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2010

Naval Postgraduate School Annual Report 2010

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“AT THE END OF THE DAY, it’s not been about grades, it’s not been about the papers or about the projects … It’s been about an experience and a time to think about what you will do in the future – in the future of your service and in the future of your nation.

The papers may be lost, the projects may be forgotten, but what will remain are those revelations that you had, those lessons you learned and the visions that you have developed by being in this extraordinarily rich environment. They will shape your perceptions, and more importantly, they should shape your actions as warfighters and as leaders.”

ADM. GARY ROUGHEAD
Chief of Naval Operations
NAVAL POSTGRADUATE SCHOOL

The mission of the Naval Postgraduate School is to provide high-quality, relevant and unique advanced education and research programs that increase the combat effectiveness of the Naval Services, other Armed Forces of the U.S. and our partners, to enhance our national security.
As with any year, it seems, time passes by at such an astonishing pace. But as the calendar turns to another year, one cannot help but reflect upon the past and eagerly nurture the sprouts of new beginnings.

This past year signified a momentous new beginning for the Naval Postgraduate School, much more than the simple switch of a number on our calendars. We began 2010 by continuing our Centennial Celebration, honoring the university’s first 100 years of excellence through education, and culminating with our finale in May. But in spite of the rapid pace with which the months fly by, that celebration seems so long ago to me.

That is, however, a good sign. When I addressed our campus at the State of the University during those late Spring celebrations, I talked about the importance of what was to come, not what lies behind us. We have focused on the success stories that have brought NPS to what it is today, and we have aptly paid tribute to them. But it is the momentum we have built that is most important, for it is an opportunity for growth in both service and stature in the era that follows that we must capitalize on.

I believe we are beginning to do just that. We have turned with resilient determination toward the path that begins with our next 100 years. Our educational programs are more responsive and relevant to the Navy, truthfully to the complete Defense enterprise, than ever. Our research endeavors continue to grow in both scholarly prowess and fiscal impact, and result in discoveries rivaling prestigious universities across the nation.

And this is all because of the people who occupy this campus. Our faculty is arguably at its highest caliber ever, mandating the rigor for which our academic programs are known. Our talented staff dedicate themselves every day to supporting our mission. Students selected to attend NPS are more carefully chosen than ever, hand-selected to lead their given services, organizations and nations. And our graduates continue making an impact on our national and global security through countless capacities.

Here, you will learn about a small collection of these people. Individuals who have ensured that the Naval Postgraduate School will indeed continue to set a true course.

Daniel T. Oliver,
President

Daniel T. Oliver
A research university. It is what the Naval Postgraduate School has aspired to become … and along the path of our first 100 years, we have indeed achieved that goal.

The fundamental connection between graduate-level education and investigative research is undeniable; it is a complementing union forever connected to the foundation of an educational enterprise.

As President Oliver noted, we began this past year bringing a close to our yearlong Centennial Celebration. It was an exciting 12 months, and a worthwhile opportunity to share so many of our success stories throughout the tribute. And in the end, the result was a detailed, vibrant snapshot of today’s Naval Postgraduate School, portraying the current state of this institution.

But what is most promising in my mind, however, is how we will change over the coming years and decades.

Our faculty are already frequent contributors to the hallmarks of scholarly achievement – publishing in and editing the most prestigious journals, lauded in their disciplines’ respective peer societies, honored with awards, fellowships and the like. And I expect this trend to continue, for we have recruited some of the best young faculty in the nation.

Research at the Naval Postgraduate School already results in impactful new discoveries, contributing to the national security of the United States and to our global partners. Exploration at NPS goes beyond the traditional realm of defense as well, with great benefits to mankind as a whole. NPS discoveries will continue to benefit the lives of people worldwide.

And our students do more than just get an education at NPS; they prepare themselves for positions of leadership throughout the Departments of Defense, Homeland Security, Energy and beyond. We see so many of our graduates years later in senior flag and leadership positions across the services and all of government – collectively thankful to NPS for the impact it has made on their careers. It is gratifying to see so many of our U.S. and international graduates in leadership positions around the globe.

I believe our common goal should be to enhance NPS leadership worldwide in addressing the great challenges of the 21st century. We clearly have the talent to make a difference.

Dr. Leonard A. Ferrari,
Executive Vice President and Provost

Leonard A. Ferrari
A NEW BEGINNING

Never before has the history of the Naval Postgraduate School become so well known throughout the campus community—a 100th birthday will encourage, if not force, that kind of deep reflection.

It was in late 1907 when then President Theodore Roosevelt felt a strong yet peaceful exhibition of America’s Naval power would firmly position the United States as one of the world’s great nations. He ordered a fleet of 16 pure white Naval vessels to depart on a 43,000-mile circumnavigation of the world. It proved to be a great feat, but more so, a tremendous challenge in maritime engineering.

Naval leadership was forced to learn a difficult lesson as the fleet struggled home in 1909—advanced technical education would not only benefit their service, it was quite necessary. Less than four months later, the School of Marine Engineering—the precursor to today’s Naval Postgraduate School—was born.

Now 100 years into the future, NPS celebrated its Centennial anniversary in a manner befitting this tremendous milestone, beginning in 2009 and continuing through early 2010 culminating with the Centennial finale in May. We welcomed the community onto campus for the always popular Concert on the Lawn and raised a glass to the next century at the extravagant Centennial Gala.

We brought more than 1,000 middle school students, teachers and chaperones from across the Peninsula to King Auditorium for a truly rare treat…a live Downlink from the Space Shuttle Discovery while it orbited the earth some 200 miles into space. NPS graduate and soon-to-be Dean of Students Navy Capt. Alan Poindexter, thrilled the audience with tales of space flight, and floating snacks across the screen.

The Centennial has changed the face of our campus forever. The heart of the Academic Quadrangle, Spruance Plaza, was redesigned and now serves as the resting place for our NPS Time Capsule, where it will remain in waiting until 2109. The Centennial Timeline stretching the 1/8-mile façade of Root Hall still, and will always, remain a permanent memorial to the university’s rich history. And the all new Centennial Park, near Lake Del Monte on campus, will soon become home to a piece of World Trade Center steel, a constant reminder to the campus of NPS’ unique, critical place in the academic realm.

But in spite of all of these lasting memorials, what is perhaps the most critical and lasting impact of the NPS Centennial Celebration is the unified determination with which we have set our sights upon the next 100 years.

“I have never been more honored to be associated with an institution than I am with the Naval Postgraduate School. Our Centennial Celebration has provided our entire campus community, both here in Monterey and our thousands of alumni across the world, with a tremendous sense of purpose and pride.”

Daniel T. Oliver
President, Naval Postgraduate School
PRIDE AND RECOGNITION

The quality of any educational effort can be measured in countless ways. Students can applaud their professors during conversations on the quad, while teachers can praise their students over coffee at the department office.

But when the praise is from beyond campus, however, there becomes something more to the recognition achieved. When peers honor students for achievement within their selected disciplines, there is a validity to the tribute beyond any campus recognition. When up-and-coming professors are selected for prestigious honors that the most seasoned academic would be pleased to accept, there is an added strength beyond a notch on the vitae. And when a senior professor is honored with an award not just for a singular achievement, but rather a lifetime of contributions, there is a far more powerful force behind that reward.

From student recognition to junior faculty achievements to lifetime awards, the campus community has been showered with all of the above this past year. Veteran Operations Research faculty Distinguished Professor Emeritus Al Washburn and Senior Lecturer Wayne Hughes, shown left, were honored with the J. Steinhardt Prize by the Institute for Operations Research and the Management Sciences. National Security Affairs Assistant Professor Sophal Ear received a Fulbright Grant in addition to his designation as a Fulbright Senior Specialist. Mechanical and Aerospace Engineering Professor Mike Ross and Mathematics Professor Fariba Fahroo were awarded the prestigious American Institute of Aeronautics and Astronautics Mechanics and Control of Flight Award. And Assistant Professor Rachel Goshorn was honored with her selection as the university’s first Command, Control, Communications, Computers and Intelligence Chair Professor.

Students, both past and present, were equally showered with honors across the spectrum. Recent doctoral graduate Air Force Maj. Christopher McClernon accepted the prestigious Alphonse Chapanis Best Student Paper Award at the Human Factors and Ergonomics Society Conference. Ironically, the keynote speaker for the conference, Captain Chesley “Sully” Sullenberger, was the same man whose career McClernon had followed closely in his dissertation research on how people handle stress under extreme circumstances. Electrical and Computer Engineering graduate Cmdr. Brad Bittle won the American Society of Naval Engineers Claud Jones Award. And Lt. Jim Drennan won the United States Naval Institute’s Robotics Essay Contest. In addition, NPS student teams won the AIAA Rocket Launch Competition and the National Security Agency’s Cyber Defense Exercise.

The result is a unified sense of pride across campus … and impressively, this is only a partial list of the various honors bestowed upon the populace of the Naval Postgraduate School.

“[The] award is a special honor because J. Steinhardt is one of our greatest pioneers in military operations research, helping to establish our abiding influence in improving Navy operational effectiveness … I am proud to have contributed to the best military operations research department in the world.”

Wayne Hughes
Senior Lecturer, Operations Research
PASSION AND PURPOSE

Marine Corps Capt. Brandon Newell may not know it, but he is a perfect example of a typical Naval Postgraduate School student.

Long before the Department of Defense realized the deep value in exploring alternative energy and conservation, Newell was passionate about it, fascinated as a child by the sun’s ever-constant ability to deliver energy. He carried this passion through his undergraduate studies at Louisiana State University, and upon arriving at NPS to pursue his Master’s in Electrical Engineering in 2008, was committed to go in a similar direction, albeit seemingly uncharted territory within the military at that time.

Newell is a Marine and, passion aside, his purpose was clear – deliver energy to meet the demands of the warfighter on the battlefield with the lowest cost in blood and treasure.

Following the devastating earthquake in Haiti in early 2010, Newell’s research brought him to the island nation, using his understanding of alternative energy resources and predictability to help NPS’ Hastily Formed Networks (HFN) team provide power to emergency communications equipment.

It was only a few months prior that then Marine Corps Commandant Gen. James T. Conway assembled the Marine Energy Assessment Team to visit the Marines Area of Responsibility in Helmand Province, Afghanistan. The team’s mandate was to investigate the fuel, water and electricity usage and delivery systems. Newell was a member of that team.

Upon returning from the trip, Newell and his team briefed the Commandant on their findings. It was clear that the Marines needed to focus on deployable, responsive and dependable resources, and thus, Conway created the Marine Expeditionary Energy Office, where Newell has been stationed since his graduation from NPS in September. The office is responsible for establishing ways to meet the energy needs of the troops in the most efficient manner possible.

All the while, changes have begun to catch on across the services, and there are only more promising things on the horizon. In late July 2010, at the White House Forum on Energy Security, it was announced that the Departments of Defense and Energy would be signing a Memorandum of Understanding in support of a joint mission to explore efficient use of resources throughout the services, including the use of renewable energy, alternative fuels, water efficiency and deployable power supplies, to name a few.

How fortunate for this effort that there are graduates like Capt. Brandon Newell whose lifelong passion for that very subject can be applied to something so critical in purpose.

“Building a new energy future is the right thing to do to strengthen our national security, to promote economic prosperity, and to improve our environment. It is also the right thing to do for our men and women in uniform.”

Honorable Daniel B. Poneman
Deputy Secretary of Energy
“A couple of Air Force captains with a lot of initiative, grit and hard work pulled off in a fraction of the time and for a fraction of the money, what would have cost hundreds of thousands of dollars for a contractor … What they’ve accomplished is commendable, and is representative of the kind of students we have at NPS.”

Thomas Johnson, Director
Program for Culture and Conflict Studies
Androids, iPhones, BlackBerrys ... whatever. While the phone giants battle for market share, students and faculty at the Naval Postgraduate School have long realized these technological marvels can do a lot more than just send e-mail, surf the Web and run a few apps. While the potential for utilizing smart phone technologies in the battlefield seems to be hitting the pens of the mainstream media of late, it is a far-from-new concept of research and development at NPS.

Take MobiAFG, for example … Any old app can put a map in your hand, but this one puts everything, and we mean everything, you need to know about an entire country in your hand – and that country is Afghanistan. That’s probably why National Security Affairs Research Professor and Director of NPS’ Program for Culture and Conflict Studies (CCS) Tom Johnson, who helped guide the effort, calls the app “Afghanistan-in-Your-Hand.”

MobiAFG, fully operational and available for download on the CCS website, was created initially for the BlackBerry platform by NSA students Air Force Capts. Robert Davis and Christopher Joers, completed in early 2010. Coined by Davis as “kind of like a CliffsNotes for Afghanistan,” the app gives the user immediate access to condensed information about the country any time, anywhere, whether you have cellular service or not. Detailed files on all of Afghanistan’s provinces are included – geographical, human terrain and poppy cultivation maps; leadership and presidential candidate profiles; tribal and clan genealogies, divisions and histories; economic, cultural and political development analyses; and a security incidents database, among many others.

But, of course, smart phones don’t just store and display data, they can collect it and remotely send it to a central repository as well. And that’s the basic concept behind another app developed by students at NPS titled Field Information Support Tool, or FIST, and it could prove quite beneficial in a wide range of missions, from humanitarian assistance/disaster response to counterinsurgency operations.

Developed by Marine Corps Capt. Carrick Longley, shown left, and Army CW3 Chad Machiela, the concept is relatively simple. Create a flexible, form-based, data collection interface tailored to the mission at hand. Equip every unit commander with the phone and app, and you’ve got a force of data collectors. In May of 2010, FIST was operationally validated when Information Sciences Research Associate James Ehlert and Lecturer Ed Fisher, along with the two students, participated in a joint training exercise with Thailand, the Navy and Marine Corps.

The team focused on the collection of health-related information in the scenario of a catastrophe, mapping data on hospitals, medical and dental clinics, and the availability of pharmacies for medical supplies, transmitting data via a mini Unmanned Aerial Vehicle (UAV) circling overhead. Tiny high-resolution cameras on board the UAV took videos of people and places below, tagged them with GPS coordinates and fed the data to an operations center where it was all fused together, real-time.

So while smart phones are capable well beyond simple communication, it’s intelligent people that truly make them smart.
OPPORTUNITY AND FATE

It really wasn’t a question of whether or not it would work. At least not to Professor Isaac “Mike” Ross and Researcher Mark Karpenko, shown right, who had been working on optimal control maneuvers for satellites and other spacecraft for years.

And while the essential principles their theories are based on were initially proposed by Johann Bernoulli in the 1700s – that sometimes the shortest path between two objects is not necessarily a straight line – it was something the space community, and the general populace, was not necessarily eager to accept.

So they set out to prove it. But in order to do so, they would need an active, multi-million dollar satellite currently orbiting in space to implement their groundbreaking maneuvers – something that would certainly not be easy to acquire.

But as fate would have it, opportunity called. After 12 years of recording dazzling sun spots and stunning solar flares, NASA’s Transition Region and Coronal Explorer (TRACE) had completed its solar discovery mission and was slated to be shut down. Having worked with the NPS team before, NASA decided to give these scientists an opportunity of a lifetime, the keys to an operational satellite and an offer to control that spacecraft for four weeks of experiments that could transform industry standards.

TRACE quickly went from being a quiet solar observation satellite to a slewing craft dancing in the sky. NPS joined forces with Draper Laboratory and NASA’s Goddard Space Flight Center to give new life to the craft, and push the limits of what TRACE was designed to do. And in the process – to prove their groundbreaking ideas, an alternative method for reorienting spacecraft using maneuvers that reduce both time and fuel consumption.

In military applications, faster maneuvers could mean more information gathered in a shorter period of time. From an industry perspective, more efficient maneuvers could improve the capabilities of satellites significantly – depending on craft characteristics, the team estimates performance improvements of up to 70 percent.

While the group is still reveling in the success of the TRACE experiments, they haven’t lost sight of their long-term goals. Given more opportunities to test on different types of spacecraft, they hope and expect their maneuvers will continue to yield positive results. And whether they are used by industry, by NASA or by the Department of Defense, one thing is for sure – their groundbreaking maneuvers have the potential to change the standard on how satellites are reoriented in orbit.

“If we marry the ideas we demonstrated on TRACE with the correct spacecraft configuration, then we can see real savings. We will be able to exploit the available control efforts, together with unique configurations, in order to really blow the doors off of what can currently be done using industry standard maneuvers.”

Mark Karpenko
Research Associate
THE UNDERWATER INTERNET

It started as a project to detect quiet submarines in the shallows, where complex propagation and too much noise make traditional anti-submarine warfare methods a challenge to say the least. But the years have been kind to the effort that has come to be known as Seaweb, and it has evolved into something much more significant.

This past year marked a decade of continuing successful experiments, a staggering 50+ sea trials, of what is essentially the underwater Internet. It has proven to be effective in both shallow waters and the deep sea; in Nova Scotia, San Diego, Long Island and Florida; in the Pacific and Atlantic Oceans; in the Mediterranean and Baltic Seas; in Norwegian fjords and under the Arctic ice shelf.

Put in the simplest of terms by project lead, Department of Physics Research Professor Joseph Rice, “Seaweb is a realization of FORCEnet in the undersea battlespace.” It is command and control in 71 percent of the world – the part where the Navy operates most. It is underwater navigation, deep water and littoral surveillance, and submarine communications at speed and depth. In these terms alone, Seaweb has the potential to remove the stealthy submarine’s most obvious vulnerability – that it must compromise depth or speed in order to communicate with the fleet around it.

Pioneered by Rice, Seaweb is the product of years of rigorous interdisciplinary research and development into underwater acoustic propagation, sonar systems engineering, transducer design, digital communications, signal processing, computer networking and operations research … and countless student theses along the way.

In the same way a secure wireless network on land uses electromagnetic waves, Seaweb uses secure acoustic modems to interconnect its mesh of network nodes. Linking the acoustic Seaweb network to the rest of the digital domain is a gateway node typically located at the sea surface, permitting real-time communications between the underwater Seaweb network and distant command centers, ships, etc.

Rice has a vision for the future for Seaweb – intricate, undersea sensor grids that will enable navigation of submarines and autonomous underwater vehicles; that could support submarine communications anywhere in the sea; that can integrate networked torpedo connectivity for engagement from distant launch platforms; that will allow communication among unmanned underwater vehicles in mine-countermeasure operations – in short, any undersea warfare system that requires data for command and control.

“It’s great working with Professor Rice because he’s a research professor who’s really involved with the ASW community and the system commands … What I learned will be of great benefit to my future career as an engineering duty officer, especially on the acoustics side … the Naval Postgraduate School is unique in acoustics with naval applications.”

Lt. Jeremy Beidiger
Applied Physics, ’10
“I highly recommend that any military officer with the opportunity attends NPS. In an organization as large as the military, the more senior you become, the more you realize that graduate-level education is a requirement ... the best investment of tax dollars I can think of.”

Capt. Cedric Pringle, ‘98
Executive Officer, USS Makin Island
PREPARED TO LEAD

The Naval Postgraduate School prides itself on developing graduates for positions of leadership throughout the Navy, all Armed Forces, and truthfully, across the entire defense enterprise. Committing an officer to advanced education represents more than an opportunity for professional development, and even career advancement. Rather, it is a pledge that the sponsoring service or agency has made to the student – that they are earmarked for advancement.

Take Navy Capt. Cedric Pringle, for example, who graduated from the Naval Postgraduate School in 1998 upon completing his thesis titled, “Smart Gator: An Analysis of the Impact of Reduced Manning on the Mission Readiness of U.S. Naval Amphibious Ships.” The premise of the research, as the title suggests, is that with the increased cost in manpower, combined with ever-tightening defense budgets, what would the impact be of utilizing technology and non-traditional practices on amphibious class ships?

Fast forward 12 years and a few tours, Pringle is now the Executive Officer, and soon to be Commanding Officer, of the USS Makin Island – which just happens to be the Navy’s newest flagship amphibious assault ship. The Makin Island represents a completely different kind of amphib, using gas turbine propulsion, all-electric auxiliary power, advanced control systems across the board and reverse-osmosis water filtration. All this means non-traditional technologies and practices greatly reduce the manpower needs and costs associated with operating this technological marvel. We’d like to think it’s no coincidence that the man who studied this very concept in theory, is now leading it in reality.

Or how about Cmdr. Joey Frantzen, who graduated with a computer science degree in 2001, and now serves as Executive Officer of the USS Mobile Bay. The Mobile Bay was commissioned in 1987, but just last year completed a 10-month upgrade process making its computer and combat systems some of the most advanced in the Fleet.

This is, however, commonplace for Naval Postgraduate School alumni. From four-stars to O-4s, graduates from NPS are in leadership positions, making an impact on America’s national security. Gen. Keith Alexander, for example, is a dual-degree graduate in Systems Technology (Electronic Warfare) and Physics – he is now the head of the U.S. Cyber Command; Vice Adm. Mark Ferguson is a computer science graduate of NPS, now the Deputy Chief of Naval Operations (Manpower, Personnel, Training & Education); Rear Adm. Nevin Carr, Jr. graduated in Operations Research, and is now the Chief of Naval Research; and, Lt. Cmdr. Frank Weisser, a Systems Analysis graduate is now lead soloist and logistics planner for the Navy’s Blue Angels.

Only a few in a long list of distinguished graduates that will only get longer.
GIVING BACK

If Naval Postgraduate School graduates truly went on to lead their respective services, then natural intuition would dictate that there must be quite a few of them in senior positions across the Department of Defense, true leaders with the kind of experience that can be shared with the current student population, enriching the overall educational experience.

Fortunately, intuition is correct.

Operations Research graduate Adm. Mike Mullen returned to NPS again this past year in August to address the student population during one the university’s frequent Secretary of the Navy Guest Lectures. Vice Adm. Richard Hunt, shown right, Commander, Third Fleet graduated in Telecommunications Systems Management in 1988, and returned to campus this past December to serve as Fall commencement speaker. Just three months prior, dual degree alumnus U.S. Cyber Command Chief Gen. Keith Alexander returned for the same purpose.

Out-of-service graduates, such as Deputy Assistant Secretary of Energy, Carter “Buzz” Savage for example, return to campus to share with students their seasoned knowledge and experience in a very critical and relevant field.

Graduates also return in leadership roles, and take a very active approach to guiding students on their education in mission-critical efforts – and these alumni do so because they are now in charge of those same mission-critical efforts.

Rear Adm. Jan E. Tighe received both her Master’s degree in Applied Mathematics and her Ph.D. in Electrical Engineering in 2001 from NPS. She is the first female Information Warfare (IW) Rear Admiral, as well as the first IW Rear Admiral to hold a Ph.D., an achievement that comes as no surprise to those who know her. In her position as Deputy Director of Operations for the U.S. Cyber Command, she returned to campus in December to address students in the new Information Dominance Corps about the needs of this budding community.

Rear Adm. Liz Young received her dual Master’s of Science degrees in Physics and Space Systems Operations from NPS in 1990. In her position as Program Executive Officer, Space Systems, Young is responsible for guiding the Navy’s efforts in space. She returned to campus in mid-October to review Space Systems student research and answer questions that would help guide them as they continue on a path of discovery.

But graduates also return to campus to receive their due honor. This past year, we welcomed four prestigious alumni into the Naval Postgraduate School’s Hall of Fame: Thailand’s Permanent Secretary of Defence General Apichart Penkitti, Vice Admiral Thomas Hughes, Admiral T. Joseph Lopez, and Vice Admiral Patricia Tracey.

“I have a great appreciation for NPS here in Monterey … It is something I am certain that each and every one of the graduates today will use every day in the rest of their careers, either in uniform or out, in ways that are totally unexpected and unanticipated today.”

Vice Adm. Richard Hunt, ’88
Commander, U.S. Third Fleet
TECHNOLOGY + PARTNERS = RESEARCH + EDUCATION

In 2010, graduate education and its supporting research leaped forward due to the development of key partnerships between Information Technology and Communications Services (ITACS) and a number of organizations both on and off campus.

The combined efforts of Operations Research Chair Rob Dell, Associate Professor Ron Fricker, Graduate School of Operational and Information Sciences Dean Peter Purdue and ITACS led to the development of the first TEAL, or Technology Enhanced Active Learning, classroom on campus. The classroom, first implemented through extensive research at MIT, facilitates collaborative learning by situating students in well-orchestrated groups, each with its own dedicated audio-visual system, workspace and whiteboard. Since then, ITACS has partnered again, this time with the Graduate School of Business and Public Policy, to install technologically-advanced, team-oriented classrooms in a brand new academic building which will open in early 2011.

America’s warrior diplomats, the Foreign Area Officers (FAO) of all the services, received a boost for their development as well – a Web portal where collaboration and skill sustainment can be accessed anywhere in the world. The site, called FAOweb, was developed through a partnership of the School of International Graduate Studies’ Joint Foreign Area Officer Skill Sustainment Pilot Program, the NPS Center for Educational Design, Development and Distribution and ITACS. Through one portal, FAOweb brings together a variety of resources, from language and culture to current news and information. The site also provides e-mail and chat tools so that FAOs around the globe can network with each other.

In addition to these specific projects, ITACS collaborated with a number of committees and individuals on campus to promote improved research resources. ITACS, the Dudley Knox Library and faculty came together to assess technical requirements of classified laboratories. ITACS also partners with the Research Computing Committee to provide sufficient support for High Performance Computing (HPC) capabilities. HPC is vital to research efforts for the DoD but also supports partners such as the Naval Academy, U.C. San Diego and Santa Cruz, and the Monterey Bay Aquarium.

Partnerships abound with off campus entities as well. NPS participates in Monterey Peninsula DoDnet. In 2010, ITACS extended the .edu network to the Fleet Numerical Meteorology and Oceanography Center. Bandwidth was also upgraded from 1 Gbps to 10 Gbps. And, a partnership of the Defense Language Institute, the U.S. Air Force and ITACS resulted in the Language Enabled Airman Program which provides foreign language education through distance modalities for Air Force pilots.

“High Performance Computing (HPC) is an essential capability for every research university. The Research organization is a major stakeholder and partner with ITACS in helping shape our strategy to expand our HPC capability, and enable our faculty and researchers to optimally exploit it.”

Dr. Karl van Bibber
Vice President and Dean of Research
Critical to any educational effort is constant access to an ever-dynamic and diverse collection of knowledge. This is especially critical at the graduate level, where detailed research and discovery is not just a temporary need or fleeting fancy, it is a fundamental part of the daily lives of every student and faculty member on campus.

Fortunately for NPS’ hundreds of students and teachers, they have access to the Dudley Knox Library (DKL), one of the best facilities in the entire Federal Library system, some 2,000 libraries large across the world. Those are strong words, indeed, but they are not those of the Naval Postgraduate School. Rather, the Federal Library and Information Center Committee, the governing body of the Federal Library system, stated such when they named Eleanor Uhlinger, shown right, NPS University Librarian, as the 2010 Federal Librarian of the Year. Quite an honor considering there are thousands of her peers across the world.

Uhlinger and her staff look at the library’s support of the campus as far more than simply a repository of periodicals, books, theses and the like. While the facility’s collections are impressive – 725,000 volumes and growing, and access to every research resource on the Web – it is a keen focus on the needs of scholars that has earned Dudley Knox its stellar reputation both on and off campus. Lauded for her attentiveness to the requirements of students, Uhlinger and her staff have placed a powerful emphasis on the educational culture of the facility.

In 2009, DKL staff championed several renovations to the library’s learning spaces, creating a combination of both quiet and collaborative environments enriched with modern technology to promote the learning experience. Physical and virtual enhancements, coupled with their patron-friendly focus and promotion of initiatives, resulted in double-digit increases of in-person reference requests, interlibrary loans and reserve item circulation, and all with only a limited increase in library expenditures.

DKL is also a partner in the Homeland Security Digital Library, the most comprehensive collection of Homeland Security related research and scholarly writing anywhere in the world.

With a mission so diverse, and recognition so far from campus, it’s no wonder students and faculty are so often on the cutting-edge of their fields.

“We are working on providing information resources, services and spaces that enable students to take their working problems from the field, think critically about them, and find ways to solve them.”

Eleanor Uhlinger
University Librarian
A hallmark of the Naval Postgraduate School has been its ability to remain cutting-edge, to be on the forefront of new technologies and always ready to respond to the needs of defense and security for our country. But what’s behind this ability to remain relevant?

At NPS, planning and constant improvement are a part of everyday operations. In 2010, the Strategic Planning Council met quarterly to discuss progress, evaluate metrics and lay the foundation for annual reporting by every school and administrative department across campus. Strategic planning at NPS has been hailed as a model by the Deputy Chief of Naval Operations, the Naval Inspector General and by the visiting team from the Western Association for Schools and Colleges (WASC). The WASC visit in October marked the end of NPS’ multi-year accreditation process, with strategic planning as one of three themes examined by the team. The final WASC Commission action on NPS’ accreditation status occurs in early 2011.

But what about the future? What will our national security requirements be in 10, 15 or 20 years? These are the critical questions that dictate strategic planning, and they must be answered. In August, President Dan Oliver commissioned the Committee on the Future, chaired by retired Rear Admiral Jerry Ellis, shown left, to determine whether NPS is positioned to serve the national security agenda of the future and provide a foundation for the next five-year strategic plan.

To carry out this charge, a think-tank of forward-looking individuals from NPS, local DoD, higher education institutions and business meet regularly. They review documents, data and analyses trying to identify the key issues facing higher education, the Navy and Departments of Defense and Homeland Security, and ultimately, national security. What are the likely new threats facing our nation in the future? How can NPS anticipate what our nation will need to not only fight, but prevent, war? What will be the strategic direction of the Navy? Does NPS have the right infrastructure, the right programs and the right support? Are there partnerships and collaborations with industry and national labs to be pursued?

These are just some of the questions with which the committee will grapple as it seeks to peer into the future and help NPS navigate a direction into a new and unknown world.

“The Naval Postgraduate School’s strategic planning process provides an important blueprint for the institution’s future, and clearly shows its aspirations for continued academic excellence and responsiveness to the Navy’s requirements.”

Vice Adm. Mark Ferguson, ‘84
Deputy Chief of Naval Operations
Manpower, Personnel, Training and Education
THE YEAR IN REVIEW – 2010

JANUARY

Assistant Professor Dr. Rachel Goshorn officially becomes NPS’ first Command, Control, Communications, Computers and Intelligence (C4I) Chair.

The seven-member NPS Hastily Formed Networks team, led by Information Sciences Research Associate retired Navy Lt. Brian Steckler, heads to Haiti to assist in providing emergency communications following the devastating earthquake.

Pictured Above:
NPS becomes the home of a Segmented Mirror Space Telescope. Designed for the National Reconnaissance Office, the telescope will be used for research and education by faculty and students in the NPS Spacecraft Research and Design Center.

FEBRUARY

Pictured Below:
Dr. Paul N. Stockton, Assistant Secretary of Defense for Homeland Defense and Americas’ Security Affairs, keynotes the 2010 Center for Homeland Defense and Security (CHDS) Alumni Continuing Education Conference. Stockton played a major role in establishing CHDS in 2002 when he was an Associate Provost at NPS.

Pictured Below:
FAOweb, a dynamic Web portal designed by NPS’ Joint FAO Skill Sustainment Pilot Program together with Information Technology and Communications Services, launches. The portal is designed to provide networking and cultural education programs to the growing Foreign Area officer community worldwide.

MARCH

“Inside NPS,” a half-hour television program, debuts on the Pentagon Channel. With a potential audience of 18 million viewers, the program features university news, research projects, alumni stories and interviews with distinguished campus visitors.

Pictured Below:
Six students from the Manpower Systems Analysis Program meet with Chief of Naval Personnel Vice Admiral Mark Ferguson, (NPS ’84) to personally brief him on their thesis projects. Two students, Lt. Jeremy McLaughlin and Marine Corps Maj. Jonathon Price, are recipients of the CNP Award for Excellence in Manpower, Personnel and Training Analysis.

The Honorable Juan M. Garcia, III, Assistant Secretary of the Navy for Manpower and Reserve Affairs, keynotes winter graduation. At the same ceremony, Bronze Star medals were awarded to students Lt. Hak J. Kim and Cmdr. Joe C. Shipley.
APRIL

The NPS Video Portal, developed by Information Technology and Communications Services, launches with more than 100 videos. Coined “YouTube for NPS,” the site provides on demand access to NPS news stories, educational videos and much more.

Pictured Above: Amory Lovins, one of “Time” magazine’s 100 most influential people in the world in 2009, keynotes the Secretary of the Navy Guest Lecture series just before Earth Day. Sponsored by the Cebrowski Institute, Lovins stressed the importance of reducing DoD’s reliance on fossil fuels, noting the extreme costs, in both blood and treasure, of wasteful practices and over dependence.

MAY

More than 300 officials attend the 7th Annual Acquisition Research Symposium, organized by NPS’ acquisition research program. The program brings speakers, such as Under Secretary of the Navy Robert O. Work, to Monterey from around the world to improve processes and efficiencies in defense acquisition.

Pictured Above: U.S. Army Chief of Staff General George Casey addresses the student body during a Secretary of the Navy Guest Lecture. Casey, a former Foreign Area Officer, stresses the importance of leaders with strong core competencies yet with broad enough range to tackle many issues.

JUNE

The Undersea Warfare Academic Group is re-established to provide increased emphasis on undersea warfare education.

Three NPS faculty are selected to receive Defense University Research Instrumentation Program (DURIP) Awards, funding the purchase of new research equipment. The awardees are Distinguished Professor Brij Agrawal, Professor Ching-Sang Chiu and Research Associate Professor Haf Jonsson.

Pictured Above: Oceanography doctoral student Jenna Brown is selected by the Office of Naval Research to receive the highly competitive National Defense Science and Engineering Graduate Fellowship. Brown’s research focuses on mapping the three-dimensional nature of rip currents and the exchange of materials, such as pollutants, in and out of surf zones.
The Graduate School of Business and Public Policy is ranked as the 45th best university in the country for graduate programs in public administration by “U.S. News and World Report.”

Thirty-three senior members of the Iraq government and military are hosted by the Defense Resources Management Institute (DRMI) for an intensive three-week course in the latest international business practices. The course is part of a larger program in which DRMI provides educational opportunities to the Iraqi government.

NPS is awarded the national Federal Agency Award for 2010 by the Federally Employed Women (FEW). Central Coast Chapter representatives received the award during the FEW National meeting in New Orleans.

Professor Isaac “Mike” Ross of the Department of Mechanical and Aerospace Engineering and Department of Applied Mathematics Professor Fariba Fahroo, are presented with the American Institute of Aeronautics and Astronautics Mechanics and Control of Flight Award for their research in optimal control theory.

Pictured Below:
During an SGL, the Honorable Richard Clarke – former National Coordinator and Special Assistant on Counterterrorism, Security, Global Affairs and Cyber Warfare to three presidents – calls for a new national cyber defense policy to reduce the likelihood of a Cyber 9/11.

Pictured Below:
Six NPS faculty are recipients of the prestigious Distinguished Professor honor during the September graduation ceremony. The six are Ching-Sang Chiu, Herschel H. Loomis, Patricia A. Jacobs, Kenneth J. Euske, Jon T. Butler and Young W. Kwon.

Pictured Above:
Two NPS “tornado chasers” use the university’s Mobile Phased Array Radar truck to track the devastating storms in an effort to improve forecasting. Bob Bluth and Paul Buczynski join researchers from across the U.S. and Canada in VORTEX2, the largest tornado research effort to date.

Traveling in Afghanistan, Professor Thomas Johnson from the Department of National Security Affairs, acts as the senior political aide and counterinsurgency advisor to the commander of Task Force Kandahar, Canadian Brig. General Jonathan Vance.
**OCTOBER**

**Pictured Below:**
An international team of scientists comes together to track typhoons over the Pacific Ocean. The group is headquartered at NPS’ Monterey Operations Center, where accurate forecasting is required in order to correctly place instruments. The goal of the study is to examine the ocean’s response to the storms. NPS acts as the hub because of its robust communications infrastructure which enables interaction among the various agencies.

The group of DoD organizations around Monterey County, known collectively as Team Monterey, visits Fort Hunter Liggett and Camp Roberts. The collaboration of DoD organizations is the vision of Congressman Sam Farr, D-Calif., and works to increase cooperation and efficiency in order to take advantage of the potential of these groups.

**NOVEMBER**

**The Special Collections and Archives Department of the Dudley Knox Library is unveiled in a dedication ceremony. The collection highlights the unique history of the Naval Postgraduate School’s past 100 years while also honoring Hotel Del Monte’s rich past.**

**Pictured Above:**
Dr. George Bekey, Emeritus Professor of Computer Science at the University of Southern California, lectures students, faculty and staff on the advances in robotics and autonomous systems.

**DECEMBER**

**The December graduation ceremony is keynoted by Vice Admiral Richard W. Hunt, Commander of the U.S. Third Fleet and an NPS alumnus in Telecommunications Systems Management. Following the procession in King Auditorium, Vice Admiral Hunt is honored with the NPS Distinguished Alumni Award.**

**Pictured Above:**
NPS is selected to host one half of the latest Defense Advanced Research Projects Agency (DARPA) Challenge. Mechanical and Aerospace Engineering Distinguished Prof. Young Kwon leads a group performing destructive structural tests on polymer CubeSat spacecraft digitally manufactured by the Space Systems Group led by Prof. Rudy Panholzer.
NPS averages approximately 1,550 resident students per year. More than 90 percent of resident students at NPS achieve graduation, with an average time to degree of approximately 20 months. NPS continues aggressively expanding its off-campus learning programs, which now serve more than 800 students per year.

### STUDENTS BY SERVICE/COUNTRY

<table>
<thead>
<tr>
<th>Type of Student</th>
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<tr>
<td>U.S. Army</td>
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<td>U.S. Marine Corps</td>
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<td>Civilian</td>
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<td>Greece</td>
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<td>Singapore</td>
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<td>Other</td>
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### STUDENTS BY SCHOOL

**DL** = Distance Learning Students  
**RS** = Resident Students

### STUDENTS BY TYPE

**Full-Time Resident**  
**Distance Learning**  
**Non-Degree**
DEGREES CONFERRED

Degrees # of Graduates
Bachelor of Science 1
Meteorology 1

Master of Arts
Security Studies 263
(9 specializations)

Master of Science
Applied Mathematics 3
Applied Physics 34
Applied Science 1
(Physical Oceanography)
Astronautical Engineering 9
Combat Systems Technology 3
Computer Science 39
Contract Management 10
Defense Analysis 72
(6 specializations)
Electrical Engineering 36
Electronic Warfare 7
Systems Engineering
Engineering Acoustics 8

Degrees # of Graduates
Engineering Science 4
(Mechanical Engineering)
Engineering Systems 24
Human Systems Integration 11
Information Operations 6
Information Systems and Operations 4
Information Technology Management 33
Information Warfare 13
Systems Engineering
Management 31
Mechanical Engineering 26
Meteorology 10
Meteorology and Physical Oceanography 11
Modeling, Virtual Environments and Simulation 10
Operations Research 52
Physical Oceanography 1
Physics 6
Program Management 25
Remote Sensing Intelligence 1
Software Engineering 5

Other Masters
Executive MBA 94
Master of Systems Analysis 34
Master of Business Administration 133

Engineer
Astronautical Engineer 1
Electrical Engineer 2
Mechanical Engineer 5

Doctorate
Doctor of Philosophy (11 fields) 18

Grand Total 1,188

FISCAL INFORMATION

The total operating budget for the Naval Postgraduate School during fiscal year 2010 was $379.1 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

NPS OPERATING BUDGET - EXPENDITURES
Sponsored programs at NPS are an integral component of the graduate education experience, and have risen dramatically over the past decade, now accounting for nearly 75 percent of the university’s annual operating budget. The primary purpose of sponsored programs at NPS is to conduct research, an imperative function to education at the postgraduate level, and its operational relevance is a hallmark of the Naval Postgraduate School. In addition to research, sponsored funding also supports educational programs as well as provided services.

Educational sponsored programs include several multi-disciplinary, needs-driven degree and certificate programs directly funded by a supporting sponsor, such as space systems, combat systems, homeland security and defense and systems engineering.

Service sponsored programs include the implementation of programs on behalf of a sponsoring agency, such as the SMART (Science, Mathematics, and Research for Transformation) scholarship program funded by the Office of the Secretary of Defense.
“THE NAVAL POSTGRADUATE SCHOOL is the anchor for our advanced education in the Navy, and in many ways, the military. The exchange of ideas, the exposure to a broader perspective, to technology and research, is absolutely vital for our young officers, both ours as well as the international officers who are here.

It taught me how to frame very difficult problems, how to look at big challenges in different ways … It was the total experience that taught me what education was all about.”

**ADM. MIKE MULLEN**
Chairman, Joint Chiefs of Staff
Operations Research, 1985

**BOARD OF ADVISORS TO THE PRESIDENT, NAVAL POSTGRADUATE SCHOOL**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Organization/Office</th>
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<tr>
<td>Vice Adm. Lee Gunn, USN (Ret)*</td>
<td>President</td>
<td>Institute for Public Research, CNA Corp.</td>
</tr>
<tr>
<td>Mr. Walter Anderson</td>
<td>President</td>
<td>NOVIUM Learning</td>
</tr>
<tr>
<td>Mr. Michael Bayer</td>
<td>President/CEO</td>
<td>Dumbarton Strategies</td>
</tr>
<tr>
<td>Honorable Dr. Jack Borsting</td>
<td>Professor &amp; Dean Emeritus</td>
<td>University of Southern California</td>
</tr>
<tr>
<td>Rear Adm. Nevin Carr, USN</td>
<td>Chief of Naval Research</td>
<td>Office of Naval Research</td>
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<tr>
<td>Vice Adm. Mark Ferguson, USN</td>
<td>Deputy Chief</td>
<td>Chief of Naval Personnel</td>
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<tr>
<td>Dr. Robert R. Fossum</td>
<td>Consultant</td>
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<tr>
<td>Maj. Gen. Raymond Fox, USMC</td>
<td>Commanding General</td>
<td>USMC Training &amp; Education Command</td>
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<td>Vice Adm. David E. Frost, USN (Ret)*</td>
<td>President</td>
<td>Frost &amp; Associates</td>
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<td>Maj. Gen. Gregg F. Martin, USA</td>
<td>Commandant</td>
<td>Army War College</td>
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<td>Dr. Elisabeth Paté-Cornell</td>
<td>Professor and Chair</td>
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<td>Honorable G. Kim Wincup</td>
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<td>Science Applications International Corp.</td>
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*Board Chair