NPS Strategic Plan
for 2018-2023

Draft 6b – 2/27/18
INTRODUCTION TO STRATEGIC PLAN
DRAFT v6b– 2/27/18

Navy mission statement (left facing page):

The United States Navy will be ready to conduct prompt and sustained combat incident to operations at sea. Our Navy will protect America from attack and preserve America’s strategic influence in key regions of the world. U.S. naval forces and operations – from the sea floor to space, from deep water to the littorals, and in the information domain – will deter aggression and enable peaceful resolution of crises on terms acceptable to the United States and our allies and partners. If deterrence fails, the Navy will conduct decisive combat operations to defeat any enemy. – Design for Maritime Superiority

Quote from SECNAV Richard Spencer:

We all have an interest in ensuring NPS endures as the postgraduate research and educational institution of choice for the Navy-Marine Corps team and our partners. But going even further, I want this institution to be the primary educational and research based enterprise that partners with the private sector and academia to provide solutions to the vexing problems facing national security across the whole of government. We will do so

• by continuing attract the best students through elevated admission standards
• by competing for and attracting and retaining a first rate faculty;
• by placing an emphasis on relevant research that builds capabilities; and
• by leveraging partnerships across government, industry, and educational institutions.

NPS mission statement (left facing page):

The Naval Postgraduate School provides relevant and unique advanced education and research programs to increase the combat effectiveness of commissioned officers of the naval service to enhance the security of the United States. In support of the foregoing and to sustain academic excellence, foster a program of relevant and meritorious thesis and research experiences for NPS students that informs the curricula, supports the needs of Navy and Department of Defense (DoD), and builds the intellectual capital of NPS faculty. Accomplishing NPS’ mission requires that our work be joint, inter-agency and international. -- NPS Mission Statement

Quote from CNO strategic document (right facing page):

The essence of Capt. Alfred Mahan’s late 19th century vision still pertains: America’s interests lie beyond our own shores. What was true in the late 19th century holds true today – America’s success depends on our creativity, our
entrepreneurism, and our access and relationships abroad. In an increasingly globalized world, America’s success is even more reliant on the U.S. Navy. ... We must do everything we can to seize the potential afforded by this environment. Our competitors are moving quickly, and our adversaries are bent on leaving us swirling in their wake. ... The desired outcome is: A Naval Force that produces leaders and teams who learn and adapt to achieve maximum possible performance, and who achieve and maintain high standards to be ready for decisive operations and combat. – CNO’s Design for Maintaining Maritime Superiority

Quote from USMC strategic document (right facing page):

Over the past 15 years, we have been continuously involved in both major combat and crisis response missions. All that time, our competitors have observed and learned much from how we operate. As a result, our future enemies will use that knowledge to oppose us in the physical and cognitive dimensions of conflict. In contrast, we have not been able to adapt at the rate of change required to ensure our success in future conflict. ... we recognize the current and future fight may not be what we experienced in the past. It will encompass not just the domains of land, air, and sea, but also space and the cyber domain. It will include information operations and operations across the electromagnetic spectrum. It will involve rapidly changing and evolving technologies and concepts, which will force us to be more agile, flexible, and adaptable. Most importantly, it will require Marines who are smart, fit, disciplined, resilient, and able to adapt to uncertainty and the unknown. -- Marine Corps Operating Concept

[Additional pull-out quote if needed:] The future requires Marines to embrace change to leverage the rapid advancements in technology at the pace of the 21st Century in order to gain an operational advantage over any potential adversary we may face in the future. ... The character of the 21st Century is rapid evolution. Our potential adversaries have not stood still, and it is imperative that we keep pace with change. – CMC Posture Statement to Congress

[Addition pull-out quote if needed:] This increasingly complex security environment is defined by rapid technological change, challenges from adversaries in every operating domain, and the impact on current readiness from the longest continuous stretch of armed conflict in our Nation’s history. In this environment, there can be no complacency—we must make difficult choices and prioritize what is most important to field a lethal, resilient, and rapidly adapting Joint Force. America’s military has no preordained right to victory on the battlefield. --- National Defense Strategy 2018
Introduction

The world around us is in great flux. The Department of the Navy must adapt and respond to an ever-evolving global context, a world swept by accelerating changes and packed with unexpected surprises. The driving forces include advances in weapons systems and warfighting techniques, from unmanned swarms to pervasive digitalization of infrastructure, communications, and control technologies. Increasing and evolving forms of political disruption from both traditional and non-state actors require new responses ranging from a renewed focus on strategic and nuclear deterrence to fighting borderless terror organizations at home and abroad.

The educational needs of the Naval Postgraduate School’s students are changing as the United States Navy, Marine Corps, and other services continuously adapt and evolve to meet the strategic challenges facing our country. The air, land, sea, cyber, and space domains are converging, requiring us to prepare our students to meet the requirements of the total force, including its joint, inter-agency, and international aspects. We must adapt to emerging changes in the nature of education, enhanced by non-traditional technologies and powered by new partnerships in teaching, learning, and research. Graduate education for the military must align emerging educational methods with the needs of the US military through innovative curricula and research programs.

This strategic plan positions the Naval Postgraduate School to continue delivering excellence in education and research programs for the United States Navy, Marine Corps, and their partners, building on our unique capabilities and strengths in the context of our contemporary strategic environment.
Our Plan

We offer this strategic plan for the Naval Postgraduate School for the next five years. In cooperation with our curriculum and research sponsors, we will continue to provide high-quality, defense focused programs of education and research. At the highest level, our plan is to organize our actions over the next five years around three main strategic themes.

Theme 1: Excellence and innovation in emerging fields critical to national defense

The military operational environment is shaped by rapidly advancing technologies that are triggering avalanches of sudden and disruptive change. Technology is digitalizing everything and connecting everyone with everything. These changes set conditions for rapidly shifting political alliances, intractable insurgencies, and contests for every shared resource on the planet. We commit ourselves to stay ahead of the emerging changes through new facilities and programs.

Theme 2: Interdisciplinary education and research programs

The Naval Postgraduate School is organized into departments and schools reflecting the main concentrations of disciplinary expertise we have assembled to support our mission. All the strategic challenges faced by the Navy and Marine Corp, as well as the rest of the Department of Defense, intersect with multiple academic disciplines. In addition, NPS can best address these challenges by expanding our collaborative work with industry and other government organizations. Both our education and research activities will benefit from this diversity of perspectives.

Theme 3: Institutional innovation and effectiveness

The NPS must function as a university with highest academic standards, operating within the context of federal rules and laws. We commit ourselves to a constant search for improvement and cost effectiveness of our business, education, and research processes. We must both look internally for improvements as well as to industry and other government organizations for ideas and best practices that can improve our effectiveness.

This plan sets out ten action areas that each reflect one or more of these three themes. To help the reader, we have created visual icons for each theme and marked every action with the icons of the themes it supports.

We recognize that many of the trends and concerns we are following in our plan can be suddenly disrupted by external events and surprises. We need to be resilient and adaptive when the surprises happen. We are preparing ourselves and our students for both an anticipated future and an unexpected future.

We stress that this plan is not a complete description of everything we expect to do in the next five years. We will maintain the core capabilities that support our core mission and that have proven valuable to our sponsors, not all of which are explicitly
mentioned here. We fully recognize that over the life of this plan, we will need to adapt to new defense issues and needs. We strongly believe that the actions we propose will significantly transform NPS’s ability to fulfill our mission and increase its value to the Navy.

We take seriously the need for “jointness” written into our mission statement and its implications for total force education. NPS is a Naval institution, meeting the graduate educational needs of Naval students. Our mission asks us to engage with the other US military services and those of our partners and allies. Every CNO for the last 30 years has emphasized that Naval officers must operate and fight in a joint environment. Officers from the different services must understand each other’s mindsets and capabilities. Learning together and sharing classroom experiences at NPS is a key element of building that understanding. The same need for mutual understanding also applies with our coalition partners and allies. NPS hosts officers from over 50 countries, who work closely together with their US counterparts, sharing experiences and perspectives on issues of common concern. Personal relationships developed at NPS have averted, and will continue to avert, numerous crises because of their shared understanding and mutual respect.
Strategic Actions

The matrix below lists the ten action areas and shows which themes each area supports. Following the matrix are ten action sections, each organized in two parts. The first part, set in italics, is a strategic direction with a horizon of 5-10 years in the future. The second part, set in regular font, is a more tactical set of specific actions with a horizon of 2-5 years. For ease of cross reference between themes and actions, we use the colored icons as markers displayed with each action.

We conclude with a resources section that outlines the resources we expect to need to complete these actions.

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E1 -- Educational Improvement and Innovation

In our graduate-level education we aim to instill the specific skills necessary for our graduates’ subsequent assignments, and we aim to cultivate abilities that will make them effective leaders and decision-makers over their entire careers. We are pursuing four strategies to achieve this goal. First, our curricula balance depth requirements in each curriculum against opportunities for students to learn a wider range of subjects outside their majors. Second, our curricula must be accessible to the highly-varied backgrounds of our students. Third, our curricula must be adaptable to the shifting needs of the Navy, the other armed services, and the civilians we serve. Fourth, we must constantly upgrade our faculty’s skills at teaching and leading research.

Action E1.1 – Create more flexibility in residential degree curricula.

The curricula at NPS are developed based on the stated needs of our sponsors who usually have subspecialty code requirements that go well beyond the actual degree requirements. Students’ course matrices are fully booked, with little flexibility to study anything else. Students required to take Joint Professional Military Education in parallel with their degree programs feel this most acutely. We believe our students’ education would in many cases be more valuable if, in consultations with our curricular sponsors, we created more space in students’ programs to accommodate more electives and other courses that broaden students’ exposure outside their professional fields. Examples include the newly-developed “all hands cyber” course and various special-topics courses on emerging technologies. We also seek the flexibility to incorporate experience-based learning such as short stays at private sector companies and non-profit organizations in the Silicon Valley area.

Action E1.2 – Explore expansion of new programs and modes of delivery.

Many potential degree and certificate students find it difficult to come to NPS for 15 -24 months to complete our residential Master’s degree programs. We receive many requests to make some of our courses available more widely throughout the DoD. We will pro-actively explore how more of our programs might be offered in an economical hybrid of residential-based and distance-learning formats. We will examine how some of our degree programs could be organized as a series of “stackable certificates” that accumulate in stages to meet the requirements of a degree program. We will expand use of self-paced, online courses for students who need refreshing of knowledge or who are missing prerequisite undergraduate courses. We will offer trials of Massively Online Open Courses (MOOCs) in selected areas where there is strong external demand including the .mil networks; these MOOCs will also make the educational services of NPS more visible to Naval and other officers. We will work with sponsors to create a form of continuing education to maintain the subspecialty-code they earned from NPS.

Action E1.3. Improve the transition for incoming students.

Our incoming students face two big challenges. Up to 70% of incoming students in many fields, technical and non-technical, have bachelor’s degrees in fields quite different from the ones they are entering for graduate study. Moreover, nearly all our incoming students have not been in a classroom environment for 6-10 years. They are
out of practice with academic writing, thinking critically, and researching questions. We will help them replenish these three skill sets, which cannot be learned from online courses. We will support incoming students to refresh the basic knowledge of their fields by providing online courses in addition to our refresher quarters and required core courses.

Action E1.4 – Establish a Teaching and Learning Center.
A consolidated Teaching and Learning Center would help us advance and improve faculty and student support:

- Technology innovation in courses (such as online platforms)
- Integration of video, online, and audio technologies into teaching
- Video recordings of audio-voice-over slide presentations by faculty
- Moving basic material out of courses and into online platforms
- Faculty teaching practices and development
- Upgrading technology in classrooms and study labs
- Effective writing and presentation
- NPS community focused on constant educational improvement

Action E1.5 – Hybrid Formats of Distance learning.
Expand distance learning enrollment to reach a greater DoD audience and make best use of NPS’s teaching capacity. Steps to this end include:

- Make more international partners aware of NPS programs;
- Expand to ROTC graduates the programs in which new Naval Academy graduates come to NPS;
- Communicate the benefits of an NPS education to junior and mid-level officers as well as detailers;
- Examine possibilities for increasing the number of enlisted military in our programs;
- Expand how we deliver programs, particularly seeking opportunities to deliver programs in hybrid formats with mixed cohorts that combine intermittent residence-based education with distance learning; and
- Explore how we serve the defense contractor community, particularly in classes and programs where we are not fully utilizing our existing capacity.
- Improve internal support services so that DL students can take advantage of the Library and the Teaching and Learning Center, and access technical help 24 hours a day.
E2 -- Improving Policies, Processes, and Practices

Every organization has opportunities to become more effective and more efficient in how it runs; NPS is no exception. As part of the Department of the Navy, we must continually adapt to ever-changing legal and regulatory requirements while maintaining sharp focus on our overarching mission of education and research. While individual improvements in operations may not seem strategic, maintaining an efficient and supportive operational environment is.

Action E2.1 – Undertake initiatives to increase diversity at NPS.
It is crucial that NPS recruit and retain the best possible faculty and staff. The US workforce has become increasingly diverse. We aim to make NPS be a place where the most-talented individuals, regardless of gender, race, religion, political beliefs, or ethnicity, want to join and stay with. Our primary objective is to create an atmosphere that is welcoming, fair, and inclusive, in which all are committed to listening to each other with respect and appreciation for the value that our differences bring to our work.

To accomplish these goals, we will create a Inclusion and Diversity Council reporting to the President and Provost that is charged to make recommendations concerning practices that we can adopt, and other actions we could take, to make our university a magnet for the most talented individuals we want to attract and retain. The council will include faculty and staff from across NPS.

Action E2.2 – Become more effective at institutional advancement.
Many people within DoD are unaware of the depth and breadth of education and research activities at NPS. A major cause is our limited capacity to communicate these aspects. Our understaffed Public Relations department is unable distribute timely news releases about our many accomplishments. Our understaffed protocol department is unable to arrange more VIP visits so that senior leaders can see for themselves what our faculty and students are accomplishing. As a result, potential students are often unaware of opportunities we offer, news of our research accomplishments does not reach all potential audiences, and Naval leaders do not know how to tap the full capabilities of NPS to address Naval and other defense issues. We will create a new position, Director of Institutional Advancement, reporting to the president and provost. This person would lead a steering committee that develops and oversees plans to make our accomplishments known. We also will look for ways increase Public Relations staff to have the manpower to communicate our accomplishments as broadly as possible.

Action E2.3 – Review and improve key processes and practices.

- Review policies for attracting, retaining, and developing faculty.
- Review policies for attracting, admitting, and refreshing students.
- Develop new incentives for faculty to engage in inter-disciplinary activities. Opportunities for new incentives include criteria for promotion and tenure, merit step increases, special act awards, fellowships, and study teams.
• Improve the methods by which NPS collects and distributes funds to cover indirect costs associated with sponsored research. The current model is too inflexible for our high-flux environment; it costs us work and raises the costs of the work we do have. In collaboration with OPNAV, we will develop improved models for collecting and distributing indirect funds and for paying personnel working part time to support sponsored research.

• Seek efficiencies in our core business processes. Key areas include travel, purchasing, contracting, property management, class scheduling, IT support, library services, thesis processing, comptroller functions, safety compliance, records management, and training. We will look at both industry and other government organizations for best practices that can be adopted within NPS.

• Improve our succession planning for leadership in key administrative and academic areas.
H1 -- Innovation

The Secretary of Defense and all of the Service Chiefs have identified military innovation as a critical requirement in the face of increasingly innovative state and non-state adversaries. Military innovation is the adoption of new technologies and practices in all aspects of the military including manning, training, equipping the force, and combat operations. Military innovation emerges from the actions of individuals at all ranks responding to opportunities and contingencies, and is rarely driven by top-down initiatives. We aim to evaluate innovative emerging technologies through research and student theses. We aim to teach our students how to be innovation leaders who can support the innovation requirements of the Navy-Marine Corps team, the Joint Force, and the broader Department of Defense.

Action H1.1. Streamline the processes for working with industry and other academic institutions.

The current process for establishing cooperative research programs with industry and other academic institutions is slow and cumbersome, mostly because of Intellectual Property rules. We will focus on establishing common written rules for government and private Intellectual property, and other process improvements that enable CRADAs to be enacted within reasonable times. We will also seek authority for entering into other types of agreements with industry that might be more efficient or broader than permitted under CRADAs.

Action H1.2. Upgrade education programs that cultivate innovation leaders.

Innovation leaders find innovative ideas and see them through to adoption as new practice in their communities, coping skillfully with resistance and unexpected contingencies along the way. We will promote and advance existing courses and studios that support the full spectrum from design thinking (focus on ideation) to innovation leadership (focus on adoption). We will make new offers in design and leadership through our resident, distance learning, and short-course programs. Cultivating innovation leaders does not end after a student graduates: the Center for Executive Education already offers short courses on innovation, which will be complemented by short courses offered off site.

Action H1.3. Establish a formal Innovation Fellows Program.

This would be in close partnership with the Navy Innovation Advisory Council (NIAC) and the Defense Innovation Unit Experimental (DIUX). Informal efforts of such a partnership have already succeeded in creating new opportunities for students and faculty. Innovation Fellows would leverage the geographic proximity of NPS to Silicon Valley and facilitate student-faculty participation with potential governmental and industry partners in projects, internships, and field experimentation. The Innovation Fellows Program will enhance the ability to take students out of the classroom to see how their education can use emerging technologies to solve real problems with partners.
Action H1.4. Institutionalize the Big Ideas Exchange (BIX).

The BIX spotlights big, transformative ideas faculty and students are developing for the military and defense community. We will host two BIX events annually and leverage the PAO, the Institutional Advancement Office, and external partners to connect the work at NPS to our broader Navy, Marine Corps and DOD stakeholders. We will organize an annual “Discover NPS” day that includes lab tours, presentations of big ideas, youth tournaments, hackathons, and a major public presentation by a national innovation leader. We will promote the Naval Research Working Group, which annually brings together topic sponsors from across the Navy, Marine Corps, and DOD. Using the Human Systems Integration research group as a model, we will reach out to Navy and Marine Corps organizations and promote their adoption of innovative technologies and practices.
H2 – Talent Management and Performance

The capabilities of our people have been, and will always be, a critical element of warfighting. The growing complexity of the technologies our warfighters use, the diverse locations in which we conduct military operations, the emergence of non-state adversaries, and the expansion of joint military operations, all make increasing demands on the education we deliver. We need to anticipate the specialties that will be essential in the years ahead and prepare the workforce. We need to enable our graduates to think, navigate, and lead in a world of accelerating technologies, contingencies, and surprises. We need to design how we work to enable efficient performance.

NPS has critical expertise in talent management and performance that needs to be expanded and coordinated to meet these goals. Towards that end, we propose the following specific actions.

Action H2.1: Build more coherent programs in talent management

NPS has a long history of conducting studies in the field of defense talent management. For the most part, these studies focus on answering specific, relatively narrow questions for individual sponsors, but have not addressed longer-range strategic concerns in talent development. We will transition our current capabilities into a sustained education and research program that creates a broadly useful forecasting and analytic capability for recruitment, workforce maintenance, and retention. To do this, we will expand our working partnerships with holders of critical data, we will develop more general models of the talent management “pipeline” for military personnel in various roles, and, in concert with current and potential sponsors in DoD, we will identify the most critical problems to which models should be applied. With these improvements, we will reshape our educational programs in the talent management area.

Action H2.2: Optimize Human Performance

NPS will expand its activities focused on optimizing human performance. Currently, NPS is a leader in understanding how sleep schedules affect performance; but this is just the beginning. NPS will develop further education and research in the field of human performance by investing in studies of how machine and humans interact, how physical performance can be advanced through wearable technology such as head-mounted displays and exoskeletons, and how biological, chemical, implanted chips, and other technologies might enhance military effectiveness.
H3 -- Ethics of War

There is a strong demand for increased education, research and training capacity around the ethics of war across NPS curricula as well as for the broader Navy and DoD communities. A number of accelerating factors have changed the role of technology in warfare – information technology, interconnectivity, and environment. For example, automated fire control systems appear essential to counter enemy threats, yet there is a big concern that they be sufficiently trustworthy to have confidence that no bug or glitch will start an unwanted war. Connectivity increases the range of coordination and awareness, but also increases the risk of “mob behavior” when enticing but false stories circulate. Grabbing resources from the global commons creates new risks of conflict in contested environments. There is a surprisingly large demand for such ethics engagement.

Action H3.1 – Create Center on Ethics of War.

Create a Center on the Ethics of War to significantly increase NPS’ capacity to provide ethics education to our students as well as extend that opportunity to the broader DoD community; produce top-tier academic research on the ethics of war; produce policy, ethical analysis and advisement to Navy and DoD; and engage the broader society on military ethics issues. Once established and running, recruit a full-time ethics of war Research Professor and additional post-docs with some teaching duties, who will work to meet the demands for both the in-house teaching at NPS and the ethics education needs across the Navy and other military services. Additionally, the a team will develop a program of ethics research, analysis, and policy advisement needs for the DoD.
H4 -- Strategy, Diplomacy, and Cross-Domain Deterrence

The strategic environment facing the United States comprises traditional military threats, evolving challenges on issues such as nuclear proliferation and global terrorism, and newer problems in areas such as cyber, climate, energy, and space. These concerns collectively raise demands on existing alliances and increase the need for coalition building and combined operations across the globe. Addressing them effectively requires contextualized understanding of the unique challenges in specific regions of the world. We will expand our portfolio of interdisciplinary research and teaching to strengthen US defense strategy, systems, and technology. We have been and will remain at the forefront of teaching and research in international security, with expertise spanning across regional operational theaters as well as specific functional security threats.

Action H4.1 – Establish a strategy-related experience tour program.
Competitively selected faculty will work closely on-site with such partners as COCOMs, private sector companies, and government agencies. The program will more closely couple our faculty and students with operational, technological and policy concerns that might affect future US strategies.

Action H4.2. Establish a Research Fellowship in Deterrence and Diplomacy.
One or two fellowship(s) will be offered annually for faculty and student teams to visit relevant bodies within the US military and government dealing with deterrence and diplomacy issues. These tours and discussions would support faculty research and student theses. Organizations to be visited would include US Strategic Command (STRATCOM), Office of the Secretary of Defense for Policy, and individual commands dealing with single-domain deterrence (Cyber Command, USAF Space Command, or others). The fellowship program would fund one trip per team and would support new proposals as well as ongoing projects.

Action H4.3 – Foster Cross-Domain Research.
Introduce a Cross-Domain Research program that invites teams of faculty from different departments to jointly propose research studies or short courses on some cross-domain issue such as space and cyber, maritime and space, or autonomous systems and warfighting. Support this with an annual “Monterey Strategy Symposium”, organized with regional partners.
S1 -- Emerging Technologies

Two of the important defense challenges facing the US include ensuring not only that we are involved in developing new technologies important to the Navy and the DoD, but in educating students who are capable of understanding and leveraging whatever new technologies do emerge. Technologies such as novel computing platforms, cyber security, additive manufacturing, novel materials for energy and structures, early synthetic prototyping, and large constellations of small satellites all promise disruptive advances to existing capabilities. To support the Navy and DoD in avoiding technology surprises and educate officers to be among the first skilled users emerging technologies, NPS must actively support laboratories exploring emerging technologies and the recruitment and development of faculty who can lead in these areas.

Action S1.1 – Establish emerging technology exploration laboratories and secure seed funding for new research in selected areas of great strategic importance. Candidates include:

- Autonomous systems
- Cyber security technologies
- Additive manufacturing
- Nano-mems cleanroom for new materials
- Modelling, simulation, visualization and virtual reality
- Nano-satellites and new-band satellite-ground communications
- Military applications of blockchains
- Quantum computing

We will propose other areas as the need arises.

Action S1.2 – Enable excellence in our faculty in these emerging technological areas.

For the emerging technologies identified above, encourage existing faculty to form new groups to establish labs and link them to education offers, and hire new junior professors to strengthen our coverage of these technologies. Seek support for Chaired Professorships for hiring and retaining senior faculty leaders in these areas. Provide incentives for multiple-department faculty involvement.
S2 – Data Science

Few organizations in the world collect and manage more data than the Department of Defense. However, the sheer quantity of these data, the large number of organizations exercising authority and control over subsets of the data, and the incompatibilities in data storage severely limit decisions across all functional areas, from personnel readiness, to command and control, intelligence, cybersecurity, logistics, meteorology, oceanography, and acquisition.

The emerging fields of data sciences and analytics make data relevant to national defense and homeland security. NPS is uniquely positioned to make major contribution to the Navy and DoD capabilities by expanding and focusing our educational programs and our research in this emerging cross-disciplinary field. NPS will educate future leaders to think and succeed in this data-rich environment through knowledge of the fundamentals, applied research, and the ability to create institutional data science capacity.

Action S2.1 – Create an interdisciplinary working group guided by a faculty coordinating committee.

The new Data Science Working Group (DSWG) will bring together faculty and staff from across NPS. This group will initially be charged with three main strategies:

- Assist with organizing existing data resources relevant to national defense;
- Provide an effective data analytic capability to answer important defense-related questions; and
- Educate military officers and DoD civilians so that we have the human capital that will make it possible to integrate data sciences and analytics into future decision-making.

The working group will develop education programs and sponsors; get research sponsorship for new technologies of gathering, storing, and analyzing data; develop a resident capability in data engineering; and coordinate data science activities across campus.
S3 – Environment

An understanding of, and an ability to predict, environmental conditions in the atmosphere, ocean, land, and space is essential to many aspects of our national security.

A number of very high profile national security systems involve technologies that are especially sensitive to environmental conditions: sensors, communications systems, missile defense and anti-submarine warfare technologies involving lasers, radar, or sonar. Many extremely high profile national security policies, plans, and operations such as planning for the impacts of rising sea level on military bases and operations, and humanitarian assistance and disaster relief operations are sensitive to evolving climate conditions.

There is a growing demand to educate service members about environmental effects as well as how to utilize and apply earth systems models for forecasting and decision-making. For those leadership roles, it will become increasingly important for naval officers to be well-informed about a range of environmental effects.

Action S3.1: Maintain our strength in defense-relevant aspects of the environment.

We will expand our range of interdisciplinary expertise in research and graduate education on environmental conditions including the operational effects of environmental conditions, energy footprints of systems and operations, protecting energy supply chains, optimizing logistic networks, and application of models and environmental information in the operational and national security environments. In this area, we will:

- Leverage NPS’s investments in expanded bandwidth to classified networks and cloud computing to enhance our collaborations with Navy, DoD, NOAA, other agencies, and universities to obtain and share access to large environmental data sets.
- Improve access to real-time and archival environmental data.
- Recruit post-doctoral researchers who will bring the latest techniques and scholarship into our classrooms and laboratories.
- Establish seminar series and annual conferences that bring faculty, students, military and industry together to discuss pressing issues and concerns.
- Engage with our sister higher education institutions (NWC, USNA, AFIT) to analyze environmental effects on sensors; weapons; personnel; strategic, operational and tactical planning; the operations of adversaries; and to develop policies and alternative courses of action based on environmental intelligence.

Action S3.2: Expand our collaborations on environment.

We will facilitate and improve faculty expeditions to ships, submarines, aircraft, and other platforms, and experiments such as those in the Navy and University-National Oceanographic Laboratory System (UNOLS) fleets or at Space and Naval Warfare Systems Command (SPAWAR) and the research labs. We will collaborate with other military organizations and with industry to obtain access to their experimental
platforms -- both equipment and computational platforms such as exascale and quantum computers -- for hands on education, research and experimentation to understand and explore environmental effects on operational outcomes for existing and planned systems.
**S4 – Cyberspace Operations**

The Secretary of Defense and all of the Service Chiefs have identified cybersecurity as the fifth dimension of warfare, along with land, sea, air, and space. We will continue expanding our cyber educational and research programs, strengthening our ability to respond to ever changing, often surprising cyber threats. We will prepare our students to be decision makers who can support the requirements of the Navy-Marine Corps team, the Joint Force, and the Department of Defense. We will maintain our National Center of Academic Excellence status (from NSA) in Information Assurance, Cyber Defense, Cyber Operations, and Cyber Research; and our Department of Defense Information Operations Center for Research.

Action S4.1. Develop new academic programs that enhance our external relationships in the cyber domain.

We will offer new cyber courses for senior leadership through the Center for Executive Education and online forums. We will establish student internships at leading cyber businesses, especially in Silicon Valley, to give our students first-hand experience with industry approaches to cyber security. We will establish faculty and staff internships at numbered fleet headquarters and on board ships, to afford first-hand experiences with the operational environments in which cyber security is critical.

Action S4.2. Cyber for all course.

We will continue to develop, refine, and distribute our comprehensive “cyber for all” course. We will work with our curriculum sponsors to incorporate the course into their students’ schedules. We will make this course available as an online service on a MOOC platform accessible for all military and DOD civilian personnel.

Action S4.3. Upgrade research and laboratories of the Cyber Academic Group.

Our students need much hands-on experience with the complexities of cyber operations, the nature of threats they will face, the improvements possible when software is augmented with security hardware. The upgrades will support improvements in the depth of knowledge to be successful cyber warriors and also the cyber research programs of the faculty. We will also get more students involved with testing cyber technologies locally and at the Field Experimentation Facility at Camp Roberts.

Action S4.4. We will work with the SECDEF office on developing concepts for a new, highly secure, flexible world-wide defense network.
Resourcing Our Strategy

Some of the actions described in the preceding section can be undertaken using resources already available to NPS. Many others will require new resources including funding, reallocation of our authorized full-time equivalent (FTE) manning level or approval to grow beyond that authorized manning level, and lab or office space.

Until we get further into the detailed planning of specific actions and have discussions with sponsors, we cannot state concretely what new resources will be required for each action. However, it is useful to consider where such resources will come from. There are five potential sources.

The first source is our existing allocations of space, money, and FTE. Some existing programs may have lower priority than the new opportunities described in this plan, in which cases reallocations will be made. We will look very carefully at how we allocate our existing resources and we will examine whether other uses would better achieve our overall mission. We can also apply our small budget for new, Navy-relevant initiatives to the highest priority elements of our strategic plan.

The second source is the Navy itself. We will work with Navy leadership to find ways of expanding the base budget to enable greater capability to achieve our strategic goals.

The third source of resources is current and potential sponsors of reimbursable projects. Most of our research funding and a good deal of our teaching is supported by funds from other sponsoring organizations. Many of our proposed actions will be important not just to the Navy, but to the other armed services and defense-related organizations. Our hybrid funding model using both direct Navy funding and reimbursable funding from our sponsors enables us to grow our new initiatives from both sources. We expect that several of our action areas will draw substantial external support, particularly once we initiate them and demonstrate our capabilities.

The fourth source is the Program Objective Memorandum (POM) process. We believe that many of our proposed actions are of such importance to the Navy specifically and DoD more generally that they are worthy of consideration in the POM process. Starting with the FY2020 POM cycle, we expect our future POM requests to reflect our strategy and to support actions that will most significantly further NPS’s ability to serve the nation’s defense needs.

The fifth source of support can be the NPS Foundation. In recent years, through the initiatives of the Foundation’s board and staff, the NPS Foundation has significantly expanded its support for the university. The Foundation already provides substantial seed funding for new research initiatives by our faculty through its Defense Innovation Fund. The Foundation’s leadership understands our strategic priorities and is fully supportive of them; they are prepared to seek expanded support that aligns with those priorities and make gifts to NPS (with appropriate DoN approvals) to support elements of this plan.

We fully recognize that it will take time to develop the resources to do everything in our plan. Fortunately, many of the proposed actions are not “all-or-nothing” in nature and can be implemented in phases. We will start with phases that can be fully implemented by reallocating our existing resources. We will start other actions at small scale, growing as new resources are committed from reimbursable sponsors, NPS Foundation gifts, or the POM process.
Some Final Thoughts on Our Strategy

Wherever possible, we will partner with organizations whose capabilities and activities complement our own.

This plan is a guide for actions, not a dictum. To keep our strategies relevant, we will revisit and update this plan annually. We will be flexible and adjust our strategies for new circumstances and emerging concerns.

With Sir Winston Churchill, we appreciate that all strategies must be evaluated regularly for results. With Dwight Eisenhower, we believe that the work of fostering extensive faculty and sponsor discussions around our strategies, and making offers to do concrete actions for our sponsors, is ultimately more important than the document itself. This plan is our guide to maintaining a peerless NPS that educates officers well and engages in research that supports the national defense.

“However beautiful the strategy, you should occasionally look at the results.”
--Sir Winston Churchill

“In preparing for battle I have always found that plans are useless, but planning is indispensable.”
--Dwight D. Eisenhower