questions/Comments

If you have any questions or comments about the DHS Center for Maritime, Island and Port Security, please send an email to any of the following:

- University of Hawaii, Center Director – Roy Wilkins RWilkins@hawaii.edu
- Stevens Institute of Technology, Center Director – Michael Bruno Michael.Bruno@stevens.edu

If you would like to be added/removed from this distribution list or have any additional questions about the Centers, please contact the DHS Program Manager, Theophilos Gemelas at Theophilos.Gemelas@dhs.gov or the Program Coordinator, Tara Duggan at Tara.Duggan@associates.dhs.gov.

