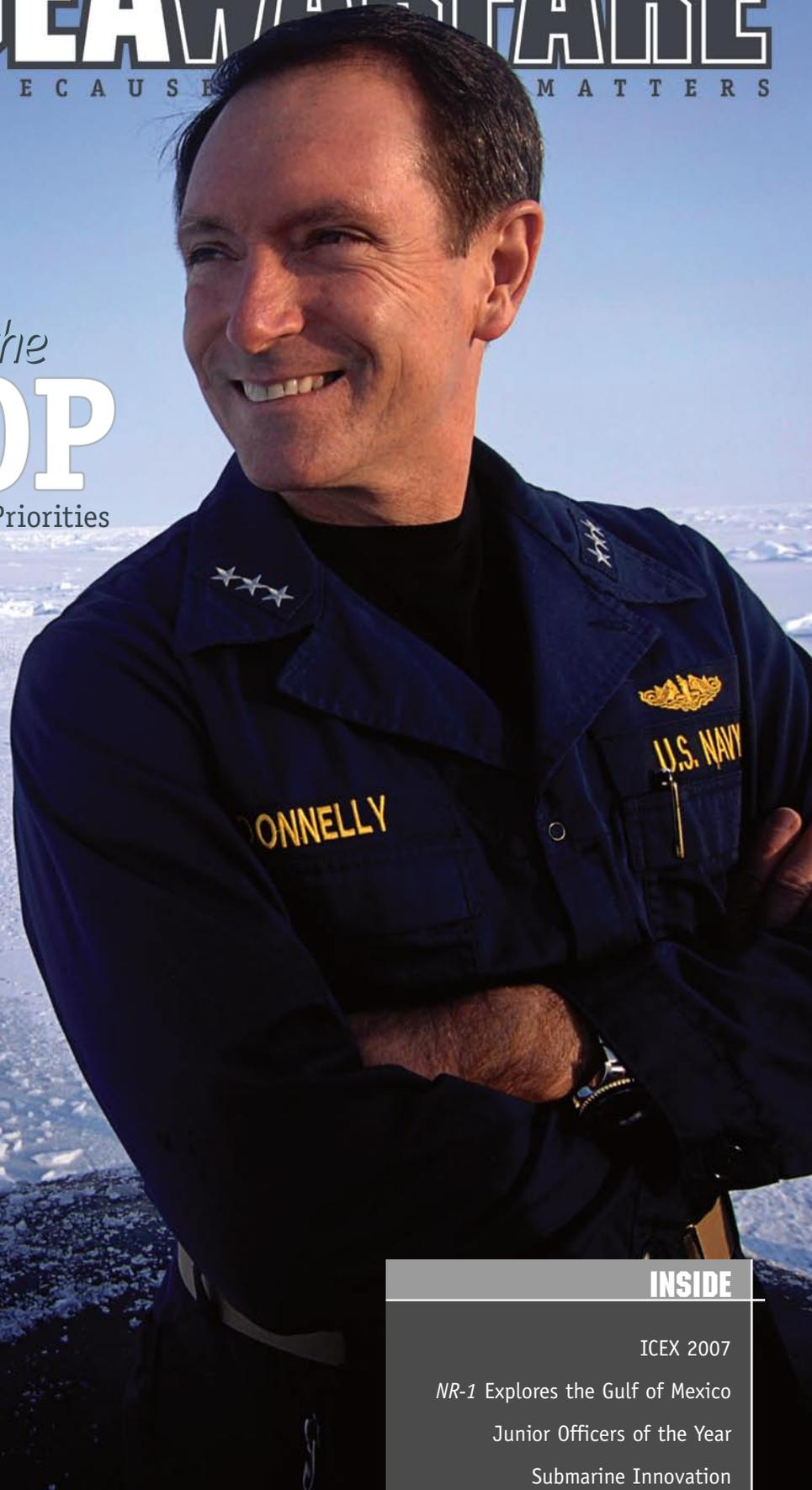


UNDERSEAWARFARE

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On The Cover



Commander, Submarine Force, Vice Adm. Jay Donnelly looks over the frozen Arctic Ocean from the bridge of attack submarine USS *Alexandria* (SSN-757). *Alexandria* surfaced through two feet of ice during ICEX-07, a U.S. Navy and Royal Navy exercise conducted on and under a drifting ice floe about 180 nautical miles off the north coast of Alaska.

U.S. Navy photo by Chief Petty Officer Shawn Eklund



“Our people are the cornerstone of our Force. Today’s submariners make up a small portion of our Navy—approximately seven percent of our Navy’s personnel operating about 24 percent of our combat ships—and you are out front around the globe every day providing for our national security. Our Sailors are talented, motivated, and have chosen to serve their nation.”

VADM Jay Donnelly, USN, Commander, Submarine Force

This summer we mourned the death of retired RADM Eugene Fluckey, recipient of the Medal of Honor and a true naval hero. One of the most aggressive and successful submarine skippers of World War II, he was credited with sinking more than 29 enemy ships totaling more than 146,000 tons. RADM Fluckey helped lead and inspire our Navy to victory. His legacy continues to inspire us today.

In addition to the Medal of Honor, Navy brass pinned four Navy Crosses, the Distinguished Service Medal, the Legion of Merit, and a host of other unit and campaign awards upon his chest. He was known for his audacity and courage, and on more than one occasion running his boat in close to shore to attack enemy shipping and bases. He even helped pioneer the idea of submarine support to special operations. We will miss him sorely.

Since my last article in this publication we have christened PCU *North Carolina* (SSN-777), laid the keel for PCU *New Hampshire* (SSN-778), and commissioned USS *Hawaii* (SSN-776), our third *Virginia*-class submarine. The *Virginia*-class will provide the U.S. Navy with the advanced capabilities required to maintain the nation’s undersea supremacy well into the 21st century. It is the future of the Submarine Force. This is the right submarine at the right time with the right flexibility. We have a solid plan to achieve a price tag of \$2 billion per ship in FY05 dollars and meet the challenge set by the CNO for a two ship per year procurement rate starting in FY12. The Undersea Enterprise and our industry partners are making great strides to achieve this goal!

Recently I selected the new Force Master Chief, CDMCM (SS) Jeff Garrison, who is currently serving as Submarine Squadron EIGHT Command Master Chief. Master Chief Garrison is reporting aboard this September and will relieve FORCM Dean Irwin. FORCM Irwin, who retiring after 23 years of exemplary service to the Navy and our Nation, has been an inspirational leader for our submariners. On behalf of the entire Submarine Force, I would like to extend a heartfelt thank you and wish Master Chief and Mrs. Irwin “Fair Winds and Following Seas.”

I am continually reminded of the talented people who make up our Submarine Force. I have had the opportunity to visit the waterfronts in San Diego, Groton, Kings Bay, Kitsap,

and Norfolk, as well as our shipyards in Norfolk, Kittery, and Puget Sound, and each time I have been impressed by the teamwork between our maintenance partners and our submarine crews. This teamwork is vital to ensuring that our boats complete their maintenance availabilities on time and that they return to the fleet ready and capable.

We recently completed our first Engineering Department Master Chief (EDMC) Course as we continue to make the professional development of our Submarine Force personnel a priority. This course improves the skill sets of our best nuclear-trained chief petty officers as they report aboard to serve in one of our most challenging billets. Soon, we will partner with the Naval Aviation Enterprise to provide a nuclear-trained leading petty officer course that will provide the additional skills our deck plate leaders need to be successful leaders at sea.

The Submarine Force continues to place great emphasis on retention and diversity efforts. I recently established a Submarine Force Diversity Office. Our first Diversity Officer is LCDR Eric Mason, who will coordinate efforts to achieve our goal of a highly professional and diverse Submarine Force that reflects the demographics of the Nation we defend.

We continue to strengthen our outreach with the American public through our namesake ties. The force recently conducted two namesake embarks. USS *West Virginia* (SSBN-736) embarked Governor Joseph Manchin, III, of West Virginia, and Governor Sonny Perdue, of Georgia, visited Kings Bay and embarked on USS *Florida* (SSGN-728).

Each of you represents a vital link in the chain of activity that results in our unique undersea warfare capability for the nation. The Dolphins you wear represent not only your professionalism but also that of the entire Submarine Force, past, present, and future.

Keep up the good work in your respective part of the Submarine Force! Smooth sailing, and good hunting.



“Undersea warriors, YOU are leading the charge to ensure the United States is ready to face the formidable threat that could be posed by an opponent’s advanced submarines. Anti-submarine warfare is an important part of our culture and a key mission for the Navy.”



RADM Van Mauney, USN, Director, Submarine Warfare

Greetings from our Nation’s capital. Washington, D.C. has many reminders of our inspiring history and of the sacrifices made in the name of freedom by our country’s founders and defenders over the years. We have seen many heroes throughout our history, and many more are serving today, working to increase our security by forging a safer world and defending our way of life. For those of you on the front lines, thanks for what you are doing for us.

One of our most memorable heroes recently departed on ‘eternal patrol.’ RADM Eugene ‘Lucky’ Fluckey passed away in June, and we will miss his leadership, guidance and friendship. His exploits, fueled by energy, imagination, and leadership, require no retelling here. They remain relevant and will continue to inspire us all. RADM Fluckey liked to say “No problems—just solutions.” Solutions have long been a hallmark of the U.S. Submarine Force as we have advanced leadership skills, technology, tactics, training and procedures to meet the challenges at hand through two World Wars, the Cold War, and our present day operations across the globe.

Your Washington, D.C. team continues to work to provide solutions to the Navy and the Submarine Force. USS *Oklahoma City* (SSN-723) was recently certified as the first submarine to employ electronic navigation, and we plan to transition all submarines to paperless navigation by the end of 2009. SSGN continues to make solid progress on course toward the first deployment later this year. In May, USS *Florida* (SSGN-728) fired four TOMAHAWK missiles and re-directed two of them in mid-flight to alternate targets. Additionally, our communications suite of the future, the Common Submarine Radio Room (CSRR), was certified for use onboard SSGNs, as it had been previously certified for SSBNs and *Seawolf*-class SSNs. Our rapid capability insertion process for sonar and fire control systems continues to mature. We are working to better align crew preparation (training and logistics) with capability installations so that you are ready to employ these new capabilities before they arrive onboard. Additionally, we are reducing the complexity of our design-build-test process to more clearly tailor new capabilities to your warfighting needs at sea. The Mk 48 ADCAP CBASS torpedo, with some impressive new capabilities, has been given a green light for unrestricted use in the fleet. We are also beginning to look into the more distant future to consider the

range of sea-based strategic deterrent capabilities that might follow our *Ohio*-class SSBNs.

RADM Fluckey was one of many who helped cement the submarine’s reputation as a decisive multi-mission weapons system. The spectrum of past successes, like RADM Fluckey’s, through your successes today, has enabled the continued evolution of undersea warfare with improved capabilities via advanced combat systems, sensors, weapons, and propulsion systems. Stealth, persistence, and relevant payload continue to be our strong suits. As undersea warriors, it is up to you to continue this legacy to ensure we are ready to face any challenges the future may bring. It is up to the Washington, D.C. team to work to provide you with the best tools possible, and we are dedicated to that task.

RADM Fluckey was successful for many reasons, one being that he was an outstanding leader. Several months ago, I had the opportunity to host some of the Submarine Force’s future leaders here in D.C.—the 2006 Junior Officers of the Year. It was inspiring to meet with this group to hear their views and answer some of their questions. With leaders like these, our force is in good hands. Our leaders at all levels must continue to challenge each other, challenge our past assumptions, and be innovative in pressing performance standards even higher.

I want to thank our shipmates who have recently departed OPNAV N87. Their work on solutions was impressive, and will help maintain our undersea dominance well into the future. Farewell to CAPT Brad Kratovil, CAPT Mike Poirier, CDR Chris Scofield, CDR Rick Dau, LCDR Jason Small, and LT George Howell. Fair winds and following seas.

Vice Adm. John J. Donnelly

Commander, Submarine Force
Commander, Submarine Force, Atlantic

Rear Adm. Joseph A. Walsh

Deputy Commander, Submarine Force
Commander, Submarine Force, U.S. Pacific Fleet

Rear Adm. Carl V. Mauney

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UNDERSEA WARFARE is the professional magazine of the undersea warfare community. Its purpose is to educate its readers on undersea warfare missions and programs, with a particular focus on U.S. submarines. This journal will also draw upon the Submarine Force's rich historical legacy to instill a sense of pride and professionalism among community members and to enhance reader awareness of the increasing relevance of undersea warfare for our nation's defense.

The opinions and assertions herein are the personal views of the authors and do not necessarily reflect the official views of the U.S. Government, the Department of Defense, or the Department of the Navy.

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In keeping with UNDERSEA WARFARE Magazine's charter as the Official Magazine of the U.S. Submarine Force, we welcome letters to the editor, questions relating to articles that have appeared in previous issues, and insights and "lessons learned" from the fleet.

UNDERSEA WARFARE Magazine reserves the right to edit submissions for length, clarity, and accuracy. All submissions become the property of UNDERSEA WARFARE Magazine and may be published in all media. Please include pertinent contact information with submissions.

Send submissions to:

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dear EDITOR,

The picture of USS *Lamprey* (SS-372) and the message from COMSUBLANT [UNDERSEA WARFARE, Winter 2007] immediately caught my attention because I was her communications officer at the time. I am curious as to how that message came to the notice of UNDERSEA WARFARE. I served on *Lamprey* from her commissioning until her decommissioning and there was never anyone named Jim Williams in the crew. Needless to say, its inclusion in the magazine stirred up a great many memories for me.

Sincerely,
John D. Alden, Cmdr., USN (Ret.)

Cmdr. Alden,

*Thank you for your interest in UNDERSEA WARFARE Magazine. UNDERSEA WARFARE Magazine received the USS *Lamprey* message from James (Jim) A. Williams, the son of Jack Williams. Jack served aboard *Lamprey* during World War II and his initials appear on the message. Jim and his mother came across the message and thought it would be of interest, particularly to previous crewmen of *Lamprey*.*

dear EDITOR,

The article "China's Undersea Sentries: Sea Mines Constitute Key Element of PLA Navy's ASW" featured in the most recent issue of UNDERSEA WARFARE Magazine [Winter 2007] is a very powerful and ever so timely article! All the dedicated officers and Sailors of our great Submarine Force need to read closely and reflect seriously on the major implications and direct relevance of this thought provoking article.

As a former commander of the Mine Warfare Command, I salute the Submarine Force's great professionalism and openness in publishing such a powerful article — an article for stronger mine warfare attention and capabilities in our Navy! Keep up the direct front and center approach of your great magazine.

Chuck Horne, Rear Adm., U.S. Navy (Retired)
COMINEWARCOM (1979-1984)

sailorsFIRST



Photo by Petty Officer 2nd Class Elizabeth Thompson

Lt. David Ridings, navigator of USS *Columbus* (SSN-762), explains the fast-attack submarine's daily activities to Baltimore Ravens inside linebacker Bart Scott (left) and Green Bay Packers wide receiver Donald Driver (right).

U.S.

Navy and Royal Navy Sailors and civilians called a polar ice camp atop the harsh, frozen Arctic Ocean home in March while supporting Ice Exercise 2007 (ICEX 2007), a joint tactical exercise on and under a mile-long ice floe adrift off the northern coast of Alaska. A camp was established in the negative 30-degree Fahrenheit climate to support USS *Alexandria* (SSN-757) and HMS *Tireless* (S88) in their overall goal to improve the understanding of under-ice operations.

The U.S. Navy contracted the Applied Physics Laboratory of the University of Washington (APL/UW) in Seattle to build and maintain the camp, dubbed the Applied Physics Laboratory Ice Station (APLIS). The small village consisted of a command hut, mess tent, nine “hooches” or sleeping quarters with six bunks in each, two tents to house temporary visitors, a generator-driven powerhouse, a runway carved into the ice and a heliport—all in an attempt to make the extreme conditions in the Arctic more bearable.

But the cold did not deter visitors from making an appearance at ICEX. Some VIPs that made the trip included: Secretary of the Navy

Donald Winter; Adm. Kirkland Donald, Director, Naval Nuclear Propulsion; Vice Adm. John Donnelly, Commander Submarine Force; Rear Adm. David Cooke, Commander Operations, Royal Navy; and Mr. John Casey, president of General Dynamics Electric Boat. Movie stars and a film crew even made an appearance to film “*Stargate: Continuum*.” APLIS also housed two students from the Naval Postgraduate School who were conducting research on under-ice oceanography.

In the end, despite harsh conditions and unpredictable ice, the personnel involved in ICEX 07 accomplished their goals and considered the exercise a success.

ICEX 2007

Postcards from the Top

12 March 2007

Position: 73-06N/145-52W
Temperature: -29 degrees F

Welcome to Applied Physics Laboratory Ice Station (APLIS)—our adventure in the great white north!

Why are we here? We’re establishing an ice camp with a tracking range so we can support testing and other operations by two submarines—one from the U.S. Navy and the other from the Royal Navy—which will be joining us in a couple days.

Where are we? We are on a drifting ice floe about 180 nautical miles (nm) off the north coast of Alaska. We’re dependent on airplane flights out of Prudhoe Bay/Deadhorse, Alaska, to ferry supplies and people to and from the camp.

Who are we? APLIS is first and foremost a team effort. The camp is being manned largely by military and civilian personnel from both the U.S. and Royal Navies. In addition, we’ll have several visitors from a host of other military commands, news outlets, media groups, etc.

What is an APLIS? The Applied Physics Laboratory of the University of Washington [APL/UW] built and is managing the ice camp for us. A few camps ago, they held a contest to see who could come up with the best alternative meaning for that acronym. The winner was “Abnormal People Living In Sheds.” You’ll be able to judge the accuracy of this alternate interpretation for yourself over the next couple weeks as I cover the daily events.

15 March 2007

Position: 73-06N/145-43W
Temperature: -2 degrees F

If you’ve been watching the temperatures, you’ll have noticed that it’s getting warmer. While passing through Prudhoe Bay, I found that some of the locals take these really cold temperatures so much for granted that they don’t even bother saying the “minus”—they would only remark on whether it’s above or below zero if it managed to get above.

During the night, we tuned in our tracking system. That done, we passed to USS *Alexandria* (SSN-757) the position of the feature where we want them to surface. Randy Ray, our Field Operations Coordinator, had scouted out the area around APLIS the day before to find



Photo by Lt. E.J. Reynolds



U.S. Navy Photo

(Previous page) USS *Alexandria* (SSN-757) after surfacing through two feet of ice during ICEX 2007. (Above, left to right) APLIS camp at sunrise.; Vice Adm. Donnelley mines ice for drinking water; HMS *Tireless* breaks through the ice and slush.



U.S. Navy Photo

a large, thin-ice area. As soon as the sun was up, Randy Ray headed back out to the feature he had scouted yesterday (“Marvin Gardens”) to ensure that it was still around—thinner ice is always in danger of succumbing to the forces exerted by the ice pack.

Luckily, it was still there. With about half the camp standing by watching, *Alexandria* came bursting through several feet of ice. But the ice around her was too thin for us to walk on so she dove again. Lt. Jeff St. George in the Command Hut vectored her to a new spot and, for the second time in three and a half hours, a crowd of onlookers thrilled to the site of a sail emerging from the surrounding ice.

When a submarine surfaces through the ice, you don’t simply open a hatch to put people aboard, because there’s a thick layer of ice covering the hatch. In this case, about three feet of it. Using chain saws, picks, and shovels, the APLIS team at Marvin Gardens hacked their way down through the ice to the submarine’s deck below, where a nice warm submarine awaited.

16 March 2007
 Position: 73-06N/145-43W
 Temperature: -9 degrees F

It started out a little overcast today but, by afternoon, had turned into another beautiful day.

We’ve now been joined by our second submarine—HMS *Tireless* (S88) arrived this morning. *Tireless* is one of the Royal Navy’s *Trafalgar*-class submarines.

Because of sensors on her deck, *Tireless* can only surface through open water or slush. One of our challenges was to find a place for her to surface. This early in the spring, the ice is still pretty consolidated and there’s not much open water. We had sighted the beginnings of a lead yesterday afternoon. So, first thing this morning, Randy Ray hopped in the helicopter and again scouted out a good surfacing site. It turned out the lead was widest just about a mile south of camp.

Randy put a homing beacon in the water. Using her upward-looking sonars, *Tireless* mapped out the lead and, just after noon, popped up through the slush.

We spent about 12 hours overnight testing the ACOMMS [underwater acoustic communications] system with *Alexandria*. This is a new system that will allow APLIS and the submarines to exchange messages by transmitting them underwater. Like almost everything else, underwater sound behaves differently in the Arctic than elsewhere. We’re testing how well this system works in the Arctic as well as interoperability with a similar U.K. system on *Tireless*.

Our first night’s testing was very successful with most of the transmissions being received at extended ranges. We’ll do some more single-ship testing tomorrow with *Tireless* then start doing some three-way tests.

Both boats are here and our test program is off to a good start. But wait—there’s more. *Tireless* dropped off a three-person documentary crew who rode up from the U.K. They’re going to stay here at APLIS for a couple days filming our activity before they head home.

Time to take a quick look at the Northern Lights then head to the bunkhouse.

17 March 2007

Position: 73-06N/145-43W
Temperature: -10 degrees F

Happy St. Patrick's Day from APLIS. Weather today was the opposite from yesterday. Started out a cold clear morning but an overcast developed in the early afternoon.

Overnight, the boats started into their first Tactical Development Test. This is a series of tests designed to evaluate performance of new sonars and other systems on both of the submarines. It's the reason we have set up the camp and will take up the majority of our test time.

First thing this morning, we broke off from testing to have *Alexandria* surface again. The reason for this was to embark today's guests. This group was hosted by Submarine Force Commander Vice Adm. Jay Donnelly and included Navy Secretary Donald Winter; Congressman John Culberson of Texas; Congressman Rick Larsen of Wash.; Ms. Sid Ashworth, the Defense Advisor to Senator Ted Stevens of Alaska; and Rear Adm. David Cooke, Commander Operations Royal Navy.

After a brief tour of the camp, it was time to send our guests out to *Alexandria* but, by this time, the freezing fog prevented the helicopter from taking off. Unfazed, they had a great time experiencing camp life. The Secretary

and Vice Adm. Donnelly even took their turns at mining ice to provide drinking water.

After about an hour of being stranded at APLIS, the weather cleared enough for the helo pilot to make it out to *Alexandria* by hugging the ground. We sent our guests off to *Alexandria* where they will get to spend the night under the ice before surfacing tomorrow and returning to Washington, D.C.

19 March 2007

Position: 73-10N/145-50W
Temperature: -12 degrees F

Today I'll talk about some of the science work that we're doing here.

We have two graduate students from the Naval Postgraduate School in Monterey, Calif., here at APLIS doing thesis research. Lt. John Bleidorn and Lt. Tim McGeehan are making use of our location on the ice to study under-ice oceanography.

They are using sonar to image an underwater ice keel and then measure the turbulent wake behind it in hopes that this data will improve models which describe the complex interactions between the atmosphere, sea ice, and ocean.

But that's not the only science that we're doing. We're going to turn the camp over to the National Science Foundation after we're done with our work. The major thrust of that camp

will be to study various aspects of ice mechanics. They have asked if we could install some of their instruments during our camp in order to monitor the movement and evolution of ice in our area. Their highest priority is for us to install a ring of instruments circling the camp at a radius of about six nautical miles (nm). Today, we finally had our chance to set them up. Our team set out this afternoon and got all six buoys installed in just a couple hours.

23 March 2007

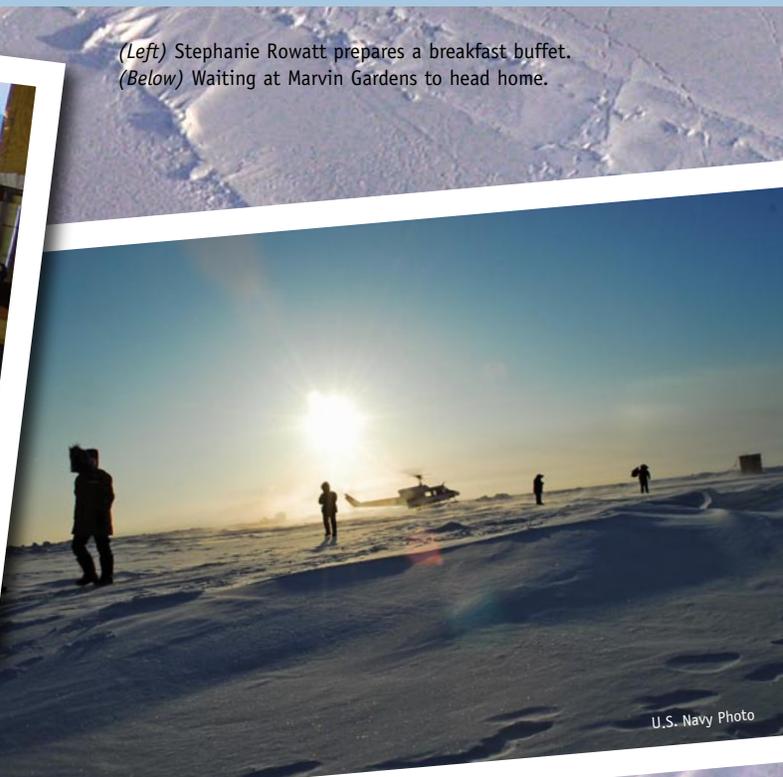
Position: 73-11N/145-55W
Temperature: -13 degrees F

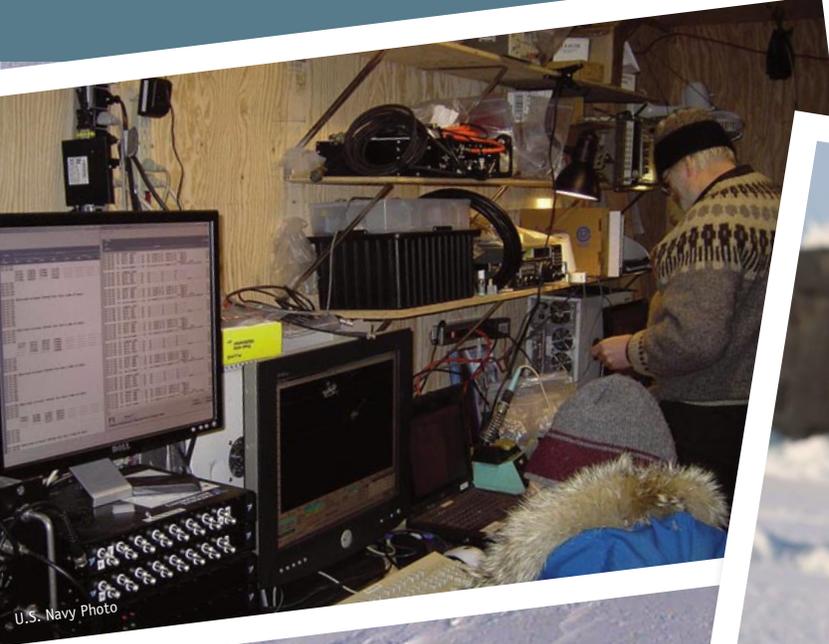
Arctic survival manuals tell us that just keeping yourself warm uses up about 5,000 calories per day. This requires that each of us ensure we eat at least three good meals each day. You might think that, in a remote site like this, large amounts of palatable food might be difficult to find. NOT TRUE! We eat exceptionally well, thanks to our cooks Victoria Simms and Stephanie Rowatt. With camp population exploding in the next couple days, they have been joined today by Trina Litchendorf.

The cooks tend to be modest about the quality of the food. However, they shouldn't be. For breakfast a couple days ago, we had freshly baked scones, freshly baked bagels, lemon pancakes, regular scrambled eggs, and scrambled eggs



(Left) Stephanie Rowatt prepares a breakfast buffet.
(Below) Waiting at Marvin Gardens to head home.





(Above) Skip Kolve and Pete Salan running the tracking range. (Right) *Stargate* actor Ben Browder watches *Alexandria* surface.



U.S. Navy Photo

with smoked salmon. We've had prime rib (twice), scampi, curried soups, cod, tilapia, and salmon prepared just about every way you can imagine. Victoria even braved the cold a couple days ago to stand outside and barbeque burgers.

If you ever get a chance to talk to an APLIS resident or visitor about their time here, one of the first things they'll tell you is how fantastic the food was. Believe them.

25 March 2007

Position: 73-10N/145-50W
Temperature: -20 degrees F

The thing that makes testing possible here at the camp is the tracking range. The way the range works is really quite simple. Before we arrived, the APL/UW team installed hydrophones in four locations about 500 yards from the camp. Earlier still, they installed tracking range equipment and synchronized clocks aboard both boats and at the camp. When on the range, the boats put out a sonar "ping" at a precise time. This allows the range computers to very accurately measure the time it takes the sonar signal to reach each of the four hydrophones. Knowing the speed of sound in water allows these times to be converted to ranges from each of the four hydrophones. Since we know exactly where the hydrophones are located, it

allows the computer to produce the position of the submarine on an X,Y coordinate system. Our Range Safety Officers monitor these positions and pass them periodically to the submarines.

When *Alexandria* asked us to provide frequent range and bearing updates to them as they are approaching a surfacing site, the APL guys quickly produced a software change that allowed the computer to calculate this information automatically. They have been invaluable at helping us keep track of the submarines and keeping the two submarines a safe distance from each other.

Only a few more days left until we finish up and get to go home. But meantime, we're staying warm.

28 March 2007

Position: 73-12N/145-09W
Temperature: -1 degree F

Everything went very smoothly today. The big event of the day was a surfacing by *Alexandria* which the *Stargate: Continuum* crew wanted to film. [The crew was onsite to film scenes for an upcoming movie.] We set things up on the ice as usual and had their cameras in place. *Alexandria* took a little extra time to get it right and surfaced right through the center of the X. With that accomplished, the *Stargate* crew went on to film the final scenes they needed and

will depart tomorrow. *Alexandria* has submerged and only has a few more test runs to finish before she too departs—probably tomorrow as well. The students from Naval Postgraduate School have wrapped up their research and departed this afternoon as did the NUWC [Naval Undersea Warfare Center] engineer conducting the communications testing.

We've accomplished what we set out to do. Our navies have gained a greater understanding of how our submarines operate under the ice and two crews have gained valuable Arctic experience. To achieve this we've endured bitter cold, incessant winds, isolation, separation, bad jokes, leaky shacks, and a near-total loss of the comforts that we take for granted at home. To offset these, we have lived an adventure in one of the world's most unique places, enjoyed fantastic food, and made lifelong friendships. One thing that the *Stargate* team has constantly reminded us of over the last week is just how lucky we are to have had this experience. I hope I've been able to convey some of that to you through these postcards.

For a complete reading of the "Postcards from the Top," please visit <http://www.sublant.navy.mil/HTML/icex.html>

Jeff Gossett is the Technical Director at the Arctic Submarine Laboratory in San Diego, Calif. and was the Test Director at Ice Camp APLIS.

The One-of-a-Kind

Submarine Innovation in the U.S. Navy

USS *Nautilus* (SSN-571), the first nuclear-powered submarine, at her christening.

Photo Courtesy of General Dynamics Electric Boat

The United States Navy has a legacy of innovation in nuclear-powered submarine design. In fact, nine one-of-a-kind Navy nuclear-powered submarines have been designed and built, and they have all pushed the limits of undersea design and capabilities. In addition to the world's first nuclear-powered submarine, USS *Nautilus* (SSN-571), these unique boats have included the only U.S. Navy submarine ever constructed with a liquid-metal cooled reactor, the only twin-reactor submarine, two prototype electric-drive submarines, and the Navy's deep-diving research submarine, *NR-1*. The lessons learned from the problems encountered in these aggressive steps in undersea technology reside in one of the Navy's most important resources—the designers and engineers who have designed and built the nine unique nuclear submarines in U.S. Navy history and those who have inherited their legacy.

The *Nautilus* Challenge

The design and construction of USS *Nautilus* (SSN-571) to accommodate a nuclear powerplant marked the birth of the Naval Nuclear Propulsion Program. Under the detailed supervision of then-Capt. Hyman G. Rickover, engineers teamed with the newly-formed Naval Reactors Branch of the Atomic Energy Commission to tackle the difficult project.

Nautilus presented a vast array of challenges that had never before been encountered in submarine construction, or in any engineering project. For example, there were the issues of balancing the submarine, given the weight of the reactor and the shielding in the neighboring bulkheads, and of designing a piping system that would accommodate the extremely high-pressure, high-temperature water that would cool the reactor. Even a small break in the piping system would cause large amounts of water to flash instantly to steam. The team was able to solve those obstacles, and in just over three years, the submarine advanced from Congressional authorization to commissioning. On Sept. 30, 1954, *Nautilus* became the first commissioned nuclear warship in the world.

Nautilus set not only speed and endurance records—she also became the first vessel ever to transit the Arctic region under the icecap and was the first to travel 20,000 leagues under the sea, a mark previously attained only by her fictional namesake.



USS *Seawolf* (SSN-575) enters the Thames River in Connecticut during her christening on July 21, 1955.

Photo courtesy of General Dynamics Electric Boat

She was decommissioned on March 3, 1980, after steaming almost a half-million miles, and today is a museum ship at the Submarine Force Library and Museum just outside the main gate of the Naval Submarine Base in Groton, Conn.

Second Nuclear Sub, But Another First-of-a-Kind

The U.S. Navy's second nuclear boat also presented unique design challenges. Preliminary development work on nuclear power involved the investigation of a number of reactor design concepts, but only two were chosen for construction: the pressurized water reactor used on *Nautilus*, and the sodium-cooled reactor used on the follow-on nuclear submarine USS *Seawolf* (SSN-575).

As with *Nautilus*, the development of *Seawolf's* liquid sodium plant involved the construction of a land prototype plant. *Seawolf* was launched on July 21, 1955, and conducted sea trials in January 1957. After acceptance, *Seawolf* operated as an active unit of the Atlantic Fleet and in 1958 made a record-breaking submerged run of two months, traveling more than 13,000 miles submerged, producing air and water for her crew the entire time.

Seawolf operated more than two years and steamed 71,000 miles on her sodium-cooled reactor, but, in 1958, the Navy had her refitted with a pressurized water reactor similar to the one in *Nautilus*, and that design is still the standard today. On her replacement plant, *Seawolf* steamed for another 27 years, finally being retired in 1987.

Seawolf stands out in the record books for other reasons as well. A few months after she was placed into service, then-President Dwight D. Eisenhower rode aboard the submarine, making him the first U.S. commander in chief to go “underway on nuclear power.”

A String of Successes

The late 1950s and 1960s were a heady time for submarine innovation, starting with the USS *Triton* (SSRN/SSN-586), which was launched in August 1958. Ordered as the finishing touches were being put on *Seawolf*, *Triton* was huge by the standards of the day. At 6,600 tons and 447 feet long, *Triton* was more than half again as large as *Nautilus*, which posed a problem for the shipyard, because she was too big for the launching way used for other submarines. Electric Boat solved this problem with an innovation that today is the standard for submarine builders—modular construction.

Triton was the only U.S. nuclear submarine ever built with twin reactors. She was also the last submarine built with a real conning tower, and the last with twin screws or a stern torpedo room. Designed as a radar picket submarine that would sprint out ahead of the fleet and report on enemy task force movements, *Triton* needed the power of her twin reactors and the speed advantage gained from her knife-like hull to avoid detection and attack, operating far from any support.

USS *Narwhal* (SSN-671), commissioned in 1969, used a natural convection reac-

USS *George Washington* (SSBN-598) was the U.S. Submarine Force's first ballistic missile submarine.



tor that eliminated the need for noisy pumps, and employed a direct-drive turbine to avoid the use of reduction gears. Consequently, *Narwhal* was the quietest submarine ever at the time of its commissioning. Many of the advances *Narwhal* pioneered were incorporated into the *Los Angeles* and *Ohio*-classes that followed.

Electric Boat delivered USS *Tullibee* (SSN-597) in 1960, and USS *Glenard P. Lipscomb* (SSN-685) in 1974. Both featured early versions of an electric drive, but even they were unique, because *Lipscomb* was almost two-and-a-half times the size of *Tullibee*, at 6,480 tons to *Tullibee's* 2,640.

Tullibee was an outgrowth of then-Chief of Naval Operations Adm. Arleigh Burke's "Project Nobska," a 1956 study that found a need for deep-diving, ultra-quiet submarine designs using long-range sonar. *Tullibee* incorporated three design changes suggested by that study: the first bow-mounted spherical sonar array; angled amidships torpedo tubes (which allowed for the bow array); and a very quiet turboelectric power plant based on the S2C reactor.

Lipscomb was quieter than her conventional drive peer submarines, but considerably heavier, and there were other problems associated with the early versions of electric drive, so the concept was abandoned for a time. Today, however, engineers have resumed work on the concept of electric drive submarines. In addition to studying the more conventional internal motor electric drive, the Defense Advanced Research Projects Agency (DARPA) is helping explore the possibility of placing the propulsion motor outside the ship. If that high-risk technology can be successful, it opens the door to shaftless propulsion, which may allow additional innovation to the submarine's configuration.

One final accomplishment in this era of innovation was *NR-1*. At 145 feet long and 400 tons, it is the smallest U.S. Navy nuclear submarine ever constructed, and is one of the deepest diving, with an operating depth of greater than 2,300 feet. Though limited to relatively slow speed, and tended by a surface ship, the *NR-1* can spend weeks submerged on a mission at deep depths, something no other U.S. deep submergence vehicle can do. To facilitate these deep-sea missions, *NR-1* has alcohol-filled truck tires that emerge from its keel allowing it to actually drive along the bottom of the ocean. It also has a host of other features, including viewports, exterior lighting, and grappling arms, which make it uniquely suited to mapping, recovery, and other missions. In addition to many military and scientific missions, *NR-1* was instrumental in assisting with recovery operations that were not practical for conventional assets including recovery of Space Shuttle *Challenger* debris and Egypt Air 990. However, *NR-1* cannot remain on a mission for months by itself. It carries only a limited amount of food, and the sanitary tank is the real limiting factor since it cannot be pumped while submerged.

During the 1970s, 1980s, and 1990s, many improvements were introduced into the attack Submarine Force aimed at maintaining the supremacy of U.S. forces over those of the Soviet Union. While many of these improvements were not obvious from the outside, they greatly improved the noise signature and weapons capabilities of our ships.

Fleet Ballistic Missile Submarines

The development of the attack submarines and *NR-1* was paralleled by the development of the Fleet Ballistic Missile (FBM) submarine. USS *George Washington*

(SSBN-598) was the first FBM submarine and was delivered in 1960. The Cold War was in full swing at that time and the sense of urgency in the country required innovative approaches to fielding this deterrent.

From a shipbuilding perspective, *George Washington* was very unique in that she started out as an attack submarine, but after she was partially constructed she was cut in half and a missile section was inserted. This missile section was developed in concert with the development of the Polaris Missile. Electric Boat initiated the ship work "on a hand shake" prior to any contract modifications, reflecting the sense of urgency shared by the Navy and industry at the time.

The FBM submarines continued to improve, and culminated in the development of the *Trident (Ohio)* class. In fact, some argue that the upgrade to the *Trident II (D5)* ballistic missile in 1990 was the straw that broke the back of the Soviet Union. Delivery of USS *Tennessee* (SSBN-734) was delayed to provide a platform for the insertion of the larger D5 missile.

The U.S. Submarine Force has a proud tradition of constant innovation and improvement. One-of-a-kind submarine designs are but the most singular and obvious examples of the successful partnership between the fleet and the designers and innovators in industry who proudly support it. Whatever course the Navy lays out for the future of submarine design, it can rest assured that those responsible for creating those designs and innovations are standing by, eager to put their expertise to work.

Mr. Malchiodi retired in 2005 as Director of Concept Formulation at Electric Boat. Over a 40-year career, he was involved with the development of several hundred concept platform studies; some of which resulted in the *Ohio*, *Seawolf*, and *Virginia*-class submarines.

Junior Officers *of the* Year

The Submarine Force Honors Their Top Junior Officers

Every year the Submarine Force recognizes their best and brightest junior officers. These Junior Officers of the Year (JOOY) are nominated by their commanding officers. Nominations are then submitted to the squadron and each squadron selects one junior officer who best exemplifies the characteristics of a future leader in the submarine community to be their JOOY representative. Both submarine tenders, USS *Frank Cable* (AS-40) in Guam and USS *Emory S. Land* (AS-39) in Italy, pick JOOYs as well.

The 18 selected JOOYs had the opportunity to travel to Monterey, Calif., to visit the Naval Postgraduate School and learn about the advances being made in undersea warfare. The JOOYs then traveled to Washington, D.C. Their visit to the nation's capital gave them the chance to sit down and talk with some of the top leaders of the Department of Defense and the Navy, including Adm. Edmund Giambastiani, then-Vice Chairman, Joint Chiefs of Staff; Adm. Mike Mullen, Chief of Naval Operations; Adm. Bob Willard, then Vice Chief of Naval Operations; Adm. Kirkland Donald, Director, Naval Nuclear Propulsion; Rear Adm. Van Mauney, Director, Submarine Warfare (OPNAV N87); and Rear Adm. William Hilarides, Program Executive Officer for Submarines. The JOOYs also spent time touring the Navy Museum, the White House, the Capitol and the National Military Command Center in the Pentagon.



Photo by Molly Little



Photo by Molly Little

(Top) Lt. Stephen Long answers a question during the interview with UNDERSEA WARFARE Magazine.

(Bottom) Lt. j.g. Christopher Grubb shares some of the experiences he had during his junior officer tour.



Photo by Molly Little

The Junior Officers of the Year listen intently to the advice offered by Rear Adm. Van Mauney, Director, Submarine Warfare (N87), during an office call at the Pentagon.

In the midst of their busy schedule, UNDERSEA WARFARE Magazine had the opportunity to sit down and talk to the 14 JOOYs that made the trip to Washington, D.C. The majority of them said that the meetings with the flag officers were the most influential part of the tour. These provided them the big picture and emphasized the importance of what they are doing daily on board their ships, things that can get lost in the day-to-day operations of a boat. Lt. Phillip Emery, of USS *Kentucky* (SSBN-737)(G), said, “When we are out on our boats, it is hard to see the big picture. But coming here and being in the midst of the ‘big picture,’ you get to see where your boat fits into it and how important it is. Being out on deployment or being in the shipyard, putting a system together and trying to figure out how it all fits into the Navy’s plan for things is hard, but you come here and you see how vital your boat is to national defense and how it all fits together.” Lt. j.g. Anthony Wilson, USS *Florida* (SSGN-728), notes the importance of “bringing back a sense of where the Submarine Force is going and what the missions are. I’ve spent a majority of my time in the shipyard, as most of the JOs [junior officers] on my boat have, so it’s important to bring back a sense of where the Force is headed.”

Another reason the JOOYs enjoyed talking to the top Naval leaders was to get advice from those who have been where they are hoping to go. Lt. Ben Grant said, “I’m looking forward to getting leadership advice from the admirals who have been through

the ranks and in the Submarine Force. I would say that about 90 percent of what we do as JOs is managing people, and, if we stay in, we are going to go to even more important leadership roles. People depend on us for that quality—leadership. And they suffer if we aren’t good at it. Obviously, all of the people we are going to meet during our time in Washington, D.C. have been successful at that to a large degree. Their words are useful to us right now and this is the perfect time

in our career to benefit from what they say and to be better officers because of it.”

Over the course of their entire junior officer tour, the majority of the JOOYs said they learned the most from deployment, the part some of them were least looking forward to initially. It was on deployment that they learned some of the most valuable lessons of their career to date and grew the most as submariners. They were able to apply all the training they had to real life situations. Lt. Jon Ahlstrom began his tour at the General Dynamics Electric Boat (GDEB) shipyard before going out for deployment on USS *Seawolf* (SSN-21). He said, “When you are spending your time in the shipyard, you start to question what you are doing there, what the purpose is, and if you are really effective as you see things that are broken and need to be repaired. Then we got to go out there with the *Kitty Hawk* Strike Group and really got to see and prove how effective we are as a single submarine against a whole carrier strike group. You realize that we definitely would be useful in large-scale situations, not just the Global War on Terrorism, but if the event ever came up and we need to take control of the seas again.”

Lt. Grant spent his junior officer tour as a on USS *Albuquerque* (SSN-706) and is now attending the Naval Postgraduate School. He also felt he learned the most from the

2006 Junior Officers of the Year

Lt. Jonathan Ahlstrom
USS *Seawolf* (SSN-21)

Lt. David Campbell
USS *Augusta* (SSN-720)

Lt. Anthony Castle
USS *Houston* (SSN-713)

Lt. William Dennis
USS *Emory S. Land* (AS-39)

Lt. Phillip Emery
USS *Kentucky* (SSBN-737)(G)

Lt. Benjamin Grant
USS *Albuquerque* (SSN-706)

Lt. j.g. Christopher Grubb
USS *Buffalo* (SSN-715)

Lt. Homer Hensey
USS *Frank Cable* (AS-40)

Lt. Stephen Long
USS *Hyman G. Rickover* (SSN-709)

Lt. Ryan Martin
USS *Jimmy Carter* (SSN-23)

Lt. Carlos Martinez
USS *Chicago* (SSN-721)

Lt. j.g. Robert McElhose
USS *Pasadena* (SSN-752)

Lt. j.g. Reginald Preston
USS *Helena* (SSN-725)

Lt. j.g. Steven Roberts
USS *Albany* (SSN-753)

Lt. Scott Smith
USS *Maryland* (SSBN-738)(B)

Lt. Matthew Sweeney
USS *Jacksonville* (SSN-699)

Lt. j.g. Anthony Wilson
USS *Florida* (SSGN-728)

Lt. j.g. Bryan Wooldridge
USS *Ohio* (SSGN-726)(G)

time spent on deployment. “When deciding to join the Navy and then go submarines, I thought I would endure the deployment in exchange for a good career and things like that. In hindsight, the deployment is where I grew the most with the people I worked with and got the chance to actually do the things that I had been training for and to see the parts of the world that everyone who joins the Navy hopes they get to see.”

Lt. Stephen Long, a crewmember on USS *Hyman G. Rickover* (SSN-709), found he learned the most after his ship’s return from deployment. For him, his boat’s purpose and place in the Navy became clearer when he accompanied his commanding officer (CO) to debrief the ship’s deployment. “I don’t think as JOs we get to see where our submarines and our missions fit into the overall realm of the Navy and what is going on in the global situation. We did a deployment that was little bit non-traditional in that it wasn’t your usual Global War on Terrorism or TOMAHAWK support mission. So I really didn’t understand the importance of what we were doing until I went around and saw my CO brief the commanders and admirals and saw that everything each submarine is doing plays a much larger role in what’s going on, and there is a lot more going on than we realize when we are out there day to day.”

One of the most impressive things about these JOOYs was their awareness of their responsibility to the Submarine Force. They were focused on the way their actions affected everyone on board their boats and how they could be constantly improving their own performance as well as that of those under or around them. Lt. j.g. Christopher Grubb, USS *Buffalo* (SSN-715), said “Our job is to help our guys who work under us to succeed. If they are successful, then the boat as a whole is going to be successful. We have other things on the side as our secondary job. But the success of the guys under us and the boat as a whole comes first.”

Lt. Carlos Martinez, a crewmember of USS *Chicago* (SSN-721), followed up on Lt. j.g. Grubb’s statement by adding, “And not even just the junior enlisted guys, we are talking about other junior officers. JOs train JOs, they are the backbone of the wardroom. I have no doubt that as we continue to move forward in the Force with the number of manning issues we have and the number of guys we have on board, we need to push the experience down to the junior guys—the opportunities to drive, stand under instruction and standing the watches.”

Lt. Matthew Sweeney, USS *Jacksonville* (SSN-609), continued, “When I envisioned my job on the boat, it was either technical in nature or tactical in nature. But I think

our real job is interacting with the junior guys. Ensuring they have to tools they need to get the job done, as they have the greatest impact on the success of the ship. We rely on them to do about 90 percent of the work on the ship, so doing what we can to help them to do their job is vital.”

These JOOYs were confident of the importance of their job and the security it has in the Navy’s future, but they were still able to see that the Submarine Force is constantly evolving as capabilities improve and missions become more diverse. They are aware of the heavy demands and expectations placed on them and are willing to work to continue setting the highest possible standards for the officers and Sailors of the Force.

Lt. Grant noted, “The only thing that stays the same about our mission is that it is constantly changing. We need to recognize that and drive that to everyone in the Force, or else we are doing the public a disservice. We will never fight a war that was like the last one we fought, so if we all accept that and learn to be more creative with the versatile capabilities of these ‘sinkable’ boats, we can be an even more powerful force to face in the future.”

Molly Little is the Managing Editor of UNDERSEA WARFARE Magazine and a defense analyst in Washington, D.C.



U.S. Navy Photo

The Junior Officers of the Year pose for a photograph with Adm. Mike Mullen, Chief of Naval Operations.

NR-1

Participates in Secrets of the Gulf 2007 Expedition

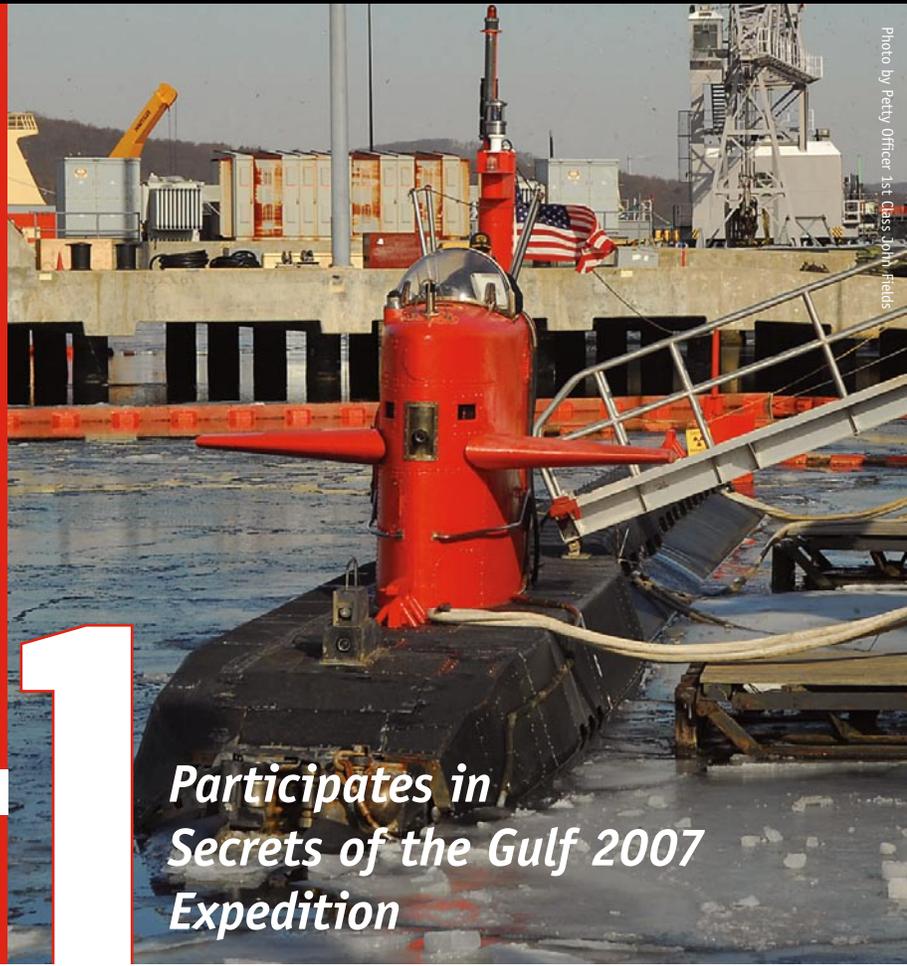


Photo by Petty Officer 1st Class John Fields

The U.S. Navy's nuclear research submarine *NR-1* participated in a scientific expedition March 2–10 to the Flower Garden Banks National Marine Sanctuary (FGBNMS) in the Gulf of Mexico to explore and monitor plant and marine life during “Secrets of the Gulf 2007.”

The Flower Garden Banks, ranging in depth between 200 to 400 feet, was named for the vivid color of plants, sponges and marine life discovered by fishermen in the late 1800s. The sanctuary was targeted for exploration because of its unique geology and biology, and its geological history also makes it a viable location to search for evidence of early inhabitants.

NR-1's mission was to carry sanctuary researchers who would explore deep-water low-relief ridges that connect various banks along the continental shelf in the northwestern Gulf of Mexico, including two of the three banks that comprise the sanctuary. Eleven *NR-1* crew members and two scientists put to sea March 2 intent on covering as much ground as possible in the few days they would have to explore and gather samples.

NR-1 was towed from Groton, Conn., by the submarine support vessel (SSV) *MV*

Carolyn Chouest and arrived in Galveston, Texas, Feb. 27 to take part in the landmark expedition in the FGBNMS.

“*NR-1* is going to be the legs of the mission,” said Cmdr. Enrique N. Panlilio, officer in charge of *NR-1*. “If a wide area of the ocean bottom needs to be searched out, then *NR-1* can search using side-scan sonar and obstacle avoidance sonar. We’ll also be down there within visual sight of the bottom looking at bottom features either through our view ports or through our cameras.”

For this mission, *NR-1* was tasked with surveying several transections at the West Flower Garden Bank (WFGB) in depths around 300 feet. A team of geologists, biologists, and marine archaeologists explored coral reefs, brine seeps, mud volcanoes, and ancient shore lines with the help of *NR-1*, *Argus* (a remotely operated vehicle), and scuba divers. Scientists were searching for signs of early life with hopes of finding evidence of early human existence along a coastline that may have extended 115 miles farther into the Gulf 19,000 years ago.

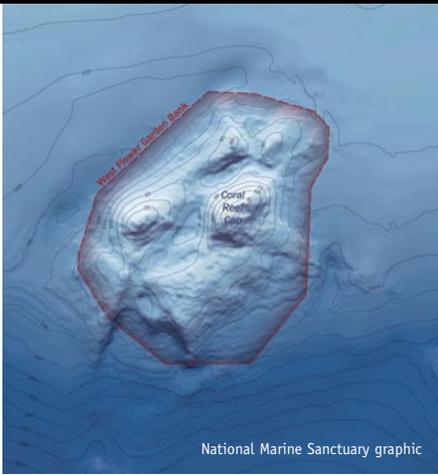
“We have better maps of Mars than we do of submerged America,” said Dr.

Robert D. Ballard, professor of oceanography at the University of Rhode Island and the president of the Institute for Exploration (IFE) at Mystic Aquarium in Conn., who directed the expedition from a telecommunications center there. “Sending men to the bottom of the ocean can provide details about our past when compared to present day, and may give clues to future events.”

Homeported at Naval Submarine Base, New London, Conn., *NR-1* was launched in 1969 and is the Navy's only nuclear-powered research submarine. It is capable of performing underwater search and recovery, oceanographic research, and the installation and repair of equipment down to depths of one-half mile.

A one-of-a-kind design, advanced technology and sonar systems provide *NR-1* with the ability to navigate precisely to detect and ascertain the position of objects in the water and on the seabed in a way other research vessels cannot.

Specific features include three four-inch view ports, which allow the crew to establish direct visual contact with the ocean floor. At the very bottom, the box keel houses *NR-1*'s manipulator arm used for recovering objects



(Previous page) Nuclear research submarine *NR-1* is moored at Naval Submarine base New London, Conn. (Above left) A portion of a sanctuary map of the Flower Garden Banks. (Above right) Inside *NR-1*. (Below) *NR-1* arrives in Galveston, Texas in preparation for Operation Flower Garden Banks Expedition 2007.

from the seabed. The sub also boasts two sample baskets each with a 1,000-pound lifting capacity and two retractable rubber-tired bottoming wheels allowing *NR-1* to cruise on the ocean floor.

Side-scan sonar surveys were conducted allowing the researchers to create detailed mapping of the ocean floor in an effort to identify ancient shorelines which may have existed thousands of years ago when the sea level was much lower due to the ice age.

“Scientists that use a manned deep submergence vehicle like *NR-1* feel they can understand so much more—by being there in person—about the complex environments with first-hand experience versus looking through a robotic camera,” said Dr. Dwight F. Coleman, director of research at IFE and the expedition’s chief scientist.

Thanks to Immersion Presents, a private organization working with the expedition, live broadcasts of the mission aired each day in classrooms and other education forums around the country giving students an opportunity to ask questions of the scientists on board the vessel via live feeds on the Internet.

“We received very positive feedback from students, teachers and the public on the educational broadcasts that were produced live,” said Coleman.

Although the scientists did not find any direct evidence of ice age human activity around the banks they explored, Coleman noted the expedition yielded some evidence of geographic formations that would have been attractive to early humans.

The results from the biologists and geologists exploring the sanctuary’s ecosystem will be used to protect these resources for current and future generations.

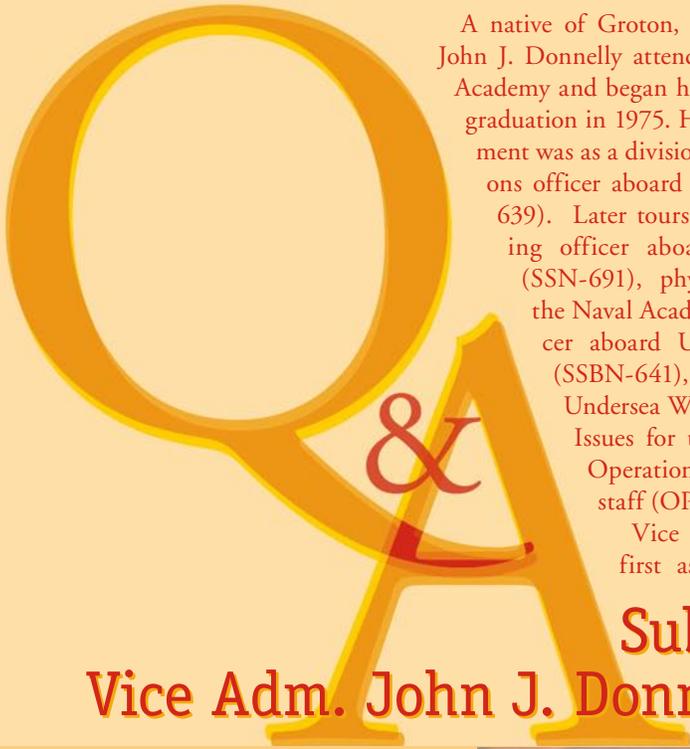
“All the scientists were very pleased by the performance of *NR-1*, the Navy team, and crew of *Carolyn Chouest* in accomplishing what was a very ambitious project,” said Coleman. “We hope to use the submarine *NR-1* in future missions to explore (more) submerged sites.”

Data collected from the expedition will be analyzed over the next few months at the Graduate School of Oceanography at the University of Rhode Island.

Petty Officer 1st Class John Fields is a Mass Communication Specialist with the Fleet Public Affairs Center Atlantic.



Photo by Petty Officer 1st Class John Fields



A native of Groton, Conn., Vice Adm. John J. Donnelly attended the U.S. Naval Academy and began his naval career after graduation in 1975. His first tour assignment was as a division officer and weapons officer aboard USS *Tautog* (SSN-639). Later tours included engineering officer aboard USS *Memphis* (SSN-691), physics instructor at the Naval Academy, executive officer aboard USS *Simon Bolivar* (SSBN-641), and Assistant for Undersea Warfare and Strategic Issues for the Chief of Naval Operations Executive Panel staff (OP-00K).

Vice Adm. Donnelly's first assignment as com-

manding officer was aboard USS *Hyman G. Rickover* (SSN-709). After completing two shore duty tours, he commanded the submarine tender USS *McKee* (AS-41). Vice Adm. Donnelly then completed a tour in Japan before returning to the U.S. as a flag officer. His first tour as a flag officer was as Director of Combat Plans (J5A). Later in his career, Vice Adm. Donnelly served as Deputy Commander and Chief of Staff, U.S. Pacific Fleet before being assigned as Commander, Submarine Force.

Upon assuming the role of Commander, Submarine Force, Vice Adm. Donnelly took some time to share his thoughts on the Force's future, the future of the Sailors and officers, and his personal goals in his new role.

Submarine Force Commander, Vice Adm. John J. Donnelly, Shares Some Insights

What are your top objectives for the Submarine Force? How do you plan on meeting these objectives during your tour as its commander?

When I came on as Commander, Submarine Force, I set three priorities, and have categorized all staff activities into one of those priorities.

The first is operational excellence. What I mean by that is we need to focus on what I call the main thing—the safe and effective operation of our ships. We have had a string of mishaps in the recent past, and I am trying to reverse that trend through a number of initiatives. Thus far, in my first six months as the Submarine Force commander, we have not had a major incident in the Submarine Force. I hope to continue that record through efforts on several fronts to help the commanding officers and the crews focus on that main thing.

The middle priority – I do not call it my second priority because it is just as important as the first – is the professional development of our Submarine Force personnel. There are a number of initiatives there. We are trying to provide the right level of training and improve our training programs to be more effective in the way we develop our people, so they have the skills necessary to succeed.



Capt. David Solms (left) salutes Commander, Submarine Force, Vice Adm. John Donnelly, signifying he is "reporting for duty" and is in command of USS *Hawaii* (SSN-776).

Finally, I am trying to improve the way we perform submarine maintenance, modernization and the recapitalization of our force. I have several partners I work with, specifically NAVSEA, Strategic Systems Programs, OPNAV N87, and several others in the Undersea Enterprise that all have a stake in our success. I am starting to see some encouraging results. We're coming together and teaming to make improvements in those areas so we can get our ships out of the shipyards on time, on budget, and back to sea where we need them.

What do you think will be the most challenging aspect of this job? What do you think will be the most rewarding?

I will start with the second part of the question. Clearly, the most rewarding is the opportunity to work with the Submarine Force personnel. I have been out of the Submarine Force for awhile in my previous assignment (Deputy Commander, Pacific Fleet), and it is a joy to come back and work with such professional, talented people on the single focus area of providing Submarine Force



Photo by Mr. Paul Farley

Crew members conduct mooring operations as USS *Scranton* (SSN-756) arrives for a routine port visit in Greece.

capability to the fleet. That really is a lot of fun.

I think the most challenging for me personally has been time management. That's my personal problem to cope with. There's so much work to be done, so many people that I want to meet, and so many places to visit that in my initial six months in this tour, it's been a scheduling challenge to fit it all into my calendar. I am trying to make it all work and I think I am getting better at that.

As a force, I think the most challenging thing I am looking at is trying to change our emphasis away from a focus on process, to a focus on the output of the process and the effects of what we are doing.

Let me give you an example. We spend a lot of time training in the Submarine Force. Training is absolutely vital and necessary to constantly refresh our skills, especially as we bring new people in to various teams, wardrooms and ships. Training is an essential fact of life, but I think we've gotten into a habit now where we are more interested in the process of training—documenting training, grading exams and developing multiple three ring binders, which will prove we did the training—when the real focus should be how much do the people know as a result

of that training. I am trying to get the administration of the training program reduced to a more manageable level, and really focus on the quality and the effectiveness of the training as opposed to the quantity and volume of the training records. That is a challenge because we have to overcome a lot of inertia.

How important is diversity in the Submarine Force? What is being done to meet the CNO's diversity goals?

Diversity is vital in the Submarine Force. We should be representative of the diversity of the nation that we are defending. The diversity in our ranks adds richness, it brings different perspectives, different points of view and we are much better as a result of that rich diversity. I think we must improve in this area. We have hired a diversity officer for SUBFOR and that person will work full time to help improve our Submarine Force diversity. The key to success in this area is to increase the diversity of the people we bring into the Force. Once we bring diverse members into our force, they retain and promote at the same rate as our other members, so we must attract high quality, highly motivated young people into our force and effectively mentor those folks to keep them within our ranks.

I think it is very, very important that we continue to focus on this effort. It is a CNO priority area and it is an area that I take very seriously. I hope to see some big gains, particularly in the officer community.

How are submarines contributing to the GWOT and the war in Iraq? Where else are submarines being used today?

On any given day we have about 10 submarines forward deployed. We are using the unique attributes of these submarines to support the combatant commanders in every region. By unique attributes, I mean their stealth, their endurance, their agility, their persistence, their intelligence gathering capabilities, and when necessary we have used, as you saw in Iraq, our combat power to add to the striking capabilities of the joint force. We will continue to use those attributes in the future. The global war on terror is all about intelligence, and the submarine is a unique intelligence-gathering platform. We are out there gathering intelligence when the potential adversary does not know he is being observed. That intelligence is used by combatant commanders in their effort to fight terrorism. I can't go into a lot of details because of classification issues, but you should know that our submarines are out there on the front lines. The products they generate for combatant commanders are being used and it is important in the ongoing efforts.

We just tested the Tactical TOMAHAWK missile using one of our submarines, and that weapon is going to add to our combat power. We have the ability to put a TOMAHAWK missile in the air and while it is in flight command it to a target for a very rapid strike. This new, flexible strike capability will be a great asset to the joint force.

How will submarines be used in support of the CNO's maritime strategy of the future? How will the roles and missions of submarines evolve near and long term?

As you look at the history of the Submarine Force, our roles and missions have continuously evolved. The key characteristics of a submarine will always be important to our maritime strategy. Our stealth, endurance, mobility, and persis-

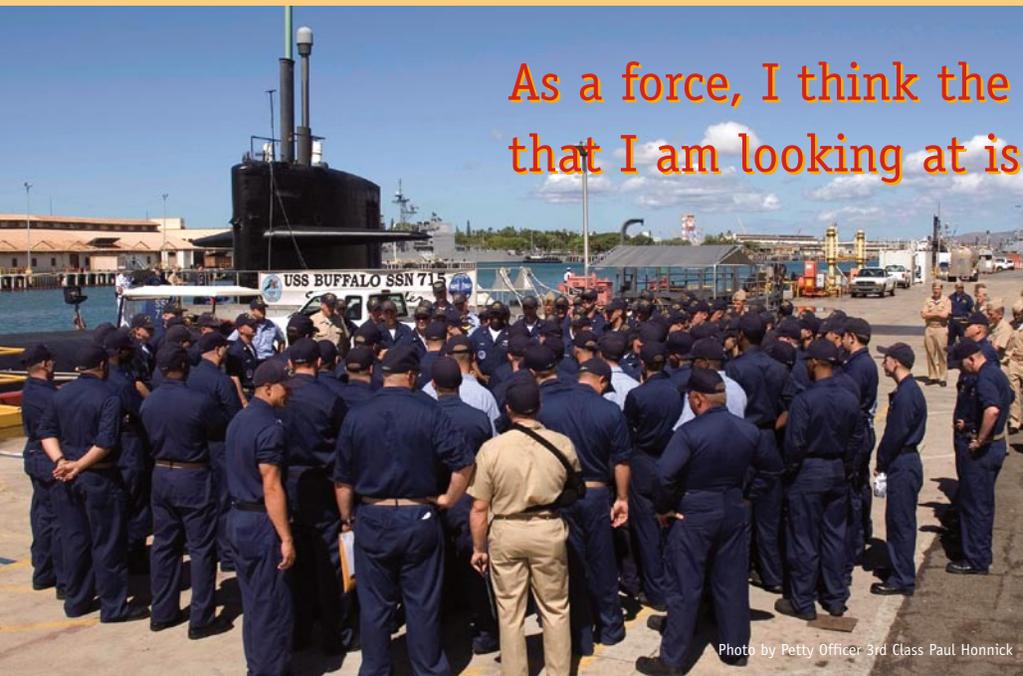


Photo by Petty Officer 3rd Class Paul Honnick

Cmdr. Brian N. Humm, commanding officer of USS *Buffalo* (SSN-715), addresses the crew during an all-hands call on the pier.

As a force, I think the challenging thing that I am looking at is to try to change our focus a little bit away from a focus on processes to more of a focus on output of the processes and the effects of what we are doing.

tence will make us vital members of the joint team. One aspect of the CNO's maritime strategy is strategic deterrence, where our SSBN's will always be at the forefront. The mission they perform is just as important today as it has ever been. They perform their mission with great professionalism and they are a key cornerstone of the CNO's maritime strategy.

The ability of our SSNs to gather intelligence in a covert nature for long periods of time will serve us well in the maritime strategy of the future. SSGN will make its first deployment later this year and brings incredible firepower to the fleet, with its arsenal of Tomahawk missiles and special operations forces in addition to its other submarine unique capabilities.

We will see the Submarine Force mission continue to evolve. We will use off-ship sensors, such as unmanned aerial vehicles and unmanned underwater vehicles, to extend the envelope of our sensors. Submarines will continue to be vital members of the strike group and the fleet as they gather intelligence and provide maritime domain awareness.

Please share your thoughts on the state of today's submarine training (both officer and enlisted). How do you see this training evolving in the future?

I mentioned that one of my priorities is the professional development of our people, and this really goes right to the core

of your question. I think the training we do can be enhanced by using all available technology. You are seeing this new technology if you go to the submarine learning centers. I have toured several of them and what is being done is truly impressive. We are bringing in the latest technology for trainers such as the Submarine Multi-Mission Team Trainer 3 (SMTT-3), a full weapons employment system that simulates on board equipment and response with a very high degree of fidelity and allows our crews to train in the shore-based trainer for the fight of tomorrow.

SMTT-3 is a tactical team trainer that replicates the actual sonar and fire control equipment that you find on a submarine and enables our crews to do training in port that you might not be able to do at sea. For example, one of the things that our boats in the Western Pacific often encounter is very high surface contact density due to the large number of fishing vessels. We can't send a submarine out to practice operations anywhere in the local operating area with that level of complexity. SMTT-3 gives them all the skills so they can hone those processes and the teamwork and the rhythm needed to handle complex situations. This remarkable technology is vastly improving the quality and effectiveness of our training.

The other initiative we are undertaking is training key enlisted members of the crew as they execute their permanent change of station orders enroute to a

job with higher responsibilities. We have always done that with the officers before each sea tour. We are expanding the practice and we will soon teach a course to our engineering department enlisted advisors. This weeklong course will provide them the necessary knowledge and the skills so they are better positioned for success. We are also working together with the Naval Aviation community to start a course for all our nuclear-trained leading petty officers as they go to their first assignment as a leading petty officer on carriers and submarines. This course will be taught either in Norfolk or in San Diego, and will give them the basic background and administrative skills to allow them to focus on leadership and learning new administrative functions when they first report. I think that's how we're going to evolve training as we develop our people for success in their assignments.

For more of the interview with Vice Adm. Donnelly, please visit our website www.navy.mil/navydata/cno/n87/mag.html.

Petty Officer 1st Class Christina Shaw is a Mass Communication Specialist with the Submarine Force Public Affairs Office.

Force Master Chief (FORCM) Dean Irwin was born in Suffern, New York and began his Navy career in 1984. He completed Basic Training and then attended Basic Submarine School and Sonar Technician "A" and "C" schools. After completing this training, FORCM Irwin reported for his first tour onboard USS *Memphis* (SSN-691), with later tours aboard USS *Hammerhead* (SSN-663), USS *Finback* (SSN-670), and USS *Pittsburgh* (SSN-720). He then served as chief of the boat

(COB) aboard USS *Seawolf* (SSN-21), where he completed the ship's inaugural deployment in direct support of the Global War on Terrorism.

After returning to shore duty, FORCM Irwin served as a pre-

deployment sonar instructor at Naval Submarine School in Groton, Conn. and as the command career counselor on the staff of Commander, Submarine Group TWO. In December 2002, he completed the Senior Enlisted Academy and then reported to Commander, Submarine Squadron TWENTY TWO. FORCM Irwin served there until he was selected for the post of Force Master Chief for Commander, Submarine Force in August 2004.

Over the course of this career, FORCM Irwin has been personally awarded the Meritorious Service Medal (one gold star), Navy Commendation Medal (three gold stars), Navy Achievement Medal (four gold stars), and various service and campaign awards.

He recently sat down with UNDERSEA WARFARE Magazine to discuss the ever-present challenge of equipping enlisted sailors to be exceptional members of the Submarine Force.

Thoughts from the Submarine Force Master Chief

Submarine Force Command Master Chief Dean Irwin addresses chief petty officers and junior officers in the crew's mess aboard fast-attack submarine USS *Springfield* (SSN-761).

What impresses you most about the Sailors in the Submarine Force today?

There are many things that impress me. I recently returned from an all hands call at Kings Bay, Ga. The first thing that impressed me about that group of Sailors was the pride and professionalism they had and the commitment to service, the commitment each of them had to their individual submarines. Each Sailor that I had an opportunity to speak with displayed immense pride in being a crewmember of his assigned submarine. I have never seen the level of pride and professionalism so high within the force. These young Sailors grew up in a different generation, so there are certainly going to

be challenges for the submarine deckplate leadership. There will be challenges in learning how these young Sailors think, what their thought process is. This generation of Sailor is accustomed to moving at a rapid pace. Sometimes there is a mindset of "What are you doing for me today?". One of my challenges is to make sure the CPOs [chief petty officers] of the Force understand this mindset so they can mentor these young Sailors into the CPOs of tomorrow.

Another area that impresses me is that the young Sailor today has an ability to advance and to pursue off-duty education more so than ever before. They are intelligent, sharp, young men and women. There are more Sailors developing them-

selves professionally and personally than ever before.

What does the Submarine Force need to do to maintain and improve upon the high standards for Sailors on the boat and on shore duty?

That's a good question. I call it transitioning from the schoolhouse to the quarterdeck. You have a new Sailor who lives in a very structured environment for six or eight months while at the schoolhouse. Room inspections, uniform inspections, an active physical readiness program, and a rigorous daily technical training program are the daily norm. He now reports to his submarine. We need to maintain the

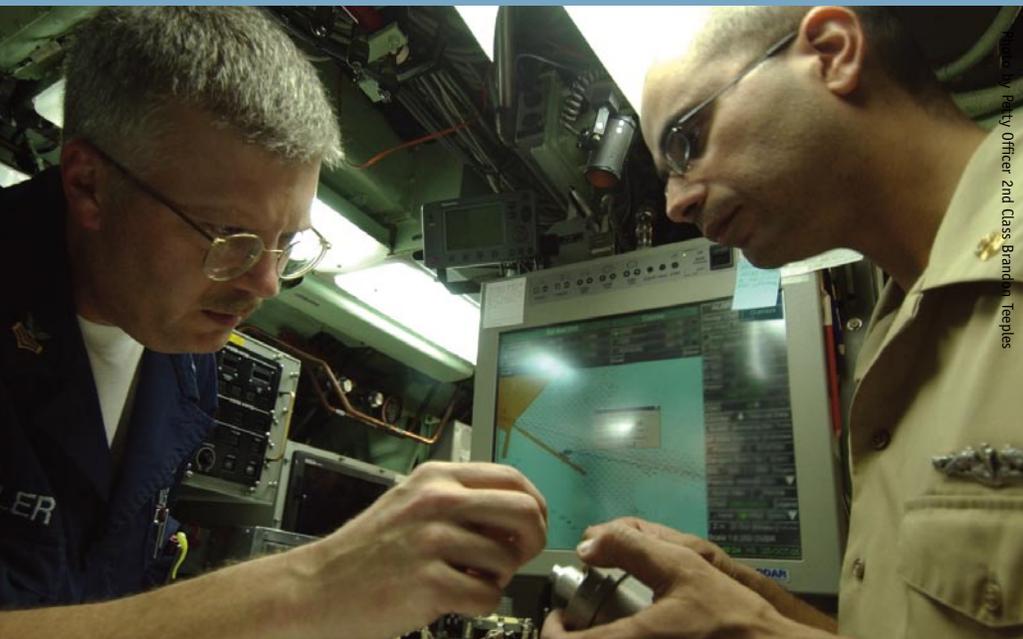


Photo by Petty Officer 2nd Class Brandon Teeples



Photo by Seaman James Seward

same high standards with checks and balances at his sea going command. If we are not ready to receive that Sailor, if the same checks and balances are not in place, we will lose that Sailor. The deckplate leadership has to maintain the same day to day care of this individual.

Some Sailors are better than others. Some Sailors need more attention. We recognize that some Sailors are at a higher risk than others. One of the programs we have recently initiated is a “submarine school report card” that transitions with the Sailor from the schoolhouse to the quarterdeck. It provides a data point for the deckplate leadership on how a particular Sailor performed in school and identifies that Sailor who may require some extra attention. The saying used to be that ten percent of the Sailors took up 90 percent of the time. The percentage of those Sailors is now probably five percent and they require less time. We are getting great Sailors to the force and it’s reflected in the numbers. We can always improve, yet there has been a 12 percent reduction in the number of DUIs [driving under the influence] from FY06 [fiscal year 2006] to FY07. Positive urinalysis numbers are down 13 percent during the same period. The number of alcohol related incidents is down 60 percent. Our sailors who were eligible for discharge for failing the physical readiness requirements has dropped from 475 in the fall of last year to 166 in the spring of this year. We’ve had zero recreational off-duty deaths this year and zero private motor vehicular deaths this

year. Last year we had six motor vehicle and two recreational deaths. This is not to say we can relax, but the Sailors are getting the message and the standards are higher than they have ever been.

After the recent operational stand down, has training gone “back to basics” with regards to basic marine skills, watchstanding skills, etc.?

Vice Adm. Donnelly’s top three priorities are operational excellence, professional development of our Force and Sailors and modernizing our submarines. By focusing on these top three priorities, it will naturally reinforce our “back to basics.” Every day we will cross two or three of these priorities. I think the CPOs play a key role in all three. I think the chief of the boat needs to be involved in all aspects of the ship. He’s not just a watchbill coordinator. He needs to sit down at the table with the commanding officer and the department heads and be involved with everything associated with that submarine. What’s the impact on the crew if we go to carry out that mission? What’s the impact on the crew and the families in conducting that maintenance after being at sea for a lengthy period? How do I juggle the school and leave requirements?

That’s one piece of the puzzle. Another piece is ensuring the CPOs set the example with supervisory qualifications. Once we have qualified on our senior supervisory qualifications, then we can hold our Sailors accountable. We need to be the best diving

officer of the watch, the best engineering duty petty officer. That’s kind of a long answer, but there is not a set way to “get back to the basics.” The Submarine Force has always been a checklist driven force. We rely on these checklists so we don’t have to rely on memory for the safety related functions we perform every day. There’s a good thing about that and there’s a bad thing. If your checklist driven your not asking questions about why the procedure is the way it is. We need to also have a questioning mindset. We need to get back to that. There is no “easy button” in the operation of submarines. We need to challenge assumptions. We need to have an active operational risk management mindset in everything we do. There needs to be questioning, forceful backup at every level of the chain of command. The junior lookout on the bridge needs to have a questioning attitude as much as the seasoned officer standing next to him. Operational risk management also needs to extend off the ship, and that’s a real challenge. The young men and women who man the submarine force are 18-19 years old and they think they are invincible. They are going to go out and live life’s experiences. If we can get some of them, all of them, to apply some level of operational risk management, I think we will continue to see the progress we have made to date.

Over your career, how have you seen Sailors evolve at the deckplate level? What skills, traits, attributes are they bringing to the Navy that they weren’t when you enlisted?

There is no “easy button” in the operation of submarines. We need to challenge assumptions. We need to have an active operational risk management mindset in everything we do... The junior lookout on the bridge needs to have a questioning attitude as much as the seasoned officer standing next to him.

They are inquisitive; they want to know. They can be impatient; they want it now. They are smarter and know how to use the resources that are available to them. They have tools available to them on the Internet where they can look up data. So, if you are a chief today, you better have the answer right, because the Sailor and their family are going to have the right answer if you do not. And that gets back to our credibility. It becomes an issue of credibility between the Sailor and his supervisors and it's vital that we maintain that credibility.

From my perspective, from when Seaman Recruit Irwin walked in the Navy, I think we have become more focused on the professional development of our Sailors than we have ever been before and more focused on family readiness than ever before. Those two things are going to ensure we retain our best sailors as we move forward. Before, if a young Sailor asked his chief for some time off and indicated it was to assist his wife with some item, the response was frequently “Your wife wasn't issued with your seabag.” If a chief said that to a Sailor today, shame on that chief. That is an unacceptable answer today and I would be very surprised to hear it from any CPO.

In my two and a half years here [as FORCM], I have seen the chief's mess evolve, and it continues to evolve. Vice Adm. Donnelly has made it very clear that now is the time to get back to the basics and to focus on the top three priorities. Combine that with the MCPON's [Master

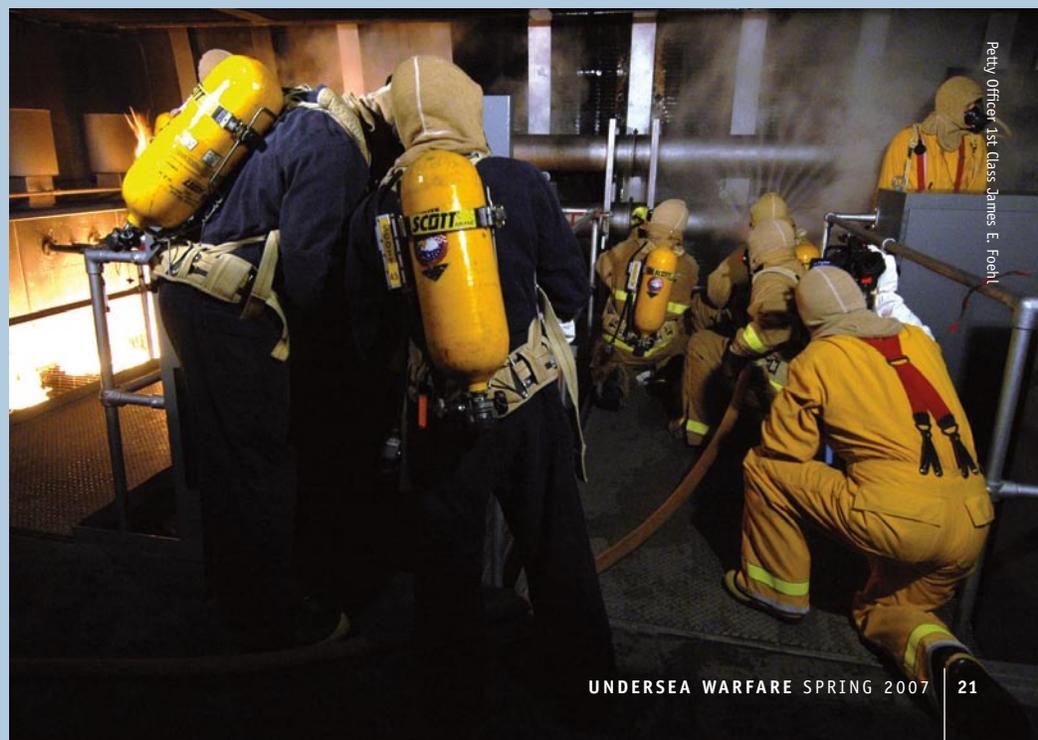
Chief Petty Officer of the Navy] guidance to the chief's mess and our expectations are set for the future—how we are going to march off and how we are going to take care of business. We have great people out there doing great things.

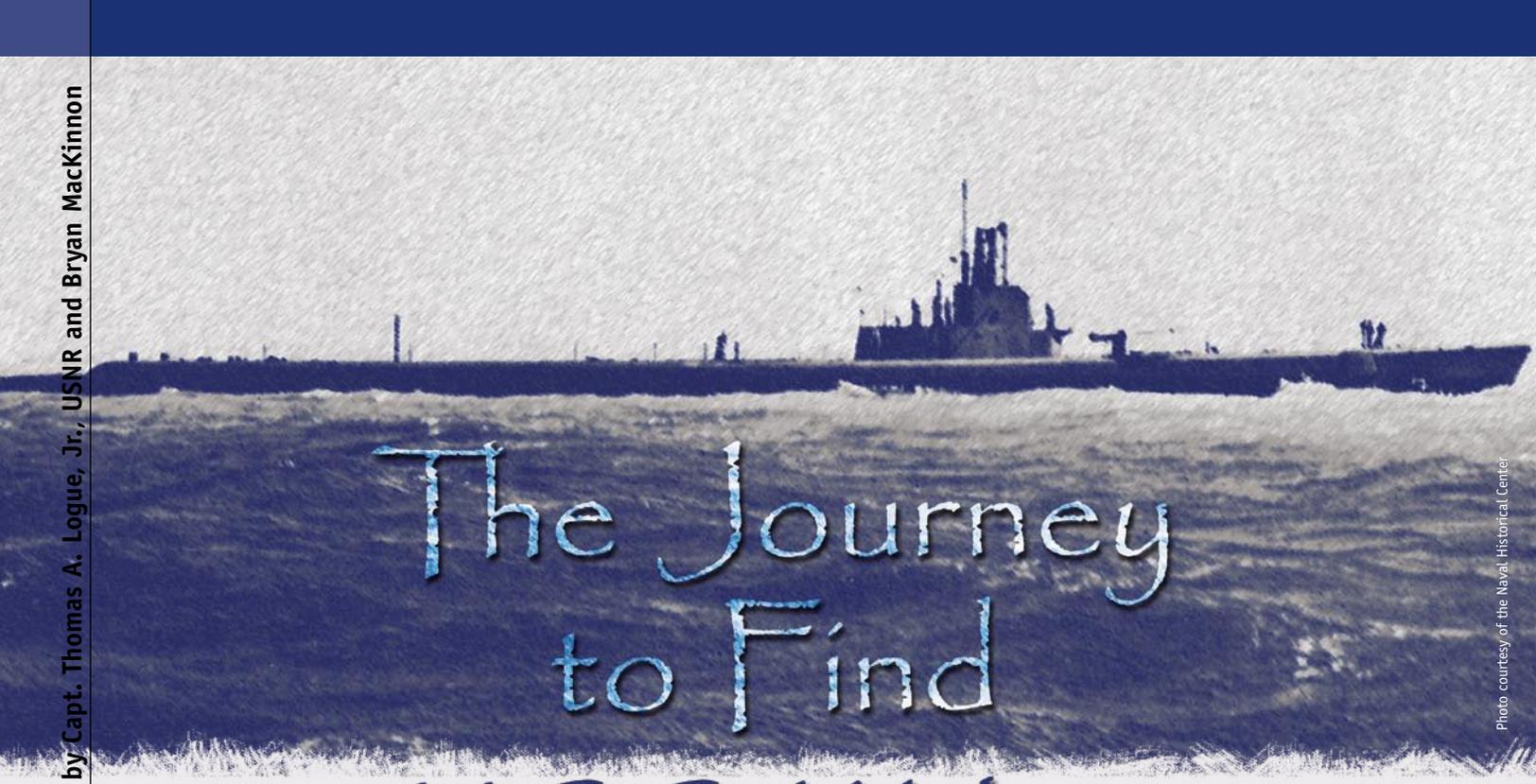
Don Miller is a retired submariner who—among his many assignments—served as Commanding Officer of USS *Buffalo* (SSN-715) and as commodore of Submarine Squadron ONE.

(Opposite page, left) Petty Officer 1st Class Jay Miller, left, and Chief Petty Officer Erick Encarnacion work on an assembly piece for the stern plane angle indicator aboard the *Los Angeles*-class fast attack submarine USS *Annapolis* (SSN-760).

(Opposite page, right) A midshipman attempts to stop flooding during a damage control simulation at Submarine Training Center Pacific.

(This page) Submariners perform damage control and firefighting training at the Naval Submarine Training Center Pacific.





The Journey to Find USS Wahoo

Photo courtesy of the Naval Historical Center

Setting sail after topping off at Midway Island in the late summer of 1943, headed for the Sea of Japan, the legendary *Gato*-class submarine, USS *Wahoo* (SS-238), was never to be seen again...until now. After considerable effort by many individuals and organizations from many countries, her final resting place has been confirmed by the U.S. Navy. She was discovered last summer, fatally damaged but in one piece, by a Russian dive team between the Japanese island of Hokkaido and the Russian island of Sakhalin, in the La Perouse (Soya) Strait.

Background

Many of today's nuclear-trained submariners may be only dimly aware of *Wahoo's* accomplishments during World War II in the Pacific theater. On the occasion of *Wahoo's* discovery, our intent is to recount some of her history and highlight some of the revolutionary tactics she employed under her commanding and executive officers, Cmdr. Dudley W. Morton and Rear Adm. Richard H. O'Kane. We also want to report some of the details of her discovery last year. Over the past eleven years, Bryan MacKinnon, grand-nephew of Dudley Morton, led the effort to find *Wahoo* and determine the circumstances of her loss.

For us, *Wahoo's* discovery represents a significant way-point in personal journeys that started very early in our lives.

Dudley "Mush" Morton, the Submarine Force's Rising Star

By the summer of 1943, everybody in the Pacific Submarine Force had heard of Dudley "Mush" Morton and *Wahoo*. They had become an overnight sensation after *Wahoo's* third patrol conducted off New Guinea earlier that same year. As part of his tasking for his first patrol as commanding officer (CO) of *Wahoo*, Morton's patrol orders included the directive: "Adjust speed, if possible, to permit daylight reconnaissance vicinity Wewak Harbor, New Guinea."² After consulting with his officers for their interpretation of "reconnaissance," Morton made his intentions clear. He decided it meant enter the harbor, submerged, and sink as many enemy ships as possible. Upon conducting a periscope survey of an inlet for which he had no official charts, he detected a Japanese *Shiratsuyu*-class destroyer apparently at anchor. He commenced firing a salvo of bow torpedoes only to discover that the destroyer was actually underway and his torpedoes would miss astern.³ He fired his last bow torpedo at 800 yards range using a "down

the throat" shot as the now fully alerted destroyer charged *Wahoo's* periscope with intent to ram. Morton obligingly kept the periscope raised to lure the destroyer into the path of his final torpedo. Morton later reported that this torpedo had "blown off the bow" of the destroyer.⁴ After snapping some photographs through the periscope, *Wahoo* commenced a 3-knot, 7-mile, submerged egress using dead reckoning and passive sonar alone.⁵ On the same patrol—two days later—Morton attacked and believed he had sunk an entire convoy composed of two freighters, a troop transport, and a tanker during an all day pursuit with multiple torpedo and gun attacks.⁶ Mush Morton, who had a flair for the terse message writing required of all submarine communications, composed the following for Commander Submarine Force, U.S. Pacific Fleet (COMSUBPAC):

SANK DESTROYER IN WEWAK SUNDAY
AND IN FOURTEEN HOUR RUNNING
GUN AND TORPEDO BATTLE TODAY
SANK CONVOY OF ONE TANKER TWO
FREIGHTERS AND ONE TRANSPORT
DESTROYING HER BOATS
TORPEDOES EXPENDED
PROCEEDING PEARL HARBOR
VIA FAIS ISLAND⁷

This patrol had been the most successful to date for an American submarine in the Pacific theater and was sorely needed for morale. Later when *Wahoo* returned to Pearl Harbor from her fifth patrol, Morton flamboyantly ordered a broom lashed to the periscope to highlight their success, reminiscent of the 17th century Dutch Admiral Martin Tromp who reputedly had adorned his flagship's masthead in similar fashion announcing his success in "sweeping" away his British adversary.⁸

Wahoo was christened "The One-Boat Wolf Pack" and after her third patrol, Fleet Adm. Chester Nimitz awarded Morton a Navy Cross. For sinking the troop transport, General MacArthur awarded him the Army Distinguished Service Cross. The *Wahoo* and her crew were awarded a Presidential Unit Citation. Word of Morton, Executive Officer (XO) Richard O'Kane, the crew

of *Wahoo*, and their achievements using daring, quick-thinking tactics spread rapidly throughout the Force. But this success was actually brought about through innovative thinking and protracted, intense effort by two committed and highly-driven submarine officers.

Morton's Unorthodox Fire Control Party

Morton and O'Kane were of like minds when it came to the aggressive pursuit of an enemy and, as such, they ended up "rewriting the book" on enemy pursuit tactics.⁹ Pre-war doctrine had called for submarines to conduct submerged passive sonar approaches only.¹⁰ Those surface ships that might happen their way were susceptible to attack. This resulted in few en-

counters and consequently low numbers of enemy ships engaged and sunk. Due to their lack of success and reluctance to pursue and engage the enemy aggressively, many submarine commanding officers in place at the start of the war were replaced.

O'Kane had felt the sting of underachievement on *Wahoo's* first war patrol. *Wahoo's* first commanding officer, Lt. Cmdr. Marvin Granville Kennedy, passed up what could have been *Wahoo's* biggest prizes of the war. The first was a midget submarine mother ship that they had misidentified as a sea-plane tender and the second, an aircraft carrier.¹¹ In both cases, a lack of experience and aggressiveness allowed these highly valued targets to get away

Growing Up Wahoo

Thomas Logue writes:

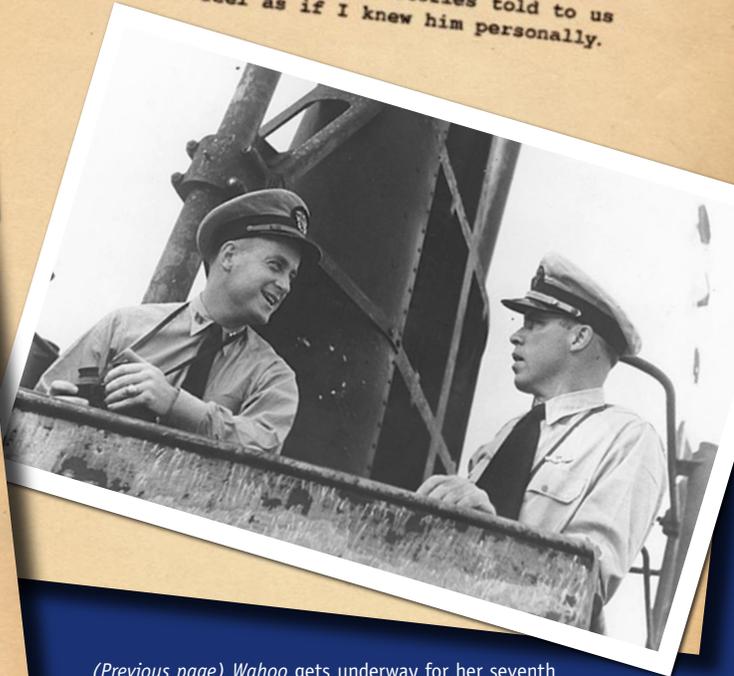
Ever since I can remember, I heard stories from my father and Uncle George about their older brother, Petty Officer 1st Class Robert "Bobby" Logue, who enlisted in the Navy after high school, volunteering for the dangerous submarine service. They told me about how Uncle Bobby had endured patrols on an older diesel submarine—USS Dolphin (SS-169). They described how he had just returned to the base at Pearl Harbor from the longest submarine patrol to that date, just four days before the devastating air attack by the Japanese. Standing duty that early December morning, he manned his battle station as deck gun captain and shot down at least one of the marauding planes.

Uncle George would go on to describe how as the nation mobilized for war, his older brother continued his service as a fire controlman on Dolphin. Dudley "Mush" Morton (a nickname shortened from 'Mushmouth' that had been given him due to his Kentucky drawl) first met Uncle Bobby when Morton rode Dolphin for sea trials in 1942. The second time the two met, *Wahoo* had just returned from her disappointing sixth war patrol. Morton had been unable to sink any targets due to the unrelenting torpedo problems which were plaguing all of America's Submarine Force, so he wanted Uncle Bobby helped train *Wahoo* sailors on the then new MK 18 torpedo because he knew how to maintain, repair, test, and fire the Navy's new weapon in combat. Even though he expected orders stateside, when Morton offered to take him along as a technical expert into the Sea of Japan aboard *Wahoo*, Uncle Bobby jumped at the chance.



Bryan MacKinnon writes:

Dudley "Mush" Morton was a legend in my family as much for his sense of humor and charisma as for his war record. He married my great aunt Harriet in 1936 in Tsingtao, China. It was during a port call Mush's ship was making that Harriet and he met and later married. When my family recalled the prewar years, the stories would always be about Mush's extraordinary and contagious gift for humor. During the war years, especially in 1943, when Mush would visit my family stateside in between patrols, much of his levity was missing as the strains of a war time command were apparent. Since I was born 15 years after the war ended, I never met Mush but the stories told to us were so vivid, I feel as if I knew him personally.



(Previous page) *Wahoo* gets underway for her seventh war patrol after refueling at Midway Island Sept. 13, 1943

(Above left) Petty Officer 1st Class Robert "Bobby" Logue was a crewman on *Wahoo* during her final patrol in 1943. (photo courtesy of the Naval Historical Center)

(Above right) Commanding Officer Lt. Cmdr. Dudley W. "Mush" Morton speaks with his Executive Officer Lt. Richard H. O'Kane on the bridge. (photo courtesy of the Naval Historical Center)



USS Wahoo (SS-238) is launched at Mare Island Navy Yard, Calif., just eight months after her keel was laid.

Photo courtesy of the Naval Historical Center

without *Wahoo* ever reaching a firing position. O’Kane had hoped that Morton’s presence as a prospective commanding officer (PCO) during *Wahoo*’s second patrol would change their luck. And although their second patrol near the Solomon Islands was relatively successful—they believed they had sunk a surfaced submarine and a tanker—both O’Kane and Morton knew they could accomplish much more.¹² They also witnessed first-hand the stress placed on the CO during these approaches and attacks and later privately critiqued his every move.¹³ Armed with this data, they got to work.

Morton relieved Kennedy on New Year’s Eve 1942 and Morton and O’Kane implemented a new twist to the traditional fire control party. But their idea required that the captain have extreme confidence in his XO, in this case Richard H. O’Kane, later Roger W. Paine, Jr., and finally Verne L. Skjonsby. In a remarkable display of leadership and faith in his subordinates, Morton promoted his XOs to the role of “co-approach officer,” assigning them to the periscope to perform all observations and fire all torpedoes.¹⁴ Thus O’Kane was granted a tremendous training opportunity that served him well both on *Wahoo* and later as captain of the USS *Tang* (SS-306). Morton wisely believed that a commanding officer should always dispassionately retain the big picture, especially during approach and attack. In the concluding section of *Wahoo*’s third patrol report, Morton summarized their innovation and his faith in his XO:

The fire control party of this ship was completely reorganized prior to and during this patrol. The XO, Lt. R.H.

O’Kane in the co-approach officer (role). He made all observations through the periscope and fired all torpedoes. The CO studies the various setups by the use of the submarine attack course finder (ISWAS) and analyzing the torpedo data computer (TDC) and does the conning. A third officer assists the CO in analyzing the problem by studying the plot and the data sheets. On the surface the XO mans the target bearing transmitter (TBT), and makes observations and does the firing; the CO conns. This type of fire control party relieves the CO of a lot of strain and it gives excellent training to all hands, especially the XO. It is recommended that other ships give it consideration and thought.

The conduct and discipline of the officers and men of this ship while under fire were superb. They enjoyed nothing better than a good fight. I commend them all for a job well done, especially Lt. R.H. O’Kane the XO, who is cool and deliberate under fire. O’Kane is the fightingest naval officer I have ever seen and is worthy of the highest of praise. I commend Lt. O’Kane for being an inspiration to the ship.¹⁵

The Secret, Wakeless Torpedo

Wahoo’s success using co-approach officers continued for her fourth and fifth patrols. But, the sixth patrol in the target-rich Sea of Japan was a different story. The Navy’s systemic torpedo problems finally caught up with *Wahoo*. All ten of the torpedoes fired either failed to detonate, detonated prematurely, or ran erratically.¹⁶ Despite his attempts to troubleshoot the MK 14’s problems at sea, Morton was forced to return from the war patrol early bringing back what remained of his defective torpedo loadout.¹⁷ He also eagerly anticipated the introduction of the MK 18 torpedo which the Westinghouse Corporation had just produced for the U.S. Navy, based on the German G7 E (electric) torpedo obtained from a captured U-boat.¹⁸

Although the MK 18s were slower and had a shorter range than the older, steam-driven MK 14 torpedoes, they had one overwhelming tactical advantage.¹⁹ Since they were electric-powered, they left no telltale wake. Heretofore when a salvo of MK 14s were fired, the Japanese escorts simply followed the torpedoes’ wakes to determine the submarine’s location, where-

upon they unleashed their punishing depth charge attacks. But when a salvo of MK 18s was fired, assuming a satisfactory fire control solution, the first indication to the target that a submarine attack had been launched would be the first MK 18 detonation on its hull. By this time the attacking submarine would have had sufficient time to conduct evasive measures—a tremendous advantage!

Bristling from the faulty torpedo performance on *Wahoo*’s last patrol and frustrated by the division, squadron, acting force commander, and the Bureau of Ordnance’s reluctance to acknowledge any torpedo design faults, Mush wanted answers, a quick turnaround with a load of the new MK 18s, and someone with him that knew this new torpedo. Having worked closely with the Westinghouse technicians on the MK 18, Petty Officer 1st Class Robert “Bobby” Logue would join *Wahoo*’s crew and accompany them back to the dangerous Sea of Japan in the fall of 1943.²⁰ *Wahoo*’s abbreviated refit included not only re-provisioning and some R&R for the crew, but also an upgrade to the angle solver section of *Wahoo*’s TDC. The upgrade accounted for the MK 18’s much smaller advance, which resulted from its smaller reach and turning radius at the slower speed. *Wahoo* then departed Pearl Harbor for the last time. Her secret operation order called for her to enter the Sea of Japan on or about Sept. 20, 1943, and conduct unrestricted submarine operations south of the 43rd parallel. USS *Sawfish* (SS-276), under the command of Lt. Cmdr. E. T. Sands, was to enter three days later and patrol north of the 43rd.²¹ *Wahoo*’s orders called for her to return by the same route no later than sunset Oct. 21, 1943, and radio back once clear of the Kuril chain circa Oct. 23.²² But Mush Morton and *Wahoo* were never to be heard from again.

The First *Wahoo* Search

Patrol planes began a search for *Wahoo* along her intended route shortly after the time of her anticipated off-station message. *Sawfish* had not heard from or sighted *Wahoo*. There was no explanation for *Wahoo*’s failure to report or return to base. But the results of *Wahoo*’s actions on her last patrol in the Sea of Japan were relayed by intercepts of Radio Tokyo which were broadcast to the world. On Oct. 5, they reported that an American submarine had

The Families Take Over

sunk the Konron Maru near the Tsushima Straits with 544 fatalities.²³ There were other Japanese vessels sunk in the Sea of Japan during the period that can only be attributed to *Wahoo*. In the final tally after the war, *Wahoo* was credited with sinking four ships on her last patrol.²⁴ Post-war research of the Japanese records indicated that an anti-submarine action had occurred on Oct. 11, 1943, in the La Perouse Strait.²⁵ And that was the extent of the Navy's investigation into the loss of *Wahoo*, until very recently.

Taking the Search to Japan

Soon after they learned of each other's common interest, George Logue and Marty Schaeffer showed up in Wakkanai, Hokkaido, Japan in 1993. It was from Wakkanai that the attacks on *Wahoo* had been launched, and these three Americans, who did not speak any Japanese, wanted to construct a memorial to her and the Japanese lost on the ships she had sunk. Logue and Schaeffer had experienced first hand the consequences of the war and wanted closure. They wanted to join with the Japanese and recognize those who had sacrificed most during the war.

To say their presence caused a sensation in Wakkanai is an understatement. While foreigners are not unknown there—Americans were stationed at the Cold War outpost of Wakkanai Air Station until 1972 and crewmen from Russian commercial ships are frequent today—their purpose was something new in

Japan's northern most city. While visiting Wakkanai, Logue, Schaeffer, and Stubler were hosted by the Japanese Maritime Self-Defense Force (JMSDF) for a private, at-sea wreath laying. Over the years *Wahoo*'s location had been inferred from sporadic reports of fisherman catching their nets on an unidentified object lying on the bottom of the Soya Strait.

Fortunately for Logue and Schaeffer, and ultimately for the *Wahoo* search, several residents in Wakkanai were to prove key to the search. Larry Hagen, who was a Christian missionary living in Wakkanai, was a key organizer for the *Wahoo* Memorial Service conducted in 1995. It was during this event that the two authors of this article first met. Another Wakkanai resident and an Imperial Japanese Navy submarine veteran, Satoru Saga, became the organizer on the Japanese side for the *Wahoo* Memorial. Saga counted among his friends Vice Adm. Kazuo Ueda, another

Thomas Logue writes:

Like so many other members of the *Wahoo* family over the years, I yearned to find out what had happened to Uncle Bobby, Mush Morton, *Wahoo*, and the rest of her gallant crew. Growing up in the 1960s and 1970s my search started by reading everything I could find about submarines and *Wahoo*. I read books like "Wake of the *Wahoo*" by *Wahoo*'s yeoman, Forrest J. Sterling and "WARFISH" by *Wahoo*'s engineering officer, George Grider." I wondered about what it must have been like serving under Mush Morton on *Wahoo* during those times. Years later after graduating from the Naval Academy and entering Admiral Rickover's nuclear Submarine Force, I got to experience first hand what modern submarine life was like. But I really could not appreciate what it must have been like on *Wahoo* until I read Adm. O'Kane's book: "Wahoo—The Patrols of America's Most Famous World War II Submarine." My Uncle George's journey to find *Wahoo* had started much earlier than mine and was far more dedicated and personal. He had learned at the very impressionable age of sixteen of *Wahoo*'s loss from his weeping mother.²⁶ She told him *Wahoo* was "overdue, presumed lost." Too young to recognize the Navy's euphemism, he vowed on the spot to find *Wahoo* and his older brother, literally. He never gave up. And starting in the early 1990's with the help of a colorful World War II submarine veteran named Marty Schaeffer, he ratcheted up the search efforts by several orders of magnitude.²⁷

Bryan MacKinnon writes:

I have been living in Japan since 1994 working for an American investment bank. Being based in Japan and related to *Wahoo*'s commander, I was in a unique position to continue the search that George Logue began many years before. In the 50 plus years since the war ended, Japan and the United States have grown very close economically and militarily. It was now possible for the two former adversaries to join together to finally solve the mystery of *Wahoo*. It was relatively easy for me to contact Japanese researchers and consult the wartime archives for any clues.



Photo courtesy of Vladimir Kartashev and the Russian dive team

Wreckage of *Wahoo* found in contested waters.



Photo courtesy of Vladimir Kartashev and the Russian dive team

er submarine veteran. It was ultimately Ueda who was able to access the Japanese archives and speak with the participants of the attack to accurately predict *Wahoo's* location.

Contested Area

The search for *Wahoo* was lengthy and patience was required. Being able to connect with the right people via the Internet was key. We knew approximately where she lay and that she was in relatively shallow water; however, she is in a highly contested part of the world. She lies in Russian territorial waters that belonged to the Japanese in 1943. To the north and west of her is oil. Northeast of her are the Kurils, an island chain that both Russia and Japan claim. But the Russians will shoot to kill to assert their claim to the land.

The Japanese Contribution

Today, a group of Imperial Japanese Navy submarine veterans meet in an informal reunion each year. Their WWII crafts, "midget submarines," of that era were about as far as can be from a *Gato*-class submarine and still be called a submarine. Cramped and dangerous, their task has been described by Capt. Yasuhiro "Tommy" Tamagawa, a reunion participant, as a kind of suicide mission, though not in the traditional "Kamikaze" sense. They had significant range and were designed for multiple patrols. These submarines were ready to be deployed in Japan's "Island Sea" in a desperate attempt to thwart the expected American invasion fleet in 1945. As the fleet approached, the midget submarine commander and his four crewmen would have made their way to the enemy, lay in wait, and at the last possible moment, fire their torpedoes. Firing the relatively massive torpedoes from these small craft would usually result in the bow broaching the surface, giving their position away. Submariner fatalities were expected to be high; however, the invasion never came.

It is then fortunate and perhaps ironic that this group of submariners was key in ultimately locating *Wahoo*. Among their number is a retired admiral; a businessman living in the city from where the attacks on *Wahoo* were launched; a retired captain who has worked as a liaison between the Japanese and American navies since the war; and a naval historical archivist. Instead of merely dwelling on their own exploits, *Wahoo* became sort of a quest for them too.

If there is one person most responsible for what we know of *Wahoo's* fate, it is Vice Adm. Kazuo Ueda (JMSDF, Ret.). Admiral Ueda, along with Saga, scoured the Japanese archives and interviewed the participants on the *Wahoo* attack. By the mid-1990s, Ueda had estimated the location of *Wahoo* to within one nautical mile of its actual location. Another group member, Noitaka Kitazawa, was an archivist retired from the Japan National Institute for Defense Studies. While Kitazawa was too young to be in the war, he did assist Keiko Takada and Bryan MacKinnon in locating for the first time actual photographs documenting the attack on *Wahoo*.

The MacKinnon Organization

The search for *Wahoo* is a 21st century endeavor aided by electronic mail and the World Wide Web. The MacKinnon Organization³⁰ became a clearing house for information contributed by families, researchers, and government archivists. Over time, a large collection of material has been accumulated. Bryan MacKinnon had been working on locating *Wahoo* since 1995 and has been in contact with the Japanese veterans group since the late 1990s. The next significant break came in 2002, when Wayne Sampey, who leads the Ocean Wilderness Group of Australia, contacted MacKinnon to assist with the search. Sampey brought decades of diving experience and professional expertise to bear. Sampey obtained sponsors and worked with the American and Russian govern-

ments who for the first time formally concurred with the plan to locate *Wahoo*. It was during this time that the Russians were informed of the *Wahoo* project's proposal of where she was located. He also began the dialog with the USS *Bowfin* Submarine Museum and Park to ensure the project was conducted by approved standards.

The Russians are Coming

The end of the Soviet Union brought a level of accessibility that did not exist before. The frustrations that both Dick O'Kane and George Logue complained of were gone and replaced by direct accessibility to Russian bureaucracy. Sampey navigated through this and the search received approvals at the highest levels of the Russian government.

During 2002 and 2003, Sakhalin Energy Investment Company Ltd. (SEIC) Explosive Ordnance Disposal Coordination Centre (EODCC) conducted extensive research of military and naval activities in and around the Sakhalin-Wakkanai region. During this time, SEIC EODCC member Ian Bullpitt consulted MacKinnon's *Wahoo* Web site to ascertain the possible location of the *Wahoo*.

In 2004, SEIC and the Russian subcontractor, Romona, conducted a sub-sea survey of La Perouse (Soya) Strait. While conducting the survey, they diverted from their normal survey route to search the "Ueda Location." They also included another area that was considered to be a possible site that Japanese fishermen had

From the Dive Team:

On July 28 and 29, 2006, dive team leader Boris Postovalov accompanied by one other diver, Andrei Doroshenko, located *Wahoo* on their second dive. Postovalov describes what he saw:

It has a rupture [in the midsection] all the way from the conning tower down to the keel. The submarine is laying down flat on the bottom surface and with the exception of this rupture, it looks almost whole. It has no other visible damage. The submarine is completely covered by various sea creatures—clouds of fish all around. It seems there are a few places with minor damage that might have been left by additional depth charging. This additional bombing was really not necessary. The sub was killed by a single powerful direct hit of an aerial bomb. The sub had no chance of survival and no one aboard likely had any chance of survival as a result of the attack.

been snagging their nets on over the years. SEIC produced side-scan sonar readings and images of both sites. The first images from the “Ueda Location” appear consistent with a submarine matching the dimensions of a *Gato*-class submarine³¹ and the second set of images appear to be those of a freighter.

In 2005, Bullpitt informed the *Wahoo* Project Group of these side-scan images. This is the first tangible evidence that the location computed by Vice Adm. Ueda in the 1990s is likely the location of the *Wahoo*.

Finding and Photographing *Wahoo*

Later in 2005, the Russian team “Iskra,” led by Vladimir Kartashev, used the SEIC images and attempted to locate the submarine. Initial equipment failures prevented a successful search. Kartashev then contacted Bryan MacKinnon and sought to join with the *Wahoo* Project’s efforts, including seeking additional funding for the Russian search efforts.

During the last week of July 2006, the Iskra team obtained video and photographic images of the “Ueda Location” that ultimately were confirmed to be *Wahoo*. The Iskra team effort was a relatively low-tech undertaking. With very limited funding, their search platform was an 18 meter sailboat with about six crew members.

Their diving equipment was basic, allowing for only a limited time at the 200-foot depth where *Wahoo* lay, and their video equipment was sufficient only for close-up shots.

After these dives, the Iskra team ended

its efforts, issued a press release, produced a short video to document their efforts, and is now using this expedition as a funding springboard for further projects in the region. Due to the aforementioned limitations of the Iskra’s team equipment, they were not able to completely document the condition of *Wahoo*’s exterior and her interior condition is completely unknown. A comprehensive survey to document her condition and perhaps more clues of *Wahoo*’s final hours would require a return visit by a more sophisticated team.

Wahoo’s Final Hours

From the Russian dive team report and their sketches, *Wahoo* appears to have been sunk by a single aerial bomb, no doubt causing immediate and catastrophic flooding of multiple compartments. The reason why *Wahoo* exited the Sea of Japan ten days early during daylight hours may never be known. Speculation has ranged from “exiting due to equipment or torpedo casualty” to “all torpedoes expended, returning to base.” Ideally, a more comprehensive survey would greatly assist in knowing more about her final hours.

Memorials Planned

After the official U.S. Navy announcement of *Wahoo*’s discovery by Commander Pacific Fleet (COMPACFLT) last October,³² Commander, Submarine Group SEVEN, Yokosuka, Japan, held an at-sea wreath-laying ceremony this year. A separate Memorial Day celebration was conducted at

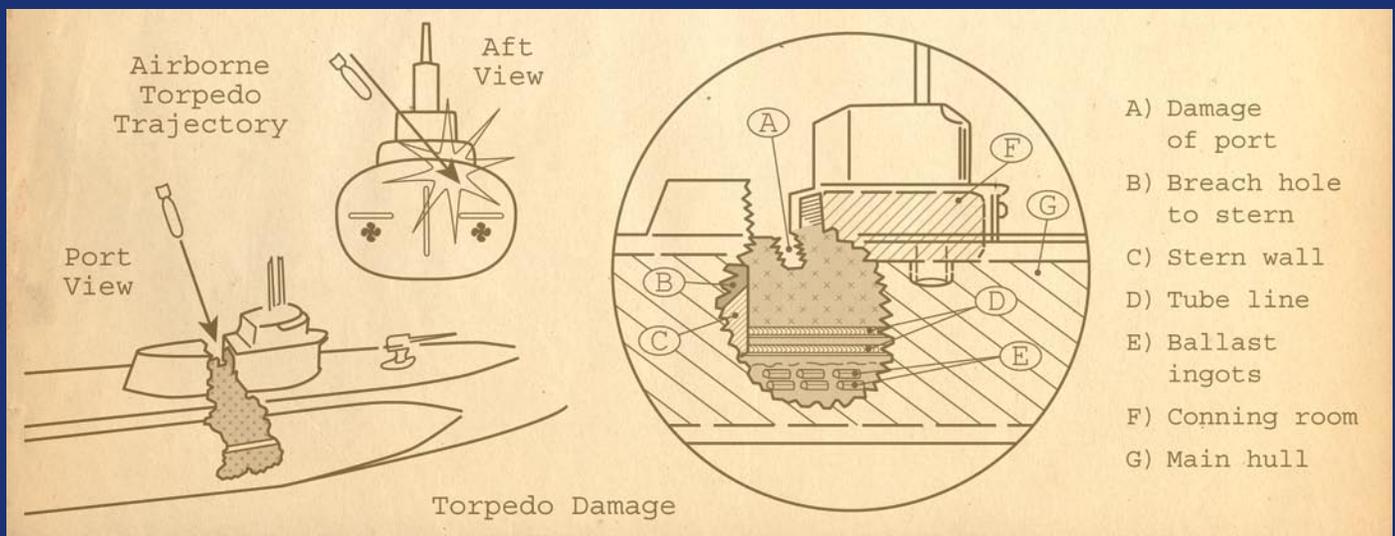
the *Wahoo* Memorial in Williamsport, Pa., the boyhood home of Petty Officer 1st Class Robert Logue, with Rear Adm. John N. Christenson, Commander Naval Mine and Anti-Submarine Warfare Command, Corpus Christi, (another nephew of Petty Officer 1st Class Robert Logue) speaking.

Surviving crewmembers and family of crewmembers who were either lost or had served on *Wahoo* are invited to attend the year’s final event on the 64th anniversary of *Wahoo*’s loss at the USS *Bowfin* Memorial in Pearl Harbor, Hawaii, on Oct. 11, 2007. For details visit www.oneternalpatrol.com/wahoo-memorial.htm or contact Charles R. Hinman, Director of Education, USS *Bowfin* Submarine Museum. Email: info@OnEternalPatrol.com. For other related World War II submarine information please visit: www.oneternalpatrol.com.

End notes for this article are available in the online version at http://www.chinfo.navy.mil/navpalib/cno/n87/usw/issue_34/index.html.

Capt. Thomas A. Logue, Jr., USNR, nephew of Petty Officer 1st Class Robert B. Logue, is a nuclear submarine officer and serves on active duty as the Chairman of the Computer Science Department at the United States Naval Academy in Annapolis.

Bryan MacKinnon, grand nephew of Cmdr. Dudley W. Morton, is founder and president of “The MacKinnon Organization,” a non-profit group which researches World War II submarine warfare. He resides in Japan and works for the Global Advisory and Banking Technology Division of Merrill Lynch, Japan.



This graphic representation of the damaged *Wahoo* is based off a hand drawing provided by the Russian dive team. Courtesy of the Alion Science and Technology graphics department,



CNO Statement on Passing of Retired Rear Adm. Eugene Fluckey

From Adm. Mike Mullen, June 30, 2007



Every man and woman serving our Navy today joins me in mourning the death of retired Rear Adm. Eugene Fluckey, recipient of the Medal of Honor and a true naval hero. We extend humbly to his family our thoughts, prayers and deepest sympathies in this, their time of great grief and sorrow.

Fluckey passed away on June 29. He was one of the most daring and successful submarine skippers of World War II—he was credited with sinking 29.3 enemy ships totaling more than 146,000 tons—Eugene Fluckey helped lead and inspire our Navy to victory. He inspires us still today. We will miss him sorely.

In addition to the Medal of Honor, they pinned upon his chest four Navy Crosses, the Distinguished Service Medal, the Legion of Merit and a host of other unit and campaign awards. He was known for his audacity and courage, on more than one occasion running his boat in close to shore to attack enemy shipping and bases.

He even helped pioneer the idea of submarine support to special operations. In the summer of 1945, he launched a group of his own commandos ashore to set demolition charges on a coastal railway line, destroying a 16-car train. It was the sole landing by U.S. military forces on the Japanese Home Islands during the war.

Fluckey was also a loyal and devoted leader, for whom his people had the greatest respect and in whom they entrusted their lives and their honor. He knew all too well how much they depended on his steady hand, and how much he, in turn, depended on them.

In his final war patrol report as commanding officer of USS *Barb* (SS-220), he had this to say about his crew: “What wordy praise can one give such men as these; men who... follow unhesitatingly when in the vicinity of minefields so long as there is the possibility of targets... Men who flinch not with the fathometer ticking off two fathoms beneath the keel... Men who will fight to the last bullet and then start throwing the empty shell cases. These are submariners.”

As we mourn his passing, so too should we pause and reflect on the contributions of this great man to our Navy and to our nation...

(Above) Rear Admiral Eugene B. Fluckey

(Right, top) Then-Cmdr. Fluckey (center) wearing the Medal of Honor after its presentation by Secretary of the Navy James Forrestal (second from left) in ceremonies at the Navy Department, March 23, 1945. Fleet Adm. Ernest J. King is at left. Mrs. E.B. (Marjory) Fluckey is second from right, standing next to her husband.

(Right, middle) Members of USS *Barb's* (SS-220) demolition squad pose with her battle flag at the conclusion of her 12th war patrol. During the night of July 22-23, 1945 these men went ashore at Karafuto, Japan, and planted an explosive charge that subsequently wrecked a train.

(Right, bottom) USS *Barb* (SS-220)

and of the thousands of lives he guided, the careers he mentored, the difference he made simply by virtue of his leadership.

We ought never forget his own words of wisdom: “Put more into life than you expect to get out of it. Drive yourself and lead others. Make others feel good about themselves. They will outperform your expectations, and you will never lack for friends.”

Fluckey certainly never lacked for friends. And on behalf of those of us—his friends and shipmates—still serving in the Navy, I wish for his soul fair winds and following seas and for his family and loved ones our deepest respect and sympathies.





Changes of Command

Submarine Squadron 11
Capt. Paul Jaenichen relieved
Capt. Michael McLaughlin

Submarine Squadron 8
Capt. Robert Kelso relieved
Capt. Earl Carter

USS Frank Cable (AS-40)
Capt. Patrick Scanlon relieved
Capt. Leo Goff

USS Albany (SSN-753)
Cmdr. Thad Nisbett relieved
Cmdr. Mark Merrick

USS Hawaii (SSN-776)
Cmdr. Edward Harrington relieved
Capt. David Solms

USS Henry M. Jackson (SSBN-730) (G)
Cmdr. Daniel Arensmeyer relieved
Cmdr. Kevin Jones

USS Houston (SSN-713)
Cmdr. Michael Lewis relieved
Cmdr. John Zavadi

USS Nebraska (SSBN-739)(B)
Cmdr. Matthew Colburn relieved
Cmdr. John Carter

USS Norfolk (SSN-714)
Cmdr. Troy Jackson relieved
Cmdr. Scott Adams

USS Nebraska (SSBN-739)(G)
Cmdr. Carl Lahti relieved
Cmdr. Geoffrey Debeauclair

USS Seawolf (SSN-21)
Cmdr. Harry Ganteaume relieved
Cmdr. Scott Hopkins

USS Topeka (SSN-754)
Cmdr. Marc Aaron Stern relieved
Cmdr. Dixon Kendall Hicks

Qualified for Command

Lt. Cmdr. Steven Antcliff
USS Connecticut (SSN-22)

Lt. Cmdr. Michael Eberlein
COMSUBGRU-9

Lt. Cmdr. Robert Figgs
COMSUBPAC

Lt. Cmdr. Luis Figueroa
USS Hyman G. Rickover (SSN-709)

Lt. Cmdr. Michael Foster
PCU New Hampshire (SSN-778)

Lt. Cmdr. Mark Hazenberg
USS Olympia (SSN-717)

Lt. Cmdr. Christopher Horgan
USS Louisiana (SSBN-743)(G)

Lt. Cmdr. Adam Hudson
Strategic Systems Programs

Lt. Cmdr. Jeffery Juergens
Pacific Fleet Nuclear Propulsion
Exam Board

Lt. Cmdr. James McIver
USS Hyman G. Rickover (SSN-709)

Lt. Cmdr. Gary Montalvo
USS Pennsylvania (SSBN-735)(B)

Lt. Cmdr. Melvyn Naidas
Naval War College

Lt. Cmdr. Louis Springer
COMSUBGRU-2

Lt. Cmdr. Brian Taddiken
COMSUBRON-2

Lt. Marc Picard
USS Toledo (SSN-769)

Lt. John Stafford
USS Topeka (SSN-754)

Qualified Nuclear Engineer Officer

Lt. John Carswell
USS Pennsylvania (SSBN-735)(B)

Lt. Jason Hardy
USS Tucson (SSN-770)

Lt. Thomas Ross
USS Pennsylvania (SSBN-735)(B)

Lt. j.g. Robert Birchenough
USS Kentucky (SSBN-737)(G)

Lt. j.g. Nicolas Bogaard
USS Columbia (SSN-771)

Lt. j.g. Daniel Bram
USS Nevada (SSBN-733)(G)

Lt. j.g. Peter Brereton
USS Michigan (SSGN-727)

Lt. j.g. Roger Callahan
USS Louisiana (SSN-724)

Lt. j.g. Brian Campbell
USS San Francisco (SSN-711)

Lt. j.g. David Ciha
USS Cheyenne (SSN-773)

Lt. j.g. Jason Cornell
USS Tucson (SSN-770)

Lt. j.g. Gregory Crosby
USS Pennsylvania (SSBN-735)(G)

Lt. j.g. Anthony Cunneen
USS Helena (SSN-725)

Lt. j.g. John Dalton
USS Maine (SSBN-741)(B)

Lt. j.g. Kevin Dalton
USS Louisiana (SSBN-743)(G)

Lt. j.g. Jason Davenport
USS San Francisco (SSN-711)

Lt. j.g. Sean Doherty
USS Louisiana (SSBN-743)(G)

Lt. j.g. Robert Edmonson
USS Chicago (SSN-721)

Lt. j.g. Rhex Edwards
USS Michigan (SSGN-727)

Lt. j.g. Jose Flores
USS Charlotte (SSN-766)

Lt. j.g. James Fulks
USS La Jolla (SSN-701)

Lt. j.g. Matthew Furqan
USS Louisiana (SSBN-743)(G)

Retired Submarine Flag Officers' Conference



Photo by Lt. Jon Ahlstrom

The Director, Submarine Warfare Division (Rear Adm. Van Mauney) hosted the annual Retired Submarine Flag Officers' Conference in Washington, D.C., on March 5, 2007 under the sponsorship of the Navy Submarine League.

Pictured from left to right are: Rear Adm. (ret.) John Padgett, Rear Adm. Van Mauney, Vice Adm. (ret.) J. Guy Reynolds, Rear Adm. (ret.) Paul Ryan, Vice Adm. (ret.) Dennis Jones, Vice Adm. (ret.) Chuck Griffiths, Adm. (ret.) Bruce Demars, Rear Adm. (ret.) Phil Davis, Rear Adm. (ret.) Joe Henry, Rear Adm. (ret.) Ralph Tindal, Vice Adm. (ret.) George Sterner, Rear Adm. (ret.) Tom Evans, Rear Adm. (ret.) Dick Riddell, Rear Adm. (ret.) Paul Tomb, Rear Adm. (ret.) Jerry Ellis, Rear Adm. (ret.) Charlie Young, Rear Adm. (ret.) Mike Rindskopf, Adm. (ret.) Rick Mies, Rear Adm. (ret.) Joe Enright, Adm. (ret.) Carl Trost, Rear Adm. (ret.) Bob Fountain, Rear Adm. (ret.) Leroy Collins, Rear Adm. (ret.) Sam Packer, Rear Adm. Bruce Grooms.



Lt. j.g. Alan Giles
USS Henry M. Jackson (SSBN-730)(B)

Lt. j.g. Christopher Hartssock
USS Pennsylvania (SSBN-735)(B)

Lt. j.g. Jason Hill
USS Ohio (SSGN-726)(B)

Lt. j.g. Aaron Kless
USS Honolulu (SSN-718)

Lt. j.g. Victor Lee
USS Honolulu (SSN-718)

Lt. j.g. Ryan Lohstreter
USS Michigan (SSGN-727)

Lt. j.g. Eric Losito
USS Jefferson (SSN-759)

Lt. j.g. Gregory Markham
USS Kentucky (SSBN-737)(G)

Lt. j.g. Ryan Martin
USS Jimmy Carter (SSN-23)

Lt. j.g. Isamu Massey
USS Nevada (SSBN-733)(G)

Lt. j.g. Curtis Melchert
USS Columbus (SSN-762)

Lt. j.g. Richard Morrissey
USS City of Corpus Christi (SSN-705)

Lt. j.g. Jeffery Munns
USS Buffalo (SSN-715)

Lt. j.g. Matthew Rehberg
USS Jefferson City (SSN-759)

Lt. j.g. Christopher Roettgen
USS Santa Fe (SSN-763)

Lt. j.g. Sean Spillum
USS Kentucky (SSBN-737)(G)

Lt. j.g. David Walter
USS Alabama (SSBN-731)(G)

Lt. j.g. Bryan Watson
USS Louisiana (SSBN-743)(G)

Lt. j.g. Jeremy Winkle
USS Henry M. Jackson (SSBN-730)(G)

Lt. j.g. Bryan Wooldridge
USS Ohio (SSGN-726)(G)

Lt. j.g. Adam Zaker
USS City of Corpus Christi (SSN-705)

Line Officer Qualified in Submarines

Lt. Jason Chen
USS Key West (SSN-722)

Lt. Abraham Marcelo
USS Jacksonville (SSN-699)

Lt. Nicholas Saflund
USS Cheyenne (SSN-773)

Lt. j.g. Ben Anderson
USS Jimmy Carter (SSN-23)

Lt. j.g. Shane Beavers
USS Asheville (SSN-758)

Lt. j.g. Christian Beisel
USS Nevada (SSBN-733)(G)

Lt. j.g. Michael Bocchino
USS Olympia (SSN-717)

Lt. j.g. Todd Bowers
USS Nevada (SSBN-733)(B)

Lt. j.g. James Brooks
USS Nevada (SSBN-733)(B)

Lt. j.g. Michael Brown
USS Pittsburgh (SSN-720)

Lt. j.g. Adam Burns
USS Charlotte (SSN-766)

Lt. j.g. Michael Canavan
USS Virginia (SSN-774)

Lt. j.g. Michael Cline
USS Augusta (SSN-710)

Lt. j.g. James Connelly
USS Houston (SSN-713)

Lt. j.g. Jonathan Cox
USS Pittsburgh (SSN-720)

Lt. j.g. Christopher Diaz
USS Minneapolis-Saint Paul (SSN-708)

Lt. j.g. Drew Dewalt
USS Cheyenne (SSN-773)

Lt. j.g. John Dietrich
USS Tucson (SSN-770)

Lt. j.g. Brian Evans
USS Honolulu (SSN-718)

Lt. j.g. Joseph Ferrari
USS Ohio (SSGN-726)(G)

Lt. j.g. William Fournier
USS Augusta (SSN-710)

Missiles Away: USS Florida (SSGN-728) Successfully Conducts Strike Operational Evaluation

by Team Submarine Public Affairs



USS *Florida* (SSGN-728) launched four TOMAHAWK Cruise Missiles from the Gulf of Mexico to the Eglin Air Force Base, Fla., land attack test range during its successful Strike Operational Evaluation (OPEVAL) between May 15 and 17, 2007.

Since completing conversion in April 2006, *Florida* has undergone sea and shore trials in preparation for rejoining the Fleet and modernization periods in preparation for conducting the Strike portion of the OPEVAL. “We’ve been working toward this for a long time,” Capt. Mark Bock, SSGN Conversion Program Manager said, “and to see the new missile control system, Battle Management Center, Multiple All-Up-Round Canister (MAC), and the crew perform so well proves the quality of work carried out by our shipyards, Norfolk Naval Shipyard and Puget Sound Naval Shipyard, and our industry partner General Dynamics Electric Boat. It is also a testament to the government team comprising

the Fleet, our partners at NAVAIR who own, develop, and maintain the TOMAHAWK Cruise Missile systems program and to Strategic Systems Programs who designed, produced, and fielded the missile control and launch systems.”

Florida launched a total of three Block IV and one Block III TOMAHAWK cruise missiles from a single Multiple All-Up-Round Canister (MAC) from missile tube three. Two Block IV TOMAHAWKS were launched less than one minute apart on the first day of testing. In a first-of-its-kind demonstration, *Florida* proved its ability to re-target one of the Block IV missiles and “flex” the other one by having it forgo its primary target to engage a pre-programmed secondary target while in flight. The Block III missile test occurred on the second day of testing, and the final Block IV on the third day. As another first, all mission planning and strike execution for the last Block IV launch took place aboard *Florida*. As in all TOMAHAWK flight tests, air safety was carefully planned by the NAVAIR Test Team in coordination with the Federal Aviation Administration. For safety purposes, the TOMAHAWK could have been guided by commands from safety chase aircraft. Additionally, alternate safe landing zones were planned along the test missiles’ flight path.

USS *Ohio* (SSBN-726), *Florida* and USS *Michigan* (SSBN-727) have completed conversion. *Michigan* hosted a return to service ceremony on June 12, 2007; USS *Georgia* (SSBN-728) is scheduled to complete conversion in late 2007. *Ohio* is scheduled to deploy for the first time before the end of the year.



CNO, MCPON Visit USS Pasadena (SSN-752)



Photo by Petty Officer 2nd Class Ben Gonzales

Chief of Naval Operations (CNO) Adm. Mike Mullen (*left, standing*) speaks to the Sailors of *Los Angeles*-class attack submarine USS *Pasadena* (SSN-752). Master Chief Petty Officer of the Navy (MCPON) Joe Campa Jr. (*right, standing*) and CNO are touring major fleet concentration areas to observe regional business practices and to address issues concerning Sailors such as rating mergers, Individual Augmentees (IA), retirement plans and the future of the Navy.

Lt. j.g. Parrish Guerrero
USS Cheyenne (SSN-773)

Lt. j.g. Steven Halle
USS Ohio (SSGN-726)(G)

Lt. j.g. Andrew Helgerson
USS Pennsylvania (SSBN-735)(G)

Lt. j.g. John Howard
USS Norfolk (SSN-714)

Lt. j.g. Daniel Inbody
USS Scranton (SSN-756)

Lt. j.g. Kenneth Ingle
USS Jimmy Carter (SSN-23)

Lt. j.g. Jeremy Jefcoat
USS Jimmy Carter (SSN-23)

Lt. j.g. Alec Johnston
USS Topeka (SSN-754)

Lt. j.g. Russell Jones
USS Topeka (SSN-754)

Lt. j.g. Eric Kang
USS Nevada (SSBN-733)(B)

Lt. j.g. Shawn Kenady
USS Kentucky (SSBN-737)(G)

Lt. j.g. Michael Kessler
USS Jefferson City (SSN-759)

Lt. j.g. Aerik Robert LaFave
USS Tennessee (SSBN-734)(G)

Lt. j.g. Chunhing Lo
USS Los Angeles (SSN-688)

Lt. j.g. Eric Luehrs
USS Chicago (SSN-721)

Lt. j.g. Edward Marchildon
USS Los Angeles (SSN-688)

Lt. j.g. Alan Mardegian
USS Greenville (SSN-772)

Lt. j.g. Matthew McCulley
USS Nebraska (SSBN-739)(G)

Lt. j.g. Patrick McDonnell
USS Springfield (SSN-761)

Lt. j.g. Sean Meredith
USS Augusta (SSN-710)

Lt. j.g. Brian Moravan
USS Nevada (SSBN-733)(B)

Lt. j.g. Sidney Morrison
USS Los Angeles (SSN-688)

Lt. j.g. Patrick Muehr
USS Louisville (SSN-724)

Lt. j.g. Curtis Nieboer
USS Maine (SSBN-741)(B)

Lt. j.g. Michael Nolan
USS Honolulu (SSN-718)

Lt. j.g. Michael Nylander
USS Dallas (SSN-700)

Lt. j.g. Luke Olinger
USS Louisville (SSN-724)

Lt. j.g. Eric Oviatt
USS Bremerton (SSN-698)

Lt. j.g. Sean Riordan
USS Hyman G. Rickover (SSN-709)

Lt. j.g. Eric Ritterman
USS Maine (SSBN-741)(B)

Lt. j.g. Scot Rives
USS Henry M. Jackson (SSBN-730)(G)

Lt. j.g. Matthew Robertson
USS Tennessee (SSBN-734)(G)

Lt. j.g. Lawrence J. Rossi
USS Augusta (SSN-710)

Lt. j.g. Travon Santerre
USS Nevada (SSBN-733)(B)

Lt. j.g. Scott Shafer
USS Olympia (SSN-717)

Lt. j.g. John Smith
USS Pennsylvania (SSBN-735)(G)

Lt. j.g. Jon Smith
USS West Virginia (SSBN-736)(B)

Lt. j.g. Matthew Smith
USS Newport News (SSN-750)

Lt. j.g. William Smith
USS Greenville (SSN-772)

Lt. j.g. Jason Stanley
USS West Virginia (SSBN-736)(G)

Lt. j.g. Steven Stefaniak
USS Olympia (SSN-717)

Lt. j.g. Zachariah Stiles
USS Maine (SSBN-741)(B)

Lt. j.g. David Stroman
USS Olympia (SSN-717)

Lt. j.g. Aaron Stutzman
USS Pasadena (SSN-752)

Lt. j.g. Christopher Topoll
USS Cheyenne (SSN-773)

Lt. j.g. Terry Turner
USS Helena (SSN-725)

Lt. j.g. Andrew Tuthell
USS Helena (SSN-725)

Lt. j.g. Daniel Urbanczyk
USS Chicago (SSN-721)

Lt. j.g. Abraham Wadsworth
USS Alexandria (SSN-757)

Lt. j.g. Matthew White
USS Houston (SSN-713)

Lt. j.g. Patrick Weed
USS Jefferson City (SSN-759)

Lt. j.g. Christopher Wing
USS Texas (SSN-775)

Lt. j.g. Robert Wynne
USS Honolulu (SSN-718)

Lt. j.g. David You
USS San Francisco (SSN-711)

Supply Corps Qualified in Submarines

Lt. F. Warren Sherman
USS Norfolk (SSN-714)

Lt. j.g. Jason Iletto
USS Seawolf (SSN-21)

Lt. j.g. Robert Salire
USS Jacksonville (SSN-699)

Ens. Andrew Haley
USS Springfield (SSN-761)

Limited Duty Officer Qualified in Surface Warfare

Lt. Michael Shrader
USS Frank Cable (AS-40)

Lt. Gregory Ward
USS Emory S. Land (AS-39)

Two Weeks of Virginia

by Team Submarine Public Affairs

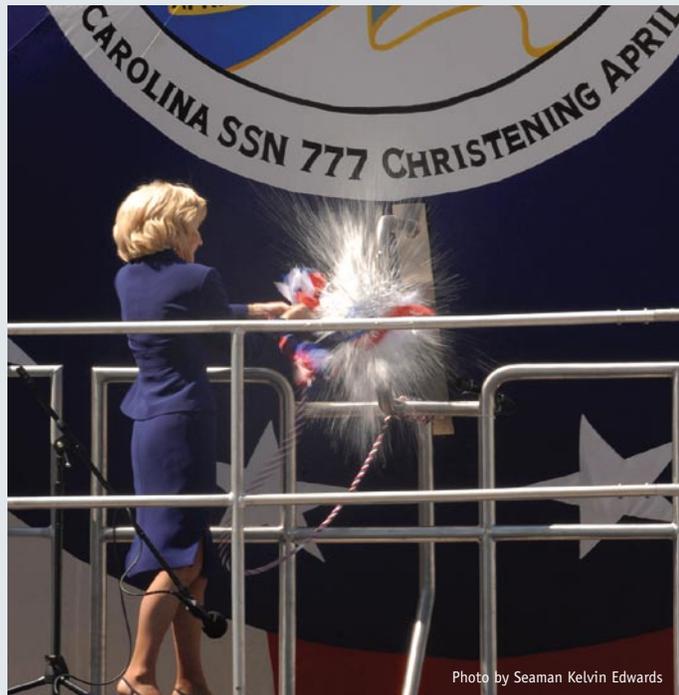


Photo by Seaman Kelvin Edwards

North Carolina (SSN-777) Christening

On April 21, the Submarine Force saw the first of three major shipbuilding events to occur over a two-week period with the christening of the fourth *Virginia*-class submarine, *North Carolina*. Mrs. Linda Bowman, wife of retired Adm. Frank L. “Skip” Bowman, has the honor of being the ship’s sponsor and carried on the time-honored U.S. Navy tradition of breaking a bottle of sparkling wine to ceremonially name a vessel. Adm. Bowman concluded his distinguished Navy career in Nov. 2004 as the Director of Naval Nuclear Propulsion (NAVSEA 08).

The ceremony was hosted by Northrop Grumman Newport News (NGNN), Newport News, Va. General Dynamics Electric Boat (GDEB) and NGNN build portions of each *Virginia*-class submarine and alternate the delivery of the submarines. When *North Carolina* delivers in Dec. 2007, it will be the second *Virginia*-class submarine completed by NGNN.

Keel Laid for *New Hampshire* (SSN-778)

The two-week series of milestones for the Navy’s *Virginia*-class Program office continued with *New Hampshire*’s keel laying on April 30, at the GDEB Quonset Point, R.I., facility.

New Hampshire’s sponsor is Cheryl McGuinness, the wife of Lt. Cmdr. Tom McGuinness, a veteran Navy pilot who served as the co-pilot of American Airlines Flight 11 on Sept. 11, 2001. Flight 11 was hijacked and flown into the World Trade Center’s North Tower. McGuinness, who lives in New Hampshire with her two children, wrote a book, *Beauty Beyond the Ashes*, and founded a ministry of the same name to help others recover from tragedies.

New Hampshire is the fourth Navy ship named after the ninth U.S. state. The Secretary of the Navy decided on the name after third-

graders from Garrison Elementary School in Dover, N.H. initiated a letter writing campaign to name the ship. Like the other *Virginia*-class submarines, *New Hampshire* is a multi-mission platform, able to launch and support Special Operation Forces, conduct precision strikes far in-land with its TOMAHAWK land attack missiles, as well as anti-submarine, anti-surface ship, and Intelligence, Surveillance, and Reconnaissance (ISR) missions in addition to providing assured access and battlespace preparation.

Hawaii (SSN-776) Commissioned

The two week series of milestones came to a close with the commissioning of USS *Hawaii* at the Submarine Base New London, Conn. on May 5.

With Adm. Gary Roughhead, Commander, Pacific Fleet, providing the key note address, Linda Lingle, Hawaii’s governor and ship’s sponsor, presided over the tradition-rich ceremony and proudly told *Hawaii*’s crew to “Man our ship and bring her to life!” *Hawaii* recognizes the tremendous support that the Navy has enjoyed from the people of the 50th state and honors the rich heritage of submarines in the Pacific theater.



Photo by John Narewski



Photo by Chief Petty Officer Shawn Eklund

(Clockwise from top left) Ship’s sponsor Linda Anne Rich Bowman christens *North Carolina* (SSN-777); John P. Casey, president of General Dynamics Electric Boat (GDEB), and Mrs. Cheryl McGuinness, sponsor of PCU *New Hampshire* (SSN-778), watch as GDEB welder Kevin Cullen welds the sponsor’s initials into a metal plate during the keel laying ceremony; Sailors “man the ship” and officially bring USS *Hawaii* (SSN-776) to life during her commissioning ceremony.

Our Distro List is Getting SOME CLEANING!



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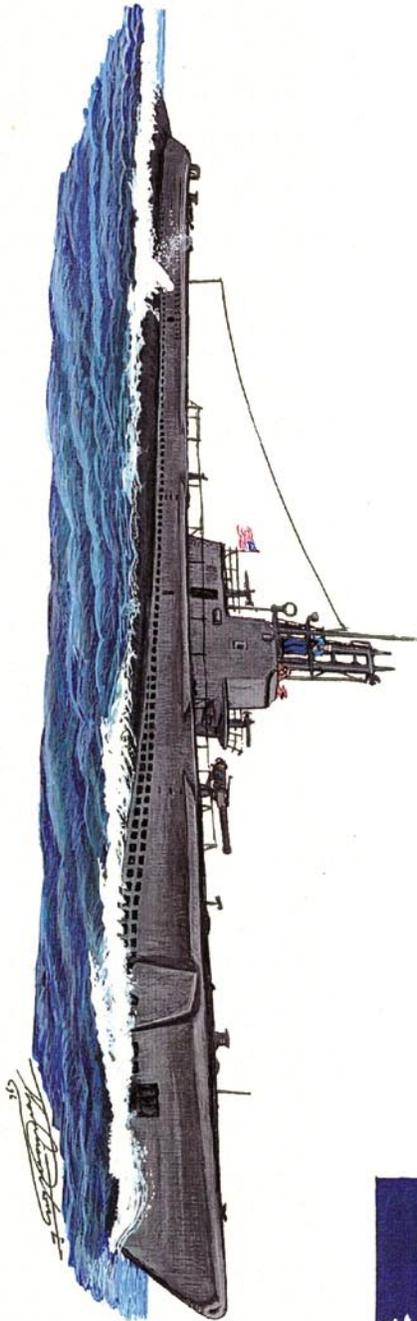


On The Back

USS *Wahoo* (SS-238), a member of the *Gato*-class, was launched in 1942. She completed six war patrols before she was sunk in the contested waters of La Perouse (Soya) Strait—between Hokkaido, Japan and Sakhalin, Russia—where she was discovered in July 2006, by the Russian dive team “Iskra.”

Thomas Denton was born Sept. 13, 1955, and joined the U.S. Navy in 1973. Completing recruit training in Great Lakes, Ill., he went to Submarine School in Groton, Conn. followed by Polaris Electronics “A” School and Ships Inertial Navigation “C” School at Dam Neck, Va. Initially Qualified on the USS *George C. Marshall* (SSBN-654), he also served on the USS *Holland* (AS-32), USS *Francis Scott Key* (SSBN-657), and USS *Canopus* (AS-34). As a self-taught artist, he became plankowner of the St. Marys’ Submarine Museum located in St. Marys, Ga. and staff artist of the *American Submariner Magazine* for U.S. submarine veterans. Tom is currently employed as a systems analyst for BAE Systems and lives in Walkersville, Md. with his wife Debbie and three children, Angela, Kim, and Justin.

USS WAHOO
SS - 238



" IN MEMORY OF THE 80 SUBMARINERS STILL ON ETERNAL PATROL "



"USS Wahoo (SS-238)"

Thomas Carl Denton, Chief Petty Officer, USN (Ret.)