NAVAL POSTGRADUATE SCHOOL MISSION
The Naval Postgraduate School provides relevant and unique advanced education and research programs to increase the combat effectiveness of commissioned officers of the naval service to enhance the security of the United States. In support of the foregoing, and to sustain academic excellence, foster and encourage a program of relevant and meritorious research which both supports the needs of the Navy and Department of Defense while building the intellectual capital of the Naval Postgraduate School faculty.
A MESSAGE FROM THE PRESIDENT AND PROVOST

The past year at the Naval Postgraduate School was a year like many others in the more than 100 years of this institution’s honored history … a statement that may surprise you.

When you think of it, however, the ultimate determination of success or failure for any organization lies in the accomplishment of mission. And at NPS, our mission is quite clear; hopefully you took a brief moment to read it on the opening page of this publication.

It is the clarity of that mission that has and continues to serve this institution very well, for regardless of our roles — as students, faculty or staff; as leadership, program and research sponsors — we are all driven by the successful execution of that one, single directive. Regardless of the changes that occurred over the course of our past year, it is through the drive of our people to fulfill that succinct mission that has kept NPS on its true course.

Throughout the pages of this report, you will experience a mere sampling of successful mission execution at NPS. And it’s one that in no way begins to do the institution, or its people, justice for the countless more ways it demonstrates mission achievement. You will have the opportunity to understand how NPS contributes to the effectiveness of Navy operations, and national and homeland security overall, and improves its leadership core of mid-grade officers.

As we have already turned our attention to 2014, our tenures in the honored positions of President and Provost are focused on the long-term strategies of this institution, and how the efforts of our faculty and staff will prepare future cadres of officers; in other words, how we will continue to execute that mission.

It is a responsibility we eagerly look forward to, for the impact of education, critical thinking and advanced leadership skills coupled with relevant research is a powerful one, and certainly something we all want to be a part of.

The respect we all have for officers of the military service, at NPS and far beyond, is an honor we can all share. To watch hundreds of them depart our campus every three months, more effective at leading the men and women of the U.S. Armed Forces, is an honor we can only hope you get to experience.
AN EXERCISE IN LEADERSHIP

Every student that attends the Naval Postgraduate School is a leader — this simple statement is a fundamental truth inherent to the institution, but is re-enforced by the process of advanced education itself.

In the short-term, the goals of a student during his or her tour at NPS are to complete a chosen program of study with the same level of professionalism, commitment and duty any officer would approach any assignment. In time, however, like many advanced educational efforts, the true rewards of a year and a half in Monterey take time to blossom.

With resounding unity, senior officers far removed from their days at NPS trumpet the university’s impact on their careers. Leaders of the highest caliber — such as Chairman of the Vice Chief of Naval Operations Adm. Mark Ferguson, Commander of the U.S. Special Operations Command Adm. Bill McRaven, and former Joint Chiefs of Staff retired Adm. Mike Mullen — all speak of the same essential skills mastered during their days at NPS. To think, critically; to analyze problems with instinctive detail; to make sound, competent and, when needed, quick decisions … In short, to lead.

Regardless of what the degree says — and for the three aforementioned iconic service leaders, theirs read computer science, national security affairs, and operations research respectively — the benefits of an education at the Naval Postgraduate School is in time, quite common. This is an institution where more than 1,000 Navy, Marine Corps, Army and Air Force officers join their uniformed colleagues from dozens of allied nations around the world, and DOD civilians from all walks of life, in the pursuit of becoming better leaders to serve their nations.

Fortunately, and in addition to the accolades of senior alumni around the world, the Navy and its sister services don’t have to wait years for their investments in leadership to pay off. The Navy’s James Bond Stockdale Award for Inspirational Leadership recognizes two officers, O-5 or below, who demonstrate the core values of the honor’s namesake, exemplifying true leadership in the U.S. Navy.

NPS was well represented in this competition in 2012, with one of the two awardees fine-tuning his own leadership skills throughout the halls of this university. And if leadership truly is a hallmark byproduct of advanced education, it should come as little surprise then, that the winners for 2013, Cmdr. Richard Massie and Cmdr. Leif Mollo, were both recent graduates of the Naval Postgraduate School.

“NPS’ defense analysis/special operations, low intensity conflict curriculum expertly focused on education that proved to be of great practical use during my subsequent tours. I found myself constantly applying what I learned in a variety of environments, whether it was overseas working with foreign counterparts, in a leadership position at [Naval Special Warfare] command, or while serving on a joint staff.”

CMDR. LEIF MOLLO, DEFENSE ANALYSIS
2013 STOCKDALE LEADERSHIP AWARD WINNER
STEPPING ONTO THE BINARY BATTLEFIELD

It is common knowledge that technology evolves with a quickness that is challenging to match. Add to this race the complexity of warfare in the Fifth Domain, and the critical nature of cyber begins to take shape.

The Naval Postgraduate School has spent a lifetime mastering the application of rapidly advancing technologies, keeping a keen eye on the benefit to the warrior. Advanced simulations for training scenarios are still in use today — but are old news around this campus. Heads-up virtual reality displays and futuristic-looking, hand-held controllers aren’t on the desks of today’s students, rather they collect dust in historical lockers as the tools of the past.

NPS’ master’s degree program in cyber systems and operations (CSO) continues on its own lightning-fast path of evolution through-out 2013. Officers from across the services continue funnelling through the CSO curriculum. Student research also pours through the program through countless theses in network vulnerability, intrusion, detection, subversion and every other digital form of warfare we have thus far.

But NPS also began building the next line of leadership for the Navy’s 10th Fleet, when the first cohort of senior enlisted students graduated this past June of 2013 from the applied cyber operations degree program, and the next group of first class and chief petty officers has already begun their own journey through the program. As their education and leadership will be critical to junior information dominance Sailors entering the fleet, these students will continue to be of high value following their studies at NPS.

Developing the leadership cadre at both the officer and senior enlisted levels will certainly provide a ready force for cyber decision makers. But students at NPS haven’t stopped envisioning what their impact on their discipline could be.

Army Capt. Joe Billingsley continues an effort he started in 2013 to further develop a Military Cyber Professionals Association, where like-minded cyber warriors can collaborate and collectively evolve their skill-sets. And Navy Lt. Jerry Wyrick performed his degree research on the development of a junior Sailor training package that provides new information dominance Sailors a compressed yet robust training program.

While each of these education and research programs is unique in many aspects, the essential goal of all of these efforts is to prepare a comprehensive cyber workforce. And no matter how quickly the technology they have to use changes, the foundation of the education that prepared them with provide the knowledge on how to move ahead.
A DRIVING FORCE IN CULTURAL CHANGE

Being green, respecting our environment and the resources nature provides is an admirable quality to any organization, or individual. Energy security, however, is not about environmentalism... It’s about combat effectiveness and the elimination of the weaknesses caused by security’s thirst for fuel. Making change to eliminate this weakness requires true cultural change.

This is, and has been, the role of the Naval Postgraduate School in the Secretary’s vision of energy security. If true cultural change is to be achieved, education needs to play a powerful role in driving this change. Throughout 2013, with the university’s dedicated energy specialization curricula now well established, and its partnering efforts through the Energy Academic Group hitting on all cylinders, what were once seedlings of potential shift are beginning to bear fruit.

A full year of near weekly Defense Energy Seminars provide students with the latest developments across the spectra of energy security topics. From “Energy Innovations for the Warfighter” from the Marine Corps’ lead expeditionary energy expert to the advantages of laser peening in nuclear power plants, every issue is covered. The result is an environment on campus that is highly educated on the variables surrounding this issue.

Continuing development of NPS’ Executive Energy Education program have focused cultural change to the other end of the service leadership spectrum. Senior flag officers and executive service civilians from various backgrounds attended the university’s executive education course 2013 offerings, and with the transition of the effort over to the Center for Executive Education, where flag education is a daily order of business, this innovative program will continue to expand its impact on the service.

Add to these efforts countless student research projects on every topic imaginable — highly-efficient battery chemistries, new biofuel applications, efficiency and cost analyses, nanomaterials, and so many more — and the degree and certificate programs that accompany them, and the past year has shown that the cultural change has already begun. The only variable left is time.
A t the Naval Postgraduate School, diverse teams of students and faculty across disciplines have been dedicated to the advancement of effective intelligence, especially in the realm of analysis and integration. Students through the Common Operational Research Environment (CORE) Lab have developed several unique capabilities and data integration methodologies over the past few years. This past year, Army Sgt. 1st Class Chris Linnel took an application built by prior Navy and Marine Corps officers titled Lighthouse, and tailored it to integrate data for Sensitive Site Exploitation missions. Other efforts in the CORE Lab have focused on the advantages of real-time Social Network analysis, and what it can tell you about the interpersonal relationships of key individuals in very remote places.

In response to a direct Centcom request, another effort this past year, dubbed Beyond Line of Sight Command and Control (BL0S C2), looks to create a self-healing, self-forming network with Type I encryption and anti-jamming capabilities that can survive in satellite denied environments. It’s commonly considered that final step in the network-centric battlefield, and faculty, students and researchers in NPS Department of Information Sciences are demonstrating its potential success and impact to an intelligence, surveillance and reconnaissance effort.

And in the realm of direct intelligence analysis, a new research effort hopes to have a similar impact. A promising new center at NPS, coined the Center for Multi-INT Studies, has been created to encourage research into the emerging field of intelligence integration, or multi-INT. The field takes an interdisciplinary approach to understanding how the integration of data from disparate sources and associated systems can improve the results gleaned from current and future intelligence systems.

As intelligence continues upon its current trend of strategic importance, collecting intelligence will not be the critical enabler to success for the DOD operator, rather, it will be the effective analysis and integration of those resources that will ultimately determine success or failure.
A NEW SPACE IN NATIONAL SECURITY

At the Naval Postgraduate School, all aspects of how DOD needs are met in space, now and into the future, are cultivated through dedicated educational programs in space systems, along with innovative research efforts that complete the students’ learning experiences.

It wasn’t long ago when the world considered the vast beauty of space as the final frontier. Exploration of it, and operations in it, were certainly possible, but only by the few economic giants who could afford it.

Today’s technology-empowered study of space is quite different. Low-earth orbit is the domain of many nations, and in the U.S., it has in fact transitioned from a requirement of the state to an opportunity in commerce. But that certainly doesn’t limit the critical value of the space domain to Navy and DOD operations.

U.S. combat effectiveness is wholly dependent on capabilities achieved in part through operations in space — communications, surveillance, intelligence and reconnaissance, and much more.

Research in low-earth orbit has quickly become the work of CubeSats — small, inexpensive cube-shaped craft that can be safely and relatively easily shuttled into orbit by your local launch provider. NPS has been at forefront of CubeSat education and research for several years.

Countless past students graduating through the university’s one-of-a-kind space systems curricula played a key part in the creation of the NPSCuL launch vehicle, and the university is now a leading player in helping DOD take advantage of these capabilities.

In late 2013, two separate launches powered several NPS-developed CubeSats into space. Their missions varied: track space debris with more precision, test a new solar cell array for powering future craft, and help the U.S. Southern Command evaluate CubeSats for communications support in dense South American jungles, to name a few.

While it remains the state’s responsibility to advance our exploration of the outer reaches of space, NPS will remain steadfast in resolving national security’s space-born challenges. And through advanced, unique education and research through the Space Systems Academic Group and others, NPS will enrich the space cadre with a dedicated pool of leadership for however the frontier is to be used next.

“Schools like NPS are invaluable to our ability to conduct operations in Latin America … The fact that we can ask NPS to look at something specific, be it drugs, economics or other areas of interest that are beyond the scope of my staff’s expertise, is very important.”

MARINE CORPS GEN. JOHN F. KELLY
COMMANDER, U.S. SOUTHERN COMMAND

Above: NPS Professor and former NASA astronaut, Jim Newman, center, and his team of researchers and students are developing new communication tools and exploring U.S. combat effectiveness through surveillance, intelligence and communication. 
Right above: NPS Research Associate Brian Wood, right, and Marine Corps student, Capt. Clayton Jarolimek, inside NPS’ Mobile CubeSat Command and Control center, working to assess the communications utility of CubeSat technologies recently deployed by U.S. Southern Command.
Right below: The segmented mirror telescope laboratory is designed and developed as a technical demonstrator and experimental testbed for cutting-edge space imaging technologies.
THE SKY/SPACE/SURFACE/UNDERSEA IS THE LIMIT

Dull, dirty and dangerous are not the only characteristics required from optimal missions for today’s unmanned systems.

Like all capabilities developed through advancements in technology, unmanned systems are a rapidly evolving field. Be they remotely-controlled or truly autonomous, imagination is carrying the utility of robotics and unmanned systems to mission sets across every domain of warfare, and beyond DOD for that matter.

Aerial drones might grab a lion’s share of the headlines, but around the Naval Postgraduate School campus, unmanned systems aren’t just fodder for attention, they offer a wealth of classroom topics and research theses. Throughout the previous year, several student-led efforts have caught the attention of service leaders and partners, and now well-established experimentation platforms provide students and faculty with every opportunity for success.

The university’s long-standing Joint Interagency Field Experimentation (JIFX) events continued throughout 2013, providing a venue where dozens of detailed experiments, and the players involved, can collaborate, learn, fail and try again. JIFX intends to shorten the distance between problem and solution for the warfighter. With the restricted airspace available at nearby Camp Roberts, Calif., where nearly all JIFX events are held, unmanned aerial vehicle research is a prevalent feature of the program.

But the sky is not the only domain for unmanned systems at NPS. An effort in autonomous, diver-assistance robotics, titled Exploration in Extreme Environments, has advanced to a point where students and faculty evaluated their technologies at the Aquarius underwater research habitat off the Florida coast. Another effort is utilizing autonomous surface vehicles that can navigate the ocean’s surface for more than year without man’s interference. Their potential utility in persistent communications and surveillance caught the attention of students across campus, and spawned several efforts this past year.

But beyond just examination of technology, students at NPS are also required to wrestle through the challenging ethical questions of unmanned and robotics systems. Both in dedicated coursework, as well as compelling organized debate, these future leaders are charging through the challenges of making tough choices.

As unmanned systems play an even greater role in both military and civilization applications, NPS’ educational programs in partnership with a forward-looking research enterprise, will provide the tools needed for success.
IN PREPARATION FOR A LESS EXTREME WORLD

While scientists, including some on our own campus, disagree on exactly when, at some point the once-extreme polar regions of the world will be, in one sense, a bit less extreme.

But extremity is not in direct relationship to strategic importance. Over the past several years, the amount of ice around the Arctic has been a bountiful topic of conversation. The Arctic’s opening sea transport lanes, such as Northern Sea Route, in addition to the Northwest Passage, have the opportunity to make a tremendous mark on international maritime transport in regions that were once paid minimal attention.

As the nation’s maritime service, the Navy must have a highly advanced, technically astute understanding of the environment Sailors operate in. Navy Oceanographers are not a large community, but they provide a wealth of information absolutely critical to an operation. Case in point... Following Typhoon Haiyan in the Philippines, prior the USS George Washington’s arrival, the first ship on site was the USNS Bowditch survey ship, working with the Carrier Strike Group oceanographer, an NPS alumnus, on the ship’s plan for safe passage.

Research required for an advanced degree in physical oceanography requires the detailed examination of intricate ocean processes... mesoscale simulations of coastal circulations; vertical heat transport in the Arctic; transbasin nonlinear internal waves, to name a few from the past year.

A stop at NPS for master’s degree in physical oceanography is a must in nearly every Oceanography officer’s career, and for good reason. Expert faculty, built upon a longstanding tradition of excellence, have developed the program with their needs in mind. And every once in a while, one of those faculty makes a landmark discovery that has the potential for worldwide implications.

And this is exactly what happened when Dr. Timothy Stanton finally detailed the amount of ice melting beneath the massive Pine Island Glacier in Antarctica. In the near term, we have a much more sound understanding of an ocean-ice process. And in reality, it is a part of the world that has a far greater ability to play a role in global sea levels than the Arctic ever will.

**For the Navy and operational oceanography, the curriculum here at NPS provides the most focused education. We have other opportunities at civilian institutions, but they won’t cover what the Navy needs better than the Naval Postgraduate School.**

REAR ADM. BRIAN BROWN
COMMANDER, NAVAL METEOROLOGY AND OCEANOGRAPHY COMMAND
OUR CONTRIBUTION TO COMBATING TERROR

It has been said that the pen is mightier than the sword … As a graduate university, it’s a sentiment our institution would agree with.

Although it is not a new type of warfare, terrorism has spent the past few decades rising to the forefront of strategic defense consciousness. In relative terms, gone are the days when conflicts are levied between major nation states. Rather, throughout the course of the United States’ recent conflicts, rogue adversaries have taken many forms, each with their own unique intricacies interwoven within a cultural, regional or religious foundation.

With this great variance in the adversary comes great challenge for the strategist. Brain is easily overrated and can be marginalized if not applied with surgical precision. But to be truly meticulous, you must be knowledgeable. And in the space of the Global War on Terror, precision is the space of the Naval Postgraduate School.

Across several academic departments and curricula, countless students focus their graduate theses on a spectra of relevant counterterrorism topics and ideas. National security affairs students might take a regionally-specific approach to an extremist group or conflict, or perform a comparative analysis on post-war reconstruction in central Africa. Defense Analysis students may examine the efficacy of deception in information operations, or the role of influence within religion-based interpersonal networks.

These are but a few general examples, and truthfully only begin to scratch the service of the university’s output in the field, especially in its role as a lead provider in the Combating Terrorism Fellowship Program (CTFP). Thousands of personnel have been educated through CTFP programs in more than 140 nations around the world, and thanks to an effort titled GlobalECCO, led by Dr. Michael Freeman at NPS, the collective knowledge of combating terrorism (CT) is now far more accessible.

GlobalECCO shrinks the CT world, creating a connected network of professionals with a massive resource of knowledge focused on countering extremism. While the mass of knowledge that occupies the GlobalECCO portal has been developed over decades, the portal itself is quite new. But as it continues to be further utilized throughout the counterterrorism world, the impact of knowledge’s pen will be felt far greater than any sword.

“We hope to enable greater on-the-ground collaboration between countries fighting terrorism by building a community of Combating Terrorism Fellowship Program (CTFP) alumni by providing some unique content, and a supporting online venue, that we think will encourage CTFP alumni to collaborate, communicate and to continue to learn.”

DR. MICHAEL FREEMAN
NPS DEFENSE ANALYSIS

 above: Perhaps one of NPS’ most important legacies is contribution to the body of knowledge in combating terrorism. In producing timely, innovative and interdisciplinary analyses relevant to policy and operations, students help contribute to global understanding, at the highest levels, of current terrorist networks and motivations. 

 above: Many NPS centers focus on research to help warfighters in theater. Students are often special operators who return directly to the fleet and forswear with the knowledge they gained at NPS.

 above: By bringing together citizens and military personnel from around the world, NPS gains important insight and perspectives on global terrorism.
OPERATION HUMANITARIAN ASSISTANCE, DISASTER RELIEF

Information Sciences Lecturer Brian Steckler’s bags were packed in the days leading up to Typhoon Haiyan, knowing he and his team of students would likely be deployed to the region to support the coming HA/DR operation.

He had good reason to assume he would be called upon... Steckler and his Hurstly Formed Network Research Group focuses on the rapid deployment of communications capabilities when every infrastructure needed to make them happen is destroyed. It is a capability he, along with teams of his students, have provided in the aftermaths of Hurricane Katrina, the earthquake in Haiti, and the 2005 tsunami in southeast Asia, among other recent major catastrophes.

Humanitarian assistance and disaster relief have been widely recognized as core missions and capabilities for sea services by their respective chiefs, as well as Combatant Commanders and senior defense leaders in the Pentagon. A strategic shift to the Pacific will only add to their importance, where they are an almost annual effort for Pacific Fleet and Pacom assets.

Operating forward means many things for American power projection and immediacy in response to any and all threats... But it also means the U.S. is ready to respond when needed in the face of humanitarian tragedy and natural disaster. And that is a powerful enabler to developing long-term partnerships with our allies and friends throughout the Pacific, and the world.

While Steckler and his team of students provide an onsite capability to the HA/DR mission, they are just a small piece of the university’s overall contribution, where more than 20 students dedicated their master’s degree theses to a focused analysis on recent HA/DR missions in 2013. Every aspect is analyzed... from the integration of Twitter analysis for advanced situational awareness to the role of the private sector in national response systems.

The sea services have made significant improvements over the past decade on the efficiencies in HA/DR operation execution... And the next wave of efficiency is waiting in the free analyses accumulated through the efforts of these students.

“HADR logistics necessitate a response supply chain, and these supply chains are very difficult to manage. There are critical time windows that must be met and a great need for collaboration amongst a diverse array of players... We have the necessary faculty with the expertise to make it work. We look at processes and at weakness within those processes. That sort of education lends itself naturally to looking at HADR problems.”

DR. ARUNA APTE, ASSOCIATE PROFESSOR
NPS GRADUATE SCHOOL OF BUSINESS AND PUBLIC POLICY

\(\text{above: NPS Lecturer, Brian Steckler and his team of students and researchers travel the globe after natural disasters and set up mobile communications networks providing real-time humanitarian assistance and disaster relief. right above and below: From the recent typhoon in the Philippines, to the earthquake in Haiti and the tsunami that devastated coastal Japan. NPS-developed emergency communications have proven vital in the immediate aftermath.}\)
AN OPPORTUNITY TO ENGAGE BEYOND CAMPUS

On any given Saturday morning in a community study room in the Dudley Knox Library on campus, a team of NPS students works one on one with area youngsters in math, writing or whatever the children express a need for help with.

It’s called Breakfast for Your Brain, and it’s a longstanding program coordinated by the Monterey chapter of the National Naval Officers Association. It’s a, “Come by if you can help,” kind of coordination effort for the NPS students, and yet there always seems to be enough officers in place no matter how full the room gets with young boys or girls in need of help.

A handful of miles away, in nearby Seaside, a pickup basketball game ensues between a team of Marine Corps officers and a second team of teens attending a charter high school for at-risk youth. It’s something of a last chance for many of the young men and women attending this school, but there’s no talk of math or English here.

Rather, it’s just an opportunity to play a game and potentially develop some sense of a connection between Marines and some young men and women looking for motivation and self-confidence. It’s a new program called MOTO, Mentoring Others Through Outreach, and it was the brain-child of NPS student Capt. Kimberly Julka launched this past year.

And in Hollister, about a 30-minute drive from NPS’ campus, thanks to the tireless badgering of Maj. Alex Williams, a cadre of students, mostly special forces officers, put their talents toward the finishing touches on a custom home for Wounded Warrior Army Sgt. Brian Jergens and his young family, who cut the ribbon on their new place this past December.

Sailors studying or working at the Naval Postgraduate School judge the local science fair, staff the hotline at the local rape crisis center, volunteer for reading programs at the local public library, coach, teach, mentor, advise, give.

These are stories that happen every weekend, somewhere within the reach of the campus. Every quarter, some of those making the difference will depart to dedicate their efforts elsewhere, but a new crop will always fill in their place. The impact is impossible to fully account for, but it is also equally impossible to miss.

“Serving is a family affair and it’s important for our kids to see that we take care of our own, that service is not something that ends when a veteran separates from the Army… When all of the fanfare dies down and these people start getting back to their daily lives, things are going to be very difficult. These Soldiers need to know that they have somewhere to turn, that there are people out there that they can contact. We are in this for the long haul.”

MAJ. ALEX WILLIAMS DEFENSE ANALYSIS
2013 YEAR IN REVIEW

January

NPS Assistant Professor Victoria Clement is granted unprecedented access to the Turkmen National Archives in support of her research into the intersection of social and political power in modern Central Asia. A historian with a background in Near-East languages and civilization, she is one of only two non-Turkmen scholars ever allowed access to the archives.

NPS: Modeling, Virtual Environments and Simulation Institute continues its inaugural cohort of students in the graduate certificate in health care simulation. Developed in partnership with the Uniformed Services University of the Health Sciences, the certificate program is delivered asynchronously to students across the country already serving as managers of programs using modeling and simulation to train health care professionals.

NPS: Dudley Knox Library Outreach and Collection Development Manager Greta E. Marlatt receives the highly coveted “I Love My Librarian Award” granted by the Carnegie Corporation of New York and “The New York Times.”

February

An interdisciplinary team of NPS faculty stand up the Littoral Operations Center, designed to advance and promote the study of U.S. Navy and allied partner nation policy and strategy for warfare in the littorals. The center will also focus on the strategic integration of new assets into existing warfare strategy.

Chief of Naval Operations Adm. Jonathan W. Greenert holds an all-hands call for students, faculty and staff on the NPS campus, Feb. 1. Greenert detailed the strategic shift toward the Pacific, and took questions from students addressing a range of issues critical to the NPS community — from budget and resources to the role of training and education for the fleet.

March

A joint NPS thesis by two Army officers examines possible security and structural upgrades to minimize loss of life to active shooters in high-occupancy facilities. Titled ‘Victim Initiated Mitigation,’ the thesis stressed the most critical component in limiting loss of life in active shooter incidents — time.

Dr. Allan Fuhs, Distinguished Professor Emeritus and a founder of NPS’ Space Systems Academic Group, is elected an Honorary Fellow of the American Institute of Aeronautics and Astronautics. Fuhs supervised more than 100 master and doctoral theses during his career at NPS.

The joint NPS, Air Force Institute of Technology master’s degree in cost estimation to meet the demands of the Weapons Systems Acquisition Reform Act of 2009.

April

NPS holds its third annual Robots in the Roses Research Fair, April 11, showcasing research across campus associated with robotics and unmanned systems. Researchers displayed robotics platforms large and small — everything from bird-like bots that seek out and ride upon thermals, to small–unmanned watercraft capable of sensing threats in harbors.

Vice Chief of Naval Operations Adm. Mark Ferguson addressed NPS students, faculty and staff during an all-hands call on the university campus, April 25. During the visit, the computer science alumnus took part in the semi-annual meeting of the Board of Advisors subcommittee, and shared his vision for the Navy with members of the NPS community.

The NPS Department of Operations Research (OR) is awarded the 2013 UPS George D. Smith prize by the Institute for Operations Research and the Management Sciences. The award is presented to an institution that demonstrates the “effective and innovative preparation of students” in the area of OR, management science or analytics.

May

Physicists at NPS collaborate with researchers at the University of Texas to develop the power supply that will help make ship-born laser weapons a reality on U.S. naval vessels.

The first cohort of senior enlisted students in the NPS Master of Applied Cyber Operations degree program graduate.

June

In one of the most memorable moments of recent graduation ceremonies, the daughters of Marine Corps Maj. Francisco Rodriguez were presented with the degree earned by their father, who completed his graduation requirements prior to his passing after a long battle with cancer in early 2013. The degree was presented by commencement speaker, Army Gen. Keith B. Alexander, then Commander of U.S. Cyber Command — Alexander was also officially inducted into NPS’ Hall of Fame during the ceremony.

Lt. Cmdr. Victor Glover, an F/A-18 combat pilot, is selected from more than 6,100 applicants to join NASA’s eight astronaut candidates who will begin training at Johnson Space Center in Aug. for potential space flight. If selected to become an astronaut, Glover, who graduated from NPS in 2009 through the Master’s in Systems Engineering Management — Product Development 21st Century program, will become the university’s 41st space-traveling alumnus.

Dr. Douglas A. Heinsler officially begins his tenure as the 34th Provost of NPS, June 3, following five years as Dean of the W. Frank Barton School of Business at Wichita State University, and a lengthy career in both academia and industry.
2013 YEAR IN REVIEW

July

Then Secretary of Homeland Security, the Honorable Janet Napolitano, welcomes a handful of international colleagues to NPS for a Five Country Ministerial, July 22. The forum focused on how close cooperation between the five allied nations can be applied to countering extremist terrorism, combating cyber-crime, and improving the exchange of criminal history information between the five nations.

Two Naval Academy Midshipmen wrapping-up summer internships at NPS, Daniel Fallon and Jonathan Dreisslein, evaluate the utilization of QR, or quick response, codes in a chat environment. “One of the many ways QR codes can help in emission control is to relay the code through light as we did with ship-to-ship signaling. However, now the QR code represents hundreds of characters and with the use of stronger LED lights, and flashing much more rapidly, messages can be relayed without radio emissions,” NPS Associate Professor Don Brutzman explained.

August

NPS joins regional leaders, educators and students at Hartnell College’s Internship Symposium, designed to partner local college students with leading NPS researchers. In the summer of 2013, NPS hosted 93 interns throughout various STEM-related disciplines, hoping to recruit the next generation of STEM professionals.

The latest cohort of the Executive Master of Business Administration distance learning program attends campus orientation week, Aug. 19–23. Although the EMBA program is delivered via video teleconference, each cohort spends a week on campus to attend course work on leadership and teamwork.

In spite of the government shutdown in early September 2013, NPS welcomes its new President, retired Vice Adm. Ronald A. Route and thanks Interim President Rear Adm. Jan Tighe for her service to the university as she returns to Washington.

To help combat the escalating rate of suicide within the active-duty military community, NPS student Lt. Darryl Depoe creates the Emotional Vitality Assistant, a smartphone application that provides service members with immediate access to mental health resources.

Defense Analysis Assistant Professor Bradley J. Strawser challenges his students to wrestle with the complex ethical questions surrounding lethal autonomous systems by hosting a debate between University of Denver Visiting Associate Professor Heather M. Roff and freelance journalist Joshua Feust, Sept. 23. Debate participants sought to answer the question, “Does the future of unmanned and autonomous weapons pose greater potential ethical dangers or potential ethical rewards?”

September

The newest group of Chief of Naval Operations Strategic Studies Group (CNO SSG) Director Fellows are announced by CNO SSG Director retired Adm. James Hogg. The mission of the CNO SSG is to generate revolutionary naval warfare concepts at the direction of the Chief of Naval Operations himself. The group focuses its efforts on high-potential tactics and innovative procedures that have not yet been exploited by the Navy.

In October, Keesing returns to NPS, Sept. 23. Keesing explores the complex ethical dilemmas associated with embedding military personnel in civilian organizations.

October

NPS mourns the passing of alumnum retired Navy Cmrd. M. Scott Carpenter, the university’s first graduate selected to be a NASA astronaut. Carpenter was part of the original Mercury 7, and was the second American to orbit the earth on board the Aurora 7 spacecraft.

Four faculty in the NPS Department of Operations Research, Drs. Tom Lucas, Paul Sanchez, Susan Sanchez and Chris Nannini, are honored with the Institute for Operations Research and the Management Sciences Koopman Prize for outstanding publication in military operations research. The professors were recognized for their contributions to a book on large-scale, experimental design and analysis.

NPS researchers and students collaborate with NASA scientists at Florida International University’s Aquarius Habitat on an innovative approach to transforming the capabilities of human-robot collaboration by using autonomous robots that can assist humans in mapping, navigating and exploring underwater space domains.

November

NPS researchers celebrate multiple advancements in the operational utility of two concept unmanned systems. The TalusSAR, or Tactical Long Endurance Unmanned Air System is a tethered, hex-rotor aircraft designed to work with very little human command and control. The Air Mobile Buoy concept could fill operational gaps pertaining to seabased, non-persistent surveillance and could also provide a much-needed, all-weather UAV capability.

Senior service leaders dedicated time to address the NPS student body of mid-level officers on critical manpower collaboration by using autonomous robots that can assist humans in mapping, navigating and exploring underwater space domains.

December

Mechanical engineering student Lt. Cmdr. Jamie Cook is honored with multiple awards during the NPS Center for Materials Research student research showcase, Dec. 11. Cook’s research into advanced carbon nanomaterials was met with high praise on campus, earning a DMIR Outstanding Research Award as well as the Naval Sea Systems Command’s Excellence in Naval/ Mechanical Engineering award.

Rocky Mountain Institute Cofounder and Chief Scientist Dr. Amory B. Lovins returns to NPS, Dec. 6, to present at one of the university’s frequent Defense Energy Seminar guest lectures. Lovins discussed his book, “Reinventing Fire,” which encourages a transition away from fossil fuels toward renewable energy by 2050.

Retired Adm. Michael G. Mullen, 17th Chairman of the Joint Chiefs of Staff and 28th Chief of Naval Operations, addresses NPS graduates, families and friends at the Fall Quarter Graduation Ceremony held in King Auditorium, Dec. 20. Mullen, himself an NPS operations research alumnus, congratulated the 373 students earning 377 degrees this quarter.
**STUDENTS AT THE NAVAL POSTGRADUATE SCHOOL**

### DEGREES CONFERRED

- **Master of Arts in Security Studies**
  - Combating Terrorism Policy and Strategic ...9
  - Civil-Military Relations ................. 4
  - Defense Decision-Making and Planning ...29
  - European and Eurasia .................. 22
  - Far East, South East Asia, the Pacific ...31
  - Homeland Security and Defense ........ 66
  - Stabilization and Reconstruction .... 4
  - Western Hemisphere ..................... 22
- **Master of Science**
  - Applied Cyber Operations ............. 4
  - Applied Physics ......................... 25
  - Applied Science (Operations Research)... 1
  - Astronautical Engineering ........... 11
  - Combat Systems Technology ............. 1
  - Computer Science ...................... 38
  - Contract Management ................. 10
  - Cyber Systems and Operations ....... 11
  - Defense Analysis .......................... 1
  - Defense Analysis (THREAT MANAGEMENT)... 3
  - Defense Analysis (WORLDWIDE DISPERSED)... 68
  - Defense Analysis (NATIONAL SECURITY INVESTIGATION)... 7
  - Defense Analysis (THREAT INFORMATION ANALYSIS)... 10
  - Electrical Engineering .................. 61
  - Electronic Warfare Systems Engineering... 3
  - Engineering Acoustics .................. 5
  - Engineering Science (ELECTRONIC ENGINEERING)... 1
  - Engineering Science (MECHANICAL ENGINEERING)... 10
  - Engineering Systems .................. 83
  - Human Systems Integration ........... 8
  - Information Operations ........... 11
  - Information Systems and Operations ... 36
  - Information Warfare Systems Engineering... 3
  - Management .................................. 46
  - Mechanical Engineering .............. 270
  - Meteorology .................................. 6
- **Doctorate**
  - Applied Mathematics .................. 2
  - Applied Physics ......................... 2
  - Electrical Engineering ................. 2
  - Mechanical Engineering ............... 2
  - Meteorology .................................. 4

### RESIDENT STUDENT ENROLLMENT

2013 Average on Board by Service

<table>
<thead>
<tr>
<th>Degree Conferred</th>
<th>Number of Students</th>
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<tbody>
<tr>
<td>International</td>
<td>12%</td>
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<tr>
<td>Civilian</td>
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<td>Army</td>
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<tr>
<td>Navy</td>
<td>42%</td>
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<tr>
<td>Marine Corps</td>
<td>12%</td>
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### DISTANCE LEARNING STUDENT ENROLLMENT

2013 Average on Board by Service

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<th>Degree Conferred</th>
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<tbody>
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<td>International</td>
<td>13%</td>
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<td>62%</td>
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<tr>
<td>Army</td>
<td>14%</td>
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<tr>
<td>Marine Corps</td>
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### STUDENTS BY SCHOOL

- Graduate School of Business and Public Policy (GSBPP)
  - Master of Arts in Security Studies 616
  - Master of Science 360
  - Doctorate 21
  - Other 23

- Graduate School of Engineering and Applied Sciences (GSEAS)
  - Master of Science 348
  - Master of Engineering 108
  - Doctorate 3

- Graduate School of Operational and Information Sciences (GSOIS)
  - Master of Science 182
  - Master of Engineering 42

- School of International Graduate Studies (SIGS)
  - Master of Science 78

### STUDENTS BY TYPE

- Full Time Resident
  - Master of Arts in Security Studies 604
  - Master of Science 1,011
  - Doctorate 270
  - Other 1,613

- Distance Learning
  - Master of Arts in Security Studies 604
  - Master of Science 1,011
  - Doctorate 270
  - Other 1,613

- Resident Students
  - Master of Arts in Security Studies 616
  - Master of Science 360
  - Doctorate 21

- Distance Learning Students
  - Master of Arts in Security Studies 604
  - Master of Science 1,011
  - Doctorate 270

### NPS GRADUATES

2013 Degrees Conferred by School

<table>
<thead>
<tr>
<th>Degree Conferred</th>
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<td>USAF</td>
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<tr>
<td>USAIRNG/NG</td>
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<tr>
<td>USCG/NSWC</td>
<td>11</td>
</tr>
<tr>
<td>International</td>
<td>150</td>
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</table>

2013 Grand Total 1,373
INTERNATIONAL STUDENTS

INTERNATIONAL MILITARY STUDENTS BY GRADE
Peak Quarter Enrollment / Summer 2013

INTERNATIONAL STUDENTS BY COUNTRY
Peak Quarter Enrollment / Summer 2013

INTERNATIONAL STUDENTS BY SCHOOL
2013 Average on Board

INTERNATIONAL GRADUATES
2013 Degrees Conferred by Service

SHORT-TERM AND CERTIFICATE COURSE PROGRAMS

REGIONAL SECURITY EDUCATION PROGRAM
By making senior leaders more aware of the strategic environments in which they will operate, the Regional Security Education Program (RSEP) contributes to better-informed decision-making at the operational and tactical levels, enhancing readiness and mission accomplishment. RSEP faculty teams board deploying naval vessels to provide education and training on the potential challenges Navy personnel may encounter. They use an interdisciplinary approach emphasizing the history, politics, economics, cultural nuances and security challenges that will impact military forces operating in the region.

LEADERSHIP DEVELOPMENT AND EDUCATION FOR SUSTAINED PEACE
The Leadership Development and Education for Sustained Peace (LODEP) provides an understanding of the geopolitical and cultural terrain of countries/regions around the world, enabling military and civilian leaders to envisage, describe and continuously re-assess each unique operational environment. The program executes distance learning courses and seminars to cultivate skills and promote whole-of-government approaches, preparing participants to build partnerships and achieve unity of effort in countries and regions of interest.

MOBILE EDUCATION TEAMS AND SHORT COURSES

GLOBAL OUTREACH
Students Instructed, FY 2013

MOBILE EDUCATION TEAMS
57 Countries Visited, FY 2013

ON-CAMPUS SHORT COURSES
43 Resident Courses, FY 2013
FISCAL INFORMATION

The total operating budget for the Naval Postgraduate School during fiscal year 2013 was $294.5 million. Funding for NPS comes from two primary sources, direct funds are provided by the Department of the Navy for the university’s core teaching mission. Reimbursable funds are provided from a variety of sponsors for the implementation of research or other unique educational programs.

NPS OPERATING BUDGET — REVENUES

2013 Revenues by Source, Direct and Reimbursable

NPS OPERATING BUDGET — EXPENDITURES

2013 Expenditures by Category, Direct and Reimbursable

RESEARCH AND SPONSORED PROGRAMS

Sponsored programs at the Naval Postgraduate School are an integral component of the graduate education experience. The primary purpose of sponsored programs at NPS is to conduct research, it is an imperative function to education at the postgraduate level, and its operational relevance is a hallmark of NPS. In addition to research, sponsored funding also supports educational programs as well as services.

EXPENDITURES BY ORGANIZATION

EXPENDITURES BY SPONSOR

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Faculty/Educational Consultant
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Stanford University

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Deputy Chief of Naval Operations for Manpower, Personnel, Training and Education
Chief of Naval Personnel (N1)

Honorable G. Kim Wincup
Senior Advisor
Center for Strategic International Studies

Dr. G. Kim Wincup