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NAVAL POSTGRADUATE SCHOOL

CENTER FOR HOMELAND
DEFENSE AND SECURITY

APPLIED RESEARCH EXEMPLARS

CENTER FOR HOMELAND DEFENSE AND
SECURITY EDUCATION PROGRAMS



FEMA

ABOUT APPLIED RESEARCH

The Center for Homeland Defense and Security's unique academic environment brings together mid- and senior-level government officials with world-renowned faculty and experts in the diverse disciplines that comprise homeland security. The CHDS classroom is a place where participants think critically about homeland security issues and work collaboratively to develop strategic solutions. Master's degree participants research and write course papers along with a final thesis. These original works concentrate on proposing creative policies, strategies and approaches to the public safety challenges facing their agencies and the broader homeland security community.

Much of the research and ideas generated from the coursework and classroom collaboration have been implemented across agencies, regions and the nation. The purpose of this report is to highlight examples of the CHDS education model that nurtures critical thinking and intellectual exploration and transforms it into homeland security practices that solve problems at the local, state, and federal levels. The research is pushed out to more than 300 agencies and universities to broaden the CHDS impact and facilitate replication of smart practices and policies. Since 2003, the Center has continuously delivered forward thinking curriculum and academic resources and served as a forum for government officials from all levels of government and across all public safety disciplines to collaborate on preventing, protecting against, mitigating, responding to and recovering from natural and man-made threats to our country and local communities.



NAVAL POSTGRADUATE SCHOOL
CENTER FOR HOMELAND
DEFENSE AND SECURITY

APPLIED RESEARCH EXEMPLARS

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APPLIED RESEARCH BRIEF *Giusti Fuses Academics with New Role*

Richard Giusti, Battalion Chief, San Antonio Fire Department

The Naval Postgraduate School's (NPS) Center for Homeland Defense and Security (CHDS) is the nation's homeland security educator. Over the past 10 years, the Center has provided a neutral education forum for leaders in local, state, tribal, territorial, federal and military agencies to develop policies and strategies to prepare for, prevent, deter and respond to natural and terrorist events. Course work and research at CHDS directly translates into innovative practice. Learn more at www.CHDS.US.

Background

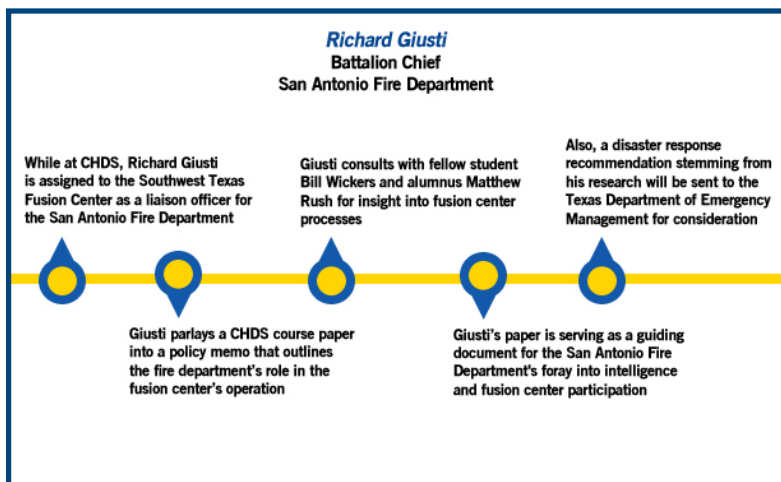
- Giusti was in charge of special operations for the San Antonio fire department when he enrolled at CHDS.
- In November 2012, while a student at CHDS, he was assigned to the Southwest Texas Fusion Center (STFC) the fire department's fusion center liaison officer.
- As liaison officer, Giusti will work with firefighters to ensure proper Suspicious Activity Reporting while making certain pertinent intelligence is directed to the fusion center from the department, and vice versa.
- Suspicious activity reporting for firefighters is a delicate balance, he noted. Their primary mission is safety and it would be counterproductive were residents to suspect they were being spied upon. "The last thing we want to do is be perceived as infiltrators for law enforcement," Giusti said. "Our constituents wouldn't trust us."

NPS/CHDS Catalyst

- Giusti cites CHDS coursework and contacts as proving helpful in his research into both fusion center processes and disaster response. "It's all about communication and building personal relationships," Giusti said. "It won't work without those relationships."
- Giusti has been able to consult CHDS contacts, a fellow student Bill Wickers, a police sergeant in Phoenix and alumnus Matthew Rush of the Austin (Texas) Fire Department, for insight into fusion center processes. "Matt Rush and Bill Wickers have kind of been my mentors on fusion centers," Giusti said during a break from class. "They've been very helpful in getting me started and pointing me in the right direction."

Impact

- Giusti's CHDS course paper is serving as guidance for the San Antonio Fire Department's foray into intelligence and fusion center participation.
- A state-wide disaster response policy may be implemented stemming from his thesis research.
- Giusti recommends drawing from the state's five Urban Areas Security Initiative (UASI) groups to respond to large-scale search and rescue events as well as hazardous materials (HAZMAT) incidents, rather than rely on Task Force 1, the state search and rescue team. Crews local to the scene exercise their skills with greater frequency whereas staff called up to Task Force 1 may not always use those skills regularly.
- "You would reduce funding and redundancy while increasing your proficiency because these people are better skilled in doing it," Giusti observed. "You want people staying on top of their game, especially in a situation when someone's life depends on you."



* as of 01/13





APPLIED RESEARCH BRIEF

Welch Launches Ready Responder Campaign at Local and National Levels *Alicia Welch, Captain, Los Angeles (Calif.) Fire Department*

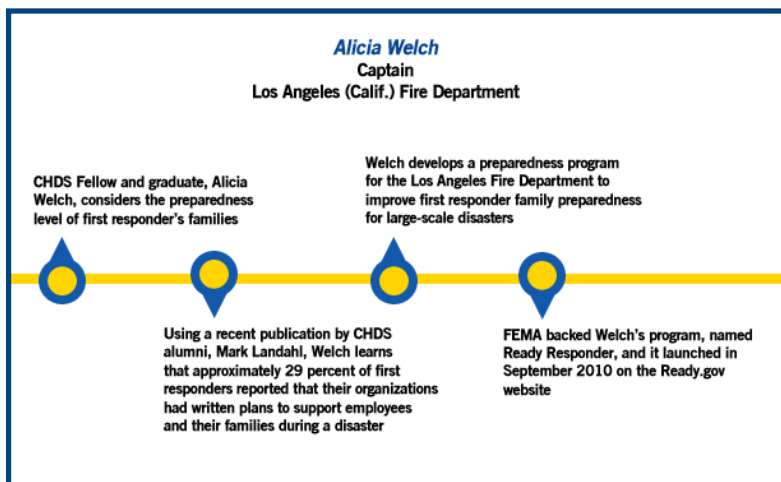
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Background

- Alicia Welch had been a Los Angeles Fire Captain for just eight months, when the tragic events of 9/11 unfolded.
- Welch recognized this event would dramatically reshape the role of the fire service in preparing for, responding to and recovering from catastrophic events. She confronted the realities of how she would respond and what the Los Angeles Fire Department (LAFD) could do to be better prepared.
- Welch, a 19-year veteran with the LAFD, continued to consider these questions while earning a master's degree at the Naval Postgraduate School Center for Homeland Defense and Security.

NPS/CHDS Catalyst

- Since Sept. 11, first responders have received the latest technology and equipment and participated in training and exercises to plan for and practice how they will respond in a future incident, but Welch realized that a critical component of individual and family preparedness was missing.
- "All of the equipment, training, and exercises contribute to a successful response, if the employees show up ready and able to work, but what if their families' are impacted by the disaster?" Welch said. "Many organizations have not addressed this issue."
- "It just kind of occurred to me that we never took into consideration the work force," Welch said. "What if we write all these emergency plans and the work force doesn't show up during a catastrophe? Then the plan won't work."
- After surveying CHDS students with assorted first responder backgrounds, the findings concluded that 97 percent of the respondents agreed employee and family preparedness was an essential element to organizational resilience during a large-scale catastrophe.
- Welch set out to address this critical gap by developing a preparedness program for the Los Angeles Fire Department.



Impact

- FEMA backed Welch's development of the Ready Responder pilot program. The program was created to improve first responder family emergency preparedness so professional responders are physically and mentally capable of coming to work and focusing on the job following a large-scale disaster.
- Welch and FEMA have undertaken a multi-layered pilot program in the City of Los Angeles to bolster workplace and household readiness for emergency responders. The LAFD launched its responder preparedness effort by distributing preparedness information packets to its 4,000 sworn and civilian staff members and hopes to expand the preparedness message to all first responders and citizens of Greater Los Angeles.
- The Ready Responder program and toolkit was launched in September 2010 on the Ready.gov website.

* as of 09/10





APPLIED RESEARCH BRIEF

Portable DNA Testing Kits Useful Tool In Immigration Determinations

Evelyn Sahli, Field Office Director, U.S. Citizenship and Immigration Services (USCIS)

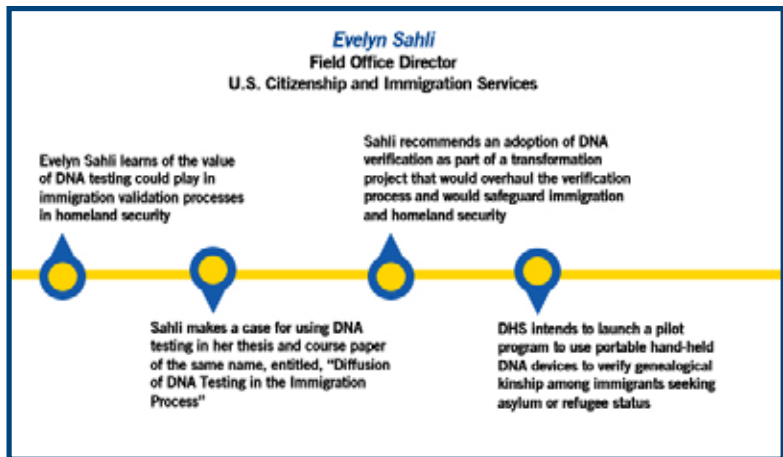
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Background

- A murder of a college student in Portland, Oregon, showed Evelyn Sahli, a U.S. Citizenship and Immigration Services (USCIS) Field Office Director in Portland, the value DNA testing could play in immigration validation processes and in homeland security. No fingerprints were left at the crime scene, but DNA testing led to a Turkish man who was married to an American student and seeking permanent residence in the United States.
- If not for the DNA testing in connection with the criminal investigation he could have possibly completed the residency process. "I realized our normal fingerprint screening process would have never caught him," said Sahli.
- "DNA is immensely valuable to the homeland security enterprise." Sahli said. "It has proven value in establishing biological relationships and detecting and deterring crime. It is a perfect tool for combating immigration fraud and preventing trafficking in humans, especially children. DNA technology can help to detect criminals and terrorists, facilitate inter-agency information sharing, improve customer service, and save resources."

NPS/CHDS Catalyst

- Sahli, said "At the same time that I moved from the Refugee Affairs Division to Domestic Operations, I was accepted into the CHDS Masters degree program. This meant that I was able to tie all of these issues together, merging real-life with academics. Without CHDS, I would have never had so many doors opened to me to pursue this subject."
- Sahli researched the prospect of portable DNA testing for her Technology for Homeland Security course paper and later for her thesis.
- In both CHDS papers, Sahli made a case for using DNA testing to ensure applicants qualify for the benefits status they are seeking.
- Sahli recommended her agency adopt DNA verification as part of a Transformation project that was intended to overhaul the verification process to expedite determinations, combat fraud and shift from paper-based processing to an electronic method.



Impact

- Almost 18 months after penning her thesis Evelyn Sahli will see her vision become a reality. DHS said in February 2011 it will launch a pilot program using portable hand-held DNA devices to verify genealogical kinship among immigrants seeking asylum or refugee status.
- She sees potential for the device to address immigration, criminal and homeland security challenges, especially the rising problem of human trafficking, something she grew increasingly concerned about when reviewing cases in which paternity was not clear.
- Sahli further advocated for the adoption of this approach, while working in Washington, D.C., and worked with participants in a DHS grant program to small businesses that were developing portable DNA testing equipment.
- With the portable device developed by NetBio of Boston, a DNA sample can be processed in less than one hour, compared with days or weeks when processed by a laboratory. "This was something that I had seen a clear need for over the years, and jumped at the chance to play a role," Sahli said.

* as of 06/11





APPLIED RESEARCH BRIEF

Paper Inspires Quest for Database Information Sharing

Ash Chatterjee, Enterprise Architect, Department of Homeland Security's Office of Infrastructure Protection, Arlington, VA.

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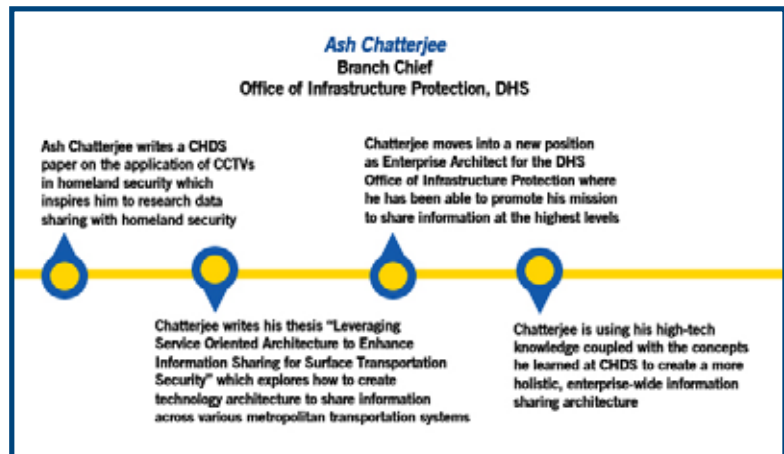
- Ash Chatterjee, an Enterprise Architect for DHS' Office of Infrastructure Protection, first began focusing on information sharing while working for the Transportation Security Administration (TSA), where he was employed while studying at CHDS.
- One of Chatterjee's missions with the Department of Homeland Security (DHS) is to educate colleagues about the importance of sharing information databases. "Most government employees don't even know this is possible," said Ash. "Most people don't think in these terms."

NPS/CHDS Catalyst

- Chatterjee wrote a research paper for his Technology for Homeland Security course on the use of closed-circuit television (CCTV) in homeland security. While working on this CHDS paper, he began thinking about developing a Common Operating Picture (COP) including CCTV data. A core component of an integrated situational awareness (SA) application, a COP supports the DHS mission of responding to threats and hazards by collecting, sharing and displaying information across agencies and organizations. A COP facilitates collaborative planning and response to threats.
- Chatterjee explored the topic further in his thesis, "Leveraging Service Oriented Architecture to Enhance Information Sharing for Surface Transportation Security." He analyzed information technology applications to address information sharing and how to create technology architecture to share information among various metropolitan transportation systems, their security partners and the TSA.

Impact

- After completing his CHDS degree, Chatterjee transferred to his current job which moved him closer to being able to enact his vision of information sharing. "However, I was disappointed to find that my new job involved the collection of infrastructure data and storing it in silos, but did not share it among HLS communities," he said.
- His CHDS paper on CCTVs inspired him to research data sharing, which has helped him significantly in his current job.
- With the tools learned from his CHDS coursework and thesis, Chatterjee has been able to promote his quest for information sharing at the highest levels of DHS. "I was able to explain to my office the importance of information sharing among various DHS agencies and their countless databases through automated means such as NIEM," he said.
- In his current position, Chatterjee is using his high-tech knowledge coupled with the concepts he learned at CHDS. In particular, he seeks to break down the "silos" of collected information for sharing across DHS' various agencies and sectors, and remains committed to empower his colleagues to do the same.



* as of 06/12





APPLIED RESEARCH BRIEF

Stigler Research Implemented in Regional Response Team

Mark Stigler, Retired Deputy Chief of Police, City of Waukesha (Wis.) Police Department

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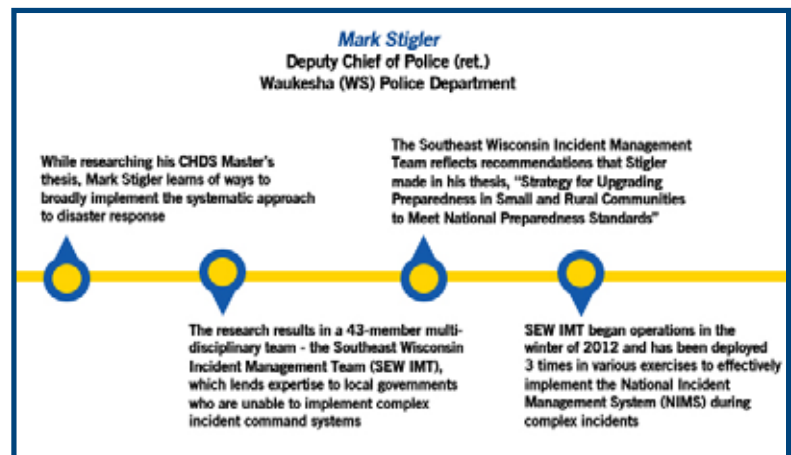
- Always a firm believer in the worth of the National Incident Management System (NIMS), Mark Stigler's views on how to implement the systematic approach to disaster response changed as he researched his CHDS thesis.
- "Before I started my research, my solution was just a stronger federal mandate, but after listening to my instructors and talking to emergency managers all over my state I quickly realized adding more mandates to those overworked people was not going to work," said Stigler, then the Deputy Chief of Police for the City of Waukesha (Wis.) Police Department.
- Stigler has retired from police work, and is now a full-time instructor at Waukesha County Technical College where he teaches criminal justice and homeland security courses.

NPS/CHDS Catalyst

- In his CHDS thesis, "Strategy for Upgrading Preparedness in Small and Rural Communities to Meet National Preparedness Standards," Stigler devised an efficient, economical way to bring NIMS proficiency to regions that may not have the resources, money or time to implement all the complex components of the system. The result is a 43-member, multi-disciplinary team – the Southeast Wisconsin Incident Management Team (SEW IMT).
- SEW IMT, led by Stigler, comprises professionals who are highly trained in NIMS and work on a volunteer basis. Key to the team's success is that its members already have relationships with the localities they would aid during an incident, event or exercise.
- Stigler credits his CHDS education with expanding his view of homeland security in his profession. "The education I received at CHDS was an integral part of my maturation process as a homeland security practitioner," Stigler said. "Without the school I would have never had the broad view of homeland security that I have now. When I work with others to build homeland security or emergency management courses, documents or teams, I always keep in mind the lessons I learned at CHDS. It makes me feel good when I can apply the things I learned at that school here at home."

Impact

- SEW IMT began operations in the winter of 2012 and has deployed three times. The most recent exercise in May 2012 was dubbed "SIMCOM 2012" and involved more than 200 participants and agencies including Wisconsin Emergency Management Director Brian Satula, who is a December 2011 CHDS graduate.
- The exercise was designed to display, educate and test Mobile Emergency Communications and interoperability between the Department of Defense and federal, state, tribal and local governments. The goal of the exercise was to develop relationships and understand the capabilities of other agencies before they are needed in a real emergency.
- "The education I received at the Center for Homeland Defense and Security was state of the art and the instructors were true mentors, many who I still reach back to when I need help. I feel duty bound to take back the new understanding they helped me reach and apply it here in my state."



* as of 06/12





APPLIED RESEARCH BRIEF

Brown Earns CHDS Thesis Award

*Michael Brown, Senior Desk Officer, Office of Global Strategies, International Operations Division
Transportation Security Administration (TSA), Arlington VA*

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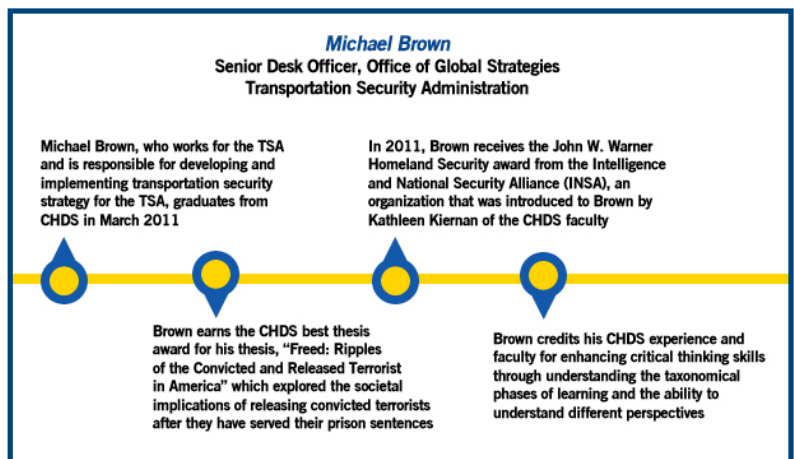
- Michael Brown's childhood experience of the murder of his father by Basque ETA separatists on Sept. 11, 1985 and the events of Sept. 11, 2001 shaped his desire to serve his country. After earning a business administration degree from The George Washington University he charted a course in the business world. But in 2004, he began to crystallize a new career path.
- "I had this epiphany about where I wanted to take my professional career," Brown recalled. "I didn't personally know anyone who was fighting terrorism. I didn't know many police officers or fire fighters. So I made a conscious decision to get into government."

NPS/CHDS Catalyst

- Brown further bolstered his academic credentials in earning a CHDS master's degree. His award-winning thesis, "Freed: Ripples of the Convicted and Released Terrorist in America," explored the societal implications of releasing convicted terrorists after they have served their prison sentences.
- Brown said. "Everybody comes from a different place. The NPS/CHDS classroom taught me to clearly recognize the similarities and nuances between disciplines, and broadened my conceptual thinking. It has helped me recognize the gaps between perspectives and also avoid 'group-think.'"
- In the summer of 2011, he worked with a group called Project Common Bond which works with children who have lost family members to terrorist acts. He noted that the world has become smaller because of technology. "As we have more contact, we have more conflict. This is why the CHDS program is amazing - to recognize that conflict and identify solutions to resolve it," he said.

Impact

- "Michael has made a significant contribution to the literature base and has compelled a public confrontation and a dialog on a threat heretofore nearly invisible. He symbolizes the true magic of CHDS, a practitioner environment in which earned experience fueled with a passion to change the world is backed with academic rigor and the results are evident," said Kathleen Kiernan of the CHDS faculty.
- Brown participated in a working group comprised of homeland security professionals in writing an INSA white paper titled "Intelligence to Protect the Homeland," published for the ten year anniversary of 9/11. He likens that working group experience to a CHDS classroom: "We had the opportunity to debate real-time issues about homeland security intelligence with professionals from multiple disciplines. The dynamic was somewhat similar to what I experienced at NPS/CHDS."
- Brown received the John W. Warner Homeland Security Award from the Intelligence and National Security Alliance (INSA) in December 2012 in Washington, D.C. The award is presented annually to first responders and domestic government employees across the national security and intelligence fields.



* as of 12/11





APPLIED RESEARCH BRIEF

Massey Puts Practice into Emergency Health and Hospital Surge Planning

Mary S. Massey, Hospital Preparedness Coordinator for Orange and Inland Counties, California Hospital Association

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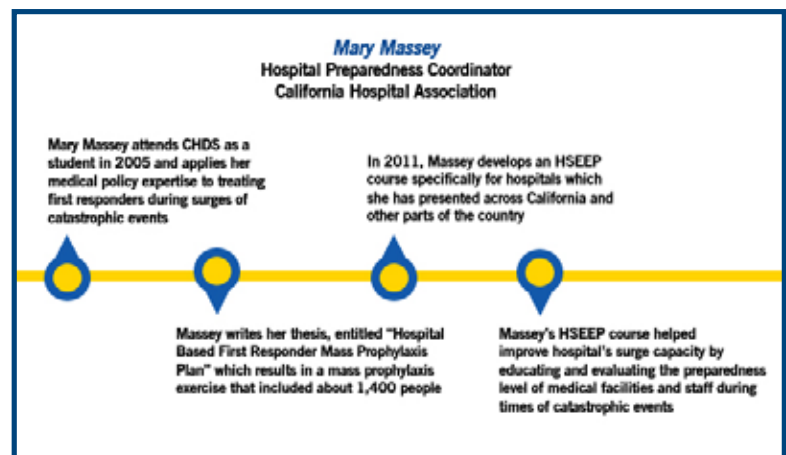
- Since 2007, Massey assisted in evaluating hospital emergency preparedness through the Homeland Security Exercise and Evaluation Program (HSEEP), maintained by the Federal Emergency Management Agency's National Preparedness Directorate, Department of Homeland Security.
- She works with hospitals to ensure they have well-practiced emergency and preparedness plans in place.
- Massey educates and evaluates the preparedness of medical facilities and staff as to their ability to operate during a "hospital surge," a large influx of patients during a catastrophic event.

NPS/CHDS Catalyst

- Massey delved into the challenge of hospital surge while studying at CHDS. She applied her thesis research to administering mass prophylaxis campaigns specifically for first responders. Mass prophylaxis is the capability to protect the health of the population by taking steps to prevent the development of disease among people exposed or potentially exposed to public health threats.
- "There was a push to do mass prophylaxis for the country as a whole, but not for the first responders," said Massey.
- Massey's thesis abstract states: "In order to effectively meet the challenges created by a bioterrorism attack, its first lines of defense, the first responders, must be rapidly prophylaxed to allow the continuance of their mission. The primary objective of this research is to develop, test, and make recommendations for a straightforward, adaptable mass prophylaxis plan to meet the prophylactic requirements of local first responders in the event of a biological attack."

Impact

- Her thesis realized immediate efficiency that included a full-scale first responder mass prophylaxis exercise that processed about 1,400 people in four hours using existing personnel and the National Incident Management System, at less than a tenth of the cost of other exercises.
- In 2011 Massey developed an HSEEP course specifically for hospitals which she has presented across California and other parts of the country. "I am trying to find a way for them to improve their surge capacity when catastrophic events happen, whether they are natural or manmade," said Massey.



* as of 10/12





APPLIED RESEARCH BRIEF

Drug Cartel Research Exemplifies Collaborative Power of CHDS Alumni

Colonel Bentley Nettles, General Counsel, Texas National Guard

Anthony Cox, Hazard Assessment Officer, Department of Emergency & Military Affairs, Phoenix Ariz.

David Gomez, Assistant Agent in Charge, FBI, Seattle, Wash.

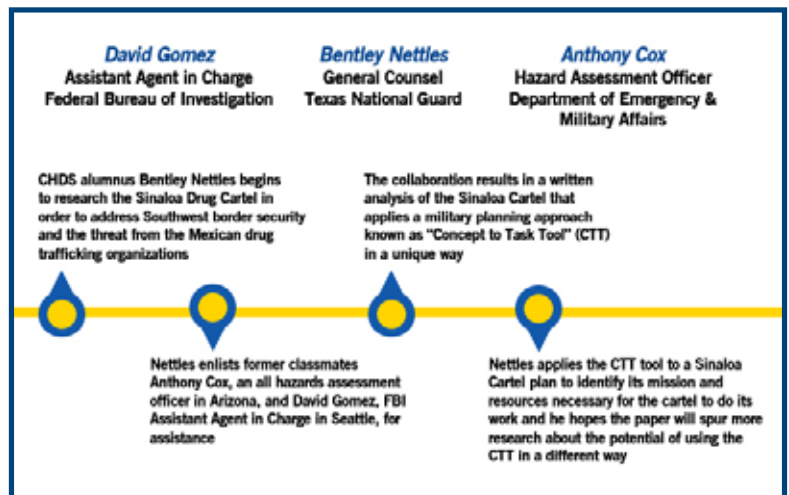
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Background

- As Colonel Bentley Nettles of the Texas National Guard began researching the Sinaloa Drug Cartel he ran into roadblocks mining the information he needed.
- Nettles' paper was an exercise in applying what is known as the Concept to Task Tool, or CTT. The CTT is typically used by military planners to provide an independent review of a plan or order by others within the organization, also known as a "blue team."
- He applied the tool to an enemy plan, the Sinaloa Cartel, to identify its mission and necessary components for the cartel to do its work. This type of information analysis can help decision-makers better combat cartels.
- "The cartel is a criminal enterprise. Those organizations have certain dependencies they rely upon which makes them potentially vulnerable to us impacting those operations," Nettles said.

NPS/CHDS Catalyst

- Nettles tapped into the expertise network that comes with being an alumnus of CHDS. He enlisted former classmates Anthony Cox, an all hazards assessment officer in Arizona, and David Gomez, FBI Assistant Agent in Charge in Seattle, for assistance.
- "Without the CHDS experience, I don't believe that a military officer, a senior federal law enforcement agency and a state hazard analyst would ever come together to work on a project that kicks the can forward in addressing Southwest border security and the threat from Mexican drug trafficking organizations," Cox said.



Impact

- Nettles' written analysis of the Sinaloa Cartel applies the CTT in a novel way.
- Nettles hopes the paper will spur additional research about the potential of using the CTT in a different way. "My goal is get it into academia where people may make suggestions on how to use this tool more effectively," Nettles said.
- The collaborative nature and cross discipline interactions encouraged in the CHDS Master's Program are helpful beyond the classroom setting. "Using skill sets from one discipline and applying it to another, sometimes you can make dramatic breakthroughs," Nettles commented.

* as of 05/11





Old Technology Not Necessarily Outdated Technology
Colleen Donovan, Hospital Preparedness Program Manager,
SC Department of Health and Environmental Control, Columbia, S.C.

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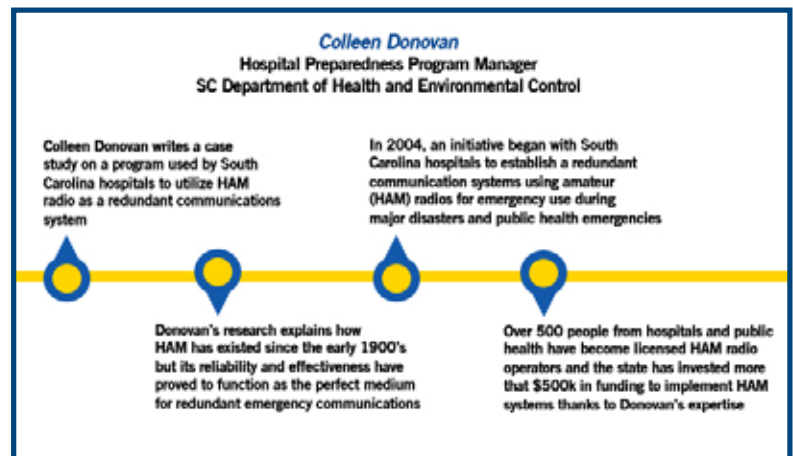
- In 2004, an initiative began with South Carolina hospitals to establish a redundant communication system using amateur (HAM) radios. The SC HEART (South Carolina Healthcare Emergency Amateur Radio Team) was formed that year.
- The goal of the project was to create a communication system to support hospitals, shelters, healthcare facilities, and Emergency Support Function #8 responders during major disasters and public health emergencies. This system is designed to be the backup communication system to the current 800 MHz radio system already established throughout the state.
- USC-CPHP has provided training for hospital personnel and public health personnel who are interested in becoming licensed HAM operators to use them in the time of emergencies.

NPS/CHDS Catalyst

- Donovan's CHDS course paper provided support for the idea that old technology isn't necessarily outdated technology. She wrote a case study on a program used by South Carolina hospitals to utilize HAM radio as a redundant communications system.
- "Ham radio has been around since the early 1900's, so it is not only reliable, but tested internationally," Donovan noted. "HAM is the most low tech communication technology used by hospitals, but it has been effective in emergency response. Sometimes, the oldest and easiest technology is dependable."
- She cited the National Hurricane Center in Florida, which relies on a HAM radio station, WX4NHC, to receive reports in affected areas and the National Weather Service's use of its "SKYWARN" program to receive ground level reports. Moreover, within minutes of September 11, 2001, ham radio operators communicated from emergency operation centers as other systems failed.

Impact

- Since completion of the CHDS technology class, other jurisdictions in the nation have asked South Carolina to participate in their exercises, the total number of individual licensed HAM operators has expanded by about 200, and there have been several requests for speaking engagements.
- "We are encouraged that all hospitals in our state who participate in the Hospital Preparedness Program now have a robust redundant communication system with hospitals and first responders in our state," Donovan said.
- To date, 505 individuals from hospitals and public health have become licensed HAM radio operators. HAMS are also available to provide communication during drills, exercises, and real life incidents across the state and work hand in hand with hospitals and public health during emergencies.
- The state has invested more than \$500,000 in funding to purchase, install and train individuals and install repeaters across the state for the security of knowing they are linked by a statewide network that they can depend on at all times.



* as of 04/10





APPLIED RESEARCH BRIEF

Master's Alum Publishes CHDS Thesis as a Book

Stephanie Blum, Attorney, Transportation Security Administration

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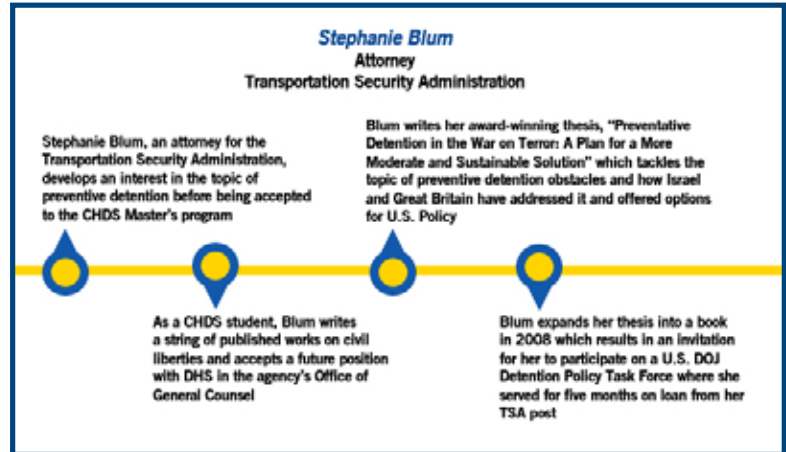
- After September 11, 2001, the Bush administration decided to detain individuals suspected of being members or agents of al Qaeda or the Taliban as enemy combatants. These detainees would be held indefinitely and incommunicado for the duration of the war on terror.
- Stephanie Blum, an attorney for the Transportation Security Administration, was interested in the topic of preventive detention before being accepted into the CHDS Master's program.

NPS/CHDS Catalyst

- While writing a research paper for the Introduction to Homeland Security, her interest in the topic of preventative detention intensified.
- She ultimately decided to make the topic the basis of her thesis.

Impact

- Upon completion of her thesis, Blum approached Cambria Press and explained the importance and relevance of her work. Cambria Press decided to publish the book titled *The Necessary Evil of Preventive Detention in the War on Terror: A Plan for a More Moderate and Sustainable Solution*.
- Blum is the first student in the CHDS Master's Degree Program to develop her thesis into a book.
- "This is a groundbreaking study that provides extremely valuable perspectives for both scholars and policymakers. It is clearly an important, if not critical, resource for other academics studying the war on terror," said Toni Tan, Director of Cambria Press.
- "Stephanie Blum is yet another example of how CHDS graduates are contributing to the next generation of this nation's homeland security leadership," said CHDS Professor David Brannan. "Stephanie's book is one of the most important legal volumes produced during this period of the so called 'War on Terror.'"



* as of 01/09





APPLIED RESEARCH BRIEF

Smith's Thesis Provided Fusion Center Career Blueprint

Walter Smith, Inspector, Philadelphia Police Department and Executive Director of the Delaware Valley Fusion Center

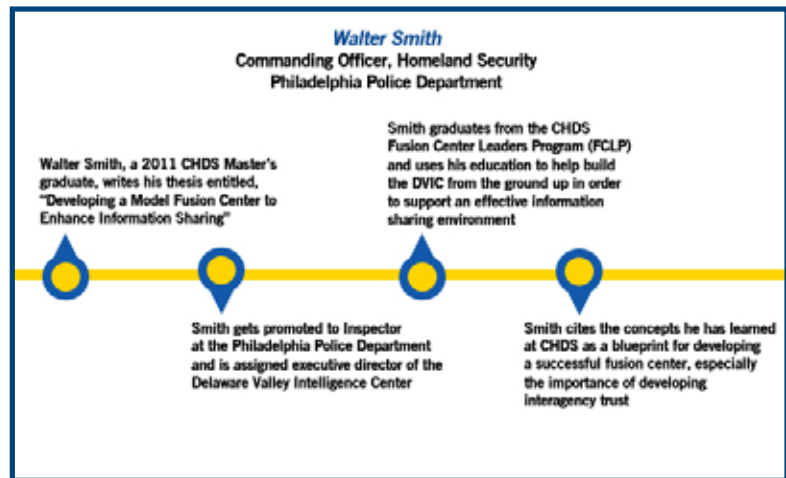
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Background

- Walter Smith is a veteran of the Philadelphia Police Department where he has worked a full range of police jobs including patrol, organized crime and homeland security.
- The Philadelphia region boasts a population of more than 3.5 million people and serves as a regional focal point for commerce and transportation and is a major port in the United States. Furthermore, it includes an array of historical icons that would be considered symbolic terrorism targets.
- The focus of Walter Smith's thesis as stated in his abstract is "...to examine correlation between the implementation of the current United States Department of Homeland Security and U.S. Department of Justice suggested Fusion Center Guidelines, and the employment of these guidelines in the successful development of a model fusion center."
- Smith is also a graduate of the Center's Fusion Center Leaders Program.

NPS/CHDS Catalyst

- The collaborative environment fostered in the Center's coursework proved to be a valuable catalyst to Smith's thesis research.
- Although the Philadelphia region had developed a robust response capability through collaborative efforts, Smith said, communication and information sharing would be enhanced through a centralized information-sharing network.
- "Interagency collaboration serves as the core of fusion center success," he said. "The concepts I applied from the CHDS Master's Degree program and the Fusion Center Leaders Program emphasized the importance of developing interagency trust and relationships. These experiences assisted me in the development of the necessary knowledge, skills and abilities to become a fusion center leader in a complex environment, which seeks to protect civil rights and civil liberties of individuals, while lawfully connecting the dots to prevent the next terrorist incident."
- "CHDS provides a preeminent education and experience to be an effective practitioner managing complex challenges in any position."



Impact

- With a recent promotion to Inspector at the Philadelphia Police Department and an assignment as executive director of the DVIC which serves 12 counties in four states, Smith has the opportunity to utilize the research he did for his thesis titled "Developing a Model Fusion Center to Enhance Information Sharing."
- "The Delaware Valley Intelligence Center was built from the ground up in order to support an effective information-sharing environment," said Smith.

* as of 12/12





APPLIED RESEARCH BRIEF

Making Sense in the Edge of Chaos: A Framework for Effective Initial Response Efforts to Large-Scale Incidents Cmdr. Cynthia Renaud, Long Beach (Calif.) Police Department

The Naval Postgraduate School's (NPS) Center for Homeland Defense and Security (CHDS) is the nation's homeland security educator. Over the past 10 years, the Center has provided a neutral education forum for leaders in local, state, tribal, territorial, federal and military agencies to develop policies and strategies to prepare for, prevent, deter and respond to natural and terrorist events. Course work and research at CHDS directly translates into innovative practice. Learn more at www.CHDS.US.

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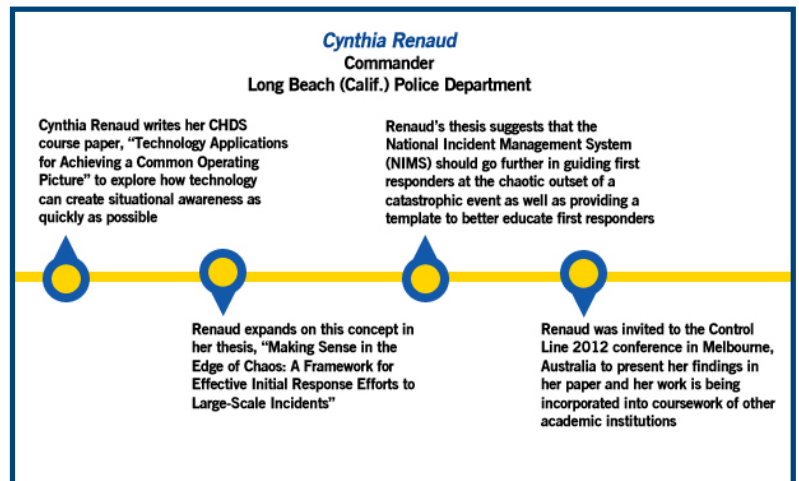
- Post 9/11, the federal government created the National Incident Management System (NIMS), an organizational structure intended to manage resources and channel communication between disparate agencies working together to solve a catastrophic crisis.
- In her CHDS course paper for the Technology and Homeland Security class, "Technology Applications for Achieving a Common Operating Picture", Police Chief Cynthia Renaud studied use of the technology to create situational awareness as quickly as possible.

NPS/CHDS Catalyst

- Renaud expanded her study of complex response situations in her thesis "Making Sense in the Edge of Chaos: A Framework for Effective Initial Response Efforts to Large-Scale Incidents." "During a big event with multiple agencies, probably the most challenging thing is to determine how the command post can take in information, sift through it to see what is pertinent, and send out orders to first responders," she said.
- Renaud credits CHDS for the opportunity to research and write about the topic and for the paper's reach. "The thesis would have never been written had I not been fortunate enough to spend two years in an academic environment where I was pushed to think, to prod, and to explore this subject area," Renaud said. "I would have gone on in my daily life thinking about this issue but not doing anything about it."

Impact

- Renaud discovered in the initial phase of chaos during large scale emergency events, the forms, checklists and organizational structure of NIMS offer first responders little help for making sense of the situation. "While NIMS is an excellent tool for managing response efforts in subsequent phases it leaves us unprepared with how to deal with the initial phase of chaos," Renaud said.
- Renaud recommends expanding NIMS to include recognition and discussion of this initial phase. Using a combination of classroom and scenario-based training, her paper also suggests a template to better educate first responders.
- Renaud's research into the early phases of incident command have spread around the globe; she was invited to speak at the Control Line 2012 conference in Melbourne, Australia, and she is scheduled to speak at the California Police Chiefs Association's conference as well as an emergency management conference in 2013.
- Instructors from institutions including Northwestern University in Chicago and the National Defence Academy in Bulgaria have informed her they are incorporating her work in their courses, and the California Police Officer Standards and Training (POST) Commission created a steering committee looking at building a course on the topic.



* as of 10/12





APPLIED RESEARCH BRIEF

Coast Guardsman Enlists Citizens, Social Media to Safeguard Nation's Waterway *Cmdr. Andre Billeaudeau, U.S. Coast Guard*

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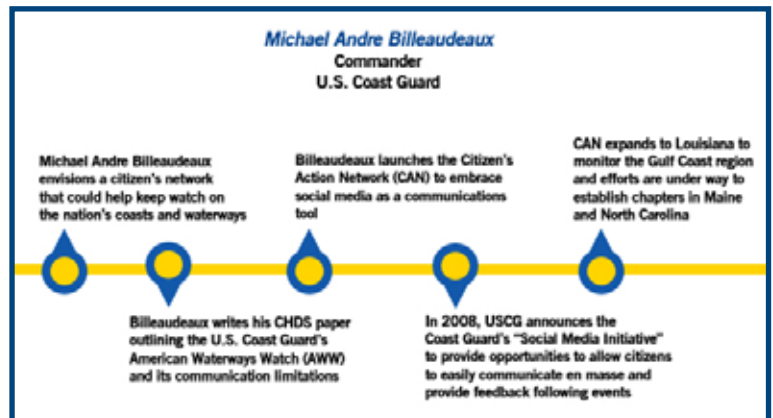
- Andre Billeaudeau, a U.S. Coast Guard Commander, had long envisioned a citizen's network that would help keep watch on the nation's coasts and waterways.
- Before he started work on his master's degree at the Center for Homeland Defense and Security (CHDS), he had launched the Citizen's Action Network (CAN) in the Pacific Northwest.

Catalyst

- In a CHDS course paper, Billeaudeau outlined the U.S Coast Guard's American Waterways Watch (AWW) and highlighted its communication limitations of how participants could receive or report information.
- The paper also analyzed theories of social networking, and the rise in popularity of Web 2.0 applications was viewed as a potential benefit to an organization such as the US Coast Guard by allowing the free exchange of information through a variety of Web 2.0 social networking applications.
- The paper paved the way for his thesis, "Leveraging Citizens and Cultivating Vigilance for Force Multiplication in the Maritime Domain," which further evaluated CAN, the unique maritime and "community" corroboration, with an emphasis towards national implementation.

Impact

- The research Billeaudeau conducted at CHDS has helped transform his vision of the CAN program into an effort that is being replicated elsewhere and a concept that is becoming part of the Department of Homeland Security's (DHS) national strategy.
- "CHDS helped move it from hobby to something much more formal; it gave it some backbone," Billeaudeau said. "The research and concept has been accepted into some national venues."
- CAN has since expanded and now has a chapter based in Louisiana that monitors the Gulf Coast region and efforts are also under way to establish chapters in North Carolina and Maine.
- It has fully embraced social media as a communications tool and the group has its own Facebook page and utilizes MOODLE, a collaborative learning application Billeaudeau learned about at CHDS.
- "I think this is one of the best bangs for buck the country has," he said. "The homeland security of the country rests on its citizenry."



* as of 04/10





APPLIED RESEARCH BRIEF

Alumnus Combats Somali Radicalization, Builds Partnerships With Muslim Community Through Community Policing Assistant Police Chief Dennis Jensen, St. Paul (Minn.) Police Department

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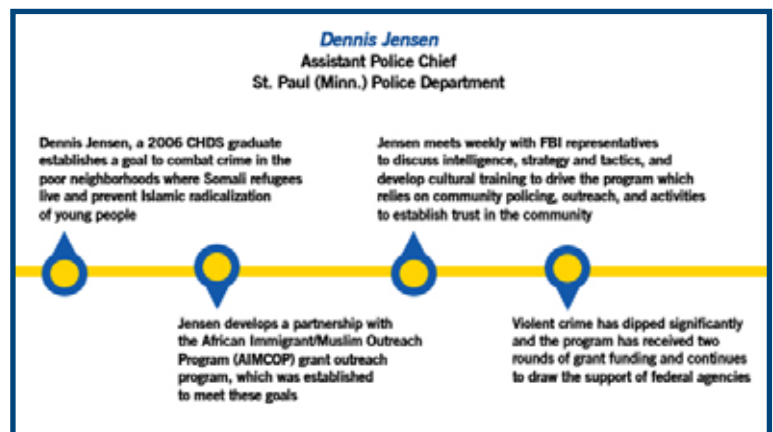
- After the terrorist attacks of 9/11/01, law enforcement needed to cultivate relationships with Muslim communities in the United States.
- Assistant Police Chief Dennis Jensen discovered the key to creating a connection to St. Paul's local Somali immigrant community was building trust in a population who are distrustful of police. In their native country, police are often brutal and repressive, so gaining trust is challenging. "They are totally afraid of law enforcement because in their county law enforcement is military," he said.

NPS/CHDS Catalyst

- For his thesis, "Enhancing Homeland Security Efforts by Building Strong Relationships between the Muslim Community and Local Law Enforcement," Jensen compared an earlier study of policing St. Paul's African American community to policing the Somali immigrant community to see if there were common lessons to be learned.
- His research showed:
 - Just two of six aspects of the earlier study proved relevant to the latter
 - The complexity of culture in immigrant communities requires law enforcement to meet each population's unique needs
 - Each immigrant population requires going beyond traditional community policing efforts to attain cultural competency

Impact

- An outreach program, the African Immigrant/Muslim Community Outreach Program (AIMCOP), was created, aimed at preventing radicalization while reducing crime and improving people's lives in their new country. This program combines community policing with outreach and activities specifically for St. Paul's Somali population.
- Somali outreach incorporated several programs through the St. Paul Intervention Project, including the Police Athletic League, tutoring and jobs training at the YWCA and women's programs.
- To engender trust the project works with the Muslim American Society (MAS) to provide translation and other services for community meetings.
- Jensen meets weekly with FBI representatives to discuss intelligence. FBI also provides counterterrorism training for about 35 law enforcement officers with the St. Paul Police Department and the Ramsey County Sheriff's Department who are associated with the project.
- The outreach effort Jensen directed received two grants, a state grant in 2005 for \$25,000 and an Office of Justice Programs grant in 2009 for \$670,000.
- Violent crime in the targeted areas has dipped 15 percent.



* as of 08/11





APPLIED RESEARCH BRIEF

Mathematical Modeling Applied to Maritime Security

Lieutenant Commander Eric Taquechel, United States Coast Guard

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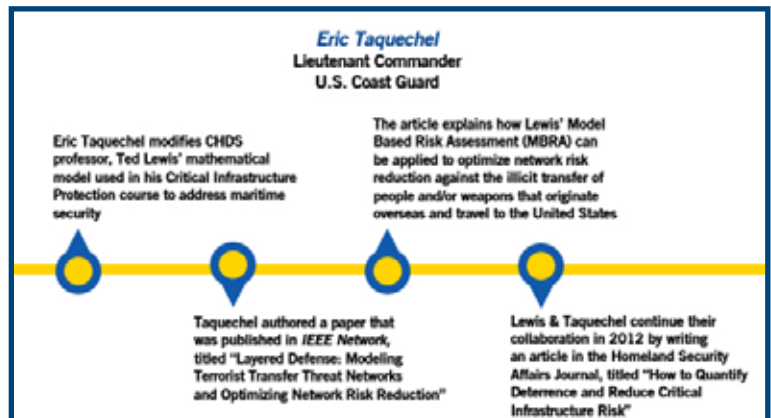
- Students in Ted Lewis' Critical Infrastructure Protection course are taught how mathematical modeling can provide a better foundation for making important decisions about protecting the nation's infrastructure assets.
- Lt. Eric Taquechel of the U.S Coast Guard learned network theory from Lewis' Critical Infrastructure Protection course and Lewis' 2006 book on the same topic, "Critical Infrastructure Protection in Homeland Security: Defending a Networked Nation."

Catalyst

- At his job at Coast Guard Headquarters in Washington, D.C., Taquechel was concurrently working on a project to analyze transfer threat, illicit people and/or weapons/components that originate overseas, travel through foreign ports and the global maritime commons and enter the United States via domestic ports. He saw an opportunity to apply Lewis' theories and practical tools, such as the Model Based Risk Assessment (MBRA), to the transfer threat problem he was working on.
- Network science, which analyzes connections/relationships between different components of a system, leverages mathematical optimization techniques and reliability engineering, was applied to the realities of the U.S.' layered defenses against the transfer threat. The analysis would show where to invest limited resources for maximum system risk reduction and/or return on investment.
- Model Based Risk Assessment (MBRA), is a modeling/simulation/analysis tool used to assess network node vulnerability, network risk and resource allocation. Lewis agreed to modify his MBRA tool to look at transfer threat analysis.
- Lewis identified a special edition of IEEE magazine as a good fit for the article Taquechel wanted to write which he hoped would inform policy in addition to contributing to the academic literature.

Impact

- Taquechel's paper was published in the November/December 2010 edition of IEEE Network, titled "Layered Defense: Modeling Terrorist Transfer Threat Networks and Optimizing Network Risk Reduction." With the hope of reaching a wider audience, he kept it minimally technical.
- Lewis & Taquechel continued their collaboration in 2012, writing an article published in the August 2012 Homeland Security Affairs Journal, titled "How to Quantify Deterrence and Reduce Critical Infrastructure Risk."
- "Again, the CHDS program helped contribute to the discourse on real-world problems," Taquechel and Lewis said. "The CHDS program is not intended to create mathematicians, or to teach students deterrence theory and game theory. But, because of the strong instructor-student relationships, the great relationships between the center and DHS agencies and the center's linkages to other fields of study, there are plenty of opportunities to apply concepts from those fields to current and emerging critical infrastructure risk management issues, in an actionable way. As practitioners and those who educate them, we have an obligation to solve problems, and combining the strengths of different schools of thought into one approach could be the best way to solve those problems."



* as of 12/10





APPLIED RESEARCH BRIEF

Student CIP Project Drives National Legislation

Lt. Tracy Frazzano of the Montclair (N.J.) Police Department
Supervisory Special Agent Jeffrey Jones, Federal Bureau of Investigation
Lt. Col. Duke Pirak, Oregon Air National Guard
Cmdr. Cheryl Wade, Ventura County (Calif.) Sheriff's Department

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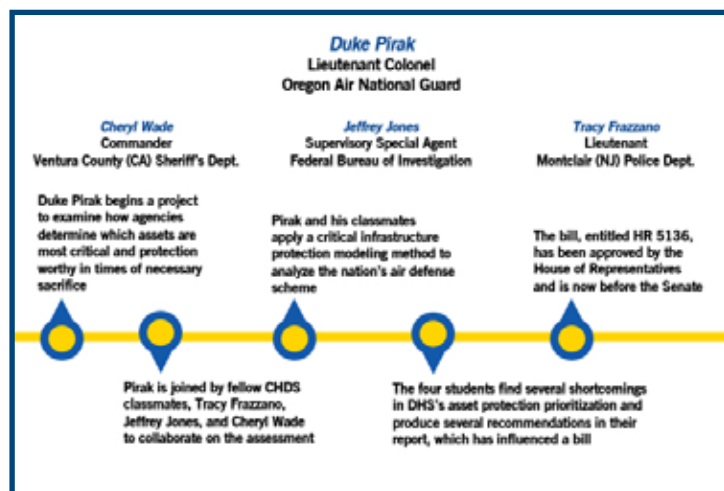
- The Critical Infrastructure Protection (CIP) course at the Naval Postgraduate School Center for Homeland Defense and Security (CHDS) teaches students how to apply modeling to assess vulnerabilities and build protection strategy.
- The underlying purpose of the course is to examine how agencies determine which assets are most critical and protection-worthy, when not everything can be protected all of the time.

NPS/CHDS Catalyst

- As part their CIP course project, Lt. Col. Duke Pirak of the Oregon Air National Guard, Lt. Tracy Frazzano of the Montclair (N.J.) Police Department, Jeffrey Jones, Supervisory Special Agent with the Federal Bureau of Investigation, and Cmdr. Cheryl Wade of the Ventura County (Calif.) Sheriff's Department examined how the Department of Defense (DoD) assesses risk and decides which assets to protect in the realm of homeland air defense.
- The four students applied a CIP modeling method to analyze the nation's air defense scheme. "We uncovered what we think are some severe flaws in their (DoD) logic and strategy," Pirak said. "The ultimate goal is to remove emotion and politics out of this and come up with something that is informed by science."
- "As a group, the research presented that we have reduced our level of air protections since 9/11 and haven't taken steps to update our analytics to support what we are protecting and how we are doing it," said Frazzano. "The overall conclusion that we reached is that our resources are far from optimized."

Impact

- Their study found shortcomings in DoD's decision-making on which population centers and which nodes of infrastructure to protect. When deciding on equally-sized population centers, one may have critical infrastructure nodes that were not being factored into the decision.
- Language in the National Defense Authorization Act, signed into law by President Obama January 2012, was included in part because of the concerns raised in the CHDS students' report.
- As a result, NORAD is now required to work with the National Guard in evaluating the best use of the nation's air defense to protect people and infrastructure.
- Their study also called for more emphasis on threat assessment; to consider events that would be devastating, yet unlikely, compared with more realistic concerns. "We suggested re-examining the nature of threat; where is it we are really vulnerable?" Pirak said.



*as of 01/12





APPLIED RESEARCH BRIEF

Robot Testing Highlights NPS/CHDS Partnerships

George Hough, Lieutenant, New York City Fire Department (FDNY)

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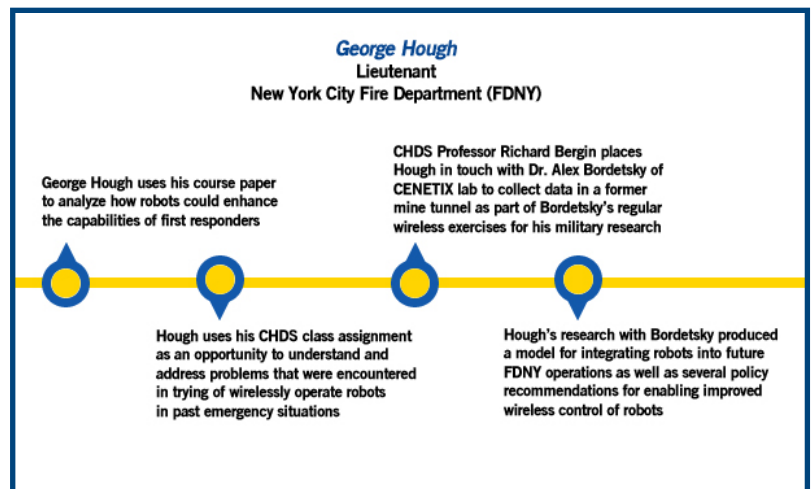
- Since 2005, Lt. George Hough of the FDNY has been involved in a project sponsored by U.S. Department of Homeland Security (DHS) Science and Technology Office of Standards that tasked the National Institute of Standards and Technology (NIST) with the responsibility of developing performance metrics and test methods for robots. These standards are to be used by members of 28 Urban Search and Rescue (US&R) teams to assist with operations at disasters and terrorist events.
- Hough published NIST data jointly with Dr. Kate Remley and other participants from NIST for the International Symposium for Advanced Radio Technology (ISART) 2007 conference. The NIST exercise became the subject of his CHDS strategy memo in his Introduction to Homeland Security class.
- Tests exposed reliability issues with the wireless communications used to control the robots. From NIST data Hough learned a key issue was interference between wireless robots operating on the same radio frequencies in an uncoordinated manner. This finding became the subject of Hough's CHDS Technology of Homeland Security course paper and provided a basis for a significant part of his thesis work.

NPS/CHDS Catalyst

- Hough used CHDS class assignments as an opportunity to understand and address problems encountered when trying to wirelessly operate robots on Sept. 11, as well as difficulties he observed at the NIST/US&R robot test events in 2005 and 2006.
- CHDS Professor Richard Bergin placed Hough in touch with Dr. Alex Bordetsky of the CENETIX laboratory at the Naval Postgraduate School. Bordetsky provided an opportunity for Remley to bring her team to California to collect data in a former mine tunnel as part of Boredetsky's regular wireless exercises for his research with the military. This work evolved into additional research outside the classroom.

Impact

- Hough's CHDS thesis work contributed to furthering applied research in wireless signal propagation in tunnels and other urban environments. The main conclusions supported policy recommendations for obtaining suitable radio spectrum to enable improved wireless control of robots.
- Remley provided Hough's thesis to the National Association of Bomb Squads working group chaired by a representative from the FBI. Many of the communication issues involved with robots to be used in search and rescue and fire department operations apply equally to bomb squad operations.
- His thesis introduced a model for how the wireless control affects technology acceptance and looked at the interrelationship of three circles of influence: the physical environment (tunnels, high rise buildings, etc.), the radio environment (protocols for sending radio signals), and the operational environment (whether the robot fits into the operations easily). The knowledge gained from looking at the problem from this perspective should prove useful for integrating robots into future fire department operations.



* as of 04/10





APPLIED RESEARCH BRIEF

Local Law Enforcement Needs Ability to Track Domestic Terrorists *David Heller, FBI Assistant Special Agent in Charge, Anchorage, AK*

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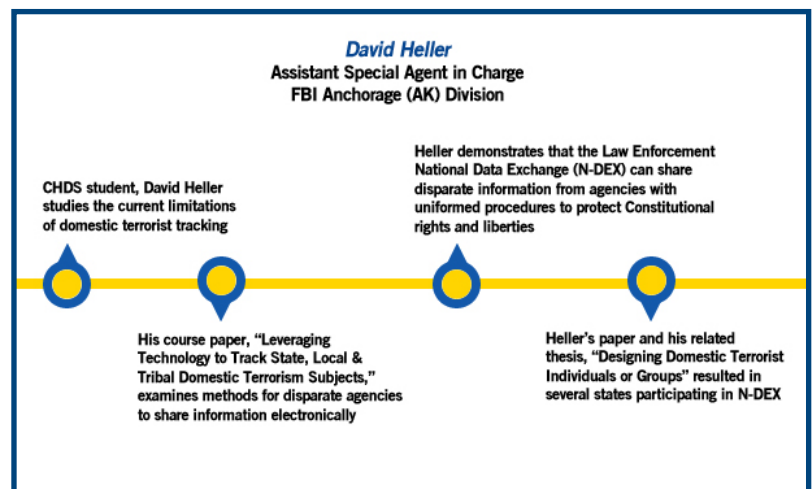
- Like many professionals on the front lines of homeland security, FBI Agent David Heller was concerned about the ability of local, state and federal/tribal agencies to track people of interest in domestic terrorism investigations.
- State and local agencies have their own systems for that kind of tracking, but they don't have the capability to do so nationally.
- A suspect whose activities may arouse suspicions of violating federal law might be of interest to state and local agencies, but there was no electronic mechanism for those agencies to share or receive that kind of information on a national level.
- Heller was particularly interested in the ability of state agencies to uniformly communicate concerns about possible domestic terrorism suspects, and those agencies' ability to track those suspects' movements.

NPS/CHDS Catalyst

- His Technology course paper, titled "Leveraging Technology to Track State, Local & Tribal Domestic Terrorism Subjects," examines methods for disparate agencies to share information electronically. Heller's paper highlights the Law Enforcement National Data Exchange, or N-DEX.
- Although N-DEX was not established specifically for tracking domestic terrorism suspects, Heller argues that the system was perfectly structured to do so.
- Federal, state, and local law enforcement agencies commonly use the National Crime Information Center (NCIC) to track warrants and arrests but there are limitations that prevent this information sharing at the national level for state and local agencies. Filling that need, however, also required a balance to protect Constitutional rights and liberties. N-DEX addresses that because of its uniformed procedures and definitions.
- Seeing the opportunity to benefit his sponsoring agency, Heller continued his research on domestic terrorism in his thesis entitled "Designating Domestic Terrorist Individuals or Groups."

Impact

- As a result of Heller's paper, agencies in Alaska, California, Delaware, Kansas, Nebraska, New Jersey, New York, Oregon, Texas, Virginia and West Virginia have begun participating in N-DEX.
- The system can leverage the data exchange index not only for suspected terrorists, as envisioned in his paper, but also for other types of criminal suspects. These states retain their own data systems, but are able to utilize N-DEX for information sharing.
- N-DEX backers are meeting with fusion centers to enlist their participation in other states.
- "There are myriad agencies out there that have databases for information sharing. The N-DEX was a way to get these agencies that have these data sources to come together and connect them," Heller said.



* as of 04/10





APPLIED RESEARCH BRIEF

Duggan Finding Solutions Through Education

Fire Chief Brian Duggan, Northampton (Mass.) Fire Department

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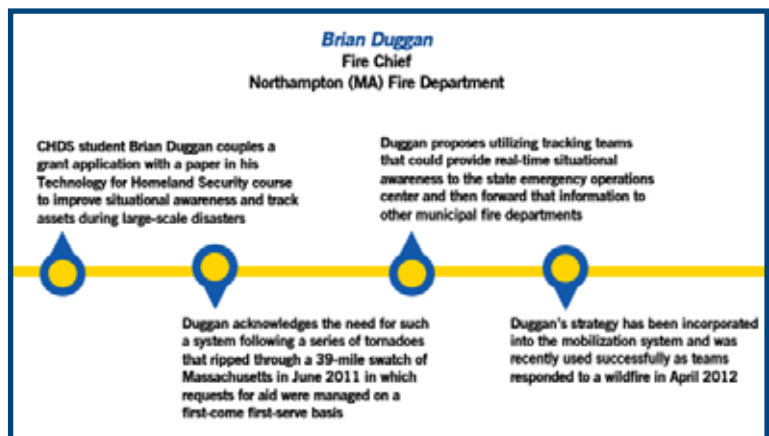
- A combination of decades-long experience and education are helping Northampton (Mass.) Fire Chief Brian Duggan solve some of the toughest challenges facing his city and the commonwealth.
- A 32-year veteran of the fire service in Massachusetts, Duggan has worked in Northampton for 14 years. He holds two bachelor's degrees and an MBA. He completed the Executive Fire Officer Program at the National Fire Academy in Emmitsburg, Md., and the Harvard Kennedy School's Senior Executive in State and Local Government Education Program.
- Still, Duggan believes the educational opportunities at the Naval Postgraduate School Center for Homeland Defense and Security (CHDS) are unmatched in both relevance and applicability and he looks forward to utilizing his CHDS education to serve his community and region for years to come.

NPS/CHDS Catalyst

- Duggan has already applied his CHDS course work in real-world ways, even before his graduation. To improve situational awareness and track assets during large-scale disasters, he coupled a grant application with a paper in his Technology for Homeland Security course.
- The need for a tracking system became clear after a series of tornadoes ripped through a 39-mile swath of Massachusetts in June 2011. Under the former model, requests for aid were managed on a first-come, first-serve basis. Duggan proposed utilizing tracking teams that could provide real-time situational awareness to the state emergency operations center and, then, forward that information to other municipal fire departments.
- "A first-come/first-serve system lacks a true definition of the context of the event," Duggan noted. "In that context (the tornadoes) there was no way to prioritize resources. So this paper focused on developing two-person situational awareness teams and coupling them with a Massachusetts Department of Fire Services technology proposal urging development of a statewide fire mobilization status tracking system. That system would be available as a display to every fire department in the state. It also has the capability of mobile computing. Situational awareness teams could look at the needs of the event and communicate back to the state emergency operations center to best determine priority and how to leverage an optimal response."

Impact

- These two programs have been enacted, Duggan said. His strategy has been incorporated into the mobilization system and was recently used successfully as teams responded to a wildfire on April 4, 2012.
- Another tangible benefit to Northampton was achieved through a project in his Critical Infrastructure: Vulnerability Analysis and Protection course. In September 2009, the water plant sustained a component failure and was flooded with several feet of water, which compromised the plant for several days. Duggan's class project examined risk and the best methods to mitigate risk within a water treatment plant that serves a local jurisdiction.
- "I've been through the Harvard program and others, but nothing compares to the quality and challenge of the CHDS program," he said.



* as of 07/12





APPLIED RESEARCH BRIEF

Computer Gaming Innovations Lead to Improved Emergency Communications *Christopher Smith, Health Commissioner, Portsmouth (OH) City Health Department*

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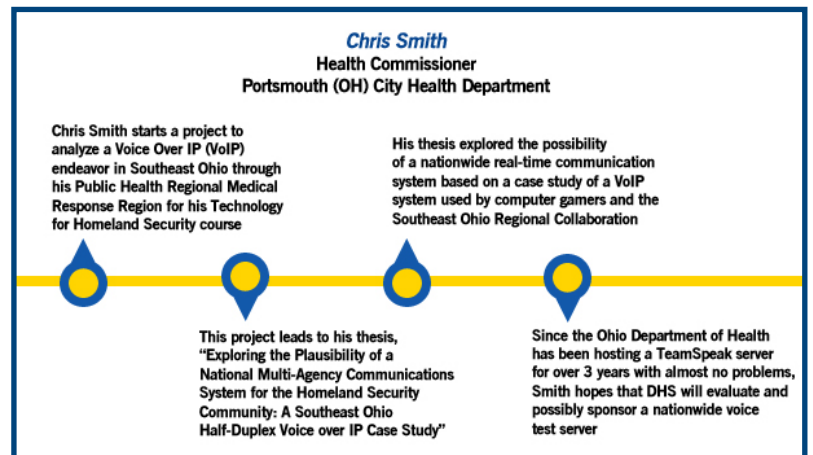
- “The Technology for Homeland Security class provided an excellent framework for analyzing an ongoing Voice Over IP (VoIP) project I had been working on in Southeast Ohio through our Public Health Regional Medical Response Region made up of 21 counties,” said CHDS graduate Chris Smith.
- The regional collaboration consists of public health departments, emergency management agencies and local hospitals. His project consisted of utilizing a unique form of VoIP to create a virtual intercom system throughout Southeast Ohio.

NPS/CHDS Catalyst

- Smith, the Environmental Health Director in Portsmouth, Ohio, utilized his CHDS course paper to write a proposal to the Federal Emergency Management Agency's Science and Technology (S&T) Solutions Program in which he sought funding to implement a nationwide system based on the Southeast Ohio VoIP model. While his funding request was turned down, it helped him clarify the pros and cons of the Southeast VoIP system.
- The class also led to his thesis, “Exploring the Plausibility of a National Multi-Agency Communications System for the Homeland Security Community: A Southeast Ohio Half-Duplex Voice over IP Case Study.”
- The purpose of his thesis was to assess the plausibility, or even the possibility, of a nationwide real-time communication system, based on a case study of a VoIP communications system utilized by computer gamers and the Southeast Ohio Regional Collaboration.
- The specific software utilized in Southeast Ohio and by the gamers is called TeamSpeak, produced by TeamSpeak Systems. It is effective because it is inexpensive, geographically independent, and utilizes very little bandwidth. While this software was originally developed to meet the needs of gamers, it coincidentally meets the needs of the homeland security community.

Impact

- The Ohio Department of Health has been hosting a TeamSpeak server for the Southeast Region for more than three years, with almost no problems.
- The Ohio Department of Health is in the process of updating its voice server with the new software and will launch the system statewide. Smith hopes that the Department of Homeland Security will evaluate, and possibly sponsor, a nationwide voice test server, but for now he is dedicated in Southeast Ohio to moving the system up slowly, level by level. Also, TeamSpeak Systems is currently looking into extending the system to handheld devices, such as cell phones, which would further enhance its usefulness.
- The system was utilized for H1N1 in the Southeast Ohio region. “The ability to utilize the TeamSpeak system greatly enhanced response to the H1N1 vaccination campaign,” Smith said.



* as of 04/10





APPLIED RESEARCH BRIEF

The Technology of a Health Threat Assessment

Beverly Pritchett, Senior Deputy Director, Health Emergency Preparedness and Response Administration, Washington, D.C., Department of Health

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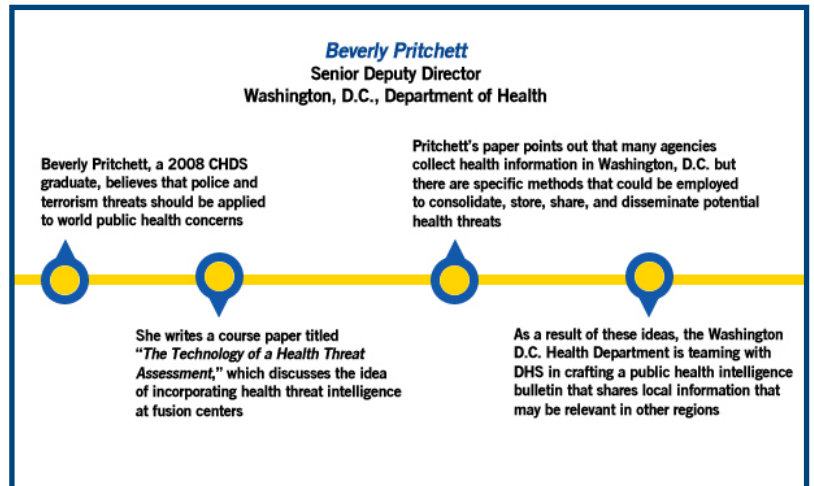
Course work and research at CHDS directly translates into innovative practice. Learn more at www.CHDS.US.

Background

- In her CHDS course paper for Technology for Homeland Security, "The Technology of a Health Threat Assessment," Beverly Pritchett states fusion centers should incorporate public health analyses in their assessments.
- Pritchett continued with the same theme in writing her thesis.
- While inclusion of health and medical information in fusion centers has been documented, relatively few have done so, and a product designed specifically toward health and medical intelligence did not exist at the state and local level.

NPS/CHDS Catalyst

- Her model demonstrates the need for the public health and medical community to improve collaboration across sectors to produce a more integrated product that enhances the understanding of the entire information sharing community.
- In her course paper, Pritchett states that fusion centers should incorporate public health analyses in their assessments. She notes that the Defense Department uses such a process, but it has not been a standard practice among public health agencies.
- Pritchett calls for applying the same type of threat assessments that are used in the police and terrorism world to public health concerns.
- The technology course paper centered on how to gather and store information with the available technology, while the thesis progressed to addressing how to analyze and assess that data by bringing together representatives from disciplines outside public health, such as law enforcement or fire safety.
- The thesis model demonstrated the need for the public health and medical community to improve collaboration across sectors to produce a more integrated understanding of the entire community, particularly at the state and local level where the intelligence would most benefit first responders and the local community.
- "I think the interesting thing is that when we share information and ideas across disciplines we tend to come up with a different picture," she said. "We look at the same thing – where the 180 buses will be parked - but we all look at it with a different lens on the threat that it might pose."



Impact

- The Washington, D.C., Health Department is teaming with the Department of Homeland Security in crafting a public health intelligence bulletin that communicates local information that may be relevant in other regions.
- Public health professionals are working with other District agencies in developing Priority Information Needs (PINs) for special events that occur throughout the tourist season in Washington, D.C. PINs provide both intelligence analysts and operations personnel with cues for situations that could develop into a public health threat during a special event.

* as of 12/08





CHDS: WHERE IDEAS ARE IMPLEMENTED

Capitalizing on Modern Fingerprint Technology

Jonathan Lines, Assistant Special Agent, ICE

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Background

- Immigration and Customs Enforcement (ICE) Assistant Special Agent Jonathan Lines considers embracing technology in homeland security practice critical. In the case of ICE, the agency needed to consider technology for sharing fingerprint data.
- His paper traced the efforts of the Federal Bureau of Investigation (FBI) and what was known as the Immigration Naturalization Service (INS), now renamed Immigration and Customs Enforcement (ICE), in blending their automated fingerprint identification systems, an effort that dates back almost 20 years.
- INS' developed its Automated Biometric Information System (IDENT) while the FBI developed its Integrated Automatic Fingerprint Identification System (IAFIS). Because each system had different requirements in the fingerprinting process, the two systems, their technologies and experience using fingerprint data were not integrated.

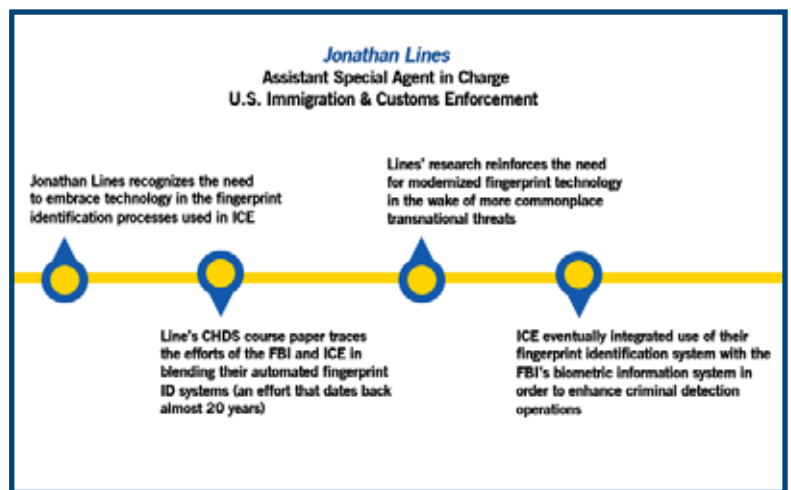
NPS/CHDS Catalyst

- Transnational threats to our nation's communities are becoming more commonplace and Lines' research reinforced his belief for the need for better technology to identify these threats for local, state and federal agencies alike.
- Lines cited cases to show why an updated system was needed. One of those cases was the tale of an illegal immigrant who, despite several encounters with the legal system, was able to slip in and out of the country undetected while committing a string of murders in Texas in 1999.
- Subsequent efforts to integrate the INS and FBI systems were accelerated in response to that case, with additional resources added for integration efforts in the aftermath of the Sept. 11 attacks.

Impact

- ICE eventually integrated use of IAFIS and IDENT and has trained its personnel on its use. Its nationwide deployment is now an agency priority.
- In March 2010, three Utah counties became the first jurisdictions in the state to benefit from an initiative called "Secure Communities". The cornerstone of Secure Communities is the activation of new information-sharing capabilities developed by the Department of Homeland Security (DHS) and the Department of Justice (DOJ) that automatically alert local law enforcement and ICE when potentially deportable criminal aliens come into local custody. In its first full week in operation, the Secure Communities program in Salt Lake County is credited with detecting more than 30 aliens in local custody who had been charged with or convicted of crimes. Of those, four were foreign nationals whose criminal records included arrests or convictions for the most serious types of crimes, Level 1 offenses. Across the country, Secure Communities is now being used by 135 jurisdictions in 17 states. ICE expects Secure Communities to have a presence in every state, with nationwide coverage anticipated by 2013.

- "This collaborative use of technology truly helps secure our communities," Lines said.



* as of 05/12





APPLIED RESEARCH BRIEF

Intelligence Policing Director Sees Biometrics' Worth

Bill Kalaf, Director of Intelligence-Led Policing, Mesa, Arizona, Police Department

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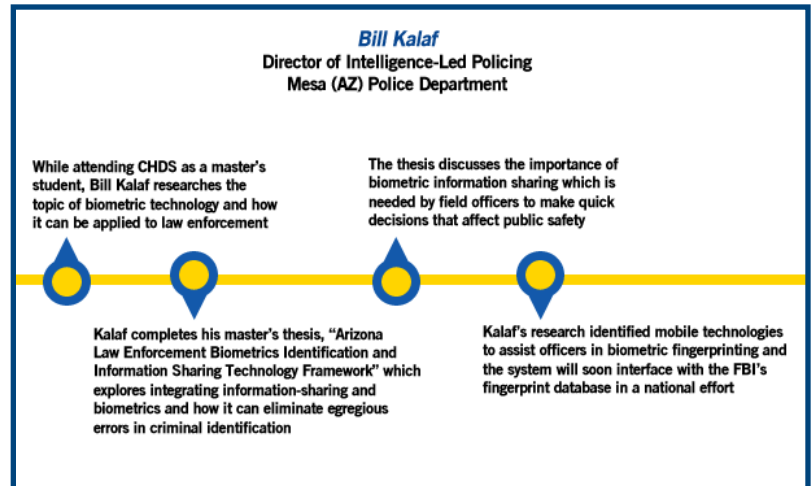
- Law enforcement record management systems are dependent on accurate subject identification information and information getting entered accurately. Example: a person by the name of John Allen Smith may be entered into a jail record as J. Smith or J.A. Smith, or some other variation. Biometric fingerprinting eliminates this problem.
- Access to this information is needed by field officers who must make quick decisions that affect public safety. CHDS student Bill Kalaf found instances where warrants for arrest were issued against invalid names. In some cases, a citizen's identity was stolen, used by a criminal, and a warrant was issued for an unsuspecting citizen.

NPS/CHDS Catalyst

- Bill Kalaf researched biometric technology for his CHDS Technology for Homeland Security course paper as well as for his thesis, "Arizona Law Enforcement Biometrics Identification and Information Sharing Technology Framework."
- His research identified mobile technologies to assist officers, including biometric fingerprinting. Portable biometric fingerprinting devices are available to identify suspects and victims whose prints are in Arizona's state fingerprint database.

Impact

- Upon graduation in 2010, Kalaf shared his research with police chiefs around the greater Phoenix area.
- In 2012, police departments in Glendale, Mesa, Phoenix and Tempe, Arizona participated in a pilot program testing a portable handheld biometric device, MorphoDent, in cooperation with the manufacturer, MorphoTrak. The portable device uses biometric fingerprinting technology to identify suspects and victims whose prints are in Arizona's state fingerprint database.
- Prints are matched against the Automated Fingerprint Identification System (AZAFIS). Soon the system will also be able to access the FBI's fingerprint database (IAFIS), the national law enforcement's fingerprint identification system.
- Kalaf sees biometric fingerprinting as just one step to a greater information sharing enterprise for law enforcement.
- He envisions a system in which patrol car computers have real-time access to criminal databases and believes using mobile technology for facial recognition is another area worthy of exploration.



* as of 10/12





APPLIED RESEARCH BRIEF

Gorman Serious About Gaming

Chad Gorman, chief of FEMA's Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) Branch

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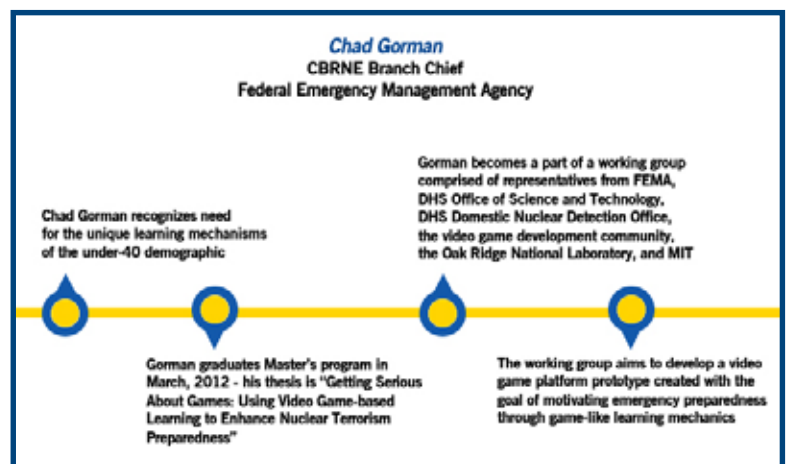
- Chad Gorman, a 2012 graduate of the Naval Postgraduate School Center for Homeland Defense and Security, sees gaming as a new preparedness educational tool that may not only inform, but motivate the under-40 generation to prepare for a nuclear disaster.
- Since August 2012, Gorman and a working group have been developing a video game platform with the aim of creating a system that motivates preparedness. The working group comprises representatives from the Federal Emergency Management Agency, DHS Office of Science and Technology, DHS Domestic Nuclear Detection Office, the video game development community as well as Oak Ridge National Laboratory and the Massachusetts Institute of Technology.

NPS/CHDS Catalyst

- The seeds of Gorman's curiosity were subtly planted during a brief conversation with Dr. Tara O'Toole, Under Secretary for Science and Technology, who inquired about using gaming during a briefing. Subsequently, he wrote a Technology for Homeland Security course paper on the topic and expanded the concept in his thesis, "Getting Serious About Games: Using Video Game-based Learning to Enhance Nuclear Terrorism Preparedness."
- Gorman cites research by Patricia Marks Greenfield, professor of psychology at the University of California—Los Angeles, showing video gaming cultivates "specialized skills such as inductive learning through observation, trial and error, and testing hypotheses; comprehending multi-dimensional imagery; and comprehension of scientific simulations."
- To spread key preparedness information – the goal is to increase nuclear preparedness – Gorman envisions utilizing a genre known as "serious games." In this genre, players forego blowing stuff up or killing zombies for a game aimed at addressing social and cultural issues. For example, a game called "Darfur is Dying" enables players to experience what life is like in war-torn Sudan as the player assumes the role of a refugee. Most importantly, the game will seek to address a preparedness gap for young people when it comes to nuclear preparedness.

Impact

- Initially, the scope of the pilot program will be limited with the aim of producing and evaluating a prototype and possibly publishing an academic paper.
- As the process evolves, FEMA will look to lessons learned at other agencies and the approach could eventually be expanded to address all-hazards preparedness.
- Gorman credits his CHDS experience for exposing him to the topic and the research support and making contacts in the gaming industry that shaped the final proposal.



*as of 08/12





APPLIED RESEARCH BRIEF

Preparedness Key to Urban School Areas Security Planning

Craig Gjelsten, Fire Chief, Park Ridge Fire Department, Ill.

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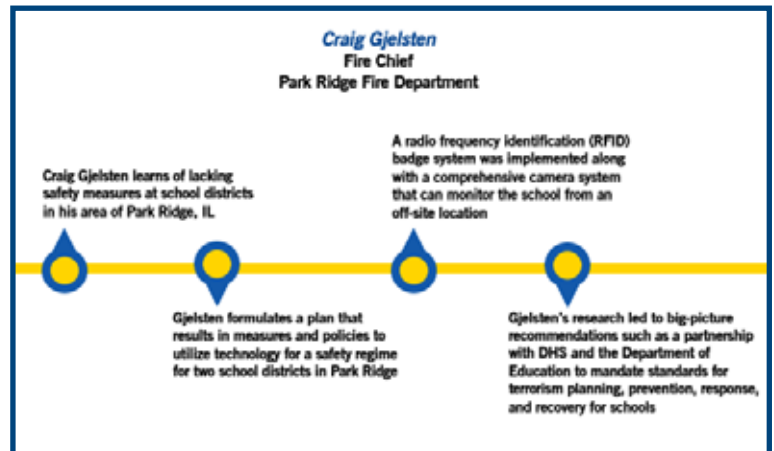
- When Park Ridge (Ill.) Fire Chief Craig Gjelsten began studying security systems at school districts in his area, he was shocked to find safety measures were lacking in an age where terrorism is an ominous threat.
- In writing a course paper for CHDS' Technology in Homeland Security class in 2007, he found the Department of Homeland Security had generally left school security up to local agencies.
- "Schools in the United States are at risk of a terrorist attack and we are unprepared," he bluntly stated in the introduction to his paper titled "Protecting Our Educational Institutions from Acts of Terrorism."

NPS/CHDS Catalyst

- His course paper led to his thesis, "Homeland Security Planning for Urban Area Schools."
- Gjelsten notes that terrorists are more and more attacking targets that historically have been taboo, such as schools. His paper surveyed security planning and how it could be improved. He studied two school districts in Park Ridge, Ill.
- To his surprise, the schools were not using technology as part of their security plan and had no uniform plan in place.
- He then focused on Main South High School, concluding that the school's plan needed updating while outlining the pros and cons of technology that could optimize its security strategy. Technology measures Gjelsten analyzed included Radio Frequency Identification (RFID), iris scanning systems and the Rapid Responder Crisis Management Planning System.

Impact

- Gjelsten's academic plan resulted in measures and policies to utilize technology for a safety regime at Maine South High School in Park Ridge.
- What resulted was a compilation of strategic and specific recommendations to improve the security at the Main South High School campus. Gjelsten worked with Rose Garlasco, the principal of Maine South High School, in the development and implementation of the school's emergency plan as well as the adoption of his recommendations.
- Two significant recommendations that were adopted and implemented were technology solutions. These were a radio frequency identifier (RFID) identification badge system and a comprehensive camera system capable of being monitored from an off-site location (i.e. a Fire Department or Police Department response vehicle).
- Gjelsten's research led to big-picture recommendations such as a partnership with DHS and the U.S. Department of Education to mandate comprehensive standards for terrorism planning, prevention, response and recovery for schools.



* as of 04/10





APPLIED RESEARCH BRIEF

FCO's Thesis Genesis of Training Program

Tony Russell, Federal Coordinating Officer, FEMA

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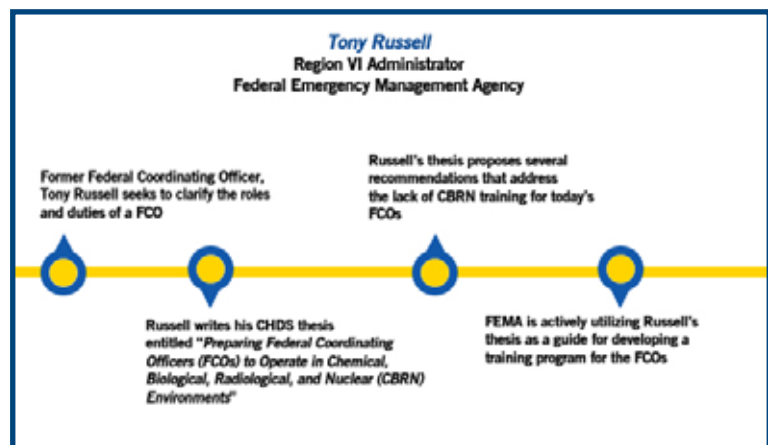
- When established in the late 1990s, a federal coordinating officer's (FCO) role with the Federal Emergency Management (FEMA) was managing traditional disaster events in support of state and local agencies.
- The FCO role expanded when FEMA began to incorporate homeland security concerns into its mission, particularly in responding to Chemical-Biological-Radiological-Nuclear-Explosives, or CBRN.
- CHDS graduate Tony Russell, a former FCO who is now superintendent of the Emergency Management Institute, sought to clarify the roles and duties of FCOs in his thesis.
- At the time, FEMA had no substantive protocol to address CBRN threats from the executive leadership "boots on the ground" perspective.
- "We didn't have people trained to do that," Russell said. "As I read more I thought, 'wow, if this happened, what would we do?'" Russell recalled. "It had to be addressed."

NPS/CHDS Catalyst

- As he researched his topic, Russell said he became increasingly concerned as he found that had FEMA needed to support a state, it didn't have the leadership training to work in a CBRN environment at that time.
- Russell's thesis traces the history of the FCO role in FEMA, dating from the late 1990s, and examines the job as it is related to the emerging challenge of CBRNs, distinguishing how those events differ from traditional disasters.
- His research led to three recommendations to address the lack of CBRN training for FCOs: full implementation of a FCO Tiered Qualifications Plan to provide FCOs with a basic understanding of CBRNs; decentralization of command and control; and, establishing an Incident Management Assistance Team dedicated to CBRN incidents.
- "If the recommendations herein are adopted, the critical command and control function of the FCO in a CBRN environment will be substantially enhanced and the readiness level of the federal response system greatly improved," Russell wrote.

Impact

- Russell's thesis, "Preparing Federal Coordinating Officers (FCOs) to Operate in Chemical, Biological, Radiological, and Nuclear (CBRN) Environments," is now being used to train FCOs on CBRN threats.
- FEMA is utilizing Russell's thesis as the genesis for developing a training program for the Federal Coordinating Officers (FCOs).



* as of 06/12





APPLIED RESEARCH BRIEF

Crisis Management and Communication Were Sturdivant's Concerns

Brian Sturdivant, Deputy Chief, Scottsdale (Ariz.) Fire Department

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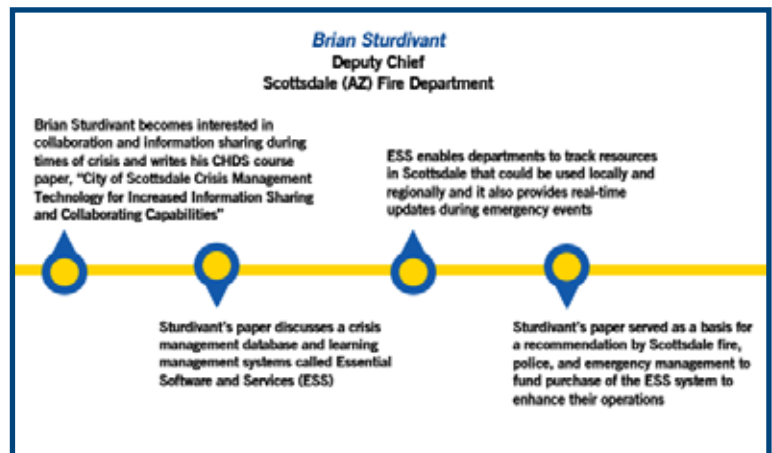
- Brian Sturdivant, Deputy Chief of the Scottsdale Fire Department, was interested in collaboration and information sharing during crises, when he wrote his Technology in Homeland Security course paper.
- The Scottsdale Fire Department is a member of the Phoenix Regional Automatic Aid Consortium, which comprises 25 fire departments within the Phoenix Valley and enables the fire unit closest to an incident to respond, regardless of jurisdictional boundaries. This poses some challenges in communications and allocating resources.

NPS/CHDS Catalyst

- In his course paper, "City of Scottsdale Crisis Management Technology for Increased Information Sharing and Collaboration Capabilities," Sturdivant conducted a case study of available technology. He envisioned technology that would aid his department and the Consortium.
- Sturdivant's paper examined a crisis management database and learning management system called Essential Software and Services (ESS) for Crisis Management.
- The software enables departments to track staffing and equipment resources in Scottsdale that can be used locally and regionally. It provides valuable, real-time updates during an emergency event and documents the various types of certification firefighters have, so decision makers know what specialties and capabilities are available for staffing purposes.
- "Ultimately, it provides a solid baseline process before we activate an EOC (Emergency Operations Center)," Sturdivant said.

Impact

- Sturdivant's paper served as the basis for a recommendation by Scottsdale fire, police and emergency management to fund the purchase of the ESS system. Funding was approved in 2008.
- In addition to enhancing operations, ESS will enhance the Scottsdale Fire Department's family support and wellness system which provides support to emergency responders and their families in the event of a multi-operational period emergency event.
- ESS can serve as the database for general and contact information for all members of the organization, along with resources available to support family members of deployed personnel.
- The system is currently being used for physical resource management, human resource management, apparatus typing, personnel records and detailing certification, training and experience.
- "We're starting out very small and basic," Sturdivant said. "We want to ensure the process meets our needs, is accurate and allows us to continue development of the City of Scottsdale's All-Hazard Incident Management Team. The program is modular in nature which allows it to expand and be as robust as we need it."



* as of 04/10





APPLIED RESEARCH BRIEF

Modernizing Emergency Alerts Poses Challenges

Anthony Cox, Individual Assistance Program Manager, Arizona Department of Emergency and Military Affairs

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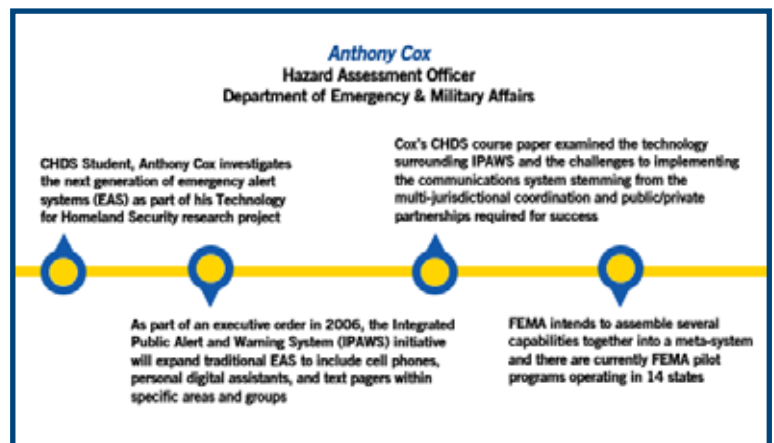
- President George W. Bush issued an executive order in 2006 to expand the Emergency Alert System (EAS). The Executive Order tasked the Secretary of the Department of Homeland Security (DHS) to enhance EAS communications to reach cell phones, personal digital assistants and text pagers within specific geographic areas and groups. This led to the IPAWS (Integrated Public Alert and Warning System) initiative being coordinated by FEMA.
- FEMA's IPAWS Program Management Office was established to take the vision set forth in the Executive Order and oversee the evolution of EAS technology to include personal and modern formats, such as messages in languages other than English and compatibility to individuals with hearing and vision disabilities.
- Interested in the next generation of emergency alert systems, Anthony Cox wrote a course paper, while a student at CHDS, that examined the technology surrounding IPAWS and the challenges to implementing this communications system.

NPS/CHDS Catalyst

- Cox's CHDS research has led to a better understanding of the potential that IPAWS has for enhancing the Homeland Security Advisory System (HSAS) concept and achieving its intended purpose with the American public. Cox highlights that there are significant challenges with implementation that stand in the way of achieving the FEMA IPAWS vision, primarily due to the multi-jurisdictional coordination and public private partnerships that are required for national success.
- As FEMA puts it: "IPAWS will improve terrorism threat advisories by communicating with as many people as possible through as many communication devices as possible."

Impact

- FEMA intends to assemble several capabilities together into a meta-system. There are currently FEMA pilot programs operating in 14 states.
- Other developments for IPAWS originate from the WARN Act which required the FCC to establish the Commercial Mobile Service Alert Advisory Committee (CMSAAC), which exists to give the FCC recommendations on the transmission of emergency alerts by commercial mobile service providers. The result of CMSAAC efforts and FCC adoption of recommendations is the nationwide Commercial Mobile Alert System (CMAS), which will transmit emergency alerts to cellular subscribers.
- FEMA has also adopted FCC guidance to use open standard technology, CAP (Common Alerting Protocol), for message dissemination. The open system provides an opportunity to bring many private sector companies into partnership. An assurance of interoperability is being addressed through coordination with the National Institute of Standards and Technology (NIST).



* as of 04/10





APPLIED RESEARCH BRIEF

Silo Thinking In Vaccine Stockpiling Persists

Thomas Rempfer, Flight Operations Supervisor, MQ-1 Predator Instructor Pilot,

Air Force Special Operations Command (AFSOC)

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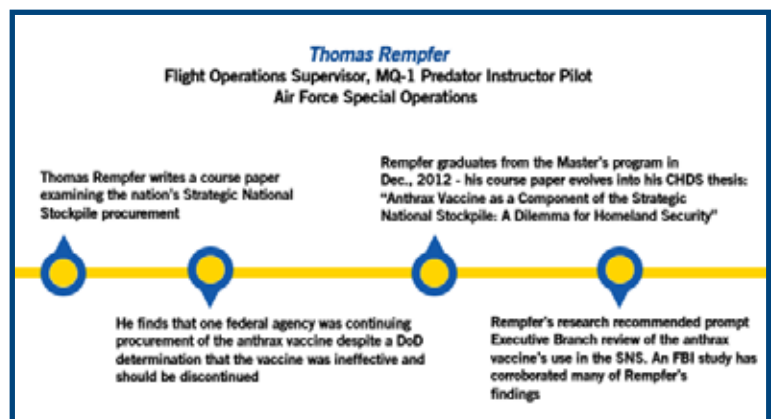
- Thomas Rempfer, a 2009 graduate of the Naval Postgraduate School Center for Homeland Defense and Security, discovered that the October 2001 anthrax scare in the U.S., in which anthrax was anonymously mailed to elected leaders and others, was preceded by a Department of Defense decision to discontinue research on an anthrax vaccine.
- Rempfer's paper exposed the "silo" thinking that has plagued many agencies that are tasked with homeland security responsibilities in the United States.

NPS/CHDS Catalyst

- In a CHDS course paper, Rempfer discusses how the motive of the letter attacks was designed to entice people to obtain the vaccine. This information was cited in a 2008 FBI study.
- The ploy seemed to work as the Department of Homeland Security began stockpiling the vaccine, despite Defense Department moves to discontinue its research.
- Using government and military documentation, Rempfer traced the history of anthrax vaccine development and how old strains of the vaccine remained in place for use despite calls for updates.
- Rempfer's technology course paper evolved into his CHDS thesis and a subsequent article published in the *Homeland Security Affairs* journal. His work recommended prompt Executive Branch review of the anthrax vaccine's use in the Strategic National Stockpile (SNS) in the form of a Presidential Study Directive (PSD) and Presidential Policy Directive (PPD) process, as well as enforcement of Homeland Security Policy Directives requiring review by DHS of stockpile components.

Impact

- The Department of Defense's medical college, the Uniformed Services University of the Health Sciences (USUHS) critiqued the current anthrax vaccine doses as being "hampered by shortcomings that make their widespread use undesirable or infeasible."
- The FBI also recently finalized its findings, corroborating Rempfer's research.



* as of 01/13





APPLIED RESEARCH BRIEF

Long Beach Detective Persistent with Port Security

Candice Wright, Long Beach Police Department

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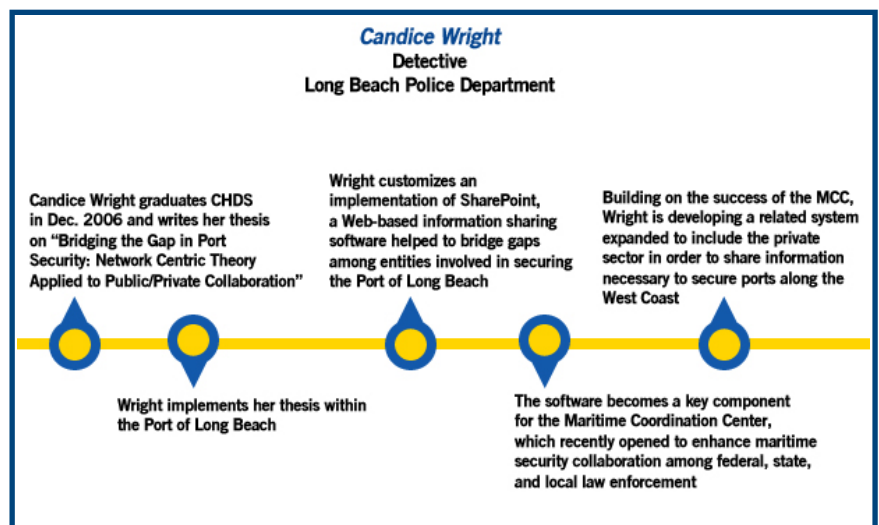
- For Candice Wright, implementing her vision of port security not only took academic research and years of professional insight, but a great deal of persistence. Her perseverance paid off in October 2012 with the launch of a new intelligence-sharing system used in support of the Maritime Coordination Center at the Port of Long Beach/Los Angeles. The program is titled SAN (Situational Awareness Network). SAN is being used to coordinate water operations as well as disseminate threat information for a bevy of agencies.
- Wright is assigned to the Port of Long Beach/Los Angeles and enrolled at the Center for Homeland Defense and Security with a goal to bolster port security, especially by integrating the private sector into security measures. Five years after graduation, she is seeing her thesis research applied.

NPS/CHDS Catalyst

- Wright's thesis urged applying Network Centric Warfare theory to security practices to "perpetuate a cycle of preparedness in the seaport, thus enhancing situational awareness for improved security." The thesis highlighted gaps among entities "responsible for securing the intermodal supply chain throughout the port complex."
- During her research, Wright learned of the software SharePoint, an off-the-shelf product used in a variety of different ways by public safety agencies. She customized the software to enhance information sharing among private and public entities operating in port areas of responsibility.
- The jurisdictional responsibilities within the Port of Long Beach/Los Angeles include more than 25 law enforcement agencies from the federal, state and local levels. This makes coordinated response and information sharing allowing for a daily common operating picture a challenge for the region.

Impact

- The software provided the cyber-infrastructure for the Port of Long Beach/Los Angeles recently established Maritime Coordination Center.
- The Center began operations in October 2011 and is aimed at coordinating information-sharing and response capabilities to enhance border security from the California/Mexican border to the county of San Luis Obispo on California's Central Coast.
- Fellow agencies need not purchase the SharePoint software. Rather, they simply need to join the website operating from the Center.
- The Center operates as a sort of smaller-scale fusion center, said Wright, by sharing information with more than 70 local, state, and federal agencies.
- The initial launch included 300 users. This approach helps diminish apprehensions some agencies may have about sharing their intelligence with other organizations.



* as of 11/12





APPLIED RESEARCH BRIEF

Air Guard Unit Capitalizing on Leading-Edge Technology *Col. Jeffrey Magram, California Air National Guard, 129th Rescue Wing*

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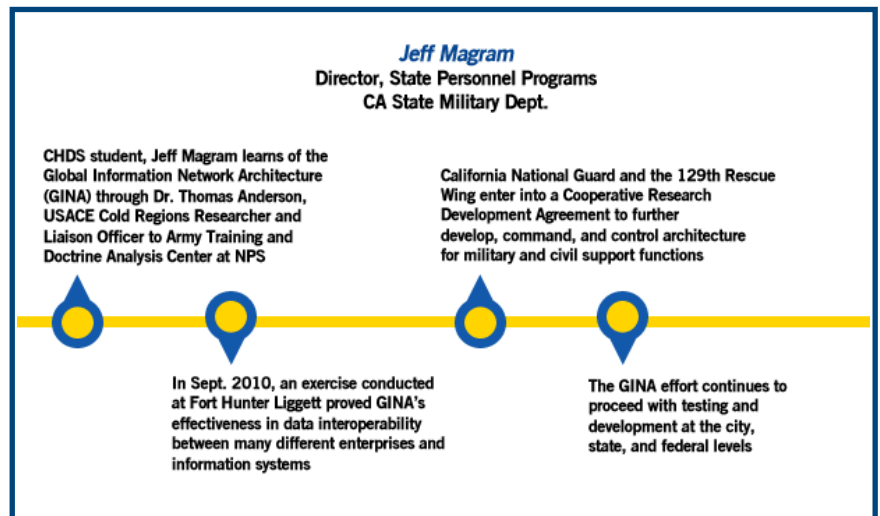
- The California Air National Guard 129th Rescue Wing has embraced technology developed at the Naval Postgraduate School (NPS) that will enable aircrews to access real-time intelligence from disparate databases.
- The technology, Global Information Network Architecture, or GINA, allows users to access strands of information from enterprise systems and networks to gain precise situational awareness, rather than accessing huge chunks of intelligence and manually analyzing it. Furthermore, it can allow for interoperable communications when commercial networks are down following a disastrous event. The same technology holds promise not only for the military, but for the emergency management and homeland security communities as well, not to mention National Guard units working in support of civil authorities.
- GINA is easily adaptable and configurable and it will enable a war-fighter or a first responder to use conventional systems, such as laptops and mobile devices, to extract pertinent time sensitive mission information.

NPS/CHDS Catalyst

- Magram learned of the technology while attending the NPS Center for Homeland Defense and Security (CHDS), where he graduated in December 2011 with a Master of Arts in security studies.
- He and his commander, Col. Steven Butow, were impressed enough with GINA that their unit entered into a Cooperative Research Development Agreement (CRADA), along with the Army Corps of Engineers, to further develop command and control architecture for military and civil support functions. The effort is proceeding with testing at the city, state and federal levels.

Impact

- The architecture has many implications for combat. On the statewide front, the California National Guard is using GINA operationally to gauge its potential in counter-narcotics investigations.
- The Guard is using data and sensor streams gleaned from the U.S. Customs Border Patrol that was processed with data from the California High Intensity Drug Trafficking Areas, along with real-time information inputted by agents using handheld devices.
- Along with military and law enforcement applications, GINA proves beneficial to emergency managers working at the local level. The city of Palo Alto, Calif., is working with the 129th Rescue Wing and incorporating GINA as part of a broader Community Disaster Network test bed. The aim of that network is to link neighboring jurisdictions, the private sector and non-governmental organizations when responding to disasters when traditional communication channels are not functioning.
- The GINA piece involves a high-speed microwave data link with the 129th Rescue Air Wing. GINA would also be a part of enabling the city to share intelligence with neighboring first responders.



* as of 08/12





APPLIED RESEARCH BRIEF

Statewide Information Sharing Explored by Squires

*Keith Squires, Colonel / Deputy Commissioner of Utah Dept. of Public Safety /
Director of Homeland Security & Emergency Management, State of Utah*

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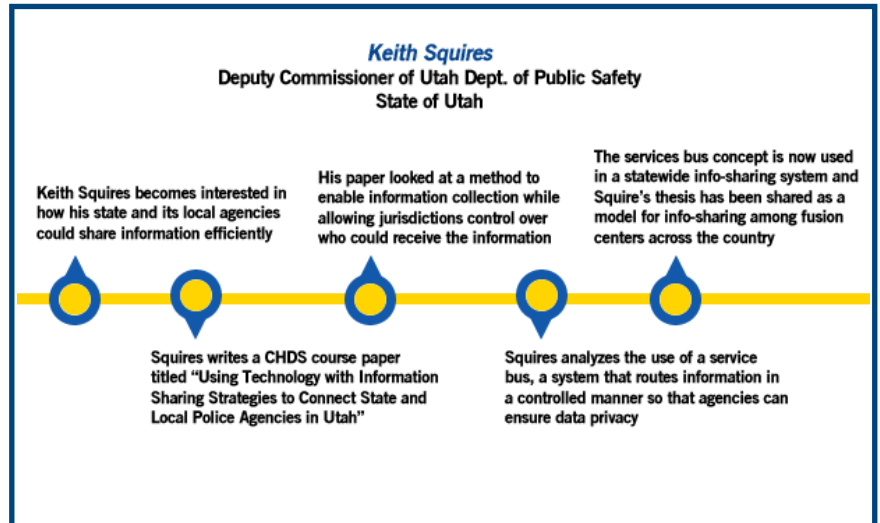
- Keith Squires, a graduate of the Center for Homeland Defense and Security Master's Degree Program, was interested in increasing information sharing between his state's local agencies and overcoming some of the jurisdictional conflicts that can sometimes occur among law enforcement agencies.
- Squires wrote a CHDS course paper titled "Using Technology with Information Sharing Strategies to Connect State and Local Police Agencies in Utah" that examined a method to enable information collection while allowing jurisdictions control over who could receive the information.
- Squires' paper emphasized the need to share information on a regional and national basis. He analyzed the use of a service bus, which is a system that routes information and directs the users to the appropriate direction for the information requested. Utilizing the service bus provided an alternative to a centralized database and allowed control of who could get the information. This method addressed concerns of agencies that were leery of sharing information and losing control of information.

NPS/CHDS Catalyst

- While a CHDS student, Squires was appointed by then-Gov. Jon Hunstman as Utah's homeland security director and the governor's homeland security advisor. "I was able to incorporate my school work at NPS with this new job," Squires said.
- Squires' CHDS course paper tied into a project at his job when he was charged with establishing a state fusion center. Though the final product did not adopt the exact method outlined in his paper, the same type of concept was used in adopting a statewide information-sharing system and the technology discussed in his paper was utilized for internal purposes at the Utah Department of Public Safety.

Impact

- The fusion center in Utah has been operating for about 18 months.
- Local law enforcement agencies are becoming more involved, Squires said. Investigators from the local departments rotate in and out of the center through a course titled "Intelligence Liaison Coordinator" and take their training back to their home agency and serve as a liaison between their department and the fusion center.
- "At the fusion center it is a matter of using the same methodology," Squires said. "It's still a matter of not creating a central database, but being able to know where information is located and directing investigators so they can access the information they want."
- Squires has shared his thesis in Washington, D.C. as a model for information sharing among fusion centers and various levels of law enforcement.



* as of 04/10





APPLIED RESEARCH BRIEF

FDNY Captain Explored Fire Service Role in Homeland Security Enterprise

Sean Newman, New York City Fire Captain

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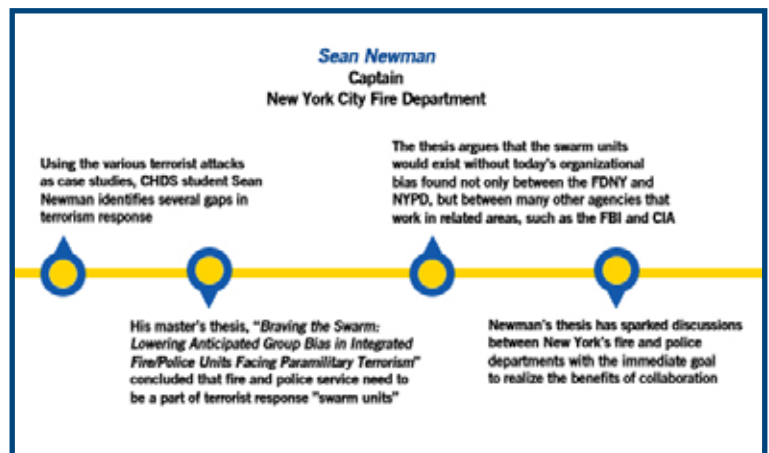
- New York City Fire Captain Sean Newman was well into his thesis research in 2008 when terrorists struck in Mumbai, India. The event shifted the way homeland security professionals view attacks as well as prompting a change in Newman's thesis topic.
- His thesis, "Braving the Swarm: Lowering Anticipated Group Bias in Integrated Fire/Police Units Facing Paramilitary Terrorism," traced:
 - How fire was used as a weapon in the Mumbai and of other historic terrorist attacks
 - How integrated public safety teams are needed to combat such attacks
 - What impediments keep divergent teams from collaborative functioning.
- Newman's research sought to identify gaps in terrorism response.
- He intended to address collaboration and expanded to look at integration.
- He wanted his research to be applicable to the greater homeland security community, not just fire and emergency personnel.

NPS/CHDS Catalyst

- In considering "swarm" units, Newman examined the theory of organizational bias, a concept taught in the Psychology of Terrorism course at CHDS, to gauge whether such combined units could mesh. He also studied swarming methods in nature.
- The research centered on four case studies:
 - Mumbai in 2008
 - An attack on a school in the Russian city of Beslan in 2004
 - The 1998 high school shootings in Columbine, Colo.
 - The Fashion Mart Fire in New York in 1995
- Common to all those events is a plan to use explosives and using fire as a weapon.
- Newman concluded that fire services need to be part of terrorism response through "swarm units" that enlist police and fire personnel.

Impact

- Organizational bias can potentially impede many agencies that work in related areas. "We're in preliminary talks with law enforcement to find ways to realize, not necessarily integrate, but to better realize collaboration," Newman said. "The conversation is the start of the solution."
- During the time since Newman's thesis, New York police and fire departments have begun a conversation regarding joint terrorism fighting. The departments conducted joint drills in 2009.



*as of 08/11





APPLIED RESEARCH BRIEF

Protecting Subway Riders from a Chemical Attack

Joselito Ignacio, acting director of the Chemical Defense Branch, Department of Homeland Security's Office of Health Affairs

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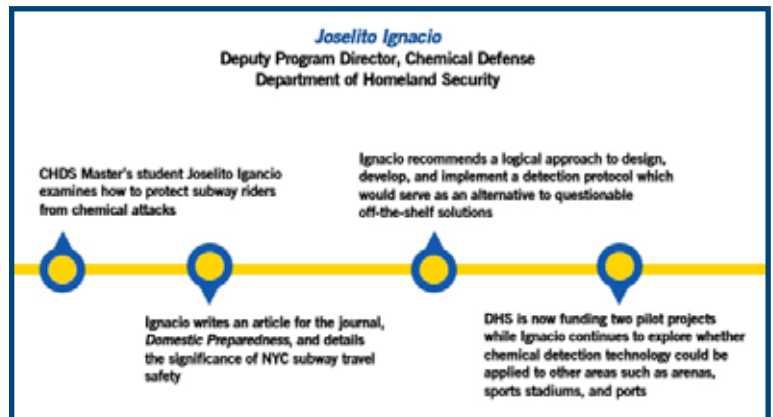
- In an article for the journal *Domestic Preparedness*, CHDS graduate Joselito Ignacio, acting director of the Chemical Defense Branch with the Department of Homeland Security's Office of Health Affairs, examines how to protect subway riders from chemical attacks.
- The article, "Protecting Subway Riders from a Chemical Attack," notes that subway usage in New York City alone, at 1.6 billion riders yearly, outpaces commercial air travel, at 713 million passengers annually, in the United States.
- "Despite this significant difference, the nation's subway systems have not imposed strict passenger or baggage screening requirements similar to those in civil aviation," he wrote.
- The article aims to take a logical approach to designing, developing and implementing a detection protocol with the capability to save lives.

NPS/CHDS Catalyst

- The impetus for the research was the Chemical Defense Branch's desire to make subway travel safer by providing guidelines that could be applicable to any metropolitan subway system.
- "Right now, if transit authorities want to develop a chemical detection program, they call a vendor," Ignacio said. "Of course, vendors will attempt to sell you products that may not necessarily be suited to your needs, and those products may not be evaluated by a third party. My hope was that the research could be shared with state and local land transportation officials to show the way to do this without purchasing off the shelf," he noted.
- The article ends with suggestions on building a detection network:
 - Develop the risk assessment methodology to gauge threats and assess vulnerabilities
 - Establish detection performance specifications
 - Evaluate the information available about the various types of detection technologies
 - Use a detector placement method
 - Develop a concept of operations
 - Create and implement a training and exercise program to help first responders familiarize themselves with the actions that they must take after a detector has signaled a release

Impact

- This research reinforced Ignacio's view that more research and work is needed in this area.
- A demonstration is currently under way in Baltimore which implements some of Ignacio's research, and DHS is funding two additional pilot projects, though the locations have yet to be decided.
- He also wants to explore whether chemical detection technology could be applied in other areas such as arenas, sports stadiums and ports.
- "I've always felt there was a mission space for this kind of research to analyze the needed information," he said. "It frankly reinforced my view of a complex approach to solving problems. Mass transit is huge in the United States. Major cities have thousands of people per day riding mass transit. You multiply that with all the systems and that is a lot of patrons."



* as of 04/12





APPLIED RESEARCH BRIEF

Police, Technology Professionals Bridge Communication Gap

Thomas Bauer, Police Chief, Oak Creek (Wis)

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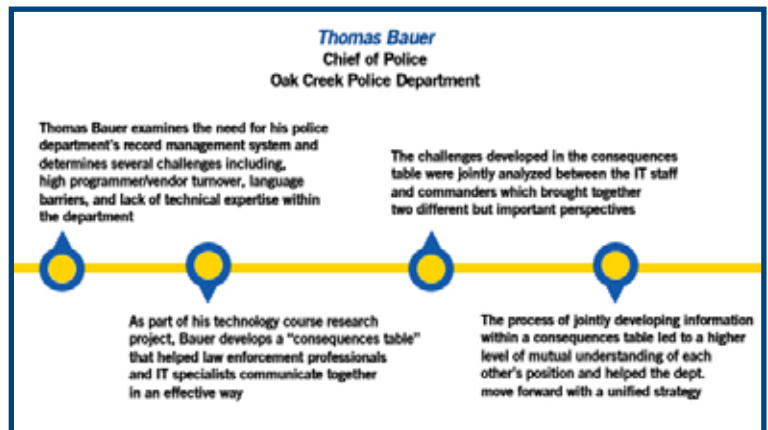
- Oak Creek (Wis.) Police Chief Thomas Bauer examined the future of his department's record management system.
- The department needed to update the software and was running into challenges, such as turnover of programmers for the vendor chosen to implement the system, a language barrier with those programmers and a lack of technical expertise among the police department staff.
- CHDS Professor Richard Bergin suggested a resource for Bauer's research which included a tool called a "consequences table", a matrix used to rate alternatives to find the best solution to reach an objective. By developing a "consequences table" Bauer was able to help law enforcement professionals and information technology (IT) specialists more effectively communicate with one another.

NPS/CHDS Catalyst

- Effectively communicating and collaborating with the IT community can be difficult as they do not necessarily speak the same language or share the same priorities as law enforcement.
- The research was directed at problems encountered on a local level with implementation of a records management system. The analysis into the problem concentrated on:
 - The speed and design of the software
 - Disagreement between the IT staff and police command on the proper level of security.
 - Inability to adequately implement upgrades to the software
 - Language/culture barriers with the East Indian developer
 - Turnover within the vendor's programming ranks
 - Lack of financial and personnel commitment from the vendor
 - All parties with a stake in the issue need to be at the table to develop the most complete strategy for effectively moving forward

Impact

- Bringing together two perspectives is much like what the emergency management community has recently realized as critical in developing incident action plans in response to critical incidents.
- Using the consequences table he developed for the technology course research project, Bauer was able to present the strengths and weaknesses of the department's newly purchased software and the vendor and the programmers to both his information technology department and senior police commanders.
- Both IT staff and commanders could more readily understand each other's priorities as the consequences table was jointly developed.
- Bauer found that by jointly developing information within a consequences table it leads to a higher level of mutual understanding of each other's position and helps the department move forward with a unified strategy.



*as of 08/11





APPLIED RESEARCH BRIEF

Common Protocol Aids Consolidated Communications

Chris Kluckhuhn, Organizational Performance Consultant, U.S. Coast Guard

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Background

- While a student at CHDS, then-Coast Guardsman Chris Kluckhuhn was well aware of the different communications platforms used by his agency to accommodate its varied roles and missions.
- He was in tune with the importance that those communications systems be interoperable when the Guard was on a task that required situational awareness.

NPS/CHDS Catalyst

- At CHDS, Kluckhuhn explored the options for situational awareness in his Technology for Homeland Security course paper titled, "Managing Information Across All Levels of the Coast Guard." "In doing the research I found the interoperability between agencies and systems wasn't difficult through the use of standard internet type protocols," Kluckhuhn said.
- Kluckhuhn's paper described the communications challenge the Coast Guard faced with varied systems for its Command and Control, Operations and Aviation functions.
- To accommodate the various functions of the Coast Guard, and yet achieve interoperability of these systems, Kluckhuhn called for the use of a protocol known as Cursor on Target, developed by the MITRE Corp. This tool enables the systems to share the basics of situational awareness: What, Where and When.

Impact

- "My premise is that programmers can use commonly available tools to link these systems together," he said. "I realized that the technical aspects of creating interoperability were fairly simple and straightforward," he noted. "The political component was the difficult part."
- Kluckhuhn formed his own company, Avwatch Inc., in October 2008 which provides situational awareness capabilities to government and the private sector.



* as of 04/10





APPLIED RESEARCH BRIEF

CIP Course Aids in Town's Water Supply Quest

Michael Biasotti, Chief of Police, New Windsor, N.Y.

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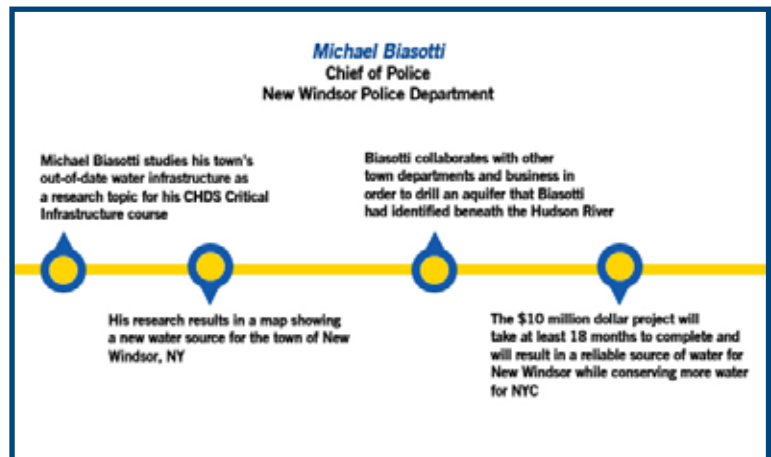
- New Windsor, N.Y Police Chief Michael Biasotti studied his town's aging water infrastructure while taking the Critical Infrastructure: Vulnerability Analysis and Protection course at CHDS.
- The town of New Windsor's major water source is the Catskill Aqueduct, which also supplies water to New York City. Reliance on that supply came with rates that were increasing yearly and the town experienced occasional unexpected shutdowns. The only alternative when shutdowns occurred was to buy water from the neighboring city of Newburgh.
- As he researched the town's water supply and potential alternatives, Biasotti discovered New York City had identified an aquifer beneath the Hudson River in the early 1900s and it was identified once again during a 1980s drought. Biasotti envisioned drilling for that aquifer to seek a new supply for New Windsor.

NPS/CHDS Catalyst

- Along with analyzing and applying concepts of critical infrastructure, his study required collaboration with other agencies as well as the private sector, both skills emphasized in the Master's Program.
- The project exemplifies collaboration that is crucial to homeland security practice. In researching, Biasotti collaborated with other town departments as well as a business owner.
- The town needed access to the river, but was thwarted in an attempt to build an access road on state-owned land. Biasotti enlisted the assistance of a steel fabricator with a shop situated along the river and who allowed the town use of his watercraft to deliver drilling rigs to the site without crossing state-owned property.
- His study would provide a map for the town of New Windsor, N.Y to find a new water source and potentially turn an expenditure for the town into a source of revenue.

Impact

- The aquifer was found, a source capable of providing 2.9 million gallons of water per day. A pipeline was built to hook into the water system's main distribution line.
- Because it is aquifer water rather than surface water, it is less expensive to treat.
- New York City residents will have more water while providing a reliable source for New Windsor as well as some of its neighboring communities, saving the town millions of dollars while providing a more dependable water supply.
- "We're looking at what was a cost of \$6 million a year (to New Windsor) is now a profit of \$20 million," Biasotti observed. "Getting the cities involved was in our and New York's best interest."



* as of 06/12





APPLIED RESEARCH BRIEF

Woodcock Engages Public with Web 2.0

Jody Woodcock, Program manager, Pierce County (Wash.) Department of Emergency Management

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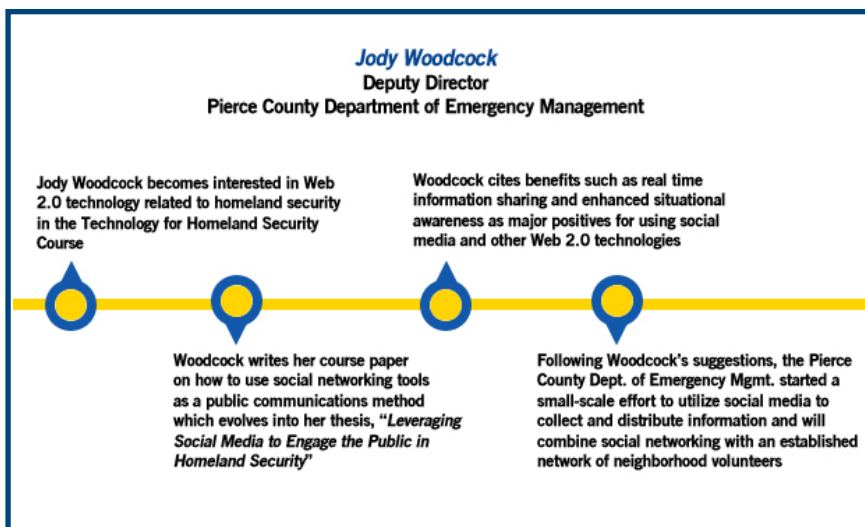
- Jody Woodcock, a 2009 graduate of the Center for Homeland Defense and Security, became interested in how to use social networking tools as a public communications method during a CHDS Technology for Homeland Security course that discussed Web 2.0 technology.
- Woodcock saw an "opportunity to multiply our eyes and ears in the community" and increase situational awareness, while remaining cognizant of a public safety community leery of social media.
- Her course paper led to her thesis on the same topic, titled "Leveraging Social Media to Engage the Public in Homeland Security."

NPS/CHDS Catalyst

- Woodcock's research led her to a University of Colorado study that examined the Virginia Tech shootings of April 2007 and the Southern California Wildfires of 2007. In the Virginia Tech case, social media was utilized by students and residents to exchange information that was well ahead of media and official government reports. The study also found that erroneous information was generally corrected by the informal social networking community. The study also revealed how residents in the Southern California wildfire area sought information that was more precisely focused on their neighborhoods instead of on the larger metropolitan region.
- Keenly aware that public safety communities have limited resources, Woodcock states "we simply can't be everywhere." "If we engage our residents to have them become part of the process, we can tap into what people are seeing and hearing. Improved situational awareness leads to more efficient resource allocation and, ultimately, better decisions."

Impact

- While in the midst of her research, it was flooding season in Pierce County, and Woodcock had the opportunity to apply some of the concepts in her paper. Her department director agreed to a small-scale effort utilizing social media such as Twitter and Facebook to distribute and collect information. The result was residents were able to identify flooding areas that had yet to come to the attention of the Emergency Management Department. The event provided the basis to consider expanding the use of social media.
- Pierce County will combine social networking with an already established network of neighborhood volunteers, people trained not only to respond to incidents in their community, but to collect actionable information and provide situational awareness. These volunteers have already been trained and are trusted by the public safety community.
- The county hopes to have a Facebook communication program in place for the 2010 fall flood season.



* as of 04/10





APPLIED RESEARCH BRIEF

Fairweather Drafted Important MOU on Homeland Security Information Network *Patty Allison Fairweather, Executive Counsel, Rhode Island Department of Environmental Management*

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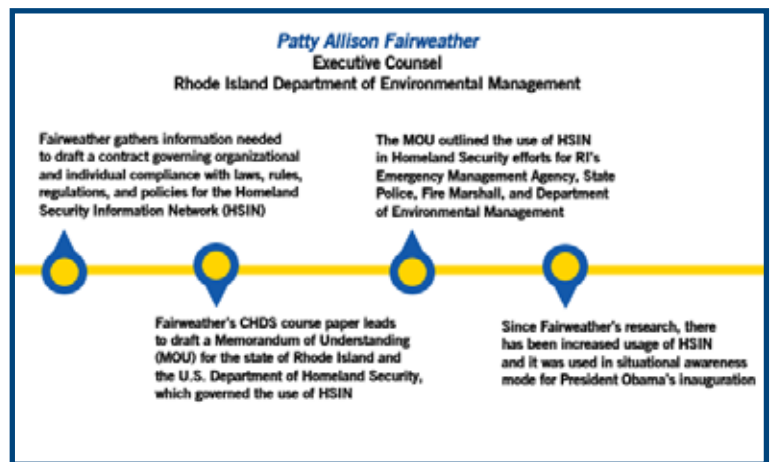
- The Homeland Security Information Network (HSIN), a web-based portal, enables federal, state, local, tribal, territorial, private sector and international partners to share information, collaborate and manage emerging threats or actual incidents.
- Patty Allison Fairweather used her CHDS course paper to draft an actual Memorandum of Understanding (MOU) for the state of Rhode Island and the U.S. Department of Homeland Security, which governs the use of the Homeland Security Information Network (HSIN).

NPS/CHDS Catalyst

- Fairweather's CHDS research encouraged accountability and responsible use of technology in homeland security. It influenced the use of HSIN technology by establishing a framework for how the information housed in HSIN is accessed, used and shared especially where it contains personally identifiable information referencing race, ethnicity, national origin, or associations and thus must be handled in accordance with applicable law, including Constitutional law.
- Her research called for smart, ethical and moral use of the HSIN technology.
- The MOU outlined the use of HSIN by Rhode Island's Department of Environmental Management for homeland security related matters. It outlined everything from technical responsibilities to information sharing policies.

Impact

- Since the completion of her research, there has been an increase in usage of HSIN. There was a call for use to 5,000 users per day by 2011; a call to increase active HSIN users by 10 percent each year; and HSIN has been deployed to at least 29 state fusion centers.
- With this increased use of HSIN, however, comes greater responsibility to pay attention to the balance between not only individual liberty and governmental intrusion, but also federal sovereignty and state sovereignty. This stems from the fact that although federal information housed on HSIN is governed by federal law, when shared with state and local partners it is arguably subject to state law, which may differ from federal laws resulting in a conflict of civil liberties laws.
- Fairweather wrote her CHDS thesis on the topic of judicial review and published a book in 2010, "State Supreme Court Chief Justices' Views: Liberty/Security and The GWOT: Delicately Balancing Liberty/Security Measures to Reduce Terror, Respect Human Dignity and Promote a More Perfect Union".



* as of 01/13





APPLIED RESEARCH BRIEF

Assistant Police Chief Explored Nexus of Governance and Technology *Michael Aspland, Assistant chief, Monterey (Calif.) Police Department*

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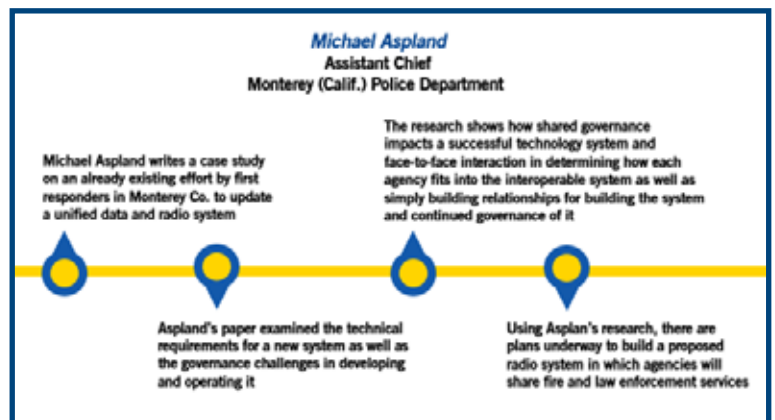
- Michael Aspland wrote a paper for his Technology for Homeland Security class on an existing effort by first-responder agencies in Monterey County to update a unified data and radio system. His paper examined the technical requirements for a new system and the governance challenges in developing and operating it. Since agencies from 12 cities within the county, as well as county agencies, will share the new radio system, governance is a key issue.
- Aspland, a 2010 graduate of the Center for Homeland Defense and Security, explains how his "research was oriented on how shared governance impacts a successful technology system."
- Aspland's course paper led to his thesis topic on the same issue, titled "Interoperable Communications Systems: Governance and Risk."

NPS/CHDS Catalyst

- Aspland's CHDS paper focused on case studies of Marin (Calif.) County and Monterey County, both of which were in the process of developing and building updated countywide emergency radio systems.
- Building the governance component involves what Aspland calls "time and grind." It involves face-to-face interaction to determine how each agency fits into the interoperable system and time to build relationships for creating the system and the continued governance of it.
- Aspland said he gained a better appreciation for the importance of shared governance, during the process of researching and writing his paper. "The challenging part is, 'how do you share leadership responsibilities?'"
- Within the shared structure, different participants assume leadership roles depending on the stage of the project. Early in the effort, Monterey County's Information Technology Department took the lead in establishing the parameters of the system's requirements. Now that negotiations are under way with a vendor to design and build the system, end-users of the communications system are taking the lead in the project.

Impact

- Relationships were established while working on the radio project, enhancing collaboration and communication between leaders from different disciplines and jurisdictions. Aspland believes established relationships between homeland security leaders results in a greater likelihood of successful resolution of emergency situations.
- Once interagency relationships were established, agencies found other ways to share services in the form of combined fire and law enforcement services. "We're beginning to leverage those relationships in other areas," Aspland said.
- Developing a shared system reduced the duplication of effort and expense of building individual communication systems, and ensured reliable communications between disparate agencies, disciplines and jurisdictions.



* as of 08/10





APPLIED RESEARCH BRIEF

New EOC Course Shows Power of CHDS Networking

John E. Pennington, Director, Snohomish County (Wash.) Department of Emergency Management and CHDS ELP Student

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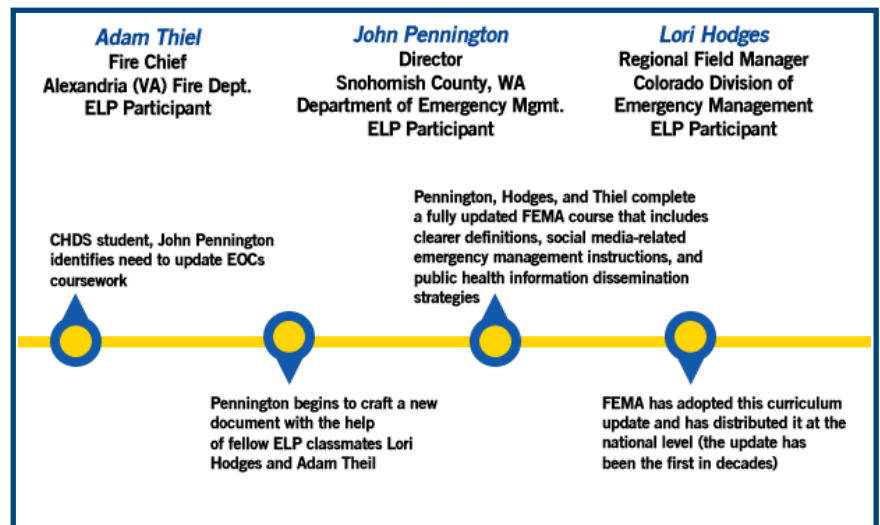
- The last time a FEMA-backed educational course for management of emergency operations centers (EOC) was completely re-written and updated, social media had yet to be invented and cell phones were a mere novelty.
- "The last course lasted 20 years," John E. Pennington said. "It's our hope that this course will not last 20 years. We hope it is revised as technology and practices evolve."

NPS/CHDS Catalyst

- Pennington enlisted the assistance of fellow Center for Homeland Defense and Security students and CHDS staff to comprehensively update the program of study for the first time in decades. The result is a revamped, FEMA-approved curriculum that provides a blueprint for large and small communities to establish or enhance an emergency operations center.
- "This is a completely new emergency operations management course that will be instituted nationwide," said Pennington, a student in the CHDS Executive Leaders Program (ELP). "The original need was identified through a host of first responders and emergency managers who realized that the techniques we used were really outdated. This really brings the course into the 21st century."
- Pennington was aided by ELP classmates Lori Hodges and Adam Thiel, who shared their public safety insights as the document was crafted. An accompanying video was produced and edited at the Naval Postgraduate School Campus by the CHDS Educational Technology Department.
- "CHDS was instrumental in getting this important course revision over the goal line," said Thiel, chief of the Alexandria (Va.) Fire Department.

Impact

- "Most people have assumed for years that EOCs cease operating after response," noted Pennington, director of the Snohomish County (Wash.) Department of Emergency Management. "They keep going, in some cases, for weeks. The transition from response to recovery is where the wheels come off the bus in a lot of communities."
- Also, the curriculum addresses strategies for warning of disasters and disseminating other public information utilizing both traditional and social media.
- "Social media was non-existent and therefore not relevant to EOCs 10 years ago," Pennington said. "That has clearly changed, so we are introducing this curriculum and beginning the process of instruction for it nationally."



* as of 12/12





APPLIED RESEARCH BRIEF

Unified Purchasing is Smart Business for LASD

Sgt. Jennifer Barsh, Los Angeles County Sheriff's Department

The Naval Postgraduate School's (NPS) Center for Homeland Defense and Security (CHDS) is the nation's homeland security educator. Over the past 10 years, the Center has provided a neutral education forum for leaders in local, state, tribal, territorial, federal and military agencies to develop policies and strategies to prepare for, prevent, deter and respond to natural and terrorist events. Course work and research at CHDS directly translates into innovative practice. Learn more at www.CHDS.US.

Background

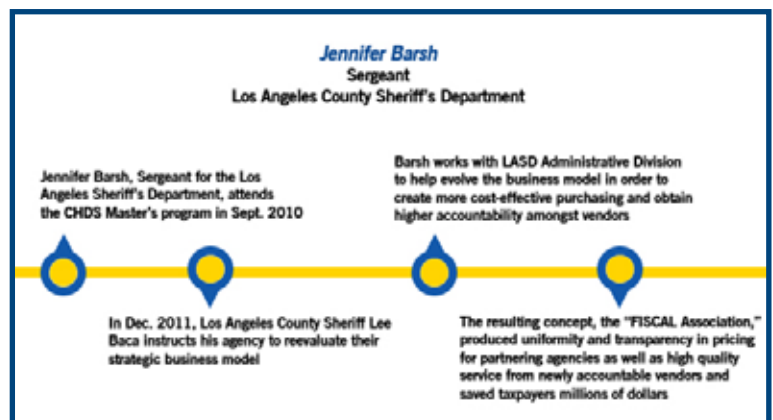
- Government agencies tend to accomplish tasks in a specific and highly regimented way. While effective in an operational or tactical setting, this approach is extremely ineffective in times of constrained budgets and fiscal adversity.
- In December 2011, Los Angeles County Sheriff Lee Baca asked his agency to reevaluate their strategic business model.
- Sgt. Jennifer Barsh, a 2012 graduate of the Naval Postgraduate School Center for Homeland Defense and Security, worked with Sgt. Chris Kovac and helped LASD Administrative Services Division evolve the business model into a more methodological and strategic approach.
- "Our agency is taking a private sector mindset and bringing it into public service," Barsh said. "Budgets and grants are being cut. It's time for us to be smarter and more diligent about the way we purchase with the public's money."

NPS/CHDS Catalyst

- During her time in the CHDS Master's Degree Program, Barsh and members of her cohort discussed budget cuts. She recognized the fiscal impact would especially affect smaller agencies.
- Various government agency procurement specialists are rarely in contact with one another thereby creating a vacuum of information in terms of pricing, commodity purchasing and customers service issues.
- Vendors and manufacturers charge public agencies of similar sizes varying prices for the exact same commodity.
- Los Angeles County Sheriff's Department developed a concept to consolidate buying power and increase vendor accountability by working with an established non-profit organization named "The Safe Cities Foundation".
- This concept, the "FISCAL Association," is simple: agencies across the country unite to exchange information, define pricing and hold manufacturers/vendors accountable for their business practices.

Impact

- The FISCAL Association model resulted in more cost-effective purchasing for agencies and higher accountability amongst vendors.
- Partnering with other agencies and defining disparate pricing models has helped drive down prices offered by various vendors and manufacturers. The idea resulted in immediate savings, with some pricing models dropped more than 50 percent.
- Sgt. Barsh envisions the FISCAL Association concept will expand to other public agencies across the country.
- Barsh estimates many millions of dollars have been saved using this unified purchasing model. Even though the Los Angeles County Sheriff's Department has had substantial budget cuts, they have increased staffing using their cost savings.
- FISCAL has also resulted in increased networking among agencies and organizations.



* as of 01/13

