**CSR and CIMES Newsletter – April 2013**

**Commander, Sector New York visits CSR and tours Stevens Davidson Laboratory.** Capt. Gordon Loebl, Commander, Sector New York and Captain of the Port of New York and New Jersey, together with his colleagues CDR James Espino and Mr. Kenneth Schnetzler, U.S. Coast Guard, met with Dr. Julie Pullen, CSR Director and CSR’s team of researchers, including Dr. Michael Bruno, Dean, School of Engineering and Science, on April 10, for a discussion and demonstration of Stevens New York Harbor Observation Prediction System (NYHOPS) and CSR’s harbor surveillance, near shore and over the horizon vessel detection, classification and tracking capabilities.

Dr. Alan Blumberg, Director, Center for Maritime Systems, began the morning presentations with an overview of Stevens NYHOPS system and the system’s capabilities to provide predictions and critical forecasts for surface currents, water levels and storm surge warnings. Utilized during Hurricane Sandy, Capt. Loebl credited NYHOPS 48 hour forecast storm surge warnings, for providing the Coast Guard with enough time to successfully notify mariners and to clear the harbor and port for closure during the storm. The significant and unprecedented damages caused by Hurricane Sandy, resulted in the closure of the Port of NY and NJ for seven days.

Dr. Hugh Roarty, Rutgers University, discussed the multi-use capabilities of the center’s coastal HF Radar networks for real-time vessel detection and surface current mapping. Dr. Roarty provided an overview of the center’s experiments in the New York Harbor, where the HF Radar systems detected and tracked vessels in real-time, and determined that one out of every three vessels detected by HF Radar, were found not to be reporting on the Automatic Identification System (AIS).

Additional presentations were provided by Dr. Hans Graber, Director, CSTARS, University of Miami who discussed the over-the-horizon vessel detection and tracking capabilities of synthetic aperture radar and the center’s activities in charting ice flows in the Arctic. Dr. Barry Bunin, Chief Architect, Maritime Security Laboratory discussed Stevens Passive Acoustic Detection System (SPADES) and its capability to detect and classify acoustic vessel signatures in the multi-vessel environment of the New York Harbor.

Following Capt. Loebl’s meeting with CSR researchers he attended a tour of Stevens Davidson Laboratory, where Stevens researchers conduct ship design tests for Department of Defense elements, including the Navy among other military organizations and industry sponsors.

During the summer of 2013, Stevens Maritime Systems Fellow, Alex Pollara will join Capt. Loebl and his colleagues for a ten week summer internship at the Command Center at Sector New York.

**CIMES researchers at the University of Alaska Fairbanks brief Lieutenant Generals from U.S. Air Force and NORAD regarding maritime domain awareness (MDA) in the Arctic.** Lt. General Hoog, Commander-Alaskan Command, Lt. General Dubie, Deputy Commander-US North American Command and Lt. General Parent, Deputy Commander-NORAD (Canada) participated in Arctic MDA briefings led by CIMES researchers from the University of Alaska Fairbanks (UAF).

UAF researchers discussed their collaborative efforts with researchers from the University of Hawaii, to build a common operating picture derived from the integration of satellite, air, and radar platforms to support navigation within ice-rich waters. In addition, research efforts that can project persistent surveillance for land and sea in remote reaches of the Arctic were highlighted. Following the briefings, spirited discussions on the challenges of operating in the Arctic for joint civilian-military operations for disaster response, search & rescue, and environmental protection ensued.
In showcasing UAF research with potential benefits to U.S. and allied security in the Arctic, CIMES colleagues Harry Bader and Greg Walker described the advances Alaska has made in the use of Unmanned Aerial Systems and in remotely powered and sustainable radar stations.

In addition to the meetings for the Generals, CIMES briefed Angie Walker, Commander, U.S. Navy Arctic Affairs Officer, Task Force Climate Change during her Arctic field inspections in Fairbanks, Alaska. Pictured above right with CDR Walker include: (L to R) Dr. Craig Dorman, (Rear Admiral, retired U.S. Navy), Cameron Carlson, Director, Emergency Management & Homeland Security Degree program, UAF, Dr. Larry Hinzman, Institute Director, International Arctic Research Center, UAF, and Harry Bader, CIMES PI and Program Head, Polar & Environmental Studies Initiative, UAF.

The Director of the NJ Office of Homeland Security and Preparedness visits CSR to discuss critical infrastructure protection and maritime resilience. Edward Dickson, the Governor appointed Director of the New Jersey Office of Homeland Security and Preparedness (OHSP) and his leadership team, including Joe Picciano, Dennis Quinn, Anne Kriegner and Brad Mason, visited CSR in early April 2013 to discuss CSR capabilities to enhance critical infrastructure protection and maritime resilience.

The meeting was held in the CSR’s Maritime Security Laboratory, where researchers demonstrated the center’s tools that can be utilized to assist the agency’s preparation and response to man-made and natural disasters.

The role of the OHSP is to administer, coordinate, lead, and supervise New Jersey’s counter-terrorism and preparedness efforts. The Office is responsible for coordinating the state’s emergency response efforts across all levels of government, law enforcement, emergency management, nonprofit organizations, other jurisdictions, and the private sector.

Representatives from OHSP have provided guest lectures during the center’s Summer Research Institute and have helped to coordinate homeland security related trainings for Stevens students, faculty and administrators.

CIMES studying Somali pirate activities using Hawaii Experimental Acoustic Range (HEAR). Somali pirate engines have been provided to the CIMES HEAR laboratory for use in the lab’s anti-piracy experiments in the Indian Ocean. The first engine and skiff were captured in December 2012 and included in CIMES experiments in February of 2013. In April, the Seychelles’ Navy secured a second engine from a captured Somali pirate skiff. The European Union Naval Force (NAVFOR) Commanding Officer, Admiral Robert Tarrant, gave the approval for the skiff to be offloaded in the Seychelles for the HEAR lab’s experiments by CIMES researcher Dr. Tom Fedenczuk.

The primary goal of providing the pirate engines to CIMES is to allow the HEAR lab to develop an acoustic warning system that alerts shipping operators of possible pirate threats.

Students in the News:
Stevens Maritime Systems Fellows defend Master’s Theses. Christopher Francis and Danielle Holden, DHS-funded Maritime Systems Fellows at Stevens Institute of Technology recently defended their Master’s Theses to an audience of Stevens faculty members and students, and CSR researchers and administrators. Christopher Francis’ thesis entitled Investigation of Acoustic Wave Penetration into a Submerged Cylinder, focused on the use of acoustic applications for the interdiction of suspect fully-submersible vessels and submarines. In her Master's thesis defense, Danielle Holden presented her work entitled Risk Assessment of the Application of a Proposed Liquefied Natural Gas (LNG) Ship to Ship Bunkering Operation in the New York Bight. Danielle's research assessed the risks of LNG vessels bunkering in New York Harbor. Both students successfully defended their research to complete their Master’s degree coursework and fulfill their fellowship requirements. Both are currently seeking employment in the Homeland Security domain.

On June 12, 2013, Ms. Holden will present her work at the Atlantic Provinces Transportation Forum in Halifax, Nova Scotia, Canada. The title of Ms. Holden’s presentation is The role of LNG and other fuels in shipping and sustainability.
Tyler Hee Wai, CIMES Master’s degree student at the University of Hawai‘i at Manoa and SRI 2011 alum, presented his research on ambient noise and boat detection at the 38th Annual Tester Memorial Symposium in Honolulu, HI. Tyler’s thesis entitled Underwater Acoustics Applications of Nonlinear Time Series Analysis demonstrates that snapping shrimp spectra vary on time scales related to boats entering and leaving a harbor and diver movements. The ambient noise background created by snapping shrimp was previously considered to vary over timescales on the order of days to weeks, but Tyler’s research demonstrates that events that take only minutes and affect harbor security are also modifying sounds produced by snapping shrimp. This finding will enable new approaches to detect ship movement in noisy, cluttered areas, and will improve the ability to monitor harbor security in near-real time.

Ms. Qing Li, SRI 2010 alum and Stevens Ph.D. candidate, was competitively selected to attend the Lloyd’s Register Educational Trust Research (LRET) Collegium, hosted by the Southampton Marine and Maritime Institute at the University of Southampton in Southampton, England. The prestigious LRET Collegium brings together doctoral students and post-doctoral researchers, from around the world to conduct collaborative research on global challenges in the maritime domain. The LRET will be held July 18 - September 11, 2013, at the University of Southampton campus. The theme of this summer’s program is Coastal Eco-Systems.

Maritime Systems Fellows, Python, Pollara, Holden and Francis, attend the DHS Career Pathways conference with SRI alumni from 2010, 2011 and 2012. CSR’s director of Education, Beth DeFares and Stevens Maritime Systems Fellows, Grace Python, Alex Pollara, Danielle Holden and Christopher Francis, met up with several of the center’s Summer Research Institute (SRI) alumni at the DHS S&T OUP Career Pathways Conference, held April 11-13, 2013, in Washington, DC. The SRI alumni in attendance were Blake Cignarella (SRI 2010, Rutgers University), Enrique Questell (SRI 2011, Univ. of Puerto Rico - Mayaguez (UPRM)), and SRI 2012 UPRM alumni Fernando Valverde Valle, Javier Rivera Collazo, and Isaac Jordan Forty.

Led by Dr. Matt Clark, Director, Office of University Programs and Ms. Stephanie Willett, Director, OUP Education Programs, the Career Pathways event provided student participants with insight into the DHS mission areas, networking opportunities with industry and government homeland security practitioners, and discussions on career planning and professional development activities.

www.stevens.edu/MIREES

The Center for Secure and Resilient Maritime Commerce (www.stevens.edu/CSR) is led by Stevens Institute of Technology and The Center for Island, Maritime and Extreme Environment Security (www.cimes.hawaii.edu) is led by the University of Hawai‘i.

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