

Panelists: Tackling Challenges, Building Trust Will Proliferate Unmanned Capabilities



Vice Adm. Scott Conn (middle) discusses issues during the Unmanned Advancements in Warfighting session. *SOLARES PHOTOGRAPHY*

NATIONAL HARBOR, Md. – As unmanned systems continue to proliferate on the battlefield, understanding of their value has increased accordingly. They are force multipliers and perform dangerous missions that otherwise would place human operators in harm's way. Their capabilities are increasing exponentially it would seem, as new technologies emerge and are incorporated into the inventory.

But these impressive tools come with a new set of challenges

as well, which a panel of uniformed and industry experts addressed during a April 5 discussion at Sea-Air-Space 2022.

"Risks involve things like communications, logistics, training and infrastructure," said Dr. Andrew Mara, the moderator, vice president for Federally Funded Research and Development Centers at the Center for Naval Analysis.

Vice Adm. Scott Conn, the Deputy Chief of Naval Operations for Warfighting Requirements and Capabilities, outlined the ongoing work of the service's unmanned task force. Their job, he said, is to find ways to solve key operations problems across all domains.

"I'm a firm believer [that] some really clear, innovative solutions are going to come from the fleet," Conn said. "Give them the tools. Let them learn. Let them provide us in the Pentagon and industry with feedback."

As he described the ongoing work with unmanned undersea vehicles, gliders, surface vessels and other platforms, DARPA's Dr. Kenneth Plaks emphasized the importance of having human operators trust their robotic assistants.

"I can see a future where it's a human on the loop that says, 'OK, go take care of that threat and let me know when it's done,' and it just does it."

Plaks also mentioned the emergence of swarms of as many as 1,000 robotic vehicles and how managing them would require critical human command and control.

"We can accelerate unmanned in all domains," said Dave Johnson, vice president of strategy at L3Harris, alluding to several projects in the works that would conduct live fire, counter-mine and other systems.

"There is a real progression of unmanned capability," Johnson said.

It is important to keep in mind the missions that can be enhanced when developing unmanned platforms, said Jeffrey Hoyle, vice president of maritime systems at Elbit Systems of America.

“We need to continue to build trust, putting weapons on unmanned surface vehicles to do the types of things that platforms can do under guidance,” Johnson said. “The way to do that is to continue with this campaign of prototyping and experimentation. Extending reach, increasing lethality and enhancing the survivability of our people and existing platforms are the things we’re focused on.”

Space: The Next Warfighting Domain



Navy Cmdr. Damon Melidossian said that teamwork among the combatant commands and commercial market will be critical in setting up the planned lower-orbit constellation of

satellites. *LISA NIPP*

As space continues to emerge as a significantly important strategic domain, the armed services and industry alike are working together to ensure that the U.S. retains and expands its dominance.

The job at hand entails several key areas, which four experts described at length during a April 4 panel discussion at the Navy League of the United States Sea-Air-Space conference at National Harbor, Maryland.

The work performed by CAES Solutions to improve situational awareness, reduced cycle times and acceleration of technological developments, as described by Gregg Bell of the company's Space Systems Division, would provide support for the identification and kill-chain issues Navy Cmdr. Damon Melidossian of the Defense Department's Space Development Agency described.

"We have a partnership with Lattice Semiconductors, where will bring our radiation-hardened electronics packaging to focus, which is going to be critical for learning in space," Bell said. "We'll be able to further advance some of the world's most critical missions."

Additive manufacturing and artificial intelligence, he added, have enabled the company to deliver solutions quicker than ever before.

Melidossian said that teamwork among the combatant commands and commercial market will be critical in setting up the planned lower-orbit constellation of satellites. When in place, he said, the constellation would reduce latency issues to mere seconds.

"The architecture we're building is done in different layers of satellites, processors and sensors, all to build out this architecture," Melidossian said. "It constitutes initially 20 satellites. What they're going to do is provide speed-of-light

data transfer from anywhere on the planet to any warfighting element.”

Getting the satellites on orbit and on schedule is “a top priority,” Melidossian said.

Ensuring that the preponderance of quick data can be put to good use is a key challenge for the software industry, said Dr. Angel Smith of Microsoft.

“Anywhere you’ve got multidomain operations, you’ve got large data sets,” said Smith, a former Marine C-130 pilot, who manages mission solutions and customer expansion at Microsoft. “You need to move data fast, and you need to make decisions very quickly. That’s where I think the software industry is uniquely postured to be able to [provide] support.”

Maj. Gen. Ryan Heritage, commander of both the Marine Corps’ Forces Cyber Command and Forces Space Command, described how the service’s emphasis on space operations is a key contingent of the effort to divest itself of archaic missions and equipment and refocus on elements that would help with the future fight.

“The Marine Corps is changing some of the training for our space staff officers – doubling down on the space operations officers.” Heritage said.

During a recent visit to the Marine Corps Air-Ground Combat Center in Twentynine Palms, California, Heritage said he heard officers from all services brainstorm about integrating these new capabilities down to the company level.

“You typically don’t associate Marines with space necessarily,” Heritage said, “but the personnel are coming.”

New Marine occupational specialties are focusing on space and cyber, he added. In time, these Marines will rise into leadership positions.

Partnerships Key to Confronting Adversaries, Harker Says



Acting Secretary of the Navy Thomas Harker addressing Sea-Air-Space 2021 on Aug. 4. *NAVY LEAGUE / Lisa Nipp*

NATIONAL HARBOR, MD. – That Sea-Air-Space 2021 was able to be held this year shows the power of partnerships, acting Secretary of the Navy Thomas Harker said Aug. 4.

“The fact that we’re able to gather today is a testament to the power of partnership – pharmaceutical companies, scientists, government researchers, military and civilian leaders – all working together to develop the vaccine,” Harker said. “That’s how we must confront all of our adversaries. Together.”

Future military planning requires a transparent understanding of needs and limitations, Harker said, adding that such an approach will protect the supply chain while strengthening small-business opportunities.

“Keep challenging the Navy and Marine Corps to innovate and transform,” Harker said. “That’s how we keep the faith with the American taxpayers and our oversight partners on the Hill. Every dollar is a strategic asset that must be maximized.”

The decision-making process for the coming budget has been tough, Harker said, acknowledging that costs associated with personnel, maintenance and recapitalization efforts have exceeded the rate of inflation. As a result, investment planning by vital industrial-base partners will be affected.

"We refuse to create a hollow force. We will not leave holes in units and create a force that leaves our Sailors and Marines without proper training," Harker said, citing the lessons learned from the separate collision incidents involving the destroyers Fitzgerald and McCain.

The two incidents occurred because Sailors and Marines were asked to do more with less, Harker said.

"One-time fixes aren't enough," Harker said. "We have to make changes, putting controls in place to prevent future events. We're putting procedures in place to ensure that we don't return to bad habits of the past."

The acting secretary highlighted efforts to improve a moribund auditing process, after independent government assessments revealed discrepancies and shortcomings he said must be addressed.

Harker called for a "get real, get better approach, demanding rigorous self-assessment, strong characterization of current performance, detailed analysis based on accountability and the opportunity to implement needed improvements."

Citing personal experience, Harker reiterated the Defense Department's stance that mental-health counseling must be destigmatized and treated equally with any other form of health care treatment. He also reiterated the overall commitment to rid the ranks of sexual harassment and assault.

"Data shows that a command that tolerates harassment and destructive behaviors increases the risk of sexual assault," Harker said. "We've distributed a watch list which has the top five signals of risk for sexual assault, to assist commanders in both the Navy and Marine Corps to identify warning signs and signals so they can take action to improve their command."

IUU Replacing Piracy as Top Global Maritime Security Threat



Illegal, unreported and unregulated fishing has both economic and security ramifications. *NAVY LEAGUE / Lisa Nipp*

NATIONAL HARBOR, Md. – The ramifications of illegal, unreported and unregulated (IUU) fishing are readily apparent on nations whose economies depend on fishing, but the practice has an impact on U.S. national security as well, a panel of experts said Aug. 4 at Sea-Air-Space 2021.

Moderator Whitley Saumweber, who directs the Stephenson Ocean Security Project, described a scenario in which 90% of the world's fish stocks are either at or above sustainable capacity while demand continues to increase.

"This combines with increasing global competition, particularly from China, which uses its fishing fleets both as a source of economic and food security but also as a way to project soft power on the globe," Saumweber said.

Coast Guard Vice Commandant Adm. Linda Fagan said illegal fishing is replacing piracy as the top global maritime security threat facing the nation.

"It's a sovereignty issue, it's a maritime security issue and it jeopardizes nations' economic food security," Fagan said. "It weakens the global rules-based order that we all rely on for our standard of living."

Tackling IUU, Fagan said, will require both experienced

leadership and close work in both building new partnerships and fostering existing one around the globe.

"We recently had the Mohawk, a 270-foot cutter, with another nation's coast guard on board enforcing fisheries rules," Fagan said. "It's those types of partnerships where we provide an asset and the other nation provides their expertise and authority to get after the threat."

Navy Rear Adm. Heidi Berg, the former Director 12 at U.S. Africa Command, said IUU fishing drew considerable attention during her tenure because of the challenges it created in other areas. She specifically cited the effects caused by China's growing presence and activity.

"In the Gulf of Guinea, [China] is now devastating those economies," Berg said. "They engender corruption. They continue to act to support authoritarian regimes that can ensure their continued access."

Other crimes, such as weapons and drug trafficking, are on the increase as a direct result, Berg said. Terrorist organizations such as al Qaida and the Taliban are gaining influence as well, she added.

Constance Arvis, the acting deputy secretary of state for oceans, fisheries and polar affairs, said the State Department is actively working with other agencies and 69 international partners on a "groundbreaking treaty" called the Port State Measures Agreement.

"We are seeking to build a clean value chain of seafood that only accepts authorized catch from authorized vessels," Arvis said. "If a port state believes that a vessel that wishes to come in has in fact engaged in IUU fishing, it can be denied port services and entry. Information is going to be shared with other ports to make clear that no IUU fishing enters the international market."

The Defense Innovation Unit is actively seeking ideas from academia, government and industry by which new technologies such as artificial intelligence and machine learning could help foster better enforcement of fishing regulations and quash IUU fishing in the process.

“We have no pride in where the solution comes from. But it is critical that when we get things to work, we find out [if] we can use the types of data here – space-based SAR [synthetic aperture radar] – to accurately identify activity that’s indicative of IUU fishing and vessels that may be doing it,” said Jared Dunnmon, the unit’s director of artificial intelligence.

Dunnmon said that the unit is conducting a prize challenge for innovators to submit ideas for countering IUU.

“The challenge is open to anyone,” Dunnmon said. “It launches this month, and we’ll run it for about three months.”

Dickinson Details Tenets of Responsible Space Behavior in Domain That Shares Similarities to the Sea



Gen. James Dickinson compares harsh domains of the sea and space in his keynote address on Aug. 3. *NAVY LEAGUE / Lisa Nipp*

Space and the sea perhaps would seem at first blush to be very different and disparate operating environments. Army Gen.

James H. Dickinson, the man in charge of U.S. Space Command, believes otherwise.

At a luncheon and then a media roundtable at the Navy League's Sea-Air-Space expo at National Harbor, Maryland, on Aug. 3, Dickinson pointed out that both environments are the harshest in which to operate. Further, both the sea and space are becoming increasingly more contested by potential adversaries.

"We each share a vast area. In the maritime domain, it's 10,000 miles across the Pacific Ocean," Dickinson said. "For us, it's out to the moon and beyond. Both are concerned with respective domains that are very vast, and very difficult, complex and unforgiving."

As the head of the nation's newest unified combatant command, Dickinson's job is to use the trained men and women sent to him by the Army, Navy, Air Force, Marine Corps and newly created Space Force for operational reasons in the space domain.

"They all bring their own capabilities to the command, which we use for daily operations," Dickinson said.

Success hinges upon an understanding of the specific challenges space poses, Dickinson said. Space debris, whether old junk or the remnants of a Chinese satellite they deliberately destroyed a little more than a decade ago, is a prime example.

"There are still remnants of that in lower orbit, and we'll have that effect for years to come," Dickinson said. "What's important about the low Earth orbit is that's where we do things with human spaceflight. The International Space Station is in low Earth orbit. When you talk about risk to human life, you have it when you have that type of activity going on."

Space Force Guardians under Dickinson's command at Vandenberg Air Force Base, California, have a primary mission of tracking

and mitigating such debris. The command then provides relevant information to governmental agencies and public entities that share an interest in knowing about what threats their space assets are facing. Dickinson compares the mission to that of the Federal Aviation Administration, which tracks and manages the safety of thousands of flights each day.

“It’s an exciting time to be in the space enterprise. There’s no lack of energy,” Dickinson said. “People want to come work for us.”

In the immediate future, Dickinson will tackle the job Defense Secretary Lloyd J. Austin III bestowed upon him with the July issuance of five tenets of responsible space behavior, which would apply to operations, fielding acquisition and every other related aspect: One, operate in, from, to and through space with due regard to others and in a professional manner; two, limit the generation of long-lived space debris; three, avoid the creation of harmful interference; four, maintain safe separation and safe trajectory; and, five, communicate and make notifications to enhance the safety and stability of the domain.

Noting that the directive is part of a government-wide effort to address conduct in space both in the U.S. and among partner nations, Dickinson expressed hope that an international agreement to support it.

“In the meantime, just think about how much we can learn from our Navy teammates in this regard – how we assess behavior and respond when adversaries fall short of the standards,” Dickinson said, “with the power from a position of strength to compel seafaring operations to operate within those rules.”

IW Deputy Chief: 'Fusing Together Information Faster' Will Create Advantage



Rear Adm. Gene Price, Vice Commander of Naval Information Forces, said AI and machine learning are areas that warrant critical attention. *SOLARES PHOTOGRAPHY*

NATIONAL HARBOR, Md. – All hopes of prevailing in the next conflict, if and when it arises, hinge on seizing the advantage in information warfare, the Navy's chief officer of that domain said Aug. 2 audience at the Navy League's Sea-Air-Space expo in National Harbor, Maryland.

"Technologies that exist today are all about fusing together information faster," said Vice Adm. Jeffrey Trussler, Deputy Chief of Naval Operations for Information Warfare. "Our data, our information, the use of artificial intelligence, robotics – the nation that harnesses that the best is going to have the advantage should we go to conflict. And I'm one of those guys who says we're in conflict right now."

Trussler then turned the floor over to Rear Adm. Gene Price, Vice Commander of Naval Information Forces, who described the roughly 11-year-old command as a place under which data from a host of communities is amalgamated.

"Information warfare is a combination of oceanography, meteorology, intelligence, electronic warfare, cryptology, cyber warfare, IT [information technology] – all these things – come together," Price said.

By integrating all of these disciplines as one, Price said, the Navy creates awareness, assured command and controlled integrated fires in the battlespace.

“This is the heart and soul of what information warfare is all about – pushing [data] out to whoever needs it, whenever they need it, wherever it is,” Price said. “Our job is to make sure that the right weapon is in the right place at the right time.”

Price cited AI/ML – artificial intelligence and machine learning – as a critical area that warrants attention.

“It’s a data problem, a platform problem, a management problem,” Price said.

Work on transferring data to AI/ML is ongoing, Price said. He also discussed continuing efforts in the field of LVC – live, virtual, constructive training. He noted that the aviation community has been involved in LVC for years, and that it should be incorporated more widely through all areas of training. The security benefits are tangible, he said.

“If we go out and practice, we tip our hand to what we want to do,” Price said. “It’s readily apparent to information warfare that we have to have a way to train for the high-end fight in a way that the rates could do their thing without tipping off too much.”

The capability is being managed mainly at the acquisition level, Price said, where a cross functional team with information forces is developing the command requirements and content necessary to make sure information is readily available in a controlled but usable environment.

Navy Closing Capability Gaps in Joint Communications



Defense and industry officials, including Rear Adm. Douglas Small, second from left, discuss joint command and control.

NAVY LEAGUE / Lisa Nipp

NATIONAL HARBOR, Md. – As the entire Department of Defense modernizes technology to enable commands, warfighters and autonomous systems to communicate with each other under the most trying of circumstances, significant questions remain.

“We’re really about closing capability gaps and building the right resourcing requirement plans [to do so],” said Kelly McCool, acting director of the Navy Digital Warfare Office, speaking during a July 2 panel discussion on netted battlespace at the Navy League’s Sea-Air-Space 2021 in National Harbor, Maryland.

Joining McCool on the panel were Naval Warfare Systems Command commander Rear Adm. Douglas Small, Northrop Grumman chief technology officer Scott Stapp and L3 Harris Technologies chief technology officer Ross Niebergall. Patrick Tucker, technical editor at Defense One, moderated the discussion, which addressed the Navy’s role in improving JADC2 (joint all-domain command and control).

Small said the Navy has a long history of expertise in connecting disparate sensors, weapons and command and decision systems. The current climate, he believes, is an expansion of this traditional role.

“We’re talking about contested environments,” Small said. “How do you get that information to the right place in a contested environment, where every aspect of how you fight is being challenged?”

Stapp pointed out that JADC2, as its name suggests, must be applied across all services and domains as well.

“It’s how you move that data into all those critical platforms,” Stapp said. “As a company, we are focusing on the integration of new and unique ways – multi-domain and multi-service.”

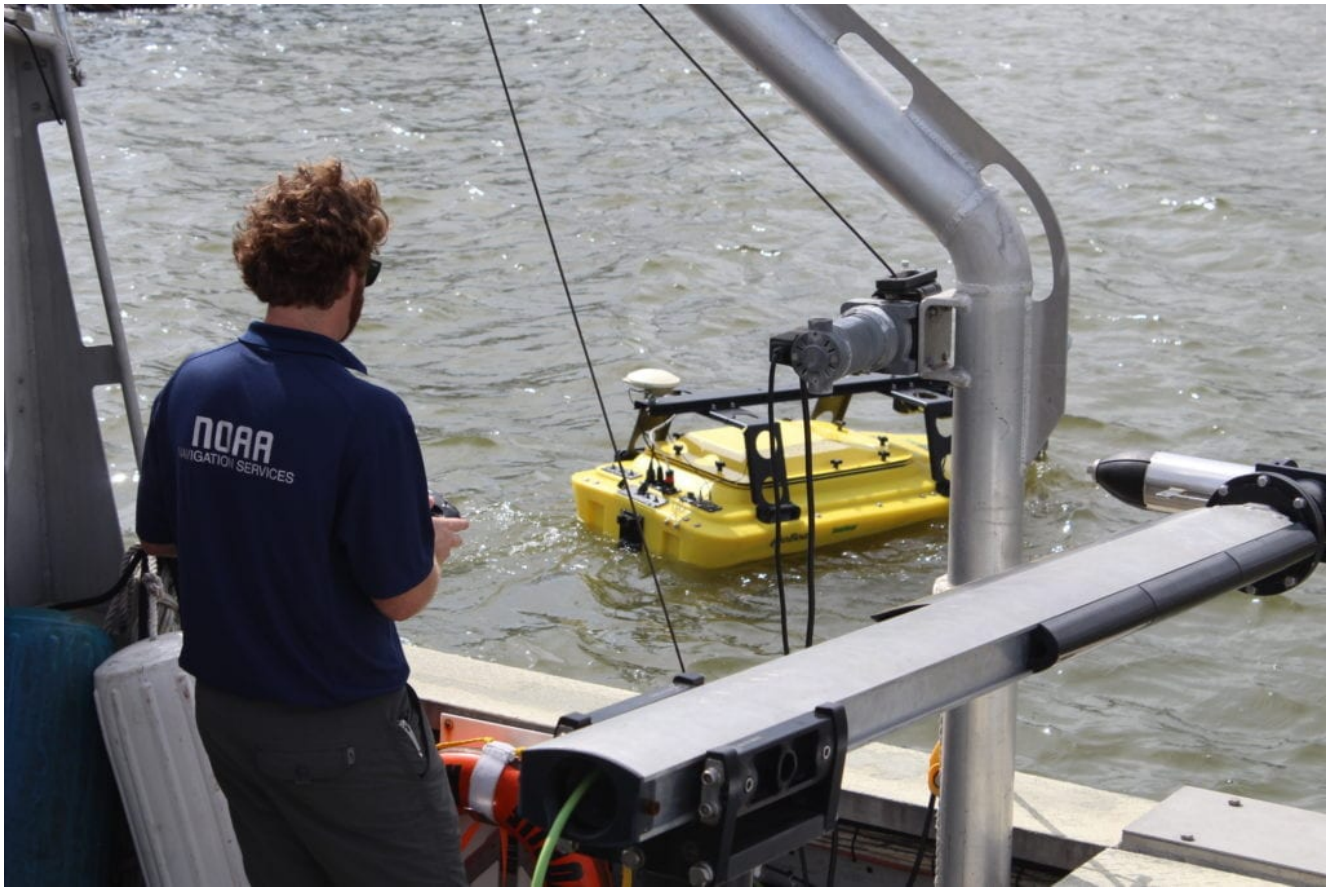
Niebergall discussed the need to take all the data generated by stand-alone systems and use it as a strategic asset. “We need to put it together into a collection that we can operate on, make sure it’s available everywhere, is secure, accurate and can be disseminated everywhere.”

The Navy is accustomed to operating in disconnected environments, Small said, providing commanders with information they need at the time they must make decisions.

“There are certainly areas where we can do a lot better – and we are,” Small said. “It’s more how you take that [data] from a naval platform and expand it out to the joint force.”

**Forecasting for the Fleet:
Naval Meteorology and
Oceanography Command Monitors
Weather, Ocean and
Atmospheric Conditions to**

Keep the Navy in the Fight



Personnel from the National Oceanic and Atmospheric Administration (NOAA) operate an autonomous surface vehicle (USV) in the Port of Gulfport, Miss., during the Commander, Naval Meteorology and Oceanography Command's (CNMOC) Advanced Naval Technology Exercise (ANTX) on Nov. 6, 2019. ANTX is a catalyst for innovation, experimentation and high velocity learning featuring more than 50 participants including industry partners. The exercise tests and evaluates technologies and future concepts that address human and machine interactions within the maritime domain. *NAVAL OCEANOGRAPHY / Kayla Adcock*

Everyone wants accurate weather predictions, but for the military, and the Navy in particular, they can be crucial – typhoons can sink ships and bad weather can force operational delays.

Providing timely and accurate weather predictions and information about the maritime environment falls to the roughly 2,500 military members and civilians who work for the

Naval Meteorology and Oceanography Command.

“Naval oceanography applies meteorological, oceanographic and astrometric decision-science expertise across every aspect of warfare,” said Rear Adm. John A. Okon, who heads the Stennis Space Flight Center, Mississippi-based command. “No other organization across our government, [including] the Department of Defense, applies this knowledge under, on or above the sea in a manner with assured information that can be protected and relied upon in the high-end fight.”

The Navy’s antisubmarine, mine, electromagnetic and special warfare communities all depend upon information the Naval Oceanography Operations Command – which reports to Okon – gathers and processes. Six Pathfinder-class (T-AGS) survey ships and a fleet of unmanned underwater vehicles operate while forward deployed, constantly compiling data.

Buoyancy gliders, drifters, upper-air balloons, satellites and telescopes monitor the operational space from the ocean floor to the stars, providing commanders with real-time understanding of the conditions in which they conduct their missions. The data is processed into numerical models that forecast conditions of the atmosphere, ocean, waves, ice and surf as accurately as possible – and predict how they would affect the performance of weapons systems and fleet operations.

“We use high-performance computing to match with the expert knowledge of our Sailors and civilians – subject matter experts – to develop various certain scenarios that might affect fleet operations,” Okon said.

For example, a typhoon moving through the Western Pacific would certainly curtail surface-fleet operations, Okon said, but offer optimal conditions to conduct antisubmarine warfare. “This is a critical tier that develops environmental knowledge and a predictive advantage to the fleet.”

Round the Clock Forecasting

The Fleet Numerical Meteorology and Oceanography Center (FNMOC) engages in round-the-clock, high-performance computing at all levels of security, from unclassified to top secret. "FNMOC has the nation's only information-assured modeling capability," Okon said.

Fleet weather centers at Norfolk and San Diego naval stations can take information from both the Oceanography Operations Command and FNMOC and provide operational area forecasts to the fleet as it is in route, Okon said. Even though such actions ensure a margin of safety, Okon pointed out that "Mother Nature always gets a vote."

The cooperative effort among the production centers and the fleet weather center provides further information that would keep the forces of nature from wreaking havoc on a mission, Okon said. Additionally, the U.S. Naval Observatory in Washington, D.C., provides the authoritative time reference essential for precise navigation and positioning necessary for accurate computer operation, as well as targeting of weapons and systems.

Okon described the concept of battlespace on demand as a multi-tiered pyramid. The bottom layer consists of observational platforms, with eyes on the oceans, the atmosphere and space. The next tier employs models generated from those observations, providing a functional understanding and prediction of any given environment. The top layer, he said, uses the collected information to determine how the environment would affect performance of forces and systems.

Ultimately, Okon said, the highly trained Sailors and civilians who work under him are experts in disseminating the data and providing the fleet with the predictive advantage they need. The work at hand requires what he calls a highly trained and motivated staff of apprentice, journeyman and

master forecasters. "They're the ones who link the data to decisions," Okon said.



AGC Asya Andrews (right) reviews model data with her OA Division team onboard USS America (LHA- 6) to assess impacts of a developing tropical depression in the South China Sea in this 2017 photo. As a result of forecasting and model performance, the team anticipated the formation of Tropical Depression 01W and provided critical recommendations to the Amphibious Readiness Group that ensured safety of navigation during their transit home from their 5th and 7th Fleet Deployment. *NAVAL OCEANOGRAPHY / Katey Turfitt*

Much of his enlisted force consists of 975 aerographer's mates. Some 340 officers are oceanographers, the senior-most of whom hold masters' degrees in meteorology.

"We also have civilians who have dedicated their lives to this cause – naval oceanography – to predicting the physical battle space," Okon said.

As technical lead for the command's acoustics department, civilian Joseph Senne evaluates the effects on the environment

as sound travels through water and into sediment. Any naval craft – manned, unmanned, surface or subsurface – will be affected, he said.

“We estimate geologic properties so that fleet systems give more accurate predictions of how acoustics interact with the seafloor as they’re moving through different world areas,” said Senne, a physicist who holds a doctorate in ocean engineering and master’s degree in marine science. While the general approach to the job is not new, Senne said, the work constantly changes as computers become more capable.

Senne and his colleagues work with other organizations in the Navy research community, including the Office of Naval Research (ONR), the Naval Research Laboratory (NRL) and the warfare development centers.

“We’re more the production piece, making sure that the answers we’re providing around the world are interacting with tactical decision aids and giving correct answers,” Senne said.

The different parts of the ocean change constantly, he said. Salinity, temperature and the water column itself all have an effect on the way sound travels.

“The cutting edge is being able to keep track of the spatial and temporal variability of the water column, as well as taking advantage of new technologies and methodologies to describe the geo-acoustic environment,” Senne said. “Sound that hits rocky outcroppings is going to behave very differently than when it’s hitting mud.”

Getting this information disseminated and delivered to the captain of a vessel can influence critical decisions. Correct information would better enable a sensor to accurately indicate that an object is one specific distance away or moving in one particular direction. Senne and his colleagues are called upon to spend considerable time at sea plying their trade, with productive results.

“We have mounted sensors on our ships that are multi- beam bathymetry and sub-bottom profiling measurement systems,” Senne said. “They’re putting out sound at very specific frequency bands.”

Based on how the sound reflects off of the sediment, the angle at which it is emitted and returned and travel time, shipboard crews can determine the depth of the water in which they are operating.

“We can do that at very high resolutions and are able to map out the seabed itself,” Senne said. “On top of that, on our acoustic surveys, we will trail seismic-type equipment behind us that is putting sound deeper into the sediment so that it’s not just reflecting from the water-sediment interface but from the layer interfaces of the sediment as well.”

Relaying the Message

The command’s Sailors have to be proficient in jobs that require mastery of a complicated skill set and explain its relevant points to people in leadership who must use them to take critical action at a moment’s notice. Chief Aerographer’s Mate Ciera Greene, an instructor at the Fleet Anti-Submarine Warfare Training Center at Point Loma, California, embraces the challenge.

“It’s super rewarding to have your products be valued at such a high level, and [to be] talking directly to the people making decisions,” Greene said. To be effective, Greene at times has to engage in jargon-filled discourse with her professional colleagues.

“When we’re going through our schooling, we are learning the parameters and rules and science of it all in depth,” Greene said.

But relaying relevant information to those who need it requires a different skill set that also must be learned,

Greene said.

"When we talk to other people, we want to explain how we got our answers in definiteness [and] build our credibility," Greene said. "When a weather briefing is due, you have to understand what everyone is thinking about, the things that matter and the things that could help. And you tailor your briefing to that."

Bogging down presentations with technical jargon could mean a missed opportunity to inject a valuable piece of information into the decision-making process. The meteorological and oceanographic community, Greene said, uses data from its models primarily provide a level of safety.

"To be a part of the mission in a way that can only make it more efficient and effective is huge," Greene said. "I'm very proud to be a part of it."

As quick as Okon is to recognize the contributions civilians and Sailors like Senne and Greene, he understands that continued success hinges upon cooperative arrangements that extend both with and beyond the Navy community. Partnerships with government agencies like the National Oceanic and Atmospheric Administration, and cooperative research and development agreements with industry, are essential to speed emerging technology through the production pipeline and deliver it to forward operators.

"It is a very big deal. These are key challenges for us, in under and on the sea," Okon said.

Arrangements such as the command's two-decade partnership with the University of Southern Mississippi and the Defense Advanced Projects Research Agency, as well as ONR and NRL, are producing results, Okon said.

"The Gulf Coast Tech Bridge Network spans from Tallahassee to Panama City [Florida], to Stennis Space Center[in

Mississippi], to New Orleans,” Okon said. “It’s a collaboration of three Navy commands – mine, the Naval Surface Warfare Center Panama City Division, and the Naval Research Laboratory at Stennis, and it serves as the nation’s regional super connector – tying together government, industry and academia to solve the Navy’s and nation’s challenges in coastal regions.”

International partners also play essential roles, Okon said, by providing vital oceanographic data and access to ports and harbors around the world. The collective effort, he said, is vital in countering the power competition and thwarting the illegal drug trade.



Naval Oceanographic Office personnel prepare to launch 10 littoral battlespace sensing gliders from USNS Maury in the Eastern Atlantic Ocean in support of NAVOCEANO’s goal to deploy more than 50 gliders globally. These gliders are unmanned underwater vehicles used to collect data that is

incorporated into ocean models, ultimately providing underwater forecasts for U.S. Navy operations. *NAVAL OCEANOGRAPHY / Rebecca Shaw*

Unmanned Expertise

Additionally, the oceanography community is emerging as a Defense Department leader in the operation of unmanned vehicles, Okon said.

“We are a key component of the Navy’s innovation culture of catalysts, and we must outpace our competition to ensure that U.S. forces retain that technical warfighting advantage,” Okon said.

With more than 20 years’ experience in operating some 100 different unmanned systems, Okon said, only the commercial oil and gas industry has been at it longer. The command has operated these systems in every ocean in the world and has what he described as a significant inventory of vehicles that have logged more than 60,000 miles and 19,000 hours of bottom time in nearly 2,000 sorties.

“We are the only organization in the world to successfully deploy, operate and retrieve the most ocean gliders at one time – more than 100,” Okon said. “We did that from one location, right here at Stennis.”

The combination of human talent and cutting-edge assets, Okon believes, place the oceanography community in a prime role for the continuing effort to maintain freedom of the seas and win wars.

“Wherever the Navy or joint maritime force is,” Okon said, “you will find naval oceanography.”

Navy Infrastructure to Combat Cyber Threats Still a Work in Progress



U.S. Navy Rear Adm. Danelle Barrett during her May 8 cybersecurity presentation at Sea-Air-Space 2019. Lisa Nipp
NATIONAL HARBOR, Md. – Rear Adm. Danelle Barrett began her May 8 presentation at Sea-Air-Space 2019 with a cost comparison. A Gerald R. Ford-class aircraft carrier costs some \$13 billion, she said. A troublemaker can build a capable hacking device that could disrupt systems on a Ford carrier and potentially every other U.S. Navy platform, for about \$9.97.

Given that Navy computers rely on the same off-the-shelf providers as industry and the bad guys, Barrett described how she is doing what she can to ensure that data gets delivered safely and quickly to who needs it, without fear of being encumbered by attackers.

Navy ships have “about 50 different systems” funneling data to commanding officers, Barrett said, who in turn have a limited amount of random access memory “to figure out what to do with all that.”

The Navy needs the right infrastructure, with machines capable of using artificial intelligence (AI) to sift through the stream of data and provide the most important facts.

As an example,
Barrett cited the considerations the carrier Abraham Lincoln's
commander and
crew would face when planning a trip through the Straits of
Hormuz.

"Things are tense
with the Iranians. We want a safe transit," Barrett said.

Every key player
on the Lincoln wants to know specifics relative to his or her
own job, she
said.

"The navigator
needs to know, can I navigate safely through at [a given]
course and speed. The
chief engineer wants ... data on problems I might have with the
plant. The
communications officer wants to make sure I don't drive out of
my satellite
footprint. The intel folks, those on tactical watch and battle
watch, need it,
too. The last time [a carrier] went through, about 20 nautical
miles away, Iranian
UAVs came over to harass the ship," Barrett said.

The Navy does not
have this capability – to provide data and ensure security to
the lowest
possible element later – today, Barrett said. She also pointed
out that
mischievous likely would not manifest itself as some bold and
splashy operation.

Rather, "They
would mess with the data just a little bit ... just enough to
make you make a

really bad calculation,” Barrett said. “It’s not going to be noticeable if it’s coming from a very sophisticated adversary.”

Barrett is spearheading a course that would have the right systems in place as quickly as possible. Stove-piping of approval for new systems, or delivery of data, will not work for her. The process will use “stuff that industry is doing, leveraging the exact same products,” and will provide interoperability. The Navy must be able to get its hands on the next fastest thing, get it installed and have it functioning – before enemies upgrade their own capabilities.

“The environment to the left of the boom is going to get more complicated,” she said.

Already, ships are inundated with data from scores of sensors in and under the surface and in the air, she said. Soon, thousands of such devices are going to be funneling such information. Managing the data, Barrett said, will require ensuring that its quality is as good as it can be. Commanders should be able to get what they need within, say, a two-hour window of their next major milestone.

“If I could do that today, I’d have a huge operational advantage,” Barrett said. “It’s a tall order. But we’ll get there.”

Services Tackling New Type of Enlistee



Three senior enlisted leaders from the Navy, Marine Corps and Coast Guard spoke during a panel discussion on May 7 at Sea-Air-Space 2019. Charles Fazio

NATIONAL HARBOR, Md. – The new generation of Sailors, Marines and Coast Guardsmen who are entering the force and in the early stages of their careers is, well, different. Such is the consensus among the three senior enlisted leaders who spoke at Sea-Air-Space 2019 on May 7.

On one hand, these young people come into military service with an unprecedented technological savvy. On the other, they have a greater need to know why they are given the tasks they must complete. And they must be placed in the right jobs – with the understanding that they should know how to perform other tasks necessary to support the warfighting mission.

“From my perspective, as I’m looking at the Sailor standing in front of me, is there are too many choices and options in time management,” said Master Chief Petty Officer of the Navy Russell Smith.

Young Sailors understandably are attracted to service by incentives like tuition assistance

and the ability to take college courses while deployed on ships. Still, Smith said, those Sailors must know how to do their jobs.

“By any measure, we have more capable Sailors today than any time in our nation’s history.”

Master Chief Petty Officer of the Navy Russell Smith

“What you’re expected to do under high stress in the middle of the night, with things exploding around you or the ship sinking,” is critical, Smith said. So too is the “ability to continue the fight.”

Leaders, Smith said, need to convince their younger charges that goals like the achievement of associate degrees are worthwhile.

“Stay with us. We’ll help you get there – but focus on your job,” Smith said.

Smith said he spent too much time in the accession pipeline to believe that the next generation of Navy leaders is not up to the task.

“By any measure, we have more capable Sailors today than any time in our nation’s history,” Smith said, mentioning that performance and retention went up due to recent efforts to bolster physical standards and boot camp requirements.

Sgt. Maj. Robin Fortner of the Quantico, Virginia-based Marine Corps Systems Command,

discussed the
need to show new recruits what the service can offer them.

“We have to make
sure we have the right incentives for those with the right
skills to stay,”
said Fortner, who was standing in on the panel for Sergeant
Major of the Marine
Corps Ronald Green.

Master Chief of
the Coast Guard Jason Vanderhaden emphasized the need to allow
the service’s
young men and women to specialize in fields that are
compatible with individual
skill sets.

“They want to get
really good at their jobs,” Vanderhaden said.

But like his
fellow panelists, Vanderhaden stressed that these
Coastguardsmen also must be
able to perform missions like damage control, law enforcement
or helicopter
landings that may be outside of their ratings. As the smallest
armed service,
the Coast Guard needs everyone possible to fulfill mission
requirements, he
said. Moreover, as the service gains from technological
advances associated
with the largest recapitalization in service history, young
members’ skill sets
must grow accordingly to keep pace.