ALL HANDS
Celebrating One Hundred Years
MAGAZINE OF THE U.S. NAVY
JUNE 2023

"Today LGBTQI+ Sailors, Marines, Civilians and Contractors work alongside their colleagues to develop creative solutions to today's complex naval challenges and stand up for our nation, our defense, our mission and our adversaries. They are molding the Department of the Navy and realizing the limitless possibilities of a collaborative, diverse and inclusive workforce where everyone can live as their true self and defend our nation from extremism and any threat."
A NOTE FROM THE EDITOR AND STAFF

Every month, we focus on the Navy’s mission-focused people and technologies. As we survey how our naval forces continue to train, fight and equip the world’s toughest Sailors, we look at our advantage at sea and the capabilities of Sailors deployed around the world.

It is our mission to reach Sailors, so please share this issue, scan the QR codes, and follow our social media channels for the latest information for Sailors by Sailors.
MEMORANDUM FOR DISTRIBUTION

SUBJECT: Department of the Navy 2023 LGBTQI+ Pride Month

The Department of the Navy (DON) joins the Nation in celebrating Lesbian, Gay, Bisexual, Transgender, Queer, and Intersex (LGBTQI+) Pride Month during the month of June. This year’s widely discussed theme, “Peace, Love, Revolution,” reflects the wave of societal transformation through which the LGBTQI+ community first found freedom and inherent pride, which they have further developed in the decades since. It is through their efforts that we can further realize a culture across the DON where everyone is treated with dignity, respect, support, and equal opportunity.

Members of the DON’s LGBTQI+ community have served from every base, ship, shipyard, and facility. Pride Month holds great importance to this community and their allies as it commemorates the Stonewall Riots of 1969 as a foundation for LGBTQI+ individuals to discover and celebrate their inherent pride. In reflecting upon the difficulties of the past, I also want to highlight Lieutenant Junior Grade (LTJG) Harvey Milk, who regrettably had to mask his true identity before our beloved Navy forced him out through an “other than honorable” discharge. LTJG Milk went on to become one of the first openly gay candidates elected to public office, before a former colleague assassinated him in 1978. I will never forget sharing my understanding of the details of LTJG Milk’s service with his nephew, Mr. Stuart Milk, and personally witnessing the christening of the oiler USNS HARVEY MILK on 6 November 2021. I am proud to know that HARVEY MILK joins the ranks of present and future USNSs SOJOURNER TRUTH, EARL WARREN, ROBERT F. KENNEDY, LUCY STONE, and JOHN LEWIS as beacons in every port of call for the diversity, equity, and inclusion that we value as a Department and Nation.

Today, LGBTQI+ Sailors, Marines, civilians, and contractors work alongside their colleagues to develop creative solutions to today’s complex naval challenges, and they stand in defense of our Nation to execute our mission and defeat our adversaries. Together, we are molding the future of the DON and realizing the limitless possibilities of a collaborative, diverse, and inclusive workforce where everyone can live as their true self and defend our Nation from extremism and any threat.

I encourage you to learn more about the cultural heritage and contributions of the LGBTQI+ community to our Nation at https://www.history.navy.mil/browse-by-topic/diversity/lgbt.html.

Carlos Del Toro
Harvey Milk was the first openly gay elected official of a major American city. Milk enlisted in the Navy in 1951. After it was discovered that Milk was gay, he was forced to resign.

31 JUN 1951
UCMJ supersedes service-specific disciplinary policies, Article 125, often applied in discharge proceedings of gay service members.

UCMJ ARTICLE 125 - SODOMY
"Any person subject to this chapter who engages in an unnatural carnal copulation with another person of the same or opposite sex or with an animal is guilty of sodomy."

31 JUN 1951
Harvey Milk was the first openly gay elected official of a major American city. Milk enlisted in the Navy in 1951. After it was discovered that Milk was gay, he was forced to resign.

30 NOV 2010
Key working group findings on repeal implementation released.

22 DEC 2010
The "don't ask, don't tell" repeal act becomes law. The Chief of Naval Operations during this time, Admiral Gary Roughead, led the Navy’s preparation for the change in policy

JUN 2012
Department of defense begins observing LGBT+ pride month.

20 JAN 2021
President Biden issues Executive Order 13988, Preventing and Combating Discrimination on the Basis of Gender Identity and Sexual Orientation.

25 JAN 2021
President Biden issues executive order 14004, enabling all qualified Americans to serve their country in uniform.

06 NOV 2021
Fleet replenishment oiler USNS Harvey Milk (T-AO 206) was christened during a ceremony in San Diego, honoring Navy veteran and LGBT+ activist Harvey Milk.

11 FEB 2013
A memorandum from Secretary of Defense Leon Panetta directs the implementation of a review of "Don't ask, don't tell" policy.

27 MAR 2015
The Family and Medical Leave Act (FMLA) extended coverage to legally married same-sex couples.

JUN 2015
Presidential directive on extending protections against discrimination because of gender identity and sex is incorporated into the Department of Defense equal opportunity program.

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The Department of the Navy (DON) announced the correction to records of 15 Sailors formerly assigned to USS Philadelphia (CL-41) (commonly referred to as the ‘Philadelphia 15’) in a ceremony at the Pentagon on June 16. The announcement was made by Franklin Parker, Assistant Secretary of the Navy for Manpower and Reserve Affairs, (ASN M&RA), with descendants of John and Larry Ponder, two members of the Philadelphia 15, in attendance to receive the letters of correction.

“This simply was the right decision,” said Parker. “I believe acknowledging and addressing past injustice only makes us stronger, because it brings us ever closer to the ideals upon which our nation was founded.”

The ‘Philadelphia 15’ were fifteen African-American Sailors assigned to USS Philadelphia who, in October 1940, authored a letter published in the Pittsburgh Courier describing the racial discrimination, abuse, and inability to advance into other, higher-ranking positions. They urged African-American mothers not to let their sons join the Navy and were subsequently discharged because of the letter with “bad conduct discharges,” or “undesirable” charges.

After thorough review of the case by leadership within the DON, it was deemed appropriate and necessary to correct the record and upgrade the discharges of these Sailors.

“The record contained evidence that suggested the race of these sailors may have been a factor that impermissibly motivated some of the decisions made by the Navy regarding these sailors,” said Bobby Hogue, Principal Deputy ASN M&RA. “That was enough for me to initiate the case.”

If any family members of the Philadelphia 15 would like to reach out to the DON for future notifications on the topic or more information, please reach out to PTGN_CHINFOnewsdesk@navy.mil or 703-697-5342.

Members of the Philadelphia 15:
As an ideal setting for experimenting and testing new capabilities and technologies in a cooperative maritime environment, exercise Baltic Operations (BALTOPS) 23 showcases growing U.S. Sixth Fleet unmanned systems capabilities.

As in previous years, U.S. Sixth Fleet is partnering with the U.S. Naval research enterprise to bring the latest advancements in emerging unmanned technologies to conduct mine countermeasures (MCM) operations. To forward these efforts, Sailors and Marines are experimenting and integrating with Unmanned Underwater Vehicles (UUVs), Unmanned Aerial Vehicles (UAVs), and Unmanned Surface Vehicles (USVs).

"The BALTOPS exercise series is a great opportunity to experiment," said Anthony Constable, an Office of Naval Research science advisor to U.S. Sixth Fleet. "BALTOPS is well-supported by Allies and partners, and because the exercise has such a strong history, it gives us ample opportunity to collect operator feedback on how they can best utilize the systems. Additionally, it allows us to showcase new technology to our NATO partners for future collaboration."

Unmanned systems provide additional warfighting capability at sea and become a force multiplier to traditional manpower. Also, unmanned systems allow navies to take on greater operational risk by removing or distancing warfighters from high threat areas while maintaining a tactical and strategic advantage.

For this year’s BALTOPS, planners primarily focused experimentation on four capabilities:

- **In-Stride Detect to Engage Sequence:** UUVs with automatic target recognition technology and advanced communications capabilities conducted real-time mission analysis and sent a sonar image of a potential underwater mine to Explosive Ordnance Disposal (EOD) technicians within minutes of traveling over the item. This capability significantly reduces MCM operational timelines from hours to minutes.

- **Launching UUVs using a USV:** UUVs, which scan the ocean floor for potential mines, are currently delivered to contested areas by operators using rigid hull inflatable boats (RHIB) or other manned small vessels. Using USVs to deliver UUVs reduces the risk of fatalities or injury by ordnance and allows operators to stay safe while the UUV scans the area.

- **Very Shallow Water and Surf Zone Operations:** Shallow water areas represent some of the most hazardous areas to operate for marines and sailors. In this scenario, members of the experimentation task unit facilitated an autonomous collaboration test using a UAV and USV to map an underwater area, allowing boats and personnel to approach a beach site safely.

- **Joint Personnel Recovery:** The JPR scenario involves sending the USV out to a distressed pilot, recovering the personnel, and bringing them back to a safe location— all unmanned, and remotely controlled from a nearby vessel.

Joe Klein, the Joint Personnel Recovery Program Manager for BALTOPS 23, emphasized the unique aspects of implementing a USV in a JPR scenario. "I thought this was a great opportunity," Klein said, referencing the USV. "This is the first time that we’ve done (JPR) with a USV, and it’s a relatively simple scenario, but we’re interested in the communications aspect, like ‘How do you vector the USV into positions,’ and ‘how do we strap the recovery target into the vehicle, as an unmanned system?’ So we’re working through those dilemmas, while also testing it as a solution to some of our problems... You can assume more risk with a USV – it has a pretty low profile, it’s not easy to spot compared to our usual, larger recovery force... it adds resources to recovering in high-threat areas.”
Naval Support Activity (NSA) Souda Bay service members and personnel celebrated Juneteenth National Independence Day during a ceremony at The Anchor on June 15, 2023. The ceremony included speakers from NSA Souda Bay who shared personal reflections about the importance of the holiday and honoring their cultures.

"It [Juneteenth] means freedom," said Master-at-Arms 2nd Class Jayla Coleman. "It means the end of broken mindsets and mentally fortified chains. The broken mindset that says ‘I should be ashamed of the way my melanin shows and the way my curls bend on my head.’ Juneteenth paved the way for me to be resilient, powerful and courageous. Let every scar tell a story. Let every broken chain show our relentlessness."

Juneteenth honors the end to slavery in the United States and is considered the longest-running African American holiday. It refers specifically to June 19, 1865, when enslaved persons in Galveston, Texas, received the news that the Civil War was over and that all enslaved persons had been emancipated. On June 17, 2021, President Joseph Biden signed into law Juneteenth National Independence Day Act, creating a federal holiday to commemorate Juneteenth.

"For more than 150 years, Juneteenth has represented a pivotal point in the fight for justice in the United States," said Capt. Odin J. Klug, commanding officer, NSA Souda Bay. "It’s an opportunity to celebrate the victories toward equality that we’ve made as a country, but also to recognize there is still more work to do. As a nation, we are at our best when everyone’s intrinsic worth is recognized, when we maintain the ability to acknowledge and learn from past mistakes, and when we resolve to work toward a better future."

Information about housing options is just the beginning.
Military OneSource offers a range of free 24/7 support for military spouses, service members and their families.

Personalized PCS Checklists • Stress relief tools • Document translation
Spouse education and career support • Budgeting help • Installation info & more

From finances to fitness, taxes to transitions, Military OneSource is here to help you master your move and make the most of your life with the military. Contact us at any time.
Coinciding with the 81st anniversary of the Battle of Midway, Vice Chief of Naval Operations (VCNO) Adm. Lisa M. Franchetti presented the Presidential Unit Citation to Chief Petty Officer Bill Norberg, a World War II veteran who served during the Battle of Midway, during a commemoration dinner at the Army Navy Country Club in Arlington, Va., June 4.

Norberg served aboard USS Enterprise (CV 6) during the Battle of Midway as the commanding officer’s phone talker.

“It is truly an honor to be here for the ceremony and being 100 years old, it is great being here tonight,” said Norberg. “I am proud to be a member of that ship and crew, which did so much to bring an end to the Pacific War.”

It has been said that at the heart of any Navy victory is the American Sailor, who is the greatest example of sacrifice and service. The Battle of Midway, fought June 3-7, 1942, demonstrates the heroism and courage of Sailors throughout a multi-day engagement, whose efforts ultimately blunted the Japanese navy’s striking force and advance across the Pacific.

Serving on Enterprise prior to the Battle of Midway, Norberg was also involved in other engagements leading up to the battle such as the Doolittle Raid.

“So many others there did so much more than I could have ever dreamed of doing, and I owe them all the credit,” said Norberg. “I am glad to be here today to celebrate the anniversary of Midway and honor my compatriots.”

Enterprise aircraft helped to sink three Japanese aircraft carriers and a cruiser during the battle. These Sailors protected the United States against the enemy’s advance in World War II by severely damaging Imperial Japanese navy assets.

“Skill, faith, and valor, the courage and ingenuity of those brave Sailors in the central Pacific on a hot morning in June 1942, changed the course of the war,” said Franchetti. “It’s important that we continue to have this yearly commemoration, to honor and remember those heroes, and to reaffirm our commitment to their values, to ensure that we remain the world’s greatest maritime force, ready to fight and win at sea.”

The U.S. Navy’s victory at Midway represents a strategic turning point in the Pacific War. Prior to the battle, Japan had naval superiority. However, after the battle, opposing fleets were balanced and the United States took the offensive.

“It is with pride and reverence that the story of Midway must be passed on,” said Franchetti. “We should not let the actions of our heroes pass out of our common experience.”

Participating in 18 of the 20 major actions of the Pacific War, Enterprise was the most decorated warship of World War II earning 20 Battle Stars, the Presidential Unit Citation and the Navy Unit Commendation.

Following the Battle of Midway, Norberg served on Enterprise until August 1945, when he transferred to Naval Station Great Lakes in Great Lakes, Ill. He was also stationed at Naval Air Technical Training Center in Millington, Tenn., Naval Station Orange, Texas, and Naval Station Norfolk, Va., until his discharge from the Navy in February 1947.

On June 17, 2023, at the age of 100, Norberg passed away at his home surrounded by family.

*Article has been edited. To see original, click [here](#).
SAILOR TO SAILOR
THE OFFICIAL NEWSLETTER OF MYNAYHR
MAY 2023

If you or someone you know is in crisis, call the Veterans Crisis Line.

DIAL 988 then PRESS 0

IMPORTANT DATES:
Feb. 1 to Nov. 1: CY 23 PRT Cycle
June 6 to June 8: Association of Naval Services Officers Eastern Region Professional Development Symposium: Norfolk, VA.
July 31 to Aug. 4: National Naval Officers Association Annual Leadership, Professional Development and Training Symposium: San Diego, CA.
Sept. 10 to 15 (Week 1) and Sept. 17 to 22 (Week 2): USS Constitution Chief Petty Officer Heritage Awards and Applications

Awards and Applications Deadlines:
Navy Legislative Fellowship Applications due June 1
2022-23 MCPON Delbert D. Black Leadership Award Nominations due June 30
STA-21 Applications due July 1
Medical ISPP Applications due July 31
Naval Intelligence Awards Submissions due July 31

FLEET MASTER CHIEF OF PERSONNEL, MANPOWER AND TRAINING: FLTCM Delbert Terrell Jr.
MyNavyHR Website

If you or someone you know is in crisis, call the Veterans Crisis Line.

DIAL 988 then PRESS 0

SPOUSE EMPLOYMENT PROGRAM
NAVADMIN 104/23 • FACT SHEET

NAVADMIN 104/23 announced updates to several programs that support Navy spouse employment opportunities. The Navy understands spouses face unique employment challenges while serving alongside their Sailor and is committed to supporting Navy Spouses by connecting them to resources and opportunities for meaningful employment.

TUITION ASSISTANCE UPDATES
NAVADMIN 112/23 • FACT SHEET

NAVADMIN 112/23 has made TA more available to Sailors, who can now submit applications as soon as 7 days from course start dates. Sailors who have 6 months left on EAOS and are under 16 years of active service are eligible to use TA. Sailors can also be enrolled in two courses that run concurrently.

NAVY UNACCOMPANY HOUSING BILL OF RIGHTS
NAVADMIN 102/23

This message is an interim change to and publishes the Bill of Rights and Responsibilities for residents of Navy Unaccompanied Housing (UH). As part of Navy's Get Real, Get Better (GRGB) initiative, the Chief of Naval Operations and Fleet Commanders identified UH as one of the most impactful GRGB Lines of Effort stating that quality housing for our Sailors is a fundamental right. Likewise, maintaining cleanliness of UH and identifying and reporting deficiencies are the responsibilities of both our Sailors and the chain of command.

DMAP PHASE III
NAVADMIN 109/23 • FACT SHEET

NAVADMIN 109/23 announced the expansion of eligible ratings to include all sea-intensive ratings (with the exception of Fire Controlman (FCA) and Operations Specialist) including: Aviation Boatswain’s Mate (Equipment) (ABE), Aviation Structural Mechanic (Safety Equipment) (AME), Aviation Ordnanceman (AO), Electrician’s Mate (EM), Gunner’s Mate (GM), and Quartermaster (QM).

RESERVE PERMAENT PROFESSIONAL RECRUITER DESIGNATOR APPROVAL
NAVADMIN 117/23

This NAVADMIN message announces the establishment of the Training and Administration of the Reserve (TAR) Permanent Professional Recruiter (PPR) Officer Designator 1287 within the restricted line.

SCREENING BOARD RESULTS AND PROMOTIONS
FY24 Navy Reserve Captain Line Selections: ALNAV 032/23
FY24 Active-Duty Navy Captain Staff Corps Selections: ALNAV 039/23
FY24 Active-Duty Navy Commander Line Selections: ALNAV 043/23
FY24 Navy Active E8 And E9 Advancement Selection Boards Results: NAVADMIN 124/23  NAVADMIN 125/23

APP LOCKER UPDATES

“Ten years since emigrating from Vietnam, eight years as a U.S. Navy Sailor, and three goals to reach – Retail Specialist 2nd Class Thuy Nguyen has made the most out of an unexpected journey, while at the same time opening the door for many others to do the same.”

READ NGUYEN’S FULL STORY HERE.
The Naval Service—forward deployed and capable of both rapid response and sustained operations globally—remains America’s most persistent and versatile instrument of military influence.
BATTING A BLUE ARCTIC

THE ARCTIC DOMAIN IS THE NEXT FRONTIER FOR US MILITARY OPERATIONS, WHERE THE PHYSICAL ENVIRONMENT POSES A GREATER THREAT TO ACHIEVING STRATEGIC DOMINANCE, MANAGING ASSETS, AND ENSURING FREEDOM OF THE SEAS.

The Current Situation

The time has come to shift our mindset as a defensive nation in more ways than one. The Arctic Ocean is in many ways an uncharted domain for conducting military operations. It will be no easy feat to operate in this region; a hostile environment for modern vessels within ice-infested waters. Currently, there exists a limited icebreaking capability by our naval forces that is completely reliant on the US Coast Guard (USCG), with assets USCGC Healy and USCGC Polar Star handling all polar pathfinding needed to ensure safe transit in these regions. This shortfall is driving the production of the next generation of Polar Security Cutters, a joint USN and USCG effort to address the dire necessity for increased icebreaking operations in the near future. The first new Polar Security Cutter is expected to be delivered in 2025.

Along with an updated force, any future naval conflict will require leveraging technological advancements made in the past 80 years since the naval challenges posed by World War II. The US was last fully tested as a strategic force implementing legacy efforts during WWII in both the Atlantic and Pacific theaters - both vastly different operational realms than what the Arctic presents. The future of warfighting will demand means beyond globally-deployed strike groups and a prominent physical presence. The Information Warfare Community will be of greater importance as the challenges facing battlespace awareness, assured command and control, and integrated fires are heightened in the austere environment of the Arctic. Successful intelligence preparation of the operational environment, mastery of the electromagnetic spectrum, and sound communications could very well be deciding factors for any conflicts in the high latitudes. Any future conflict will now be settled in large part by how well information, including environmental intelligence, is gained, exploited, and disseminated.

Technology that implements Artificial Intelligence/ Machine Learning (AI/ML) methods could yield a warfighting advantage in predicting the physical battlespace. Current projects are underway across the fleet, many led by Office of Naval Research and Naval Research Laboratory, to address the need for advanced multi-platform data assimilation to improve high-latitude numerical environmental models for forecasting and predictions. A variety of environmental data collected through in situ or remote means is necessary for these modeling efforts to be successful. The sea ice edge can vary by hundreds of miles overnight when faced with the dynamic meteorology present in the region. Many analytical intelligence challenges can be partially to fully automated AI/ML, but even these innovative efforts require substantial data, among other resources, as a driving mechanism. It will be essential to fill the current environmental data gaps in the Arctic if the US is to harness the technical advances made in computing and successfully exploit technologies such as more sophisticated models and innovative AI/ML projects. Some small but mighty naval commands have started paving a path forward to meet these shortfalls.

The US National Ice Center (USNIC) is a tri-agency organization of the US Navy, the National Oceanic and Atmospheric Administration (NOAA), and the USCG has a mission to provide global to tactical scale ice and snow products, ice forecasting, and related environmental intelligence services for the United States government. Less than 50 uniformed, civilian, and contract personnel comprise the USNIC on a daily basis with only a dozen of those individuals performing the USNIC duty of creating a variety of routine ice analyses for the Arctic, Antarctic, US Great Lakes, and other geostategic locations where ice may form; a daily analysis of US Northern Hemisphere snow, and ice products to directly support assets and personnel in the field. With such a small team, providing environmental intelligence to ensure safety of navigation in treacherous polar waters and economic prosperity within and along high latitude commercial routes and port regions is a heavy task.

Anticipating Change

Sea ice not only affects its local surroundings but is also a driver of global ocean temperatures and currents. Sea ice generally forms during the winter months and recedes in the summer months, leaving some sea ice to linger until the next summer. As sea ice has a high albedo, implying it is a bright surface, much of the solar radiation received by sea ice will be reflected away from the earth, assisting in keeping the polar regions cold. As temperatures warm either seasonally or climatologically, less sea ice remains to reflect this solar energy, creating a positive feedback cycle that further exposes ocean waters to insolation and the absorption of energy. This cycle, intertwined with sea ice cover, is one reason the polar regions are sensitive to even the slightest fluctuations in global temperature. Sea ice not only affects its local surroundings but is also a driver of global ocean temperatures and currents. Several portions of the Arctic Ocean that have historically been covered with sea ice through at least parts of the winter will become increasingly ice-free in the coming years. This decrease in ice poses the consequence of shorter maritime trade routes, or completely new transpolar routes, becoming available thus significantly decreasing maritime Arctic transit. The great power competition's intrinsic threats to the Arctic region are expected to grow as economic and geopolitical opportunity grows. It should be noted that the Arctic is the sole shared battlespace with a peer competitor. There is no doubt rapid change is occurring in the Arctic, making it the opportune time to form strategic war plans that include solutions from the Information Warfare Community.

A Way Forward

The US National Strategy for the Arctic Region was most recently updated in October 2022 with a new 10-year scope that seeks a peaceful, stable, prosperous, and cooperative Arctic; acknowledging the heightened strategic competition in the Arctic alongside corresponding strategic objectives that share commonalities with the USNIC mission. The geostrategic importance of the Arctic domain will only increase each year as the decline of the perennial sea ice continues and the ice edge shifts. It is imperative to strengthen awareness and corresponding action of the unique operating environment that the Arctic presents which will yield a strategic advantage. This effort includes investing in technology that detects and tracks potential threats and improves our own capabilities in the region as a nation. This is not a simple task due to the dominant role that Russia has in the Arctic, as well as the growing concern for China's desire to be an influential nation in the region.

The Arctic is still largely unfamiliar in its delicate environmental complexities. The need for increased and enhanced observations continuously grows as the sea ice left behind year after year becomes more fragile, thin, and diminishes in extent, losing an equivalent area the size of South Carolina annually. Characterizing the ice in the region requires various input sources whether it be satellite-derived data, in situ sensing platforms, or occasionally...
Support the safety of navigation. For making sea ice products, the USNIC is able to provide analysts. By bringing AI/ML into the analytical workflow, sea ice characterization from its current standards which are influenced by climate change, the workload for operational regions. The USNIC most heavily relies on satellite imagery to reach that goal. Deployed personnel feedback while onboard icebreaking operations in the region. The limited in situ observations help increase near-real-time environmental knowledge in the Arctic, but at current numbers, they form an incomplete picture and are not enough for fully forecasting and safety operating within such a complex, harsh domain. The USNIC and partners are able to sense atmospheric and sea state conditions by using a network of buoys through the US Interagency Arctic Buoy Program (USIABP), but the unforgiving surroundings that the Arctic poses degrade any deployed hardware quickly. The resulting data gaps require routine sensor replacements and drive the demand for development of tailored equipment for this cold, icy region. The USNIC most heavily relies on satellite imagery to fulfill its mission. As the sea ice extent continues to be influenced by climate change, the workload for operational centers like the USNIC rises with increased vessel traffic near ice-infested waters. The USNIC is pursuing automated solutions to combat the uptick in vessel traffic needing ice products and expertise. This will improve sea ice characterization from its current standards which are reliant on manual analytical methods by trained ice analysts. By bringing AI/ML into the analytical workflow for making sea ice products, the USNIC is able to provide enhanced qualitative and quantitative sea ice products and support the safety of navigation.

Domain Detection

In situ sensors deliver invaluable information on the scene utilized for reporting near-real time atmospheric and sea state conditions, initialization, and forcing of global weather models, validation of satellite-derived environmental data, and identifying long-term trends in the region. Buoys are routinely deployed by members of the USIABP, including USNIC personnel, from either shipborne or airborne platforms. In collaboration with 12 nations across the globe, the USIABP observations contribute to the broader International Arctic Buoy Programme (IABP) buoy network. In situ sensor deployments can be costly and require careful planning but the data they collect is necessary to achieve a prosperous and peaceful Arctic region. Since deploying buoys, the USNIC and other IABP partners have gained the ability to validate environmental predictions and identify vital trends in the Arctic for large-scale operations such as Ice Exercise (ICEX) held every two years on the Beaufort Sea. Deployed buoys are subject to the harsh environment of the Arctic which may become dormant for weeks or months in detrimental weather, of not destroyed completely by the force of shifting ice. Buoys typically only survive a few years at best before requiring complete replacement. Data gaps are also formed from the sensors drifting south of the Arctic Circle, no longer reporting conditions proving useful for Arctic operations. Having additional sensing platforms in the Arctic region and expanding their performance is on the docket not only to global researchers and the USNIC specifically, but also fulfills a pillar of US National Strategy for the Arctic Region: "Security: Develop Capabilities for Expanded Arctic Activity," calling for "investing in modernized domain awareness to detect and track potential airborne and maritime threats and improve sensing and observational capabilities, including for sea ice, ship traffic, and weather." The future of the Arctic and its stability depends on how effectively we depict battlespace awareness in the region. Well-equipped sensors and novel computing methods will allow the United States to reach that goal.

The USNIC primarily examines Synthetic Aperture Radar (SAR) satellite imagery due to its ability to penetrate clouds and provide reliable, high resolution coverage throughout day and night. This imagery in conjunction with AI/ML algorithms is a powerful tool that will allow end operational users, like USNIC and partner services like USCG’s International Ice Patrol, Canadian Ice Service, and Danish Meteorological Institute to form better environmental products and predictions of the polar regions. The embedded potential in using AI/ML processes will further increase the efficiency of the USNIC to more effectively support mariners, save ice analysts time and effort as support requests continuously increase, and lead to increased comprehension of a changing polar environment.

Even the most advanced AI/ML models at first require substantial data sets to be trained on before becoming a part of the operational workflow to characterize sea ice. Environmental machine learning models that intake satellite imagery can vary in output based on several factors, including fluctuations in season, viewing angle, weather conditions, and which region of the Arctic being imaged. While AI/ML applications ideally make manual processes more streamlined and of higher quality, there is significant effort initially to ensure the model is producing accurate and meaningful results for the mission, like classifying multiple stages of sea ice from a single SAR image.

Joint Effort

It requires a team effort to fully utilize aforementioned technological advancements to better predict the Arctic battlespace. Industry partners continue to provide cutting edge business models and oceanographic sensors that more effectively aid decision-makers in mission planning and execution than solely what the DoD is capable of. The observational gaps can be filled with multitudes of smaller, satisfactory instruments rather than just a single highly precise, expensive unit — yielding minimized temporal latencies when viewing data from every angle. The USNIC has recently taken part in the Cooperative Research and Development Agreement (CRADA) between Naval Meteorology and Oceanography Command (CNMOC) and Sofar Ocean Technologies. This partnership allows further testing of buoy-based sensors in high-latitude operating environments for longevity in severe weather conditions faced in the Arctic. An ongoing effort exists to bring currently available data from shipboard and unmanned platforms into global weather models and decision support services such as USNIC sea ice products. A joint force of all DoD players operating within the Arctic region will determine mission success as conflicts arise. The US Navy’s Arctic Submarine Lab coordinates ICEX to challenge naval operational readiness, boost experience and understanding, and develop partnerships with like-minded nations, other armed service branches, and research partners. USNORTHCOM holds Arctic Edge biannually across the Alaskan landscape, in order to gain agility training in a cold-weather environment for both US and Canadian defense personnel. These exercises require improved coordination and communication between all service branches in the coming years to test and maximize joint capabilities in the region.

Most recently, the USN Strategic Blueprint for the Arctic ("A Blue Arctic", 2021) was released, acknowledging that 90% of global trade travels across the world’s oceans, which is expected to double over the next two decades. The Arctic Ocean has the potential to connect over 75% of the world’s population as melting sea ice opens up timelier maritime trade routes between North America, Europe, and Asia.

An opening of the Arctic Ocean brings the US closer to northern neighbors to provide mutual assistance in times of need; enable allied nations to defend the homeland, deter aggression, and coercion; and protect sea lines of communication. The US Navy’s resilience in the Arctic is embodied by the late RADM Robert Peary, credited as the first to land at the North Pole in 1909, "I will find a way or make one". Building a more capable Arctic naval force is critical to securing our national security. For more information regarding current sea ice and snow support products, reach out to the US National Ice Center.