



NAVAL POSTGRADUATE SCHOOL

IN REVIEW

JULY 2010

101 Years and Counting

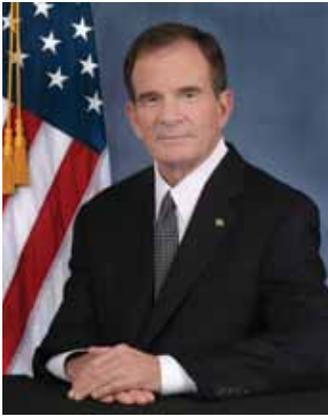
University brings a triumphant close to yearlong Centennial celebration

Inside:

Provost and Executive VP Ferrari
On the Value of Research

Annual Acquisition Symposium Promotes
Smarter Spending Across the Services

Students Develop 'Mobile
Afghanistan' Smart Phone App



Daniel T. Oliver
Vice Adm., United States Navy (Ret.)
President, Naval Postgraduate School

NPS must look farther down the road than just the end of this current year. What will our school be like in five, 10 or even 20 years? Who will our students be? What will be the defense and security needs of our nation? ... In order to help answer these questions, I have asked retired Admiral Jerry Ellis to chair a Committee on the Future.

PRESIDENT'S MESSAGE



Welcome to the beginning of NPS' next 100 years.

As you will see in the pages which follow, NPS celebrated the closing of its Centennial year in style with parties, the second annual State of the University Address, a community event on Memorial Day and a visit from an astronaut. And on June 9, following re-dedication of Spruance Plaza, we cut the cake in honor of our 101st birthday.

So what lies ahead for the Naval Postgraduate School? During the remainder of this year, we are continuing our preparations for the second and final part of our regional accrediting process. We will submit our Educational Effectiveness Review Report in early August. That will be followed in October by an on-site visit by a team from WASC (Western Association of Schools and Colleges). Thanks to the hard work of many of our faculty, administrators and staff, we believe that NPS is well prepared and has much to show our visitors in the areas of strategic planning, enhancing and documenting educational effectiveness activities and making improvements in business and administrative areas.

But NPS must look farther down the road than just the end of this current year. What will our school be like in five, 10 or even 20 years? Who will our students be? What will be the defense and security needs of our nation? How will we best support the defense community of our country and those of our partners? What curricula need to expand or even be created? Who will be our research partners? What will our funding streams look like?

In order to help answer these questions, I have asked retired Admiral Jerry Ellis to chair a Committee on the Future. Based on practices of other higher education institutions, this committee will try to answer those questions and develop a vision of what the future might bring. To assist in these efforts, the committee is comprised of members of our own Board of Advisors, other NPS faculty, administrators and students, and creative individuals from the defense and higher education communities. Their initial report to the Strategic Planning Council is expected in January 2011.

Using results from that effort, the Strategic Planning Council will turn next year to developing our next five-year strategic plan. Our current plan has served us well and guided NPS to expand both education and research efforts into new areas – geographically as well as programmatically. The next strategic plan must not only build on our legacy but mark a path to the future in which NPS will be recognized as the truly great institution it is.

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ON THE COVER

The Stars and Stripes waves majestically above a sea of red, white and blue during the annual Concert on the Lawn in front of Herrmann Hall on the university campus. A plethora of patriotic tunes filled the ears of thousands during the yearly community affair – but this one was special as it would be the final event of NPS' yearlong Centennial Celebration, honoring 100 Years of Excellence Through Knowledge.

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Published by the Office of Institutional Advancement

UNIVERSITY NEWS



Business School Ranks in U.S. News and World Reports' Top 50

U.S. News and World Reports slotted NPS as the 45th best university in the nation for graduate programs in Public Administration in its annual graduate school rankings.

"This ranking is based entirely on the judgment of other Deans and program directors. As such, it measures our reputation with our peer institutions," said Graduate School of Business and Public Policy Dean Bill Gates. "For a niche program such as ours, and one of the only programs that includes an MBA degree, this is a particularly noteworthy accomplishment. It also shows the value of our outreach efforts with our public administration peer institutions."

Each year, *U.S. News* ranks professional school programs in business, education, engineering, law and medicine. According to the publication's Web site, the rankings are based on two types of data: expert opinions about

program quality and statistical indicators that measure the quality of a school's faculty, research and students. These data come from surveys of more than 1,200 programs and some 12,400 academics and professionals that were conducted in fall of 2009.

Students' Smart Phone App Maps "Human Terrain"



Marine Corps Capt. Carrick Longley

Thanks to a faculty-student team at NPS, smart phones will play an even greater role in field-

based data collection for a variety of missions, from humanitarian assistance and disaster response to counterinsurgency operations.

The prototype of a new smart phone application, called Field Information Support Tool (FIST) Light, was developed by two NPS students – signals intelligence officer Marine Corps Capt. Carrick Longley and Army CW3 Chad Machiela – under the guidance of Information Sciences Research Associate James Ehlert along with Defense Analysis Department Prof. Nancy Roberts and Assistant Professor Sean Everton. Longley conceptualized and designed the knowledge management system for his master's thesis in Information Warfare Systems Engineering, and Machiela developed its ethnographic socio-cultural module.

"FIST fundamentally changes the way we collect, process, analyze, aggregate, display and disseminate data in a variety of environments by leveraging the power of smart phones for field-based data collection and fused situa-

tional awareness," Ehlert said. "It's an easy-to-use, inexpensive handheld solution to achieving communications interoperability and a common physical and human terrain operating picture for both on-the-ground field collectors and tactical decision makers."

Building on a previously developed system at NPS, FIST enables data to be collected in the field, sent to a remote server and pushed to existing databases. Additionally, it enables data manipulation by exporting data into native formats for various analysis applications.

"FIST is the result of a bottom-up process, based on the field experience both Chad and I had in Iraq," Longley stressed. "When I was a radio reconnaissance platoon commander and then an officer-in-charge during combat operations in Operation Iraqi Freedom, I asked myself, 'There are thousands of smart phone apps. Why can't there be one that makes it easy to pull together and visualize all this data we're collect-

Army Chief of Staff Gen. George Casey Addresses NPS Community

NPS students, staff and faculty gathered to see Army Chief of Staff General George W. Casey offer a hopeful and focused look at the future of the Army and its role in the big picture of the U.S. military. During his visit on May 13 as a Secretary of the Navy Guest Lecturer, Casey expressed his gratitude for the men and women in uniform, and the challenges they continue to face.

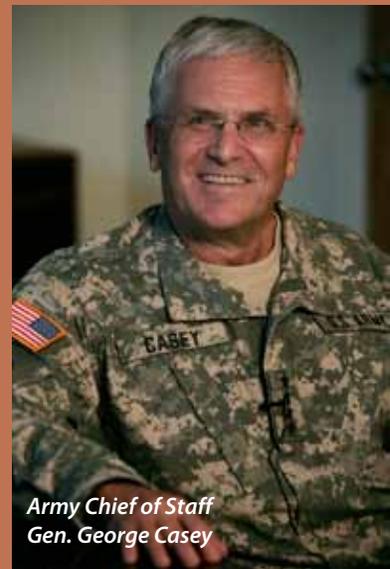
"The quality of the young men and women coming into today's Army is as good as it's ever been and I couldn't be prouder. Because they all come in knowing that they are going to war," he said.

"A lot of people talk about how slow the army was to change," said Casey. "We've gone from a force that knew relatively little about counter-insurgency as an institution in 2003/2004, to being the best counter-insurgency force in the world, bar none, in a five-year period. And I've been very impressed with how the Army has changed and adapted. I think it's a credit to the young men and women who have been leading this change."

Adding to the demand, the services are stepping up to help others, creating a global need for competent leaders. As a former Foreign Area Officer, Casey understands the need for officers to not only be experienced as soldiers, but also as culturally-astute leaders creating better understanding across boundaries.

"Because of the complexities that we see in the environment we're facing – and it's only going to get more complex as we go to the future – we need leaders of character and competence who are supremely competent in their core proficiencies and broad enough to do a range of things," explained Casey.

"It's the leader that needs to grasp the situation and chart a course through the complexity. And if he's not competent and confident, and broad enough to think his way through tough problems, then we won't get what we need to get ... leadership is going to be key to our continued success in the 21st century security environment."



Army Chief of Staff Gen. George Casey



ing?’ So we designed a customized software solution to meet our own operational need. If we’d had FIST then, we could have gotten them to a much larger collector team, and had a much wider and deeper sensor network.”

Renowned Scientist Amory Lovins Promotes Cleaner, Safer Resources



Rocky Mountain Institute Co-Founder Amory Lovins

If energy conservation was a competition, Amory Lovins is the man everyone would want on their team. He is one of the leading scientists in the energy community, co-author of *Winning the Oil Endgame: Innovation for Profits, Jobs and Security*, and one of *Time* magazine’s 100 most influential people in the world in 2009. Lovins fittingly addressed the NPS community just two days before Earth Day as the Secretary of the Navy Guest Lecturer, April 20.

Hosted by NPS’ own Cebrowski Institute, Lovins is widely known for his work with the Rocky Mountain Institute. “The Rocky Mountain Institute, which I co-founded in 1982, is an independent entrepreneurial non-profit think-and-do tank. Our mission is to drive the efficient and restorative use of resources,” he noted. “We do solutions not problems. We are practitioners, not theorists. And we do transformation not incrementalism.”

In 2004, when the Rocky Mountain Institute released *Winning the Oil Endgame*, Lovins received funding from the Pentagon, the world’s largest oil buyer, to outline a plan for making the United States oil-free through the use of modern technology and smart business strategies. “We’ve had a remarkable consistent vision of the kind of world we are trying to help create. Our current statement of that is a world thriving verdant and secure for all forever,” he said. “And the best way we know to do that is to create abundance by design. That is, turn scarcity by un-intention into abundance by design. By using a different kind of design called integrative design, to achieve very large savings of energy and resources.”

During his lecture, Lovins spoke about the importance of establishing efficient resources and methods in the battlefield. Dependence on an electricity grid and fuel supply is not only costly but leaves troops vulnerable to attack. While stationed in or near hostile territory, troops must worry about interruptions in supply, threats to fuel convoys, and navigating difficult terrain with limited resources. He notes an additional expense and safety risk in protecting the resources both in transit and on-site.

“We found that the Department’s mission has incurred a huge cost in blood and treasure and lost combat effectiveness due to the waste of energy throughout the battle space, and the almost complete dependency of fixed facilities on a very vulnerable electric grid,” Lovins explained. “There are solutions to both of these problems. They create revolutionary gains in capability. The cost will be comparable or lower in capital and much lower in operations. No trade-off, no compromise.”

Area Students Get a Call from Orbiting Space Shuttle Discovery

More than 1,000 students, parents and members of the NPS community packed King Auditorium on an early April Saturday morning where they received a call from the Space Shuttle Discovery orbiting more than 200 miles into space – part of the NPS Centennial’s Education Downlink STS-131, Teaching from Space event.

Shuttle Commander and NPS graduate, Navy Capt. Alan “Dex” Poindexter, along with Mission Specialist Dottie Metcalf-Lindenburger and Pilot Air Force Col. Jim Dutton, engaged the audience in a lively discussion about their mission and the realities of weightlessness in space, while students were also allowed to ask questions of their own.

NPS’ own resident astronauts, Space Systems faculty Jim Newman, Dan Bursch and John Phillips – all veteran space travelers – opened the event sharing with the students their own experiences in outer space, and gave them a preview of what to expect from the downlink.

Students were immediately introduced to the visually-stunning impact of weightlessness as Metcalf-Lindenburger’s hair floated wildly in all directions while Poindexter was suspended upside down. But in spite of the fun, and great questions from the students such as whether or not the crew had seen any aliens, the downlink is really about education and opportunity.

NPS boasts more astronaut graduates than any other graduate-level institution in the world. “This event was a wonderful opportunity to showcase our university and the impact we can have on individual lives,” said Director of Alumni Relations Kari Miglaw. “I saw a lot of amazed faces in the crowd today, and I wouldn’t be surprised at all if in 20 years, one of these students here today returned to NPS to study Space Systems along his or her own journey to becoming a next generation NASA astronaut. Inspiration is powerful, and I think we inspired a few students today.”

A big hit with the students was when Mission Specialist Dottie Metcalf-Lindenburger (left), a high school teacher in Vancouver, Wash., floated a snack across the screen to the waiting mouth of Pilot Air Force Col. Jim Dutton (right).



FACULTY SHOWCASE



DRMI Faculty Develop Course for Iraqi Ministries

The Defense Resources Management Institute (DRMI) hosted 33 senior members of Iraq's government and military at NPS May 3-21 for an intensive three-week course tailored specifically to the Iraqi Ministries.

Iraq's Ministry of the Interior and Ministry of Defense each had participants in the course, from unranked civilians through general officers, male and female, from economists to engineers.

"They want to implement their own 'Train the Trainer' style of education and training," said Steve Hurst, a Senior Lecturer for DRMI. "Nothing's simple. We've set in place a really comprehensive plan."

All of the interaction between DRMI and Iraq's government was due to the determination of Melissa Henton, who had been assigned as staff for the Under Secretary of Defense for Policy and Global Security during Operation Iraqi

Freedom, Hurst explained.

"A few years ahead of her time, Ms. Henton had the vision to see that our efforts in Iraq to bring a lasting peace would only be successful if we followed our mission to defeat terrorism with an equally determined program to introduce Iraqi government ministries to the latest and best international business practices," he said.

While Iraq has allowed select members of its military to study at NPS before, DRMI's Iraq Resources Management Course has been one of the first successful attempts to host a large number of Iraq's government and military members for an extended period of training in the U.S.

"If you take them out of Baghdad, and they realize there's not a checkpoint on every corner, maybe we're exposing people to more than just textbook knowledge here," said Hurst.

The three weeks in Monterey represented only a small portion

of DRMI's interaction with the Iraqi government. Since the beginning of DRMI's involvement, Hurst has made 10 different trips to Iraq on 10 different educational missions, with the rest of the team making similar commitments.

"With our work in-country and now with participants coming to our course here, we've been afforded the direct opportunity to make a difference in relationships for this and future generations," Asst. Professor Jason Hansen said.

Three NPS Faculty Win Prestigious DURIP Awards

Three Naval Postgraduate School faculty members have been selected to receive prestigious Defense University Research Instrumentation Program (DURIP) Awards for fiscal year 2010: Mechanical and Aerospace Engineering (MAE) Distinguished Professor, MAE Department Associate Chairman and Director of the NPS Spacecraft Research and De-

sign Center Brij Agrawal; Professor of Oceanography and Director of the NPS Coastal Ocean-Acoustic Center Ching-Sang Chiu; and Center for Interdisciplinary Remotely Piloted Aircraft Studies (CIRPAS) Research Associate Professor and Chief Scientist Hafliði "Haf" Jonsson.

Part of the University Research Initiative, the awards fund the acquisition of new research equipment by U.S. institutions of higher education to enhance their ability to conduct research and educate scientists and engineers in areas of importance to the national defense.

Agrawal will use his \$300,000 Office of Naval Research (ONR) grant to fund the purchase of a ship motion simulator for the NPS Spacecraft Research and Design Center's laser beam control test bed.

"We need to be able to mount the beam control test bed on a device that reproduces a ship's motion in order to test the con-

NPS' Tornado Chasers Use Advanced Radar to Improve Forecasting

Research Associate Professor Bob Bluth and Radar/EW Lab Director Paul Buczynski are true tornado chasers, spending several weeks in and around Oklahoma with NPS' Mobile Phased Array Radar truck to track and record one of nature's most deadly forces.

The effort is part of a large, multinational experiment titled VORTEX2 now in its second year. More than 150 researchers from universities and government organizations across the U.S and Canada descend upon the Midwest and "tornado alley" with nearly 30 different types of sensors and radar systems. Sponsored by the National Oceanographic and Atmospheric Administration, National Weather Service and the National Science Foundation, VORTEX2 is widely considered the largest and most comprehensive tornado research effort ever.

"The purpose is to surround a tornado with as many sensors as possible and collect as much data as possible," said Buczynski. "Each sensor will collect a

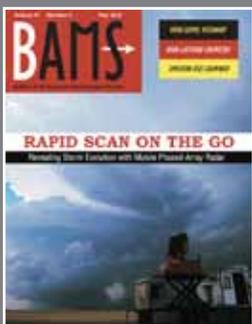
very specific type of data and when [you] fuse all the data together you may have an answer" as to why and under what precise conditions tornados form, he added.

Researchers hope that with a deeper scientific knowledge of tornados and the factors that lead to them, great improvements can be made in advance warning systems.

"Right now, they can issue watches and a warning when they think something may happen," said Buczynski, "but truly they only have a true 5-10 minute warning when a tornado is going to form. Just think if you can issue a true 30-minute warning how many lives could be saved?"

The Mobile Phased Array Radar system, owned by NPS' Center for Interdisciplinary Remotely Piloted Aircraft Studies (CIRPAS), has been modified over the last several years into one of the most capable radar systems in the world, according to CIRPAS Director Bluth. In fact, the radar system is the cover story of the May edition of the *Bulletin of the American Meteorological Society*, widely considered as the leading publication in the meteorology discipline.

NPS' Mobile Phased Array Radar truck tracks a powerful storm moving through the Oklahoma plains in support of VORTEX2, one of the largest, most comprehensive tornado research projects ever undertaken. The radar system was the subject of the cover story of the May 2010 edition of the Bulletin of the American Meteorological Society. (Cover image provided courtesy of the Bulletin of the American Meteorological Society.)



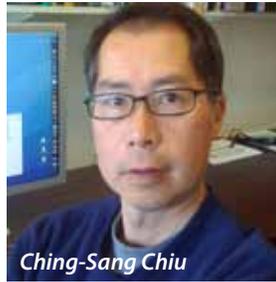
FACULTY SHOWCASE



Hafliði Jonsson



Brij Agrawal



Ching-Sang Chiu

control algorithm,” Agrawal said. The software program compensates for the ship’s motion so that future shipboard anti-missile weapons like the Free Electron Laser being researched at NPS can hit their targets.

Chiu plans to use his \$278,000 grant, also from ONR, to acquire two moored wide-band sound sources that will enable shallow-water acoustic propagation experiments in non-U.S. waters covering the upper half of the low-frequency range.

“These compact, highly efficient, portable sources with 500-800 and 800-1200 Hz sweeps will

greatly enhance the frequency coverage and diversity of the existing pool of moored sources available to the U.S. shallow-water acoustics research community,” Chiu explained. Chiu has participated as a lead scientist in almost all of the shallow-water acoustic propagation experiments sponsored by ONR in recent years, including the Barents Sea Polar Front Experiment and Asian Sea International Acoustic Experiments.

Jonsson will be using his DURIP grant to purchase a suite of atmospheric sensors – including advanced thermometers and pressure and radiation sensors – as well as

satellite communications capability to renew and enhance the payload of CIRPAS’ “Twin Otter” low- and slow-flying aircraft.

“The new satellite communications will enable us to watch in real time on the ground what the instruments are measuring in the atmosphere, from a laptop via the Web,” he said. “This eliminates the need for a flight scientist on the plane, which frees up more space for the scientific payload. The grant will also help us maintain the airplane, so we can keep the research going.”

Prof. Awarded Fellowship in Terrorism Studies

The Foundation for Defense of Democracies, a non-partisan policy institute headquartered in Washington, D.C., has named De-

fense Analysis Associate Professor Douglas Borer an “Academic Fellow” for 2010-11. Borer traveled to Israel in early June for an intensive course in terrorism studies, and in particular, how democracies can defeat the worldwide terrorist threat.

Nancy Haegel Honored with Local Teaching Award

Distinguished Professor of Physics Nancy Haegel was honored as one of 21 Monterey Peninsula teachers selected to receive awards for their excellence in teaching, positive impacts on their students and fellow educators, and for serving their communities off campus. The Allen S. Griffin Awards for excellence in teaching at the high school through post-secondary school levels, established in 1982, was created by a bequest from the late Col. Allen Griffin, founder and former publisher of the local newspaper, the *Monterey Peninsula Herald*.

Team Boosts Basic Trainee Performance With “Smart” Sleeping

The Army calls on its Soldiers to “be all you can be.” In a major step to bring this slogan to life, an NPS team has found that shifting the sleep schedule of new recruits to better match their natural biological rhythms can have an immediate positive impact on training effectiveness and performance.

Operations Research Associate Professor Nita Miller and Senior Lecturer Lawrence Shattuck, along with NPS doctoral student Air Force Lt. Col. Anthony Tvaryanas, compared the improvement in marksmanship and mood scores of two groups of Fort Leonard Wood “boot camp” Soldiers – a control group subjected to the traditional 4:30 a.m. rise time and an experimental group whose bugle call was moved to 7:00 a.m. Each group consisted of about 200 basic combat trainees with a median age of 20.

The results were striking. The intervention group slept an average of 5.9 hours versus 5.3

hours, just a half an hour longer than the control group, but resulting in better sleep hygiene and more efficient sleep, according to Tvaryanas.

“By their own self-reports, the intervention group woke up more rested and in a better mood with better motivation, and their marksmanship scores improved faster and more overall,” he said. “By chance, the experimental group started with lower marksmanship aptitude but improved quickly, and the rate of improvement was positively correlated with sleep.”

“Army basic trainees are teenagers, and teenagers are ‘owls’ – they naturally go to sleep late and get up even later,” Miller said. “If you adjust the sleep schedule so it lines up with their physiology, they do better on a whole range of measures.”

Tvaryanas added, “In this study, we didn’t add more sleep, we only shifted the schedule, which resulted in Soldiers

getting more actual sleep with positive effects on learning and performance without necessitating any change in the content or duration of training activities.”

The sleep study was championed by then Commanding General of Ft. Leonard Wood’s U.S. Army Maneuver Support Center, Maj. Gen. Gregg Martin, who stressed the importance of the military’s teaming with industry and academe to harness the nation’s brainpower.





On the Value of Discovery

“In a time when we’re asking our senior officers to wrestle with challenges that the nation, and the world, just hasn’t seen before, it takes a special skill set, and a special set of technologies ... and NPS is going to help us get there. [NPS] is where we form the truly thinnest part of the triangle, and ask them to lead us into the next decade.”

*The Honorable Juan M. Garcia, III
Assistant Secretary of the Navy*

By Provost and Executive Vice President Leonard A. Ferrari

The Naval Postgraduate School is a unique combination of historically distinct and well-entrenched cultures – I cannot think of any organization that has quite the same blend of defense establishment with traditional, high-level academia. We are fortunate that our university has such a clear and concise mission to guide us, and that we remain so faithfully driven by that mission.

As with any combination of firmly rooted cultures, there are sometimes differences in the application of our collective values. I was recently asked why the Naval Postgraduate School spends such a great effort in its operationally-inspired research; why our faculty and students exert so much time into the research endeavor; why we allocate extensive resources – physical, financial and emotional – to the power of discovery, and why this needs to be a part of our educational process. In short, could we succeed without it?

To the traditional academician, these questions have clear answers. To the traditional defense establishment, however, they are questions legitimately posed. In a historical sense, the United States Armed Forces, perhaps any nation’s military, rises to excellence through the effective application of training, discipline, and a cohesive bond of ideals. Sailors, Soldiers, Airmen and Marines are excellent operators because they are well trained to execute precisely what has and will be asked of them.

Students at the Naval Postgraduate School, however, are not returning to the fleet or battlefield, Pentagon or combatant command to simply follow those around them. Graduates of this university will often not just be executing the known steps of the exercise or operation before them. They will be called upon to find innovative solutions, work collaboratively on wicked problems and communicate these to superiors and subordinates in a clear and effective manner.

We educate so the Navy, Marine Corps, Army and Air Force officers, DoD civilians and even international partner officers who depart Monterey with an NPS degree will be the ones standing at the forefront. They will be the leaders; they will be the decision-makers answering the questions we have yet to ask; and they will need to be prepared.

The value of education is undeniable – as evidenced by the comments on these pages of a few recent visiting Naval and defense leaders to our campus. But to educate at the graduate level, we must challenge the student to engage their critical thinking ability in a manner they have never been required to before. In the classroom, this is achieved through the rigorous curricula for which NPS has come to be well known.

Beyond the classroom, however, it is the research and operational support endeavors that create a forced independence in discovery, daring the student to contest his or her own preconceived notions and ideas.

“There are very few things that are more important than advanced education, the Navy and Marine Corps is really shifting on this. I believe this is a grand transformation for the Navy ... Trying to understand that grand shift and what it means, we need to have smart young officers who have operational experience and can apply that operational experience ... so that we can move forward. The payoff we get in the Navy by investing in education is enormous.”

*The Honorable Robert O. Work
Under Secretary of the Navy
Space Systems Operations, 1990*

On the surface, a master's or doctoral thesis is simply the development of the solution to a new question that the student is compelled to answer. But it is also an examination in great detail of every implication of that question; a compulsory application of those invaluable critical thinking skills in the very specific and demanding field they have been studying in their NPS graduate studies.

But beyond all of this ... what is so valuable about the research effort, what makes it truly necessary to the path of education, is that these are questions that have never been answered before. And working through questions that have not been posed previously is exactly what true leaders are required to do.

As noted, any academic will tell you the role of research is well intertwined within the fabric of education – it is intrinsically inseparable. But there are times when we need to be reminded about why we give so much of ourselves to the effort of research and what lies beyond the exercise of critical thinking.

In the simplest of terms, research fulfills the mission-critical needs of the Departments of Defense and Navy, the agencies of the U.S. government as well as those of our allies, enhancing our national security. A few examples ... research at NPS breaks new ground in how DoD/DoN acquire all things – one of Secretary Ray Mabus' top agenda items; it creates smart phone applications that intensely benefit the operational warfighter in Afghanistan; and it creates a complete shift in the understanding of littoral rip currents – and these are just the examples provided in one issue of this magazine.

A vibrant and relevant research program helps recruit world-class faculty – something that has become a hallmark of the Naval Postgraduate School. It is a constant and unrelenting safeguard to the quality of our curricula; and it meets the accrediting standards that require our faculty to remain on the cutting-edge of their given fields.

At NPS, faculty should and do have the academic freedom to pursue relevant research in support of the school's broad national security mission. Operationally-relevant research is primarily supported by external funds, sought by and awarded to Principal Investigators with valuable expertise in the given field. Programs and projects are screened and reviewed by Chairs, Deans and the Vice President of Research to ensure academic rigor, student involvement, and relevancy to national security.

And, because most NPS research is reimbursably funded and supported by the Department of Defense and the national security enterprise, only space and time – not dollars – dictate the extent of research produced at our university. Without the variety of reimbursable programs at the school, the advancements and maintenance

Students work with the next generation of space research vehicle, CubeSats, in NPS' clean room. Upon touring the facility and learning of its research, Under Secretary of the Navy, The Honorable Robert O. Work stated, "That kind of research, that kind of infusion of smart young officers back into the operational forces is just invaluable."

Naval Postgraduate School

"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. Michael Mullen

Chairman, Joint Chiefs of Staff

Operations Research, 1985

of our superb programs would very likely erode over time.

Nowhere else but at NPS is a university's mission so intrinsically connected to operational relevance. Our students are officers whose personal skill sets and varied experiences in the battlefield bring a distinct focus, discipline and determination in the pursuit of their studies, and their research. At the same time, our faculty bring dual expertise to the teaching and research they perform, coupling military knowledge with adroitness in their respective fields.

The reality is, master's level education alone cannot satisfy the NPS mission of education and research in support of the United States military and our allies, nor can it maintain the expertise of our faculty and the quality of our programs. Integral to the bestowment of an NPS graduate level degree is an uncompromising demand of operationally-relevant student research in every thesis or dissertation topic.

NPS is, in the truest sense, a research university ... One that has never been more closely aligned with our guiding mission. In many cases, if NPS were not conducting research in a number of specific areas, the research would be conducted by others who would not possess the technical and operational expertise found at the Naval Postgraduate School. From the institution's strategic planning to its curricula development, to its faculty publications reporting on vital research, the heart of this institution is centered in our service to the Departments of Defense and Navy, the U.S. Federal Government and our global partners. And all of this is done to improve the national security of the United States, and of our partners worldwide.



Research Revolutionizes Understanding of Rip Currents

By Barbara Honegger

In surf zones near the Naval Postgraduate School and around the world, NPS Oceanography Assistant Professor Jamie MacMahan is quietly revolutionizing the understanding of rip currents, transforming

the perception of these dangerous currents from that of a swimmer's worst nightmare into knowledge that could be a potential life-saver.

MacMahan, an expert in near-shore and wave processes, discovered a fresh approach to researching littoral rip currents. Instead of expensive GPS sensors that relay position data in real time, MacMahan and his students mount low-cost GPS devices with memory cards inside swarms of drifters whose brightly-colored florescent poles bob in the waves like giant pick-up sticks. The dozens of position-tracking sensors are then retrieved and their saved location and velocity data processed to reveal detailed surf zone flow patterns across various wave and tidal conditions.

This approach yielded a much more comprehensive data set, and in the process produced a paradigm-shifting discovery. The conventional view of rip currents – that they're fast, narrow flows moving away from shore – is dangerously incomplete. Rather, they're a system of giant whirlpools whose circular eddies can also act like conveyer belts carrying a swimmer who treads water safely back to shore.

"Finding a way to make inexpensive GPS-enabled drifters, where you can field 40 or 50 instead of just four or five, has filled in the voids of the traditional view of how the surf zone flow field behaves," he said. "That first view was that everything in the rip current goes out to sea, where we now know that only 10 to 20 percent exits the surf zone. That's a major advance in understanding."



Naval Postgraduate School Oceanography Assistant Professor Jamie MacMahan revolutionized our current understanding of rip currents by discovering a fresh approach to researching the littoral phenomena, mounting low-cost, highly specific GPS devices with memory cards inside swarms of brightly-colored drifters.

“The whole idea is to keep the drifters cheap and then do aggressive analysis afterwards,” explained MacMahan, who won NPS’ Menneken Research Award in 2009. “The cost breakthrough came when I found a hobbyist GPS with a geo-caching memory card and was able to do some tweaks on it, which brought the cost down to only \$350 per unit, compared to \$3,500 to \$7,000 for traditional GPS-enabled drifters. Because they’re so cheap, we toss them into the surf and don’t mind losing some, but we usually get them all back”

The Naval Postgraduate School’s GPS-enabled drifters are also highly accurate, tracking horizontal position to within 40 centimeters and measuring current speed to within 1 centimeter per second.

“This new view matters because rip currents are the third deadliest natural hazard in the U.S., after heat waves and floods, and kill more people in Florida than lightning, hurricanes and tornados combined,” MacMahan noted. “Each year in the U.S., 18,000 swimmers and divers have to be rescued from these currents, representing 80 percent of all surf zone rescues, and 100 of them drown. We’re working with lifeguards on how to integrate the new view into their training and public awareness campaigns.

“But understanding the mechanisms behind rip currents is important not just for swimmer and beach safety,” MacMahan stressed. “It’s also important for tracking and predicting the trapping of pollutants from rain runoffs and other sources and harmful algae within surf zones, and thus for water quality and sea biology. It used to be thought that these currents carried all the ‘bad stuff’ out to sea, but now we know that they don’t. Depending on the location and conditions, only about 16 percent of floating material is ejected from the surf zone each hour. And this doesn’t happen continuously, but only every five to 15 minutes, and material is transported out to only about two surf zone widths.”

In addition to the drifters, which give a two-dimensional velocity profile, MacMahan and his team are also now using dye and dye sensors, which can pick up parts per billion, to get a 3D view of current flows in and out of the surf zone. “The dye represents tiny sea creatures and pollutants,” he said. “We’re working with biologists under NSF [National Science Foundation] sponsorship to see how and how fast they’re moved out of it, and how and how fast they come back into it.”

In June, MacMahan expanded the 2D surface drifter work using dye tracers in another surf zone field experiment in Sand City, Calif., and yet another at the Carmel River State Beach next year.

With Office of Naval Research sponsorship, MacMahan’s team has also used drifters to study river currents for naval operations. “We’ve deployed in rivers all over the U.S.,” he said. “Drifters are an inexpensive way to estimate river velocity, but they don’t work well for meandering rivers, because as soon as they go around the first bend, they flow towards the bank and tend to get stuck. They’re fine for studying river mouths, where fresh water flows meet the ocean.”

MacMahan is also now deploying smart underwater autonomous vehicles (UAVs) and dye tracers in river field experiments to evaluate river hydrodynamics and validate numerical models.

“My primary role is as a field experimentalist,” MacMahan said. “I go out and collect observations to validate theory or models using unique platforms – UAVs, autonomous catamarans and personal watercrafts [jet skis] – that get away from all the traditional approaches to increase our understanding. Field observations are critical for validating models, and every time we do an experiment, we find new things. But that’s only half the picture. I work closely with Professor Ad Reniers of the University of Miami, a former NPS postdoctoral fellow, who’s a numerical modeler. In the U.S., we’re a very unique team. Rip currents have been studied since the 1920s, and you never- know when that fundamental paradigm shift will occur.”



Doctoral Student Receives Prestigious National Fellowship

Oceanography doctoral student Jenna Brown has been selected by the Office of Naval Research to receive the highly competitive National Defense Science and Engineering Graduate Fellowship. Brown successfully competed with more than 2,400 applicants for the prestigious three-year grant, which covers full tuition, fees and a stipend.

“I was surprised and honored to hear that I’d received the award,” Brown said. “I can now support myself while supporting [dissertation adviser Oceanography Assistant] Professor Jamie MacMahan and his great field research program.”

The mission of the fellowship program, sponsored and funded by the Department of Defense and administered by the American Society for Engineering Education, is to increase the number and quality of U.S. scientists and engineers. Applicants are evaluated based on a rigorous assessment of their academic ability and future potential in fields of interest to DoD.

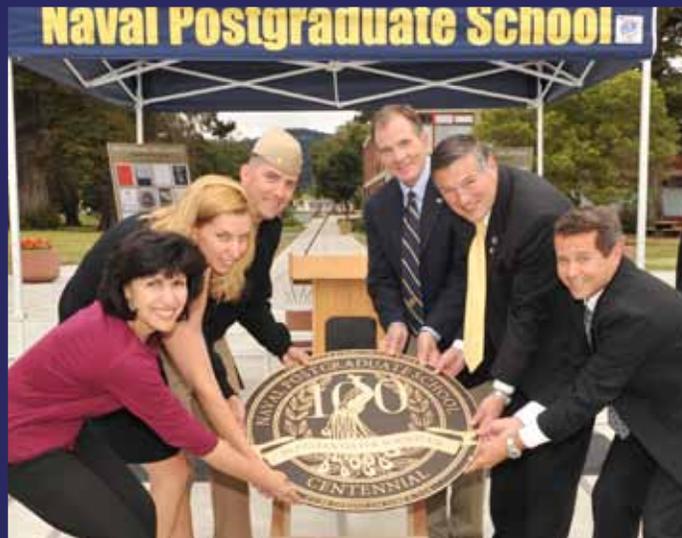
Brown’s doctoral research, which began last summer, is on mapping the three-dimensional structure of rip currents and the exchange of materials in and out of surf zones.

“I really like doing field work, especially under Professor MacMahan, who’s a world leader in rip current research and whose energy and dedication make it both educational and enjoyable,” Brown said. “I like all the instruments and equipment we use to take measurements, and the variety of platforms, like USVs [unmanned surface vehicles] and AUVs [autonomous underwater vehicles] we get to use in the research.

“It’s really exciting to conduct this field research, which provides a better understanding of what happens to pollution deposited in the oceans and can be used to quantitatively evaluate human health hazards and protect wildlife and delicate ecosystems,” Brown said.

Brown plans to publish the results of her Ph.D. research in scientific journals and present her findings at international conferences and to health and environmental organizations.

NPS Celebrates "That Was the Year"



(top left) The Barbara McNitt ballroom returned to the elegant glory of its past as more than 200 members of the NPS community danced the night away at the Centennial Finale Gala, raising their collective glasses in "Toasting the Next Century."

(top right) The NPS Color Guard, in perfect unison, kicks off the 2010 edition of NPS' popular annual Concert on the Lawn. The yearly tradition packed the grounds surrounding the front of Herrmann Hall while the Monterey Bay Symphony played a variety of patriotic music.

(bottom left) NASA Astronaut Navy Capt. Alan Poindexter, NPS alum and Commander of the recent Space Shuttle Discovery mission, served as a guest of honor for the Centennial Finale, outlining his latest mission to the International Space Station to attendees during his lecture in the ME Auditorium.

Year That Was!" Centennial Finale



"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

By Barbara Honegger

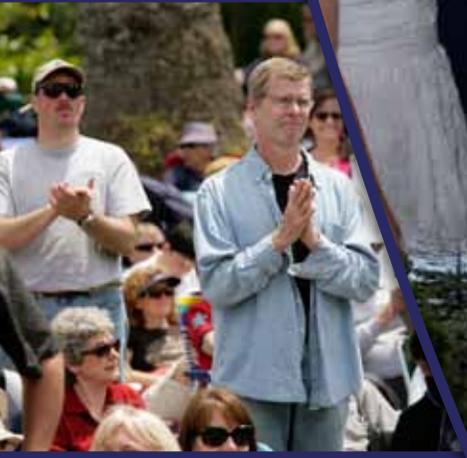
From a personalized message from the International Space Station to the final triumphant flourish of John Philip Sousa's "Stars and Stripes Forever" conducted by his own great granddaughter, the Naval Postgraduate School celebrated the week that was, of the year that was, of the century that was in its Centennial Finale, May 27-31.

As the Del Monte Brass band played "Anchors Away," the close of the university's first 100 years kicked off with a welcome by Centennial spokesperson and NPS National Reconnaissance Office Chair Professor Dan Bursch in King Auditorium, May 27.

"Of all my accomplishments in 26 years of service as a naval flight officer and astronaut, one of my proudest achievements is earning my graduate degree [Engineering Science, 1991] from the Naval Postgraduate School," Bursch told the packed audience of students, faculty and staff before introducing President Dan Oliver for the State of the School address, "A Year of Tradition, Celebration and Discovery"

(bottom center) On the university's actual 101st birthday, NPS officials dedicated the Centennial Time Capsule and renovated Spruance Plaza in the final Centennial event. Shown, left to right, are Mary Jo Avila, owner and president of MJ Avila Company which is responsible for constructing the plaza and burying the time capsule; Kari Miglaw, Director of Alumni Relations and Centennial Planning; Lt. Cmdr. Matt McCann, Public Works Officer in Charge; Daniel T. Oliver, NPS President; Pete Dausen, NPS Base Director; and Dan Bursch, National Reconnaissance Office Chair Professor.

(bottom right) One of the Concert on the Lawn's guests of honor, Monterey Mayor Chuck Della Salla, welcomed the near 2,000 guests filling the grounds near Herrmann Hall.



“Thank you for joining us on this remarkable weekend as we bring to a close our Centennial Celebration and embrace the beginning of our second century of providing unique, defense-relevant education and research,” Oliver opened. “It was one year ago that we gathered in this very auditorium to launch a yearlong commemoration, and it has been a truly remarkable year.

“This Centennial year has given us a renewed sense of purpose,” he continued. “We held our first-ever alumni reunion and are building an annual tradition with the events you are all here for today. We showcased some of our university’s greatest assets – our students – to leaders throughout the defense infrastructure in Washington, D.C. We held an Astronaut reunion, inviting our long list of 38 space-travelling alumni back to campus, and hosted an educational event directly from the International Space Station to nearly 1,000 local 8th graders here in King Auditorium ... And we placed a lasting memorial timeline stretching the length of Root Hall that will forever honor our history.”

To a backdrop of colorful, action-packed slides, Oliver showcased outstanding examples of defense-relevant research by the university’s “greatest assets,” its students and faculty; its state-of-the-art technology and infrastructure; and the strategic planning and resources that make NPS a uniquely successful graduate research university. He reviewed academic projects and programs “that represent a wonderful microcosm of the educational vitality unleashed on our campus on a daily basis.”

Oliver noted the continuation of the school’s five-year Strategic Plan, “*Vision for a New Century*,” to guide and drive the university into its second 100 years, created under the direction of Executive Vice President and Provost Leonard Ferrari, and the creation of a new Committee on the Future chaired by NPS Undersea Warfare Chair retired Rear Adm. Jerry Ellis. The mission of the new committee – comprised of select NPS faculty and administrators, members of the Board of Advisors; visionaries from the defense network and armed services; high-level academics from other institutions; and the president of the student council – will be to unleash its collective intellect to envision the Navy, the Department of Defense and NPS five, 10 and 20 years out and to anticipate curricula to meet those future needs.

“I have never been more honored to be associated with an institution than I am with the Naval Postgraduate

School,” Oliver said. “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 ... I congratulate you for being part of NPS during this remarkable time, and ask you to join me as we cross this auspicious threshold into our second century.”

Bursch then introduced Director of Alumni Relations and Centennial Planning Kari Miglaw, who roused the audience with a “100 Years of NPS” review of the year’s celebrations – the NPS Timeline, Hall of Fame, Alumni Relations online community, Air and Space Week, Earth Day, “Green” Energy Day, a research showcase in the nation’s capital, and a NASA Teach-in from Space to name a few.

“NPS approached the Centennial as more than just a big birthday party,” Miglaw said. “We took this as a golden opportunity to highlight our heritage as the nation’s leading graduate-level, research-based defense university. Throughout this centennial year, we set the stage to ensure NPS’ next century is even more productive than its first.

“You, who are here today, will carry the NPS torch and define the success of NPS in the future,” she continued. “One of you in this auditorium will be the next great leader and will be in the new NPS Bicentennial Hall of Fame. You will remind people of the value NPS delivers to the national and global stage. The next chapter of NPS history and the NPS legacy is now yours to write.”

The Centennial Time Capsule and Spruance Plaza dedication ceremonies scheduled to follow the ‘State of the School’ address were given a literal “rain check” as the clouds opened and drenched the newly-renovated plaza, postponing the event to coincide with the actual 101st birthday of NPS on June 9. The time capsule, capped with a giant seal sporting the school’s Centennial peacock logo, designed by ITACS Web Developer Sarah Farley, and containing memorabilia from the university’s recent history, will be opened by NPS faculty, students and staff 100 years – and 400 graduating classes – into the future.

On May 28, campus leaders and Public Works officials celebrated the ground-breaking of NPS’ new Centennial Park next to Lake Del Monte. When completed, the grassy park will sport benches and a Sept. 11 statue containing a piece of steel from the World Trade Center.

NPS graduate (Aeronautical Engineering, 1995) and Astronaut Navy Capt. Alan “Dex” Poindexter regaled NASA enthusiasts with his experiences as commander of the recent STS-131 Space Shuttle mission to the International Space Station (ISS), in a special Space Enrichment Lecture in the Mechanical Engineering Auditorium the afternoon of the 28th. It was Poindexter who led the live downlink from the ISS to local grammar school students in King Auditorium just seven weeks earlier.

He noted that the mission marked a number of firsts, including the first time the combined weight of the Shuttle and Space Station had reached one million pounds and a record of four women astronauts on board. Commenting on a breathtaking NASA video of the Earth 3,500 miles from horizon to horizon taken from the Station’s new cupola window and the crew working and relaxing inside, Poindexter stressed the importance of the mission control ground team, and of the international dimension of space venture to achieving a geopolitical breakthrough.

“When you see the Earth from space, you don’t see political boundaries,” Poindexter stressed in a prelude to his keynote address at the Centennial Finale Gala dinner and dance the following evening. “You don’t see Asia and Africa and America as being different. If five international space agencies can partner and work together in space for common goals and purposes, which we’re doing in the International Space Station, then there

“When you see the Earth from space, you don’t see political boundaries. You don’t see Asia and Africa and America as being different. If five international space agencies can partner and work together in space for common goals and purposes, which we’re doing in the International Space Station, then there has to be a way to fix the political differences here on Earth.”

Navy Capt. Alan “Dex” Poindexter, NPS 1995 Shuttle Commander, STS-131

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The day was capped by an evening Centennial wine and beer tasting and charitable auction under a grand tent on the east lawn of Herrmann Hall, co-hosted by the Alumni Relations Office and NPS Officer Students’ Spouses’ Club. The event featured live music and more than 20 Central Coast vineyards and breweries, with the funds raised going to military family scholarships and local and military charities.

The “Crown Jewel” of the Centennial Finale was a Gala dinner dance in the Barbara McNitt Ballroom of the Old Del Monte Hotel on the theme, “Toasting the Next Century.” Centennial spokesperson and master of ceremonies Dan Bursch played a surprise videotaped message from the International Space Station before ringing the elegantly dressed guests to their seats. “We made a cosmic request a few months ago,” Bursch quipped, “and luckily it was approved.”

“Greetings from the International Space Station,” Col. T. J. Creamer, an Army aviator and Flight Engineer on Expedition 23, said from the big screen in Herrmann Hall’s grand lobby. “Although my path to the stars didn’t include the Naval Postgraduate School, I know that NPS was the path for 38 of my fellow Astronauts. I want to wish the Naval Postgraduate School congratulations on the accomplishments of your first 100 years. Enjoy the Centennial Finale Gala, and here’s to the bright future of NPS and space in the next 100 years!”

Following a hearty welcome by President Oliver, Capt. Poindexter captivated the sold-out event with highlights from his career as a Naval Astronaut and his space shuttle and International Space Station missions. Bursch then led the near 200 guests in a Centennial toast, while the band played and everyone danced until the stroke of midnight.

As a prelude to Memorial Day, the school held a special non-denominational Service of Remembrance on Sunday, May 30 for all those who have served the nation, led by NPS Chaplain Lt. Cmdr. Thomas Statler.

The finale of the Finale was a special Memorial Day Concert on the Lawn on the theme “A Day to Remember” with the Monterey Bay Symphony jointly celebrating the Naval Postgraduate School’s 100th year and the 25th anniversary of the symphony. NPS flung open its gates to more than 2,000 members of the local community who basked on a sea of brightly colored blankets while listening to rousing marches. A highlight was the inaugural performance of a special tribute to local poet Robinson Jeffers, his stanzas set to original music by Robert Nelson, read by narrator Taelen Thomas.

A day to remember indeed ... In a perfect capstone to the Centennial Finale, John Philip Sousa’s great granddaughter led the orchestra in an encore of her great grandfather’s stirring march, “The Stars and Stripes Forever.”

For more information about the NPS Centennial, go to www.nps.edu.



Annual Acquisition Symposium Promotes Smarter Spending Across the Services

By Amanda D. Stein

As the U.S. faces two wars overseas and an economic struggle here at home, the issue of military acquisition is as pressing as it has ever been. NPS' Acquisition Research Program made its yearly contribution to the conversation with the 7th Annual Acquisition Research Symposium, May 11-13, where over 300 attendees gathered from around the country. Following the theme "Creating Synergy for Informed Change," the symposium offered the audience an opportunity to ask questions of the presenters and share dialogue on various acquisition-related topics from across the services and departments.

The setting provides a diverse forum for defense acquisition peers to discuss research on various topics, with experiences and expertise ranging across the board. "These senior officials from the defense department, academia and industry really have no other forum to gather like this and discuss original research on the defense department's acquisition processes, policies and procedures," explained Acquisition Chair retired Rear Adm. Jim Greene.

This year's symposium proved to be as popular as ever, attracting distinguished speakers and presenters from around the world. Leading on

day one as the keynote speaker, Under Secretary of the Navy, The Honorable Robert O. Work, welcomed attendees and expressed the importance of acquisition research to meet the challenges in today's budgetary climate.

"I can't think of anything more important than acquisition research and acquisition excellence right now," said Work. "We need research, just as this symposium is designed to do, to allow us to make good decisions. One of the things we're grappling with is we're trying to bring in 5,000 acquisition professionals. Should we bring in more contracting officers? Should we bring in more people who are cost estimators? Should we bring in more engineers? What is the highest payoff for the department? So this type of [research] symposium really helps us make the decisions on how we will get the highest payoff in the department."

He, along with many speakers throughout the week, noted points from a series of speeches recently given by Secretary of Defense Robert Gates. Gates is known for his hard-line stance on the defense budget, and his efforts to get military and civilian officials working towards more efficient spending. He regularly expresses the need for effective

combat capability to be available to the warfighter in a timely manner, to ensure the safety and success of our troops overseas. Funds, however, are not as plentiful as they once were.

“The attacks of September 11, 2001, opened a gusher of defense spending that nearly doubled the base budget over the last decade, not counting supplemental appropriations for the wars in Iraq and Afghanistan,” stated Gates in a May 8 speech at Eisenhower Library in Abilene, Kan. “Which brings us to the situation we face and the choices we have today – as a defense department and as a country. Given America’s difficult economic circumstances and perilous fiscal condition, military spending on things large and small can and should expect closer, harsher scrutiny. The gusher has been turned off, and will stay off for a good period of time.”

Gates’ speech came only days before the symposium, setting the tone for dialogue surrounding acquisition research, processes and policies. The issues of what to buy, who to buy from, and what kind of standards to aim for are among the most pressing in the acquisition process today.

Concerns for the future of acquisitions were also echoed by Dr. Jacques S. Gansler, Under Secretary of Defense for Acquisition Technology and Logistics from 1997-2001, and a plenary session chair and keynote speaker for the symposium every year since it began in 2003.

“The nation is obviously [facing] fiscal problems, as is the world, in terms of Medicare, Social Security, Medicaid, and the debt structure building up huge shares of the budget. Defense is going to have a problem. It’s not going to get the \$100 billion it’s getting this year. And as a result, we have to worry about getting more for less,” explained Gansler. “That’s the challenge for the future, and the security area is expanding in terms of things we have to deal with. We have to be able to deal with everything from pirates and terrorists on one end of the spectrum to regional conflicts, peer competitors, nuclear concerns and getting drawn into regional conflicts – this huge spread of instability in the world.”

Gansler stressed the need to provide the warfighter with the best possible equipment for the cost. Standards, he noted, should be set to ensure that quality is never compromised for the sake of savings.

“Today, every single U.S. weapon system has a foreign part in it. At least one. That’s because it’s better, not because it’s cheaper. It’s better. And we have to recognize that,” noted Gansler. “Now we obviously still worry about vulnerability, jobs in America and so forth. But our first and primary objective for national security is national security.”

Cost was also the topic of conversation at many of the symposium panels, which showcased the 69 original research papers featured at the symposium. Taking his place on a panel featuring distinguished acquisition professionals, NPS student Lt. Nicholas A. Meyers presented his research thesis titled, “An Economic Analysis of Investment in the United States Shipbuilding Industry.”

Meyers is a student of the Graduate School of Business and Public Policy who graduated in June, and was the only student to present research in the panels. His hard work and extensive research earned him a rightful place on the panel alongside James E. Thomsen, Principal Civilian Deputy, Assistant Secretary of the Navy (Research, Development & Acquisition), Rear Admiral David H. Lewis, Vice Commander, Naval Sea Systems Command and Dr. Nayantar Hensel, Chief Economist for the Navy.

Meyers outlined the economic state of the shipbuilding and repairing in-



dustry, and why the need for investments is pressing. “As politicians seek to stimulate and sustain U.S. economic growth, they hope to create or maintain jobs, expand national gross domestic product, and provide a lasting resource for future economic potential,” stated Meyers in his thesis paper. “Investments in shipbuilding ardently accomplish all three goals, as [my] study will seek to demonstrate.”

The projects and topics presented at the symposium were just a fraction of the total number of papers submitted for consideration. In fact, the number and quality of papers submitted was so impressive that organizers increased both the number of presenters per panel and the number of panels to accommodate more projects. The ambitious agenda proved to be a huge success, prompting the Acquisition Research Program team to already start planning for next year’s symposium, set for May 11-12, 2011.

“[This symposium] was the best we’ve had. It was terrific,” said Greene. “The papers and the speakers were extraordinary. Our attendance was maxed out. We had to actually turn people away. And the audience participation was fantastic. It’s going to be very, very hard to top this performance next year.”

As DoD’s acquisition process, policies and procedures continue to evolve, NPS’ Acquisition Research Program strives to lead the way by producing quality research products and bringing together top acquisition officials, academics and industry to create an active dialogue on the pressing issues of the day. With over 600 research products contributed to date, the Acquisition Research Program at NPS continues to significantly enhance the body of knowledge in and about the defense acquisition community.

“If we had one word to describe the security situation for the future, it’s uncertainty,” said Gansler. “Now how do we prepare for uncertainty? It was easy to prepare for the Cold War. We just had to keep matching the Russians ship for ship, plane for plane, tank for tank. That’s not the environment of the future. We have this huge spread with less money. How do we handle that? That’s the challenge. That’s the acquisition challenge.”

Images:

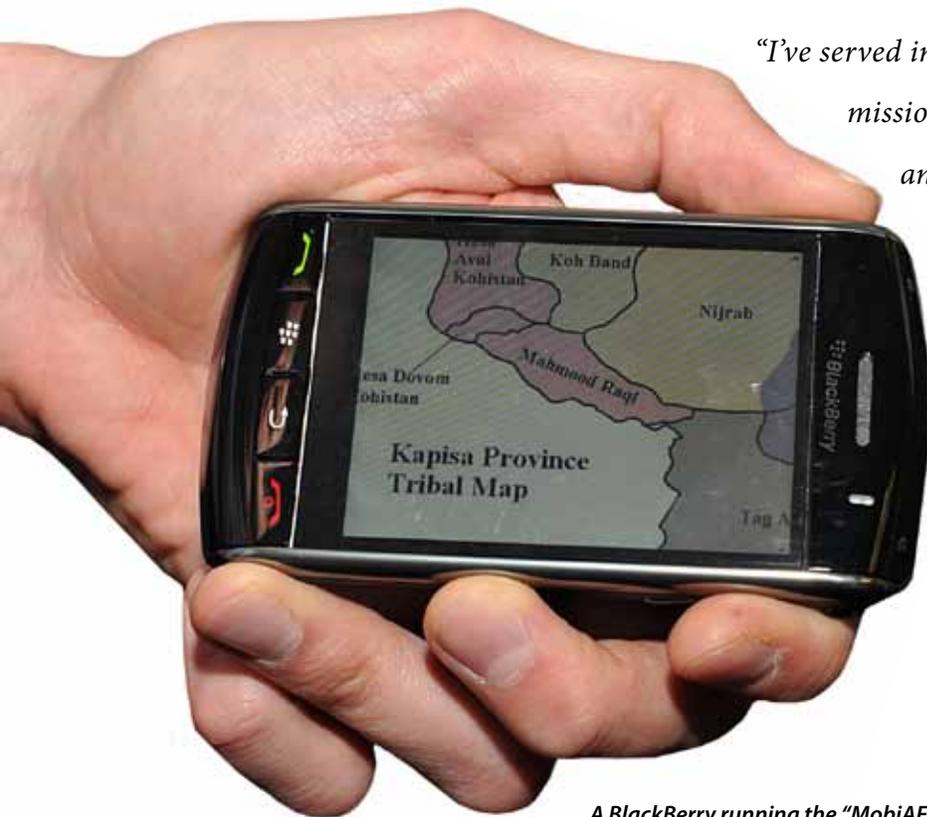
(page 16) The Honorable Jacques S. Gansler, former Under Secretary of Defense, offers opening remarks for the 7th Annual Acquisition Research Symposium on May 11. Over 300 attendees from around the country gathered to discuss the current defense budget and what can be done to promote more efficient spending.

(page 17) NPS Acquisition Chair, Retired Rear Adm. Jim Greene, left, sits alongside keynote speakers The Honorable Jacques Gansler, center, and The Honorable Robert O. Work, right, during the 7th Annual Acquisition Research Symposium. The Symposium featured 69 original research projects on various acquisitions topics, and gave participants a chance to share their expertise with over 300 attendees from around the country.

Students Design “Afghanistan-in-Your-Hand”

Smart Phone App

By Barbara Honegger



“I’ve served in Afghanistan ... where we had over 100 field missions outside of Kabul over a six-month period, and if I had this then, it would have been of tremendous value ... It’s really exciting to see our efforts culminate in something we know our fellow warriors will find extremely useful. And not just useful – someday, this is going to save a lot of lives.”

Air Force Capt. Christopher Joers
National Security Affairs, NPS 2010

A BlackBerry running the “MobiAFG” application displays a tribal map of Kapisa Province in Afghanistan.

While smart phone apps can put a map in your hands, two Naval Postgraduate School students have designed one that puts a whole country in your hands – and it’s Afghanistan.

That’s why National Security Affairs Research Professor and Director of NPS’ Program for Culture and Conflict Studies (CCS) Thomas Johnson calls the new BlackBerry application tailored by Air Force Capt. Robert Davis and Christopher Joers for in-theater warfighters, “Afghanistan-in-Your-Hand.”

Johnson gave the students the option of conducting research and writing the new software application in lieu of the usual research paper for a course he teaches on contemporary Afghan politics, and Davis and Joers jumped at the opportunity.

“As a result of extensive travels in Afghanistan and briefings with top military commanders, I became aware of the urgent need to make

[CCS]-created data widely available to military personnel in undeveloped regions and non urban conflict zones where there’s typically either no or limited Internet access,” Johnson said. “We call the solution MobileAfghanistan – or MobiAFG for short – because it’s the mobile, off-line version of our CCS Web site. Like the Web site, it aggregates important data with geospatial maps and analyses in a 21st Century electronic gazetteer, streamlining open-source data about this critical country, its people and leaders to in-theater warfighters.”

“MobiAFG is kind of like a CliffsNotes for Afghanistan,” said Davis. “It gives you instant access to condensed information about the country any time, any where, 24/7/365, in the palm of your hand. All you need is a BlackBerry with the application downloaded, and a battery, and anything you want or need to know is at your finger tips.”

The compact, easy-to-use, offline app contains detailed files on all of Afghanistan’s prov-

inces, including 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.

“I’ve served in Afghanistan with the Strategic Counterintelligence Directorate, where we had over 100 field missions outside of Kabul over a six-month period, and if I had this then, it would have been of tremendous value,” Joers said. “So it’s really exciting to see our efforts culminate in something we know our fellow warriors will find extremely useful. And not just useful – someday, this is going to save a lot of lives.”

“The main goal was to get the best unclassified information, fast, to our people in the field,” Davis added, “and it feels really great to have turned that vision into a reality.”

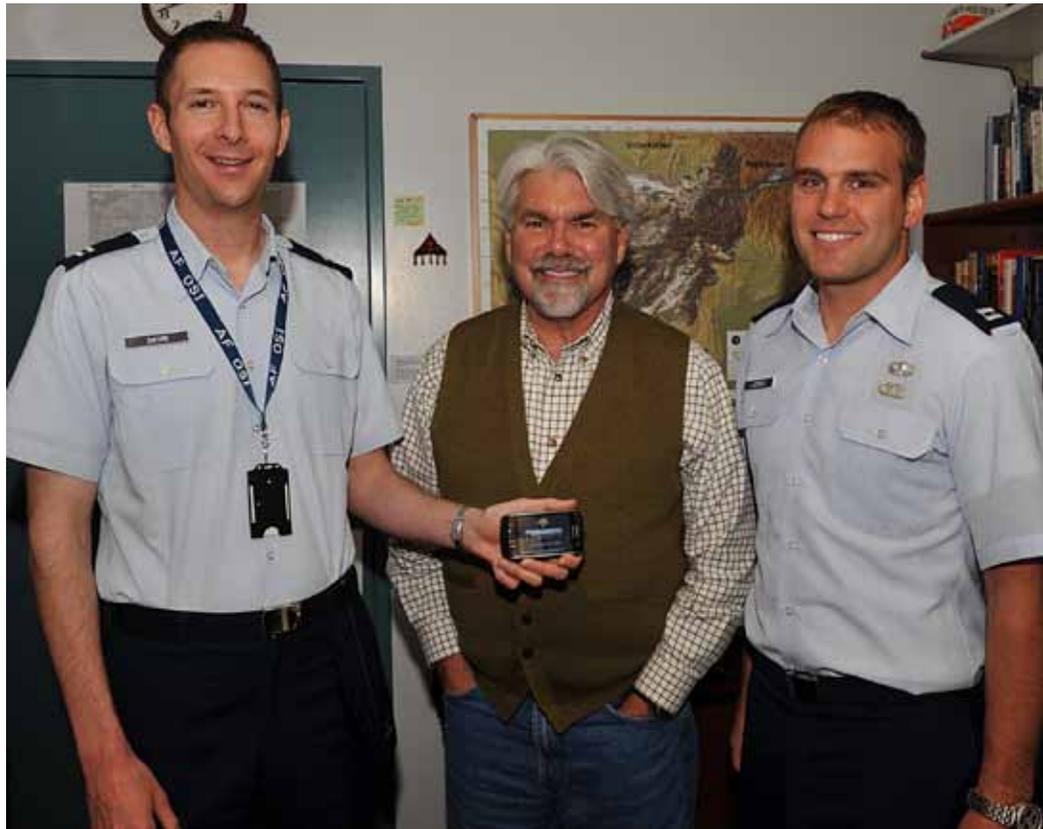
Davis and Joers provided a hypothetical

scenario to illustrate how MobiAFG might be used in the field. An Air Force Captain deployed to International Security Assistance Force headquarters in Kabul is redirected to Camp Leatherneck in Helmand Province where there is no Internet access. He needs quick information on the tribal personalities and alliances in the region to accomplish his mission. He pulls out his BlackBerry with the app downloaded and selects Provincial Overview, Southern Afghanistan, and Helmand for a tribal map and in-depth human terrain analysis of the area.

“The real story here is that 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 to come up with anything comparable,” Johnson said. “What they’ve accomplished is commendable, and is representative of the kind of students we have at NPS.”

“I think Professor Johnson was blown away when we pulled it off, and I’m amazed we were able to do it, too, especially as we had only one quarter,” said Davis.

“All the stars really aligned for this project,” Davis added. “I concentrated on the programming and Chris really got into the content editing and reformatting the Web pages. And all along we had incredible support from Professor Johnson, who’s one of the world’s foremost authorities on Afghanistan. It’s really great he gave us the freedom to follow an extraordinary project like this and approach it in the way we wanted, right from the beginning. It’s been a lot of fun having three minds working together to create such a great product.



National Security Affairs (NSA) student Air Force Capt. Robert Davis, left, holds a BlackBerry sporting the new “Mobile Afghanistan” application that he and Air Force Capt. Christopher Joers, right, designed for in-country military personnel as a special project for a contemporary Afghan politics course taught by NSA Professor Thomas Johnson, center.

“We also had incredible support from Research in Motion [RIM], the company that makes the BlackBerry,” Davis continued. “Being able to test the application in real time on physical BlackBerries, which RIM provided, was critical to ensuring that the program would display properly and be easy to use operationally on the ground. They’ve already shown it to the Chief Information Officers of the Secretary of Defense and Secretary of the Navy, and displayed it at mobile device conferences.”

In addition to in-depth coverage of Afghanistan, MobiAFG also has on-the-go pages on Pakistan and Central Asia, academic publications, NPS theses, and relevant *CCC Review Journal* articles. Standard CCS Web site pages are also available in areas where there is Wi-Fi access.

The students are currently doing a directed study with Johnson extending the Afghanistan, Pakistan and Central Asia apps beyond the BlackBerry to the iPhone, iPod Touch, iPad and other mobile platforms, which they hope to be available by June.

“By supporting a multitude of mobile platforms, we’re ensuring the largest number and widest possible range of warfighters can get ac-

cess to this data resource,” Davis said.

While the team seeks to expand the number of platforms MobiAFG can be used on, also critical to the effort’s success is ensuring the data is as current and up-to-date as possible. Professor Johnson and his team are currently seeking the external funding required to facilitate this update.

After graduating from NPS, Davis and Joers both report to the Defense Language Institute, where Davis will study Arabic and Joers Turkish.

The NPS Center for Culture and Conflict Studies is dedicated to the study of anthropological, ethnographic, social, political and economic data to inform U.S. policies at both the strategic and operational levels. Its mission is premised on the belief that the U.S. must understand the cultures and societies of the world to effectively interact with the local peoples.

MobiAFG is currently available for all BlackBerry phones running operating system 5.0 or higher, at <http://www.nps.edu/programs/ccs/mobiAFG/mobiAFG.html>. For more information on the NPS Program on Culture and Conflict Studies, go to <http://www.nps.edu/Programs/CCS/index.html>.

Communications Pioneer With NPS Ties Keynotes Spring Graduation

By Barbara Honegger

There was something special about Spring 2010 graduation ceremonies at the Naval Postgraduate School, where 248 U.S. and international students earned a total of 253 advanced degrees, June 18.

The air was electric as a capacity audience of family members, colleagues and friends cheered the about-to-be graduates as they entered King Auditorium to a rousing march by the Del Monte Brass followed by an operatic rendition of the National Anthem by Mary Whitaker, daughter of NPS Operations Research Associate Professor Lyn Whitaker.

President Dan Oliver kicked off the ceremony by introducing the keynote speaker, Dr. Irwin Mark Jacobs, Chair of the National Academy of Engineering and co-founder of the Fortune 500 company Qualcomm, whose pioneering Code Division Multiple Access (CDMA) mobile wireless technology is used by an estimated 800 million cellular customers worldwide.

“On June 8th, we celebrated the second 100 years of the Naval Postgraduate School with two newly-renamed student awards presented by former Secretary of the Air Force, Director of the National Reconnaissance Office and first [DoD] Director for Telecommunications, Command and Control, and Communications Systems Thomas Reed,” Oliver said. “Those awards were re-named for the late Dr. Jack Wozencraft – former NPS Dean of Research and Distinguished Professor of Electrical and Computer Engineering; founding Chairman of the NPS Command, Control and Communications Academic Group; and recipient of the Institute of Electrical and Electronic Engineers Alexander Graham Bell Medal. Jack’s co-author on the acclaimed communications engineering textbook *Principles of Communications Engineering*, still in use worldwide, and the namesake of the University of California, San Diego Jacobs School of Engineering, Dr. Irwin Jacobs, is our guest speaker today.”

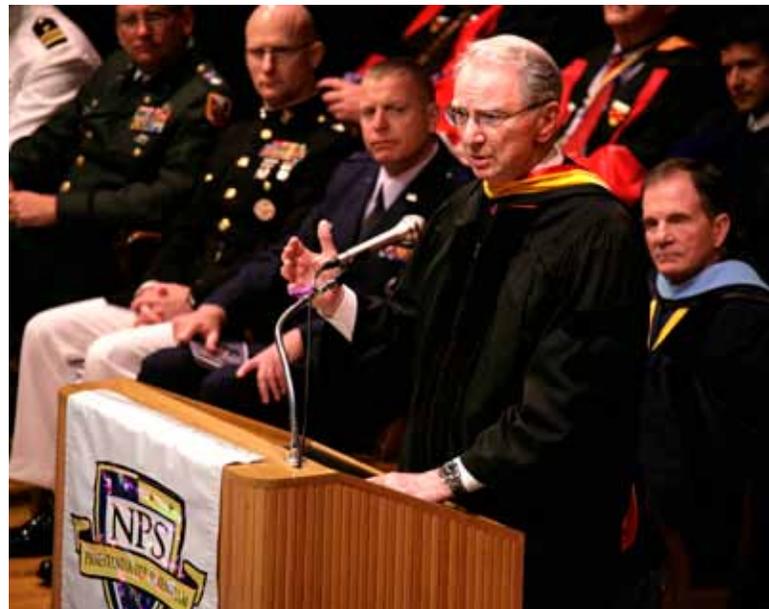
Before turning over the podium, Oliver noted, “The Chairman of our Department of Computer Science, Professor Peter Denning, was one of Professor Jacobs’ students at MIT, and NPS is benefiting from his and Mrs. Jacobs’ endowment of the Jacobs School of Engineering, as two of our newest professors – Assistant Professor of Systems Engineering and Electrical and Computer Engineering and our first C4I Chair Dr. Rachel Goshorn, and Information Sciences Research Assistant Professor Deborah Goshorn – both earned their Ph.D.s in electrical engineering from the Jacobs School.”

Jacobs reviewed the highlights of his career, which began

with a high school teacher telling him there was no future in science and engineering; and included changing his major from hotel administration to engineering and moving to MIT for his doctorate.

“I was invited to stay on as a faculty member, which is when I had an office next to Jack Wozencraft,” Jacobs recalled. “We became good friends and colleagues and wrote the book together, beginning with class notes and feedback from students to shape it. It was because of the book that I got a lot of requests for consulting, which led me to start a company called LINKABIT, where we worked for 10 years with military programs and NASA to develop terminals in airplanes and ships and Army ground vehicles that could talk to satellites and carry sensitive messages. To stand out from the other companies that were pursuing the problem in a traditional way, we built our system around a [central] processor and [Very Small Aperture Earth, VSAT] terminals.

“The change came when the general in charge of space communications for Fleet SATCOM [Lt. Gen. Forest McCartney] decided to take a risk and fund it for production, and it’s still in use today,” Jacobs said. “Then, in 1985, I co-founded Qualcomm to move the CDMA mobile wireless technology developed for military uses into commercial applications, where it’s now used in all third-generation cellular communications.



Dr. Irwin M. Jacobs, Chair of the National Academy of Engineering and co-founder of communications giant Qualcomm, addresses the near 250 graduates and accompanying friends and family during commencement ceremonies on Friday, June 18 in King Auditorium. While an electrical engineering professor at MIT, Jacobs co-wrote Principles of Communications Engineering with the late Dr. Jack Wozencraft, NPS Distinguished Professor and former Dean of Research – the textbook remains in broad use worldwide.

“The point is, that was a very brave decision by the Fleet SATCOM general, to take a chance on a relatively unknown company with a new idea,” Jacobs noted, “and it leads to my two main messages today. As you take advantage of this wonderful education you’ve been given, become more receptive to new ideas. Be innovative. Be open to new possibilities and new approaches. If you are, the future is very exciting. And – as Jack Wozencraft was very positive and emphatic – understand the theory, but find its real-world applications. Take the theory and put it to use. Put it into practice.”

Following the ceremony, the graduates and family members gathered in the Barbara McNitt Ballroom for a reception and the ceremonial cutting of the class cake. Sharing the honors with President Oliver, Provost and Executive Vice President Leonard Ferrari and keynote speaker Jacobs was nuclear surface warfare officer Lt. Jamie Vandyke, winner of the Monterey Council Navy League Award for Highest Academic Achievement.

“I’m a mechanical engineer and nuclear surface warfare officer, but when I came to NPS, I took the opportunity to do something completely different and went into Space Systems Operations,” said Vandyke, whose thesis is on power beaming using ground-based lasers to charge solar cells on orbiting spacecraft. “The Naval Postgraduate School offers the unique opportunity to earn a first-rate graduate degree while applying what you’ve learned to real-world military issues, what both Dr. Wozencraft and Dr. Jacobs said are so important. NPS has earned my highest recommendation.”

On June 8, the Spring 2010 class gathered in King Auditorium for a Graduate and Faculty Awards ceremony to recognize outstanding students and faculty who had attained the highest levels of achievement in academics, instruction, research and community service. Kicking off the ceremony was the awarding of three Bronze Star Medals to Air Force Maj. Kimberly Garbett, Air Force Capt. William Singiser, and Navy Lt. Timothy Sulick.

“It’s truly been a deep honor to be able to pass through the hallowed halls with the legacy of so many who have devoted their lives to their country, studied here at the Naval Postgraduate School, and achieved greatness,” said Garbett, a regional affairs strategist in the National Security Affairs Department Europe track. “I definitely encourage others who might have the opportunity to attend this first-rate school to grab the opportunity without hesitation. It is a true crown jewel and a once-in-a-lifetime opportunity.”

The top student award went to Vandyke, who “took the cake,” getting to cut it at the reception with a sword he complained, tongue in cheek, that he’d been given only a day to find.

“You get a sword when you’re an O-4, and I’m an O-3,” he said. “They only gave me 24 hours notice. I was finally able to get one from a friend who’s graduating next quarter.”

Of the 248 graduates, 88 came from the Navy, 26 Marine Corps, 41 Army, two U.S. Army Guard and 18 Air Force. The class also included 41 Department of Defense civilians and 32 international students from allied and coalition countries. Degrees awarded were nine Ph.D.s, 157 Masters of Science, 44 Masters of Arts, 39 Masters of Business Administration, two Mechanical Engineer, one Electrical Engineer, one Bachelor of Science and five dual degrees. Sixty-four

students also completed their Joint Professional Military Education (JPME). Fifty-eight degrees were awarded to students in absentia, who were unable to attend due to operational commitments.

Graduation Coordinator Sonya Solomon contributed information for this report.

Grad Week Honors the Legacy of Former NPS Dean Jack Wozencraft

What made Spring 2010 graduation so special was the unprecedented week of pre-commencement activities celebrating the life and achievements of applied information theory and digital communications engineering giant, the late Dr. Jack Wozencraft, NPS Dean of Research from 1972-74 and a Distinguished Professor of Electrical and Computer Engineering.

The pre-graduation Enrichment Week included a series of Wozencraft Memorial Educational Fund Lectures by world-renowned experts including the Hon. Thomas Reed, former Secretary of the Air Force and Director of the National Reconnaissance Agency; the Hon. Richard H. Shriver, former Asst. Secretary of the Treasury for Information Technology; Dr. Robert Kahn, widely known as the “Father of the Internet,” now with the Corporation for National Research Initiatives; and Dr. James Babcock, Principal Deputy Assistant Secretary of Defense for C3I, and founder of the Washington Intelligence Division of MITRE Corporation.

“Many of Jack Wozencraft’s academic and professional colleagues came to campus to share the positive impact he had on their lives and their careers, many of whom are considered the ‘brain trust’ of communications engineering and information theory in the United States if not the world,” said NPS President Dan Oliver. “And crowning the memorial was a personal message from former President and Mrs. Bush paying tribute to their friend Jack Wozencraft and all those who came to honor him.”

During a memorial service held in Wozencraft’s honor, NPS Chief of Staff Air Force Col. Pete Boerlage and Provost and Executive Vice President Dr. Leonard Ferrari, who studied under Jacobs at MIT, presented Mrs. Wozencraft with a rededication of her late husband’s 1985 NPS distinguished professor medal.

At an elegant dinner in the LaNovia Room the next evening, Wozencraft’s son, Dr. Colin Wozencraft, rose in his father’s place. “We want all of you to know how incredibly privileged and honored we feel as a family to the Naval Postgraduate School, and the incredible sense of humility we feel not only at all the very important work our father did, but the large number of his colleagues and friends who came all this way to share with us how he touched and transformed their lives and careers. To be in the presence of so many who knew my father, and to have this great opportunity to also be able to tell them about him, is beyond words.”



Dr. John M. "Jack" Wozencraft

Another Milestone in Kualu Financial Implementation

By Joan Ackerman

The Naval Postgraduate School is leading the way as an early adopter among its higher education colleagues by implementing a cost-effective alternative to vended enterprise resource planning, or ERP, software – a financial system developed in the community source model.

Kualu, which means “small wok” or “humble utensil” to Malaysians, is the inspirational name given to the Kualu Financial System (KFS), and is expected to be fully implemented at NPS on October 1, 2010, following three years of planning, preparation and testing by NPS’ financial leadership team.

“The Kualu initiative is fundamentally based on the academic principles of open standards, peer review and collaboration. The principles applied to administrative systems ensure greater flexibility and local authority – precisely what is needed for greater responsiveness for our campus community,” said Provost and Executive Vice President Leonard Ferrari.

The functionality of existing enterprise financial information systems has not been sufficient to meet the growing needs of the campus or to provide data necessary for campus leaders and executives to proactively manage. Upgrading the aging architecture would be cost-prohibitive; therefore, KFS – an open-source financial information and management system developed by the Kualu Foundation, a non-profit consortium of higher education institutions – emerged as the preferred solution.

KFS does not carry the initial and ongoing financial costs of a commercial product and mitigates the organizational requirements associated with a homegrown product. The system is scalable and accessible, and provides transparency, simplicity, on-demand access, one-stop tracking of all financial data – including labor and travel expenditures – and is a repository for high-level historical data. Unlike existing systems, KFS also provides audit trails, the ability for end users to track transaction status at all times, a single entering, routing and tracking process for all procurements, and the capacity to attach documents and pictures.

“The Kualu Financial System provides us with better auditing capabilities, better accountability, and more tailored reporting at the local level. The notion that we are investing in ourselves rather than paying

high licensing costs to an administrative software corporation is gratifying,” said Vice President of Finance and Administration Colleen Nickles.

For ease of use at NPS, some customizations and/or enhancements are being developed and reports are being created in KFS that offer the same level of detail as the existing systems.

NPS established a phased approach for implementation of KFS – beginning with project preparation, the migration of data, and parallel processing of transactions and reporting in both the KFS and legacy systems – in advance of October 1, when KFS will replace certain legacy systems as the internal financial information management and reporting system used by the school.

The KFS Communications Advisory Committee has loaded the KFS Web site with training schedules, the project plan, a list of committee members, and the Get Smart with Kualu Training Manual which can be found at <http://intranet.nps.edu/ITACS/KFS/index.html>.

“The Kualu Financial System project is another way in which the Naval Postgraduate School leads in innovation. This is a promising direction for higher education and government administrative systems – an effective combination of technological and functional area expertise working together to improve our financial processes and to make them more transparent,” said NPS President Dan Oliver.

Other Kualu modules in development for NPS use are Kualu Rice, an identity management enterprise application; Kualu Student, which will replace the current Python system in 2012; and Kualu Coeus, a research administration module originally developed by MIT.

After three years of preparation and planning by NPS’ financial leadership, the Kualu Financial System (KFS) continues on its path toward complete implementation on October 1 of this year. An open source enterprise resource planning (ERP) system, utilizing packages like KFS places the university at the forefront of its higher education colleagues in implementing cost-effective alternatives to expensive ERP software.

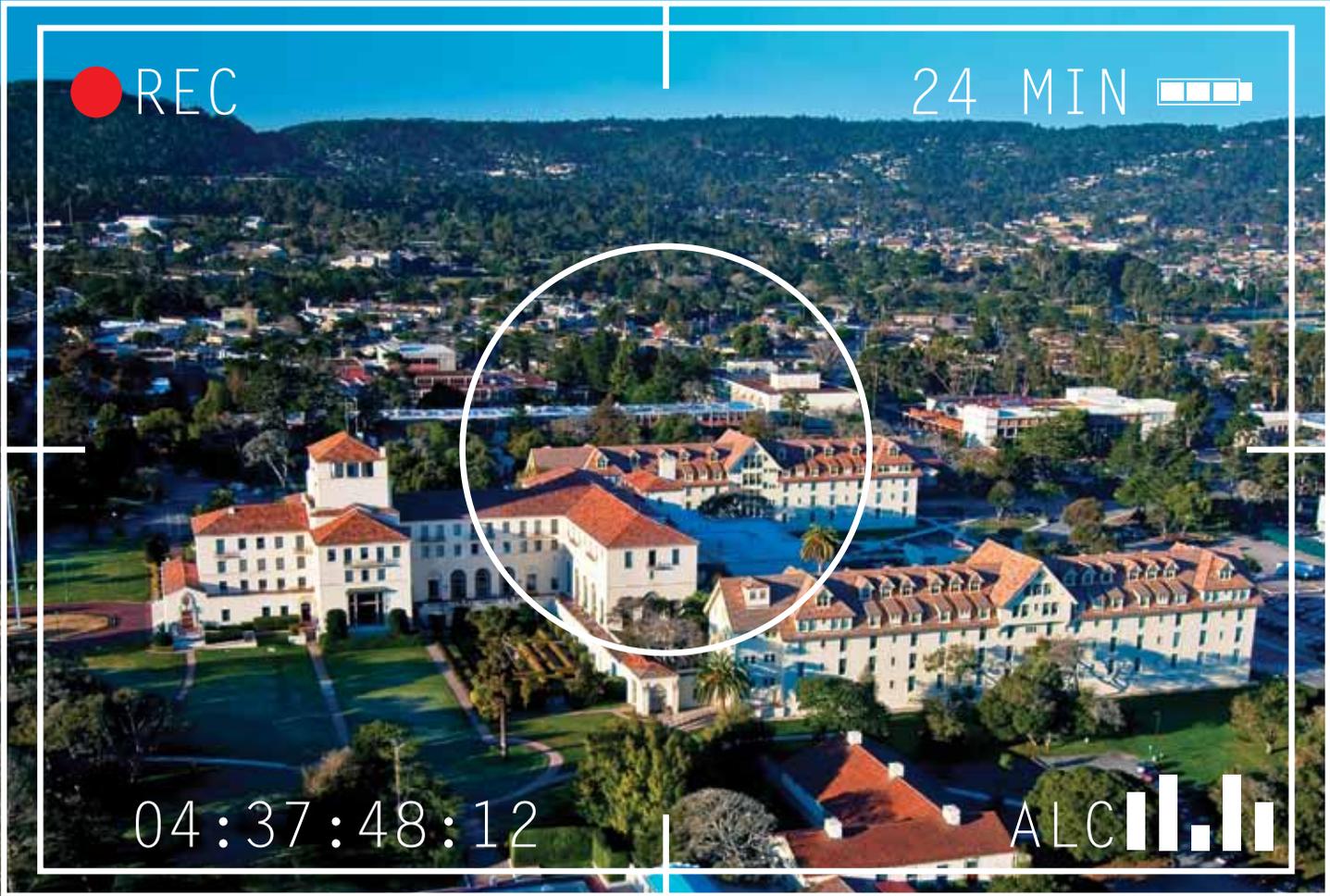
Members of the Kualu Financial System implementation team are: Standing left to right, Colleen Nickles, Vice President of Finance and Administration; Col. Pete Boerlage, Chief of Staff; Chris Coppola, President of rSmart; Keith Showers and Satish Vijayan, rSmart representatives; Tom Halwachs, Director of Financial Systems; Gil Howard, Director of Academic Planning; Joe LoPiccolo, ITACS Director; and Dan Boger, Information Sciences Department Chair. Sitting, left to right, are Kevin Little, Comptroller; Orla Mester and David Lyons, rSmart representatives; Dan Oliver, President; Leonard Ferrari, Provost and Executive Vice President; Danielle Kuska, Director of Research and Sponsored Programs; and Doug Moses, Vice Provost for Academic Affairs.



THE MISSION OF THE NAVAL POSTGRADUATE SCHOOL IS TO PROVIDE HIGH-QUALITY, RELEVANT
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Breaking New Ground

Earlier this year, Navy Captain Jan E. Tighe was nominated for promotion to the rank of Rear Admiral, joining a growing number of female flag officers. But Tighe, a 2001 Electrical Engineering doctoral and Applied Math master's graduate from NPS, is breaking new ground in one of the Navy's most critical officer communities.

Tighe will become the first female Information Warfare (IW) Rear Admiral ever, as well as the first IW flag officer with a doctorate, an indication of the role advanced education plays in solving the issues of tomorrow's Navy, and an achievement that comes as no surprise to those who know her.

"She's obviously a very smart and capable lady," said NPS Professor Jeffrey Knorr, then Chairman of the Electrical and Computer Engineering Department, fondly recalling Tighe's endless commitment to education and helping her fellow officers.

"The notion of lifelong learning is not an option for me, it's in my DNA," said Tighe. "I loved every minute of my time at NPS, whether in the classroom or doing research, [and] I have been able to apply knowledge gained at NPS to every subsequent job.

"I realize that, the fact that I'm the first woman selected to flag rank as an IW officer is significant to those coming up in the ranks and I am grateful to have the opportunity to represent all that is possible in our great Navy," Tighe continued. "Our community's core skills have never been more in demand by the Navy and the nation than they are today."

While Tighe awaits notification of her first flag assignment, her current position as Executive Assistant to Army General Keith B. Alexander will certainly help groom her for success. Alexander, himself an NPS dual master's alum, is the Commander of the recently formed U.S. Cyber Command, Director of the National Security Agency and Chief, Central Security Service.