



NAVAL POSTGRADUATE SCHOOL

UPDATE
NPS

MARCH 2013



U.S. Navy photo by MC1 Grant P. Ammon

NPS, NATO Partner to Build Transparency in Defense Institutions

By Kenneth A. Stewart

As the U.S. Partnership for Peace Training and Education Center (USPTC), NPS and its Defense Resources Management Institute (DRMI) are playing a pivotal role in partnering with NATO on the Building Integrity (BI) program. The BI effort, established in 2007, seeks to empower developing nations across the world with the skills, knowledge and tools to build efficient, corruption-free defense institutions.

The latest major development in the BI effort brought an international contingent of diplomats and senior government officials from nations across the globe to Monterey for the “Building Integrity” conference, Feb. 25–28.

Opening the conference was NPS Interim President Rear Adm. Jan E. Tighe, welcoming the 180 representatives from 35 NATO member and allied nations.

“The guiding principles of the Building Integrity initiative are critical to developing worldwide global security, and I am very proud to have [NPS] partnering with you in standing up to these challenges.” – NPS Interim President Rear Adm. Jan E. Tighe

“The guiding principles of the Building Integrity initiative are critical to developing worldwide global security, and I am very proud to have our own institution partnering with you in standing up to these challenges,” she said. “Throughout our institution, some of the brightest minds in their respective fields dedicate their professional careers to teaching military officers about these very values.”

NATO Supreme Allied Commander Transformation Gen. Jean-Paul Paloméros served as the opening keynote speaker, encouraging conference attendees to take advantage of the valuable opportunity the BI conference provides.

This year’s conference seeks to explore the strategic impact of corruption and identify practical tools to assist participants in managing scarce resources while promoting best practices. The focus of the effort is perfectly tailored to the intellectual capital in NPS’ DRMI.

“This is the U.S. contribution to NATO’s Building Integrity program,” said DRMI Director Dr. Francois Melese. “[DRMI] encourages transparency, fiscal management and decision making. The idea is to increase transparency through financial management and fiscal tools. If you invest in increasing transparency, you increase detection which increases the probability of deterrence.”

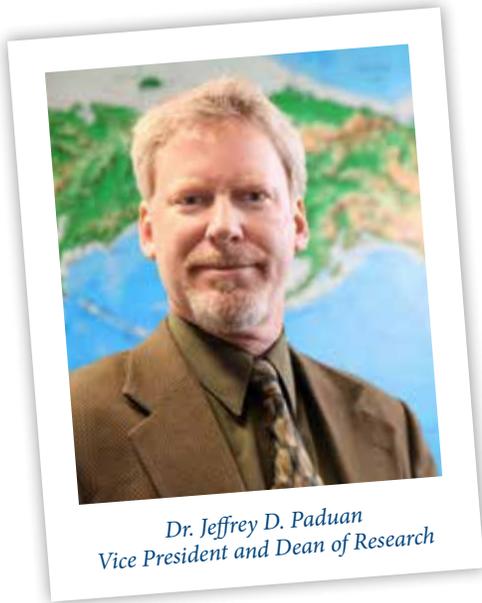
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A Message From ... Dr. Jeffrey D. Paduan

Vice President and Dean of Research, Naval Postgraduate School



It has been eight months since I took over as Dean of Research. I can say without hesitation that very little about the job has been as expected and that nothing about these past eight months at NPS has been “business as usual.” Long-time Research and Sponsored Programs Office Director Danielle Kuska retired on January 3. We miss her experience and inexhaustible commitment, but the many professionals around her have stepped up to the challenges. Like everyone on campus, they are working through disruptions from the local and national levels of government. I appreciate their efforts and the patience being shown by the broader campus community.

Within this climate of change and uncertainty, I want to highlight an area of unique opportunity and unflagging need. NPS has the opportunity to become a more visible and much more effective resource to the operational Navy. However, to move in that direction we must, in my view, learn to become a greater sum of our many parts. We already have a world-class assemblage of researchers. We also have many individual DOD sponsors who are very happy with the work that we produce. The need, however, is to learn how to let sponsors and potential sponsors know what else is happening at NPS that can contribute to solving their problems.

As Dean of Research, I have the privilege of meeting many of the VIPs that visit NPS. So far, nearly every one of them has expressed a desire to know more about what expertise is available at NPS and what projects are underway. This need is expressed in one of the CNO initiatives from 18 months ago to produce a “research portal.” That initiative is now being guided by Associate Dean of Research, Distinguished Professor Kevin Wood.

The research portal will be successful when we begin to routinely append proposal abstracts, project information, and publications to a master database with modern search capabilities and sophisticated permissions management. We have an excellent model and resource available to us in the Dudley Knox Library’s Calhoun system. So I know it can be done.

Within this climate of change and uncertainty, I want to highlight an area of unique opportunity and unflagging need. NPS has the opportunity to become a more visible and much more effective resource to the operational Navy. However, to move in that direction we must, in my view, learn to become a greater sum of our many parts.

We also need something more than the research portal itself to reach our maximum potential. It is not enough to make it easy for Navy leadership to know what we are doing. We also need a cadre of “translators” to help them make sense of it. Because I do not believe that we should give up our strength in PI-driven research programs, we need more help identifying overlap between those programs and operational Navy requirements. To that end, I will be asking for increasing participation from our colleagues in uniform to act as go-betweens. PMPs, military faculty, program officers, military associate deans and others have both the Navy experience and the academic familiarity to bridge the two worlds.

A great example of this is work done by Lt. Cmdr. Keir Stahlhut for the August 2012 METOC curriculum review. For several years that curricular sponsor has been providing a list of desirable thesis topics and, in most cases, the faculty advisors have not recognized themselves (i.e., their research) in the topics provided. However, by looking at each completed thesis in the past three years with an eye toward the Navy’s research area touch points as well as the sponsor’s thesis topics list, Lt. Cmdr. Stahlhut concluded that fully 20 percent of the completed theses had complete overlap with the sponsor’s topics list and 50 percent of the completed theses had partial overlap with the list. Imagine if similar analyses were undertaken across NPS by our many expert translators. It is one of my top goals to make that happen on a regular basis.

“Update NPS” is a monthly publication for students, faculty and staff of the Naval Postgraduate School produced by the Office of Institutional Advancement. For additional copies, comments, or to suggest story ideas, contact the editorial staff at update@nps.edu.

Students Complete JPME in Joint NPS, Naval War College Program

By Amanda D. Stein

In 1986, after a series of snafus in joint military operations, the Goldwater-Nichols Department of Defense Reorganization Act implemented sweeping changes across the defense department. Among them was a greater emphasis on preparing Soldiers, Sailors, Airmen and Marines to operate side-by-side, seamlessly, in times of peace and war.

Today, joint operations are commonplace, and the men and women of the armed forces are well prepared to work alongside one another, in part because of joint operations education like the Navy's Command and Staff program which includes Joint Professional Military Education (JPME) Phase I credit.

program (C&S) in conjunction with students' degree programs.

Naval War College Monterey Chairman Fred Drake explains that in addition to saving students the time they would normally set aside exclusively for JPME studies, doing the program during their time at NPS gives real-world context to their studies as officers from across the services work side-by-side in their NWC C&S and NPS master's degree programs. With NPS' student population representing all five branches of service, NPS is its own joint military community, with plenty for students to learn from each other both inside and outside the classroom.



The latest collection of honor graduates from the Naval War College Monterey Program is pictured following a brief ceremony on campus, Jan. 29. Since the program's inception in 1999, more than 3,000 officers have completed Joint Professional Military Education Phase I certification through the partnership while concurrently completing their NPS degrees. (U.S. Navy photo by Javier Chagoya)

Courses with JPME credit are just one way in which the DOD prepares officers for joint assignments by exposing students to operational and decision-making processes that will make them effective in joint assignments or working with other services. The two-phase program traditionally requires students to attend courses at the Naval War College (NWC) in Newport, R.I., or fulfill them through distance learning outside of their day-to-day duty assignments.

Since 1999, the Naval Postgraduate School has partnered with the NWC's Monterey office, located on the NPS campus, to allow students to complete the four courses that comprise the NWC Command and Staff

intermediate level service college PME requirements. The NWC courses were tailored to the structure of other courses offered on campus, allowing them to seamlessly fit into students' degree matrices.

"We try to work with the other departments to provide the least amount of interference, and give both organizations a chance to optimize their resources here on the Monterey campus," said Drake. "From the student standpoint, the NWC courses look, add and drop just like any other course here. We try to function, from the student standpoint, as much as like any other NPS department as possible, while fulfilling Naval War College requirements here on the West Coast."

"I guess you could say we are a bit of a catalyst for students to converse with folks out of different curricula. We give them more of a profession of arms perspective," said Drake. "I like to think of us as sort of a great add-on to the NPS master's degree. You can come here instead of going to some other school, and you can get your professional certification in the process, what a twofer."

All U.S. military officers and senior DOD civilian employees are eligible to take the NWC courses at NPS. Navy, Marine Corps and Army officers can use their NWC C&S diploma to fulfill their services'

from the
MEZZ

NPS Interim President Rear Adm. Jan E. Tighe presented the final recommendations on the way ahead for the Provost search to the Under Secretary of the Navy, Vice Chief of Naval Personnel and NPS Board of Advisors. Tighe expressed her thanks to the diligent effort of the Provost Search Committee on seeing the long and arduous process through to completion. The committee presented its final report and recommendation to Tighe on February 8.

In order to track forward progress for the Inspector General recommendations, Tighe has requested the creation of a dashboard to monitor the status of each associated Plan of Action and Milestone. The IG Inspection Recommendation teams continue progress on all fronts, and the status of each are reviewed regularly at the President's Council Meeting.

On February 12, Tighe traveled to Camp Roberts in south Monterey County to witness first-hand the latest edition of the Joint Inter-agency Field Experimentation program. Students, faculty and several other participants briefed Tighe on a cross-section of specific projects from the long-standing cooperative field experimentation program.

On February 26, Tighe provided welcoming remarks to approximately 180 senior diplomats and officials from 35 NATO allied and partner nations during the 2013 Building Integrity Conference. As the U.S. Partnership for Peace Training and Education Center, NPS and its Defense Resources Management Institute partner with NATO on the Building Integrity program, which seeks to empower developing nations across the world with the skills, knowledge and tools to build efficient, corruption-free defense institutions.

From the Mezz provides a brief report on the activities of NPS' senior administration. For more details on any of these reports, please contact the Office of Institutional Advancement at pao@nps.edu.



NPS students work with a quadrotor aerial vehicle during the Joint Interagency Field Experiment, Feb. 11-14. (U.S. Navy photo by MC1 Grant P. Ammon)

NPS Hosts Interagency Field Experimentation Program

By MC1 Grant P. Ammon

A team from NPS conducted Joint Interagency Field Experiment (JIFX) 12-2 with representatives from the DOD's combatant commands (COCOMs), as well as federal, local and state agencies at Camp Roberts, Feb. 11-14.

Sponsored by the Office of the Secretary of Defense's Joint Operations Support directorate, and the Department of Homeland Security, JIFX is a collaborative field experimentation program that allows students, researchers, defense industry leaders and military members to test, evaluate and collaboratively develop new technologies.

"The Office of Secretary of Defense's Joint Operations Support has funded NPS to provide an environment for the combatant commanders in which they can rapidly evaluate and refine existing requirements and potentially identify new requirements to their capability challenges to the warfighter," said NPS Department of Information Sciences Associate Professor Dr. Ray Buettner, director of field experimentation.

NPS coordinated the event where graduate students and faculty were able to execute experiments and demonstrate research projects developed at the university.

"I view JIFX as a terrific opportunity for our students, faculty, COCOM partners, and other government agencies to come together in an experimental way," said NPS interim President Rear Adm. Jan E. Tighe. "It's a chance to test out new ideas and innovations, and for

our students to actually see it all come together.

"Student learning is not just theoretical back in the classroom, or even the lab, but here they actually get to do something practical with the knowledge gained while studying at NPS," continued Tighe.

The series of field experiments allowed for an open dialogue on technologies demonstrated, and with participation from California's National Guard units, researchers and industry representatives were provided with direct feedback from the warfighters' perspective on the applicability of the technology demonstrated.

"This environment is pre-acquisition," said Buettner. "There are no sales involved with this experiment. Because we have academics running the environment, it's about research, and not acquisition. We're able to lower the barriers to collaboration."

For NPS student Navy Lt. Chris Guttierrez, who attended JIFX to demonstrate his thesis work on beyond line-of-sight communication equipment based on netted iridium technology, the ability to take his work outside the classroom and into the field was highly beneficial.

"You can get a lot from the classroom, but to really get out and meet other folks that are looking at the same problems that you're interested in is invaluable," said Guttierrez. "This is especially helpful as a thesis student at NPS. We're here doing research on things that might affect the Navy and the military in the future."

Design Team Successfully Accelerates Beam in FEL Spoke Cavity

NPS Research Associate Professor Richard Swent of the physics department has been working with Los Alamos National Laboratory and Old Dominion University on an Office of Naval Research funded free electron laser project to design a spoke cavity that would accelerate the particle beam in a more efficient and compact way than accelerators of the past. For the Navy, such advancements could mean eventually using the capabilities for shipboard laser defense.

"What they tested was a kind of superconducting accelerator cav-

ity that looks like it has promise for certain applications, particularly high-vibration applications, like on a ship," said Swent. "This was the first time that one of these so-called spoke cavities had accelerated a beam. They had done some testing on them before, but they had never actually gotten to the point of using one as an accelerator."

From here, Swent is continuing to work with the group on the next phase of the project, which will look into beam dynamics simulations, and the design of beam transport systems and diagnostics.

Navy Energy Director Talks Innovation, Future of the Force

By Kenneth A. Stewart

Navy Energy Coordination Office Director, Capt. James Goudreau, addressed NPS students, faculty and staff in the Mechanical and Aerospace Engineering Auditorium, Feb. 22. Goudreau is one of several energy and conservation experts invited to share their views with university researchers as they seek innovative solutions to the Navy's energy challenges.

"Nations today rarely go to war over ideology... But nations will go to war over resources, especially if they see those resources as critical to their national survival," said Goudreau. "How we use energy today is a tremendous vulnerability."

Goudreau made a lengthy argument for energy conservation and technological innovation. Still, he insisted that his passion for conservation was driven not by environmental or political concerns, but by a desire

to maintain the Navy's ability to accomplish its most critical wartime missions.

"As a military, we must prevail in combat. There is no other reason we put on a uniform everyday," said Goudreau. "Energy translates into warfighting capability now and it translates in the future... We are having this discussion now, putting scarce resources into this endeavor, because we want to win the fight."

Goudreau offered some frank assessments and made several dire predictions, but he approached the Navy's present energy challenges with a great deal of optimism.

"We are going to enter a time where we are forced to change, but its empowering," said Goudreau. "It will open up new opportunities so that we can break the patterns of six decades of energy dependence. When faced with a threat, we find a solution."

Systems Engineering Faculty Honored with Prestigious INCOSE Award

By MC1 Grant P. Ammon

NPS Systems Engineering (SE) Professor Dr. Dave Olwell, and his colleague, Stevens Institute of Technology Distinguished Research Professor Dr. Art Pyster, earned "Product of the Year" honors from the International Council on Systems Engineering (INCOSE) during a ceremony held in Jacksonville, Fla., Jan. 26-29.

The award is given annually to the INCOSE product that provides the most significant value to INCOSE's stakeholders.

Formally recognized during INCOSE's International Workshop, Pyster and Olwell served as lead principal investigator and co-principal investigator, respectively, on the Body of Knowledge and Curriculum to Advance Systems Engineering (BKCASE) project.

"The (BKCASE team) has done an outstanding job in the development of this SE repository of information and training guidance," said INCOSE President John Thomas. "The world's systems thinkers and engineers are al-

ready benefiting from these efforts. INCOSE is proud to have provided many experts to assist in the success of this endeavor."



NPS Professor Dr. Dave Olwell, left, INCOSE President John Thomas, center, and Dr. Art Pyster, of the Stevens Institute of Technology, right. (Photo courtesy of Olwell)

Launching in 2009, the BKCASE project involved the creation of a Systems Engineering Body of Knowledge (SEBoK) and the creation of an Advanced Graduate Reference Curriculum for Systems Engineering (GRCSE).

"This project will have a wide-ranging and deep effect on the practice of systems engineering," said Olwell. "It was completed on-time, on-budget, and exceeded expectations."

The SEBoK is the recognized and authoritative source of information on the systems engineering discipline, consisting of hundreds of articles, glossary terms and links to resources. GRCSE provides a standardized set of curriculum and content recommendations to align academia with current systems engineering research and to guide the development and improvement of graduate degree programs in systems engineering.

FACULTY news & notes



Graduate School of Business and Public Policy Associate Professor of Economics **David R. Henderson** recently had two articles published in The Wall Street Journal. The Jan. 19-20 article, "When the Rain Came Down," is a review of Alan Blinder's book, "After the Music Stopped." The Feb. 20 article, "An Economist Who Made the Science Less Dismal," was an appreciation of the work of the late Armen Alchian.

Operations Research Department Research Assistant Professor **Emily M. Craparo** recently received the 2012 Army Modeling and Simulation Award, Team Analysis division, for her work with collaborators from the Army's Training and Doctrine Command Analysis Centers in Ft. Leavenworth and White Sands.

Department of National Security Affairs Assistant Professor **Dr. Sophal Ear** recently released his second book in three months. His latest work, "The Hungry Dragon: How China's Resource Quest Is Reshaping the World," follows China's political and economic influence through the acquisition of natural resources around the world.

Department of Defense Analysis Assistant Professor **Sean Everton** released his new book, "Disrupting Dark Networks," late last year. The book is the first of its kind to apply Common Operational Research Environment Lab-developed methodologies to social network site analysis.

THIS MONTH ON INSIDE NPS

- Interview with NPS Interim President Rear Adm. Jan E. Tighe. (Part II of II)
 - Interview with Commander, United States Northern Command and North American Aerospace Defense Command Gen. Charles H. Jacoby Jr.
 - NPS Spotlight on student volunteers at Pebble Beach Pro-Am on efforts to support the La Mesa Elementary School by raising funds for art, science and math teachers.
- "INSIDE NPS" AIRS WEEKLY ON THE PENTAGON CHANNEL

NPS Developed Replenishment at Sea Program Could Save Millions

By Kenneth A. Stewart

Faculty at NPS have developed a shipping resupply program that aims to save the Navy millions of dollars in fuel costs.

Navy Cmdr. Walt DeGrange is part of a team of researchers that is rethinking the way naval vessels refuel and take on supplies. He and his team have developed an innovative program known as the Replenishment at Sea Planner (RASP).

“The idea is to plan optimal shipping routes that allow vessels to replenish at sea,” said DeGrange. “The U.S. Navy has the greatest naval capability in the history of the world because we can stay at sea indefinitely ... There are very few foreign navies that have this capability, it’s one of the things that makes our Navy so unique.”

NPS research associate, Anton Rowe wrote the detailed code that makes RASP work. “Everyone has seen video of the Air Force refueling in midair, this is the Navy’s equivalent of aerial refueling operations,” said Rowe.

Traditionally, navies have had to pull into ports to take on fuel and supplies. The U.S. Navy is different in that it forward deploys supply ships globally, and is able to conduct replenishment operations while fleets are underway. This ability increases the speed with which naval units can deploy and saves millions of dollars annually.

“The Replenishment at Sea Planner (RASP) creates a schedule that minimizes the distance that supply ships have to travel, and identi-

fies routes that allow vessels to travel at speeds optimal to fuel conservation,” said Rowe.

“The 5th Fleet out of Bahrain is currently using RASP,” added DeGrange. “In the past, planners had to sit down with a pencil and paper to plan out resupply routes and schedules — it was a very time consuming process. Utilizing RASP, planners can accomplish with a few keystrokes what took planners many hours to do by hand.”



Navy Cmdr. Walt DeGrange is part of a team of NPS researchers that is rethinking the way naval vessels refuel and take on supplies. (U.S. Navy photo by Javier Chagoya)

Planning supply routes by hand is not only time consuming, it is also prone to human error. If a planner makes a mistake, supply ships have to sail faster to catch customer ships. Increased speeds force vessels to burn more diesel, increasing fuel costs exponentially. RASP was designed at NPS utilizing software familiar to most planners, Microsoft Excel.

“The input is all of the customer ship schedules, supplies and ports,” said DeGrange. “You run the model and the output is a schedule that gives you the optimal routes. The RASP program can evaluate hundreds of thousands of possible routes and give the best option in a matter of minutes.”

The 5th Fleet in Bahrain launched RASP, Feb. 5. While it will be several months before final cost savings will be fully determined, DeGrange and his team are hopeful they will be in the millions of dollars.

Focus On ... Female Enlisted — IT and Flag Admin

A Monthly Look at Names and Faces on Campus

In celebration of Women’s History Month, three NPS female service members — Information Systems Technician 1st Class Angelica Santana, Yeoman Seaman Breana E. Ruiz, and Intelligence Specialist 1st Class Kelli Homza — share their thoughts on the rewards and challenges of their work as Navy Sailors.

From different backgrounds and points of views these women are proud of their service and the tireless efforts of those who came before them.

“I think it’s great to be acknowledged as a woman serving in the military,” said Santana, a systems administrator for Information Technology and Communications Services. “As a woman and a mother it can be difficult to meet the challenges that we face so its good to be recognized as we move forward in this career.”

Homza, the Leading Petty Officer for the NPS Special Security Office, notes that as with as much sacrifice as the Navy demands, she willingly accepts it.

“Being a mom in the Navy is hard because I constantly have to leave my kids,” said Homza, “but I enjoy my job and want to serve my country.”

As a young Sailor, Ruiz is only beginning her career in the Navy but already has ambitious goals for herself. An active member of the NPS community, Ruiz serves as a sexual assault advocate in addition to her duties as an administrative assistant.

“I love being in the military,” said



From left to right, Information Systems Technician 1st Class Angelica Santana, Yeoman Seaman Breana A. Ruiz, and Intelligence Specialist 1st Class Kelli Homza. (U.S. Navy photo by MC1 Leonardo Carrillo)

Ruiz. “Equality is very important to me, being in what is traditionally regarded as a man’s job.

“I like that we are starting to see more women involved and recognized as equal.”

Any Day at NPS ...



NPS Graduate School of Business and Public Policy student, Navy Lt. Kasey Carter, prepares for a day of "paying it forward" as a volunteer at the 2013 AT&T Pebble Beach Pro-Am, Feb. 5. Carter is one of several NPS students who are volunteering at the tournament in order to fund a full-time teaching position at the La Mesa Elementary School. (U.S. Navy photo by Natalie N. Stamey)

Republic of Korea (ROK) Army Maj. Gen. Inbum Chun speaks with NPS Assistant Professor Karen Guttieri during a campus visit, Jan. 25. Chun traveled to NPS specifically to observe and learn more about Guttieri's unique civil affairs and governance graduate education certificate programs, and to explore possible collaborations between the university and the ROK Army. (U.S. Navy photo by Kenneth A. Stewart)



NPS U.S. Army Foreign Area Officer Chair Col. Gary D. Espinas listens to comments by NPS alumnus, U.S. Army Training and Doctrine Command Deputy Commanding General and Chief of Staff Lt. Gen. David Halverson during a campus visit, Feb. 22. Approximately 200 Army officers are currently studying at the university, with an even larger number taking advantage of NPS' modular and certificate education programs. (U.S. Navy photo by Kenneth A. Stewart)

Retired Coast Guard Vice Adm. David P. Pekoske, a former vice commandant of the service, addresses homeland security students from local, state and federal agencies during a Center for Homeland Defense and Security course. (U.S. Navy photo by MCI Leonardo Carrillo)



NPS Interim President Rear Adm. Jan E. Tighe presents Professor Curtis Collins with the Navy's second highest civilian honor, the Navy Superior Civilian Service Award, during a ceremony celebrating Collins' retirement and 41 years of government service, Feb. 6. Collins spent 25 of his 41 years of federal service as an NPS professor. (U.S. Navy photo by MCI Grant P. Ammon)

STUDENT voice

By Lt. Art L. Zepf,
Co-Chairman, President's
Student Council

Since Kris and I took office in January, we have been actively pursuing subjects that you, the student body, find relevant. Below are two examples of current Student Council topics.

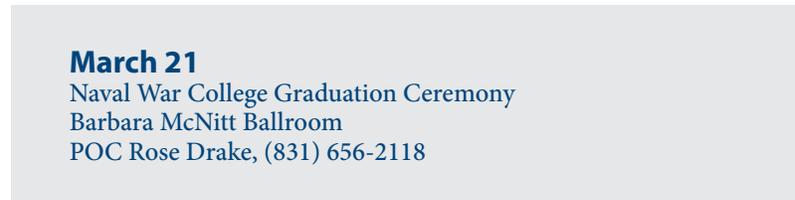
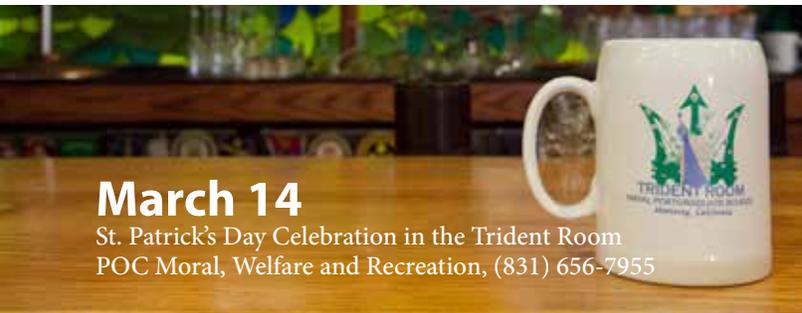
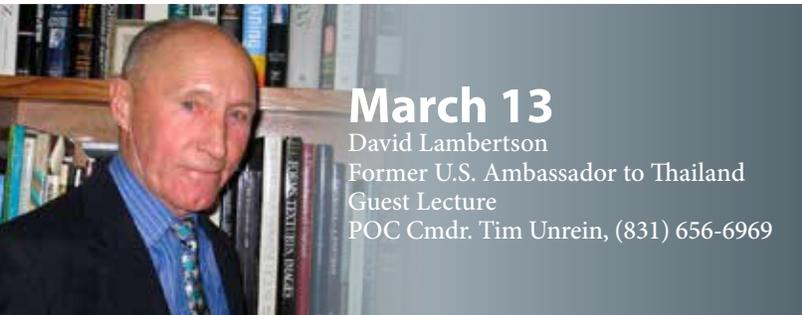
The Secretary of the Navy Guest Lecture Series is a crucial way NPS can have prominent figures and experts share their knowledge. There have been concerns about the frequency of the lectures and some of the themes that were discussed, therefore changes to the program are being worked out. If you want to get involved in the process, SGL nominations can be made by any member of the NPS community. There is a link on the NPS Intranet to make SGL nominations. Also, if after attending an SGL you would like to opine, please provide feedback by clicking the link just below the nomination form.

The council is also organizing volunteer work in the Monterey community at the Veterans Transition Center (VTC) in Seaside. The VTC mission is to provide services such as traditional housing, emergency resolution, and case management programs for Monterey County's homeless veterans and their families. They help assist veterans with short-term problems and provide them means to acquire employment. An NPS volunteer day is being planned for this quarter. Look-out for the announcement on the muster page.

If you are interested in getting involved in these topics or you have any other student-body related subjects, please contact me at alzepf@nps.edu or Lt. Kris Yost at klyost@nps.edu or attend the next PSC meeting, announced on the muster page.

Lt. Art L. Zepf is the Co-Chairman of the President's Student Council. Visit the PSC on the intranet at <http://intranet/psc/index.html>.

On Campus this Month



buy and sell your textbooks

www.nps.edu/CurStudents/BookExchange

STUDENT BOOK EXCHANGE
NAVAL POSTGRADUATE SCHOOL

Historical Highlights

The newest building on the NPS campus was named for Lt. Cmdr. Milton E. Reed, a military professor in the Naval Academy's Department of Marine Engineering and Naval Construction. Reed was designated the first technical head of the School of Marine Engineering, established by Secretary of the Navy General Order No. 27 in 1909.

Supported by an extensive library of technical engineering materials and laboratory facilities, Reed was charged with stimulating interest in engineering matters throughout the Navy and providing competent design engineers for the future in a 2-year program of experimentation, lectures, reading, research, and study.



"It is not expected nor intended by the Navy Department in the preparation of the curriculum for the school, that the forgoing work shall completely cover the post-graduate education to be given the student officers. Ample opportunity is given to them to develop

ideas or methods that they may originate or elaborate leading to better efficiency, design, economy, maintenance or operations." (Source: International Marine Engineering, July 1910, p. 281).

Historical Highlights are provided by the Dudley Knox Library.