

THE NAVY'S ENVIRONMENTAL MAGAZINE

Currents

winter 2010

Spotlight on Oceanana

**Beth Lowell, Federal Policy Director,
Discusses the Challenges
Facing the World's Oceans**

**Common Errors to Avoid in EPCRA Reporting
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ONR Partnering in Research to Battle Ghana's Eroding Coastline**



THE NAVY'S ENVIRONMENTAL MAGAZINE **Currents**

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cover

Sharing the spotlight for this issue of *Currents* is Beth Lowell, Federal Policy Director at Oceana. Founded in 2001, Oceana is an international nonprofit organization dedicated to achieving measurable change in the world's oceans. Beth discusses her organization's efforts to protect and restore the oceans including campaigns to protect sea turtles, promote responsible commercial fishing practices and eliminate shark finning in the United States and elsewhere.

Spotlight on Oceana

Beth Lowell, Federal Policy Director, Discusses the Challenges Facing the World's Oceans

Currents (ISSN 1544-6603) is the official environmental magazine of the U.S. Navy, Chief of Naval Operations Environmental Readiness Division (N45). Participating Commands include the Naval Air Systems Command (NAVAIR), the Naval Facilities Engineering Command (NAVFAC), the Naval Sea Systems Command (NAVSEA) and the Naval Supply Systems Command (NAVSUP).

This magazine is an authorized publication for members of the Department of Defense. Statements made in the N45 Outlook column reflect the official environmental policy of the Navy. The contents in the remainder of the magazine are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense, or the United States Navy. Inclusion of any product or service in any *Currents* feature article does not constitute an endorsement by the Navy. The Navy encourages all readers to check with the appropriate supervising authority prior to using any product or service mentioned in the magazine.

Article submissions should be submitted through the appropriate Command representative using the *Currents* article template. The Security and Policy Review (SPR) must be completed by the individual Commands before *Currents* management can consider an article for publication. All other inquiries may be addressed to the management of the magazine.

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Environmental Readiness Director Gives Update on Environmental Programs

WELCOME TO THE winter 2010 issue of *Currents*. As we recover from the holiday season, I'd like to offer an update on some of the projects that have been underway during my first few months here as the director of the Chief of Naval Operations Environmental Readiness Division.

Let me first say how impressed I've been with the staff here and the many environmental experts with whom we interact on a daily basis. There is a lot of hard work going on as we continue to grapple with complex issues while following aggressive, often abbreviated timelines. I appreciate the professionalism and dedication I see across the broad spectrum of topics that demand our focused attention.

Environmental Planning on the Move

We've been quite busy in our environmental planning. We're presently finishing up phase I (planning for at-sea training on ranges and operating areas) and looking ahead to phase II (planning for all at-sea training worldwide). To track our progress, we've been participating in monthly meetings with the Director of the Office of Protected Resources at the National Marine Fisheries Service. I believe we have established a great working relationship with their team. Along with our environmental planners, they have worked hard to help us meet range Environmental Impact Statement (EIS) schedules and compliance requirements. As we start preparing for our annual permit renewals under phase I and ramp up efforts under phase II, the workload is certainly going to increase. We will continue seeking opportunities to make that interagency teaming process as efficient and streamlined as possible.

I appreciate the professionalism and dedication I see across the broad spectrum of topics that demand our focused attention.

Presidential Priorities: Clean, Green Energy

Since I've come on board here, we've been energized in some new directions in light of the new administration's focus on environmental issues. One such area has been

clean and renewable energy and controlling greenhouse gas emissions. If you look at Executive Order 46156 (Federal Leadership in Environmental, Energy and Economic Performance), and consider the five related goals the Secretary of the Navy announced this past October at the Naval Energy Forum, it's clear we will face significant challenges in achieving those goals in a timely manner. Luckily the Navy has great people on our team, and we're certainly up to these challenges. I look forward to assisting the Ashore Readiness Division and senior leadership in working these issues, whether in determining what existing technologies we may be able to use or considering other new and creative approaches to help meet those goals.



Safeguarding the Bay

Executive Order 13508 (Chesapeake Bay Protection and Restoration) highlights the importance of the Chesapeake Bay as a vital natural, historic and economic resource, and asks federal agencies to show leadership in conserving and revitalizing the Bay. From a Navy standpoint, much of this work is being accomplished at the installation level under direction from Commander, Naval Installations Command (CNIC) and the regional commanders, but the Environmental Readiness Division is involved in policy coordination at the headquarters level. Members of my staff recently participated in an initial planning meeting on this topic with representatives from the Office of the Deputy Assistant Secretary of the Navy for Environment,

the Office of the Deputy Undersecretary of Defense for Environment, Regional Environmental Coordinators from Army, Navy, and Air Force, and several Non-Government Organizations (NGO). I hope this dialogue will continue, and eventually lead both to partnering opportunities and

more chances to tell other organizations about the good work we're already doing to protect the Bay.

Ocean Policy Task Force

Another item of note has been our office's support of the Interagency Ocean Policy Task Force. The task force, which is led by the White House Council on Environmental Quality (CEQ), was established by the Obama administration to develop a national policy and framework that allows for sustainable use of the oceans, Great Lakes and coastal areas for environmental, economic, recreational and security priorities. Our first order of business was to develop an interim report that explained our draft approach, and then we took that document to public hearings. I was able to attend hearings on the east and west coasts and hear feedback from a wide variety of people, ranging from individual citizens to representatives from environmental NGOs.

ment, all parties were able to reach an agreement that protected public health and allowed the title of the ship to be transferred to the city on 14 December 2009.

Cleanup & Community Partnering

I recently had the opportunity to tour a series of environmental restoration efforts at Naval Station Norfolk. Groundwater contamination at one of the sites is being remediated through injection wells that accelerate the breakdown of volatile organic compounds. At another site, a landfill cap has been installed in order to safely reuse the area for sports fields. Near the base's carrier piers, they installed a cover on a landfill area and then built a parking lot over it. The parking lot was designed with a special gravel system that, along with a system of trees and catch basins, allows water to filter down through it rather than creating runoff into the Chesapeake Bay. This is an example of the type of responsible Bay stewardship I

We've been energized in some new directions in light of the new administration's focus on environmental issues.

Participating on the task force was an eye-opening experience and an exciting chance to work closely with important partners in the environmental realm, including the National Oceanic and Atmospheric Administration, the Coast Guard, U.S. Environmental Protection Agency (EPA), CEQ and others. I look forward to assisting the task force over the next year as they plan to better utilize the oceans in a sustainable manner that will help marine ecosystems while taking into account our national security requirements.

Ex-WISCONSIN Transfer

For several years, the Navy has been involved in an effort to officially transfer the ex-WISCONSIN (BB-64), an Iowa-class battleship originally commissioned in 1944, to the City of Norfolk for use as a floating museum. Before the transfer could occur, Norfolk and EPA had to reach an agreement on how to ensure that visitors are protected from polychlorinated biphenyls that may be present on the ship. Through strong coordination among the City of Norfolk, EPA, Naval Sea Systems Command, the Chief of Naval Operations Environmental Readiness Division, and the Office of the Deputy Assistant Secretary of the Navy for Environ-

referenced earlier. As part of the restoration process, the base, CNIC and Naval Facilities Engineering Command are also cooperating with the City of Norfolk and the Virginia Department of Transportation to enable a road extension to be built through base property into Norfolk International Terminal to help relieve traffic congestion.

Final Word

These activities are just a sampling of the good work that's been done over the past few months. We have a lot to look forward to in the next quarter and year, and I believe we've set a great foundation for what's to come. In the near future, the big items on our plate will likely be the continuation of our at-sea training EISes and the Program Objectives Memorandum (POM) 12 budget. We will be going into great detail reviewing thousands of line items in the Navy budget to verify that we are adequately funding the right projects at the right pace. We want to ensure the Navy is in compliance with the laws, and also make substantive progress on our environmental stewardship programs. ⚓

All the best,
Rear Admiral Herman A. Shelanski
Director, Environmental Readiness Division

The logo features a stylized orange swirl icon to the left of the text "Spotlight on Oceana". "Spotlight on" is in a smaller, white, sans-serif font, while "Oceana" is in a larger, bold, orange, sans-serif font.

Spotlight on Oceana

**Beth Lowell, Federal Policy Director,
Discusses the Challenges
Facing the World's Oceans**

SHARING THE SPOTLIGHT for this issue of *Currents* is Beth Lowell, Federal Policy Director at Oceana. Founded in 2001, Oceana is the largest international organization focused solely on protecting and restoring the world's oceans.

This is the fourth in a series of interviews with representatives of environmental non-governmental organizations (NGO) intended to broaden our understanding of the NGO community and to enhance Navy-NGO environmental cooperation and partnerships.

This interview was conducted on 3 December 2009 in Oceana's Washington, D.C. offices by Tracey Moriarty, Director of Environmental Outreach and Information for the Chief of Naval Operations Environmental Readiness Division, Bruce McCaffrey, Managing Editor, *Currents* and Kathy Kelley, Contributing Writer, *Currents*.





Oceana

Currents: Good afternoon Beth. Thanks for taking the time to sit down with us today. Can you start by telling us a little bit about your background?

Beth Lowell: I've been at Oceana for five years. Although I've

worked in conservation for much of my adult life, this is the first time I've worked for an organization focused solely on protecting marine life. When considering that water covers roughly 70 percent of the earth, yet how few groups are working to protect the oceans, it's hard to imagine where my efforts would be of more value.

Before Oceana, I spent five years focused on endangered and threatened species and defending the Endangered Species Act (ESA) at the Endangered Species Coalition, which is a coalition of about 400 groups working to protect endangered wildlife.

My first job in the environmental field was as an organizer. I worked with college students in New Jersey on a range of environmental issues and then moved to Washington, DC for an organizing position with the national organization. After spending time in DC, I realized that my real interest was in advocacy.

Currents: What is the overall goal of Oceana?

Lowell: Our overall goal is to protect and restore the oceans—and our campaigns address this in several different ways. The oceans face a lot of problems and we try to focus on issues where we can have a direct impact. Our main areas of focus are responsible fishing, protection of marine wildlife, pollution and climate change issues.

Currents: Can you tell us about some of those campaigns?

Lowell: Sure. Each of our campaigns runs between three and five years, and at the end of that time, we're expected to have tangible results in place. As the Federal Policy Director, I work on all of our campaigns at some level, but mainly focus on responsible fishing issues and shark finning, which I'll talk about later.

One of our campaigns focuses on the protection of sea turtles. Commercial fishing poses a huge threat to sea turtle populations. Each of the six sea turtle species found in U.S. waters is listed as either "threatened" or "endangered" under the ESA. One commercial fishing technique called bottom trawling has had a large impact on sea turtles. These fisheries use massive trawl nets that are

The Basics About Oceana

IN 1999, A group of five foundations commissioned a study and discovered that no organization was working exclusively to fight ocean threats on a global scale. Further, less than half of one percent of all resources spent by environmental nonprofit groups in the United States went to ocean conservation. To fill this gap, the foundations formed Oceana in 2001.

Oceana's vision statement is simple: "Oceana seeks to make our oceans as rich, healthy and abundant as they once were." To achieve this mission, Oceana is dedicated to achieving measurable change by conducting specific, fact-based campaigns with fixed deadlines and articulated goals.

Oceana's work falls into six general categories:

1. Pollution prevention
2. Responsible fishing
3. Protecting marine wildlife
4. Climate and energy issues
5. Preserving marine spaces
6. Monitoring and exploring the marine ecosystem

In fewer than ten years, Oceana has achieved dozens of concrete policy victories for marine life and habitats. For more about their past and current projects, visit www.oceana.org.



towed behind their fishing boats. The problem is that, in addition to shrimp and other fish, sea turtles can get caught in these nets as well. For every pound of shrimp caught, five pounds or more of bycatch is discarded. (Note: Bycatch is the unintended catch of species not targeted in a commercial fishery that often results in huge amounts of fish and other marine life being thrown back into the ocean either dead or dying.)

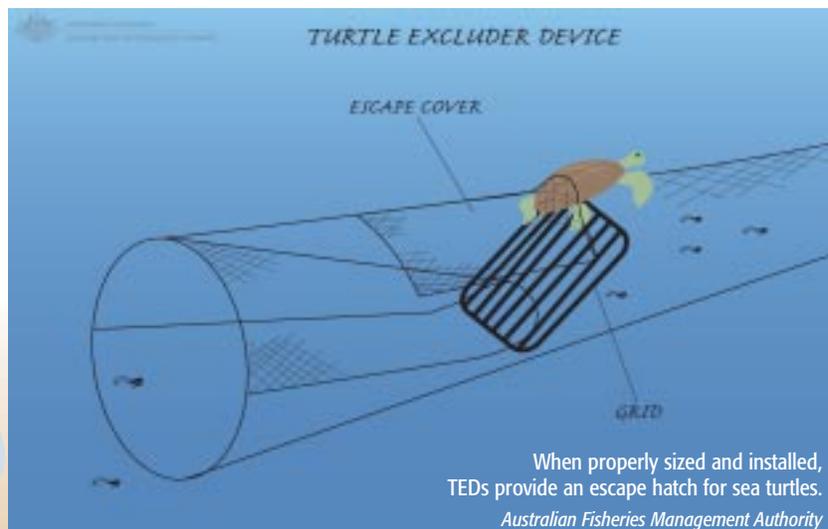
For every pound of shrimp caught, five pounds or more of bycatch is discarded.

Currents: I saw on your web site that there are devices they can be installed on trawl nets that would allow sea turtles to escape.

Lowell: Yes, they're called Turtle Excluder Devices (TED). Essentially, they're escape hatches for sea turtles. A TED allows a sea turtle to free itself from the trawl net with minimal if any harm. A TED is a grid of bars in the neck of a net that allows sea turtles to escape, reminiscent of an escape hatch. The bars are spaced far enough apart so that shrimp and fish can pass through to the tail of the net while larger species, such as sea turtles, are allowed to escape. These devices are actually required in shrimp and summer flounder fisheries. Unfortunately, there are a number of fisheries around the country that use trawl nets without TEDs. We found that an average of 770 sea turtles are captured each year in mid-Atlantic trawl fisheries alone. We're trying to make these devices required in all trawl fisheries.

Currents: What other kind of work are you doing in that area?

Lowell: We work at the regional fishery management council level on responsible fishing issues like ensuring that their fishery management plans end overfishing. We believe that in all commercial fisheries



When properly sized and installed, TEDs provide an escape hatch for sea turtles.
Australian Fisheries Management Authority



ABOVE: Today, industrial fishing worldwide yields between 80 and 100 million tons of fish, but it also generates 27 million tons of discards or bycatch, including loggerhead turtles.

NOAA

RIGHT: A sea turtle ensnared on a long line. Commercial long lines are up to 40 miles long with thousands of hooks. Each year thousands of turtles are unintentionally killed by long lines.

Carlos Perez, Oceana



that we should count what is caught—everything, even the bycatch. Set limits on catch and bycatch. And have control measures in place to ensure that fisheries are following the limits. We call it the “Count, Cap and Control” approach. One way to achieve the counting is to put fishery observers on fishing boats. These scientifically trained observers are there to count the catch. Oceana has been working to increase funding for this program in the federal budget

process to increase observer coverage in fisheries. The federal government is doing a better job of accounting for bycatch and increasing observer coverage, but there is definitely room for improvement. We would like every fish to be accounted for when fish limits are set. You may have a scallop fishery that’s catching scallops but they’re also catching a significant amount of yellowtail flounder, which is neither used nor counted. Other fisheries are doing the same thing. So the

only yellowtail flounder that are actually being counted are the ones caught by the yellowtail flounder fisheries. As a result, a huge amount of bycatch is unaccounted for. There needs to be some kind of limit so we’re not allowing fisherman to indiscriminately discard all of their bycatch.

Our responsible fishing campaign also looks at international fisheries subsidies. Countries are basically promoting unsustainable fishing practices across the world by providing their fishermen with money that allows them to fish further offshore for longer periods of time. And now they’re fishing on the high seas because coastal waters are already fished out.

About 20 billion dollars a year in subsidies is being spent world-wide to promote these bad fishing practices. For instance, some European countries are paying for their fishermen to fish off of the coast of Africa because most African countries don’t have the money or the boats to fish their coasts. This also leads to a global security issue. More than a billion people depend on fish as a primary source of protein. We need to stop stealing fish from poor countries that rely on the oceans.



Commercial fishermen haul in a trawl net. Trawl nets can stretch 40 feet in height and spread over 200 feet wide.

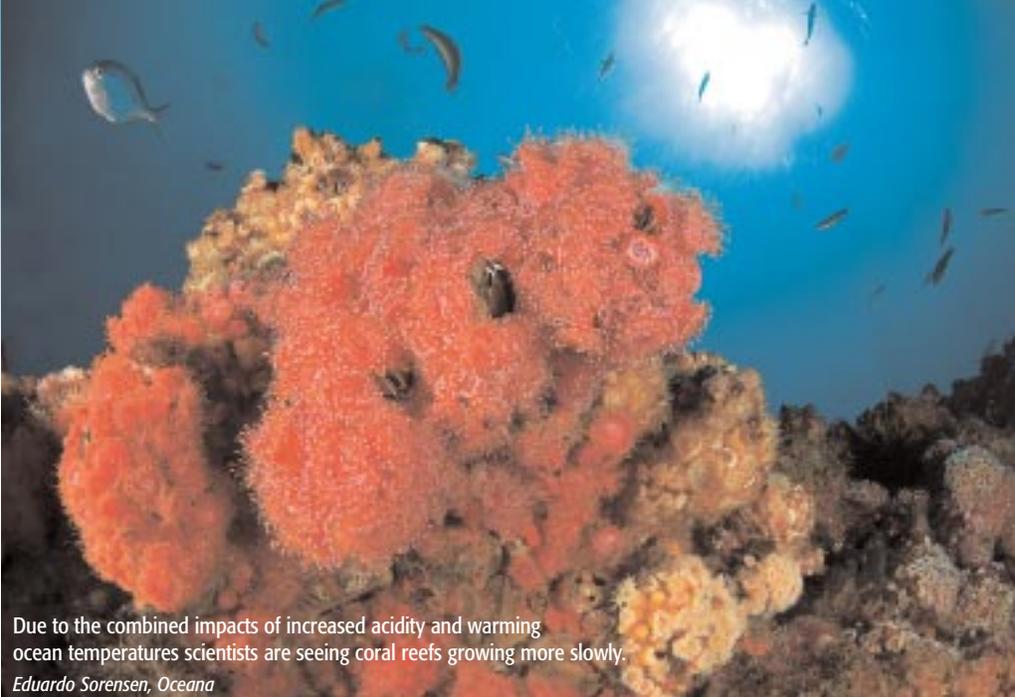
Juan Cuetos, Oceana

We're working at the World Trade Organization to address fishing subsidies in the international trade agreement that would require countries to limit fisheries subsidies—eliminate the really horrible ones, reduce the questionable ones and report on the status of all of them—in essence, have a more transparent system.

We also have a climate change campaign. For us, climate change is especially important—not only because the oceans are impacted by climate change and ocean acidification but because the oceans are a driver of the climate system.

We focus on a few different issues regarding climate change. Specifically, we are working to increase awareness that the oceans are directly impacted by the carbon dioxide that we are producing due to a process it causes called “ocean acidification.” The acidification of the oceans needs to be addressed in any and all comprehensive global warming legislation or treaties. This is one of the issues that I find especially scary—that the more carbon dioxide humans emit, the more carbon dioxide the oceans absorb. The oceans have done us a great service by lowering the amount of carbon dioxide in the atmosphere and therefore lessening climate change. Unfortunately this is making the oceans sick, causing them to become more acidic. Carbon dioxide is changing the chemistry of the ocean itself. If we continue on the current trend, we may see some collapses in the global food web.

The oceans are 30 percent more acidic than they were prior to the industrial revolution and we are already seeing impacts of this change, most importantly across coral reefs. Due to the combined impacts of increased acidity and warming ocean temperatures scientists are seeing coral reefs growing more slowly. They have observed this on the Great Barrier Reef in Australia and reefs in Thailand and the Caribbean. Similar results are being seen in laboratory experiments where researchers are able to adjust the pH level of water. Experiments have shown that many species, including corals, oysters, mussels, and pteropods (swimming sea snails), have greater difficulty



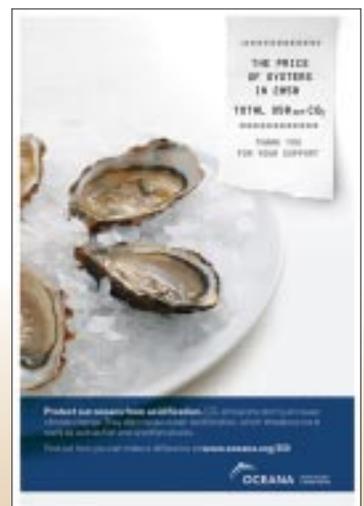
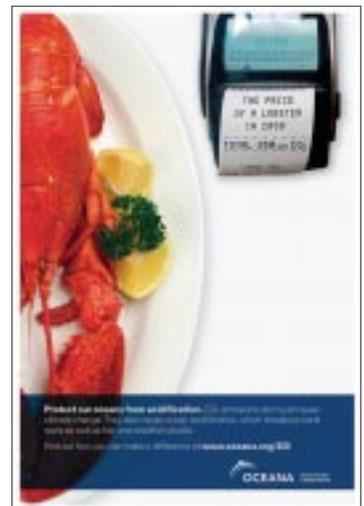
Due to the combined impacts of increased acidity and warming ocean temperatures scientists are seeing coral reefs growing more slowly.

Eduardo Sorensen, Oceana

building their shells and skeletons in more acidic conditions. And when you realize that some of these shelled animals are the basis of the marine food web or provide vital habitat to millions of marine species, you wonder what will happen when their very survival is threatened. So we're working on raising awareness about ocean acidification and its potential impact on the global food chain. We had an advertising campaign—which was highly visible in Copenhagen, Denmark at the United Nations Framework Convention on Climate Change—regarding the number 350. 350 parts per million (ppm) is the safe upper limit of carbon dioxide for our atmosphere if we are to prevent the worst impacts of ocean acidification.

If we continue on the current trend, we may see some collapses in the global food web.

The Intergovernmental Panel on Climate Change concludes that atmospheric carbon dioxide levels must be reduced to under 350 ppm. Oceana used advertising pieces such as these to raise awareness at the Copenhagen summit.





Currents: How are you raising awareness? Other than the 350 campaign?

Lowell: All of our campaigns include five components—policy (or legislative), media, science, legal and grassroots advocacy. We’re trying to get ocean acidification language inserted into the climate bill. We’re meeting with congressional staff and administration officials to inform them about the need to get emissions to a level that will halt the acidification of the oceans. And we work with Oceana’s “Wavemakers” (more than 300,000 members and e-activists in over 150 countries) to make them aware and ask them to take action. And as we are moving forward, it is critical that we look back at policies already in place to make sure they are doing enough for the ocean—especially on ocean acidification.

Currents: Thinking about areas where your work might overlap with the Navy—obviously the Navy has a vested interest in understanding the behavior of a number of species of marine mammals. Does Oceana do much work pertaining to marine mammals?

Lowell: Right now we don’t have a dedicated marine mammal protection campaign per se, but we work on marine mammal issues when they arise. We also participate in various

Take Reduction Teams which are stakeholder groups that create Take Reduction Plans under the Marine Mammal Protection Act (MMPA). A lot of our wildlife-related efforts in the last several years have been focused on upholding our existing environmental laws, such as fishery laws, the ESA and the MMPA. Our ongoing wildlife campaign is focused on sea turtles. We’re trying to move forward on the Sea Turtle Protection Act, which would be similar to the MMPA. We wanted to address shortfalls in current turtle protections and make sure that if sea turtles are de-listed they have other protections in place.

The Basics About Ocean Acidification

BY NOW, MOST of the risks associated with climate change are well-known. Sea levels are likely to rise, droughts and flood events will intensify, and worldwide temperatures will increase. A lesser known and more insidious impact of our carbon dioxide emissions is the process of ocean acidification.

The oceans absorb roughly 30 percent of global carbon emissions and 80 percent of the heat generated by increased levels of greenhouse gases. This absorption helps to protect us from some of the immediate impacts of climate change, but the increased levels of carbon dioxide are quietly changing the chemistry of the ocean. This is bad news for marine organisms like hard corals, clams and crabs. There is evidence that these organisms may not be able to form shells and skeletons in the more acidic waters. If ocean acidification continues, the water in which these organisms live could become so corrosive that it would destroy their shells and skeletons directly.

Coral reefs are highly vulnerable to changing pH levels. Since 1980, nearly 30 percent of the world’s tropical corals have already vanished, mainly due to warming events. At current rates of emission growth, tropical corals could be gone before the end of this century—and deep sea reefs could be even more vulnerable to the ocean’s rising acidity, although not much is known at the moment about how they are likely to respond.

The disappearance of coral reefs would be devastating on many levels. Reefs are home to a quarter of all marine species and are critical to the livelihoods of many humans. To prevent the loss of coral reefs, scientists conclude that atmospheric carbon dioxide levels must be reduced to 350 ppm or below. Levels are currently at 385 ppm and rising.

In December 2009, a resolution was introduced in the U.S. House of Representatives that urges the U.S. to adopt national policies and support international agreements to address ocean acidification, and to study its effects on marine ecosystems and coastal communities.

Currents: Are you proposing some draft language for this act?

Lowell: It's already been drafted. First, we wanted to make sure that we have some idea of how many sea turtles are out there. All population estimates from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (FWS) have been based on nesting females. So we know how many females come to shore and how many hatchlings there are from monitoring. Unfortunately, we don't know what happens to the juveniles or the status of adult males. We're estimating the entire sea turtle population on nesting females, which could be quite inaccurate. So this act would require NMFS and FWS to:

1. Develop an accurate inventory of sea turtle populations, and
2. Determine how many sea turtles can be "taken" from a population without jeopardizing it.

Currents: The Sea Turtle Protection Act would be similar in structure to the MMPA?

Lowell: Exactly. The same system of determining potential biological removal levels, but just related to sea turtle populations. So we can then tell the fishermen, this is how many sea turtles you can take.

Currents: But fishermen don't have take limits now?

Lowell: They actually get an incidental take limit at the fishery level.

Currents: How is the incidental take limit enforced?

Lowell: That's the whole problem. That's the reason we developed the legislation, because the NMFS issues Incidental Take Statements for each

fishery, but does very little to follow up on the actual number of sea turtles caught. We asked the NMFS how many turtles they authorize to be caught each year and they didn't have an answer. So we requested all of their Biological Opinions and Incidental Take Statements, reviewed their own documents, totaled them and found that they authorized a huge number of sea turtle takes—over 10,000 sea turtles killed and an additional 334,000 harmed each year.

Currents: Where do these limits fall?

Lowell: Since sea turtles are an endangered species, these take limits fall under the ESA. NMFS is authorizing a large number of sea turtle takes. And those numbers don't include efforts like U.S. Army Corps of Engineers dredging projects. When we reviewed the authorized levels of sea turtle takes and compared it with the bycatch estimates in fisheries, the take levels were often exceeded. But instead of taking any action, NMFS has issued higher take authorizations instead of requiring any corrective action.

A couple of years ago there was an ESA oversight hearing in the U.S. House of Representatives. The Committee asked the FWS if they ever consulted with NMFS when authorizing sea turtle takes. By law, FWS is supposed to conduct an analysis of the impact of takes before issuing new limits. FWS admitted that they were not consulting NMFS prior to issuing revised take limits.

The Threats Facing Sea Turtles

SEA TURTLES HAVE been swimming the world's oceans since the dinosaur era, more than 110 million years ago. Just decades ago, sea turtles were plentiful, but now all six species found in the United States are listed as threatened or endangered.

The major threats to sea turtle populations are fishing gear such as longlines and bottom trawls, and loss of nesting beaches. TEDs are a partial solution. These devices, installed in trawl nets, allow turtles to escape. Nets equipped with properly functioning TEDs could lead to a 97 percent reduction in sea turtle entrapment. Currently, however, only shrimp and summer flounder fisheries are required to use these devices.

Oceana is working with Congress on the first comprehensive sea turtle legislation in American history. The Sea Turtle Protection Act will provide expansive protection for sea turtles in U.S. waters by:

- Recovering sea turtle populations and maintaining healthy populations thereafter
- Reducing sea turtle bycatch
- Analyzing the cumulative impacts of all authorized takes of sea turtles
- Capping the number of takes so that sea turtles can maintain healthy population levels
- Designating protected sea turtle habitat areas
- Coordinating sea turtle conservation and management among all federal agencies

Part of this proposed act will require the use of properly sized TEDs in all trawl fisheries operating in seasons or locations where sea turtles are present.

For more about sea turtles and the threats facing them, go to www.oceana.org, and click on "Our Work" and "Protecting Marine Wildlife."



That's when we realized that something needed to be done.

We are currently working on legislation that requires the U.S. government to find out how many sea turtles there are, do a cumulative analysis of the

takes and determine the Potential Biological Removal (PBR) for each species of sea turtles. The PBR is a formula that takes into account the current population of the species and provides the number of sea turtles that can be taken from a population without impacting the species' ability to reach an Optimal Sustainable Population. The appropriate agencies would then use the PBR to authorize and limit takes.

Currents: Are there sections in the proposed sea turtle protection legislation for habitat restoration and designation?

Lowell: We do have habitat protection in it as well. Currently, once a species is delisted or no longer needs the protection of the ESA, it will have no habitat protections in place. We only have two critical habitat areas designated for sea turtles in the U.S.—one in Puerto Rico and a second in the U.S. Virgin Islands. Sea turtles were listed before the critical habitat provisions were added to the ESA so the federal government was not required to designate critical habitat at that time. Sea turtles now rely on existing state protections and FWS refuges, but run into issues with spending, staffing and enforcement constraints. What sea

The Interagency Ocean Policy Task Force

ON 12 JUNE 2009, President Obama signed a memorandum establishing an Interagency Ocean Policy Task Force, led by the White House Council on Environmental Quality. The task force, a group of 24 senior policy level federal officials, is charged with developing recommendations for a national ocean policy, a framework for improved stewardship, and guidelines for effective coastal and marine spatial planning.

"This plan shows vision, and a commitment to promoting healthy oceans and taking an integrated approach to maintain and protect oceans," stated Beth Lowell. "It also recognizes the need for proactive, science-based management for the Arctic Ocean, which is already stressed by rapid climate change and threatened by expanding industrialization," she continued.

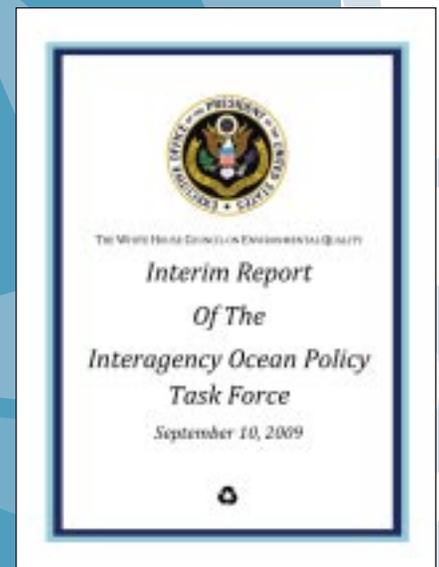
The task force immediately initiated a public engagement process to gather information and recommendations from a broad range of stakeholders and interest groups, including energy, conservation, fishing, transportation, agriculture, human health, state, tribal and local governments, ports, recreational boating, business, and security. The information gathered at these roundtables, combined with comprehensive reports from the U.S. Commission on Ocean Policy and the Pew Oceans Commission, were combined to produce the task force's interim report, issued in September 2009.

The interim report contained the following objectives for a national ocean policy:

1. A vision of what a national policy should achieve for the ocean, our coasts, and the Great Lakes
2. A brief description of the value of these important areas and the various issues confronting them
3. A statement of our national policy
4. A set of overarching guiding principles for management decisions and actions affecting the ocean, U.S. coasts and the Great Lakes

The report also included recommendations for improving the existing coordination framework regarding ocean stewardship, focusing in particular on the Committee on Ocean Policy. The task force is expected to release its final recommendations in early 2010.

Read the full report at www.whitehouse.gov/assets/documents/09_17_09_Interim_Report_of_Task_Force_FINAL2.pdf.



turtles need is dedicated habitat protections of both onshore and offshore areas that are important to the conservation of the species. We're hoping to get this legislation introduced in 2010.

Currents: Are there other campaigns that you want to talk about?

national ocean policy to protect, maintain and restore marine ecosystem health and a framework and guidance on how agencies can implement the policy, coordinate with one another and how conflicts are resolved.

One of the things that we've been pushing for years is the need for a national ocean policy to protect, maintain and restore the marine ecosystem.

Lowell: I'd also like to talk about some of the other things that we're working on—like the Interagency Ocean Policy Task Force. One of the things that we've been pushing for years—even before the Pew Ocean Commission and the U.S. Commission on Ocean Policy were formed—is the need for a national ocean policy to protect, maintain and restore the marine ecosystem. Right now, there are about 140 laws governing and over 20 federal agencies managing various aspects of the ocean. Yet we don't communicate particularly well. This can lead to conflicts over shipping lanes, fisheries, offshore energy development, marine protected areas and other issues.

There needs to be a common vision; so we were excited when President Obama announced the formation of the task force in June 2009 whose primary purpose will be to develop a national ocean policy as well as a framework for marine spatial planning. (For more information, see our sidebar entitled "The Basics About Marine Spatial Planning."). We are looking forward to the final report from the task force. This should include a strong

We feel strongly that the marine spatial planning piece of this Interagency Ocean Policy Task Force is a tool to implement the national ocean policy. Marine spatial planning done poorly would be bad for conservation. We're viewing this policy as a Clean Air Act of sorts for the oceans—but without the legislative element.

There were six public hearings held by the task force and a lot of NGOs participated, including Oceana and the Ocean Conservancy. There were a lot of various industry representatives, fishermen and other ocean stakeholders there as well.

We think the task force is a great opportunity to explore the best way to coordinate ocean conservation management decisions across all agencies. We'd like to see the National Oceanic and Atmospheric Administration (NOAA) have a stronger role in the process, especially since they have a lot of the relevant in-house science and management expertise. We're happy with the process so far, but I think it's going to come down to the



details. The interim report was as specific as it needed to be but there are certainly a lot of questions remaining about how the final policy will be implemented.

Currents: What opportunities do you see for Oceana and the Navy to collaborate?

Lowell: There are a number of areas where we could collaborate. First, I'd like to point out that the Navy is doing a lot of great things for the environment. And I have firsthand experience with this. I had an opportunity to tour Camp Pendleton, San Clemente Island, Coronado, Kaneohe Bay and other military installations as part of my work with the Endangered Species Coalition. The military brought conservation organizations onto their installations to show us what they were doing, to engage in active dialog and to develop relation-



Beth Lowell kayaking in Alaska.
Oceana

ships with the resource managers. This was a great opportunity for organizations to see the challenges the military faces on the ground with encroachment and how the military is using workarounds or proactive measures like conservation buffers to address these challenges. So I know about the great things going on there.

But you need to get better about telling your story.

The Navy is doing a lot of research and involved in a lot of conservation activities. While I think the military services are getting a lot better at telling their stories, there's more that can be done. You should share some of the great work you're doing on

things related to climate change, emissions reductions, alternative energy platforms and so on.

Also, I think the Services are getting better at trusting and working with environmental conservation organizations. They're realizing that we're not trying to shut down everything the Services are doing. There is a benefit in collaboration where possible and we should actively look for and pursue those opportunities.

Currents: What advice would you give us on how the Navy can get our message out to your community?

Lowell: That is always a challenge. Active outreach to the organizations

The Basics About Marine Spatial Planning

ON 12 JUNE 2009, Marine spatial planning (MSP) is a planning and decision-making process that brings together multiple users of the ocean, including business, industry, government and conservation. Essentially, MSP is similar to land-use planning.

As more and more people compete for the same resources, the need for MSP is growing. Many world governments and some U.S. states have adopted some form of MSP. However, U.S. coastlines and the Great Lakes are still governed by more than 140 laws and 20 federal agencies; each with different goals and missions.

In December 2009, the Interagency Ocean Policy Task Force released an interim framework for MSP in the United States. Under this framework:

- Coastal and marine spatial planning would be regional in scope, instead of sector-by-sector or statute-by-statute.
- MSP would be developed cooperatively among federal, state, tribal, local authorities and regional governance structures.
- All decisions would be science-based.

- Stakeholder and public input would be ongoing.

The full report may be accessed at www.whitehouse.gov/administration/eop/ceq/initiatives/oceans/interim-framework.



near an installation can be helpful. Here in DC, informal lunches that bring together conservation organizations and resource managers to have discussions could help. Someone should be constantly thinking about how to get your success stories out of the military world and into the public arena. Additionally, send representatives to conferences about offshore wind and other relevant energy and environmental issues. A lot of networking takes place at these conferences.

Currents: Do you think that tours of our installations, like the one you took of Camp Pendleton, would be valuable in educating the NGO community about some of the environmentally progressive things that we're doing? Do you think it would be helpful to resurrect those tours?

Lowell: I think that those tours are helpful for a number of reasons. It builds rapport and relationships, which I think is paramount to anything anyone is trying to do.

Right now, there are no technologies available for cleaning up oil spills in the Arctic's frigid environment.

I think that inviting representatives from the local community—folks who live around your installations—would also be very helpful. A lot of the time, too many people have no idea “what goes on behind that wall” and they assume the worst. I think that sort of outreach is critical.

And of course, once we learn about some of the things that you're doing, we can also promote that perspective with your neighbors. There are groups that focus on alternative energy. Getting some of these folks into your facilities could become a great form of technology transfer.

Currents: How about other opportunities for collaboration?

Lowell: I think attending and/or hosting stakeholder meetings and technical conferences is a good idea. That would be an opportunity to identify issues and areas where collaboration is possible. I'm sure you're already involved in joint research projects with other NGOs.

Currents: Yes. In fact, we're working on publicizing our research on our marine mammal efforts now. We're putting it all out there to share with the NGOs, the stakeholders and the person on the street who wants to know. It's a pretty good summary of everything that we're doing.

We're gaining a better understanding of the behavior of the marine mammal populations on our ranges.

Currents: What about Oceana's habitat work?

Lowell: Our destructive trawling campaign is protecting corals and other areas that have important ecological functions. I'm sure that the Navy's installations have some system in place capable of monitoring deep sea habitat to ensure that their training exercises are not impacting it. It's probably reflected in your Integrated Natural Resource Management Plans (INRMP)?



Arctic sunset.
Caleb Pungowiyi, Oceana

Currents: Well, we don't have INRMPs for our at-sea activities but they play a crucial function on our shore facilities. We do have offshore protection efforts underway as well. For example, as part of our efforts to monitor and protect marine mammals on the Navy's at-sea ranges, we have implemented a robust marine mammal research program.

Obviously there are some parallels with the work that both of our organizations are doing to protect sea turtles and coral reefs. Is there anything else you would like to talk to our readers about?

Lowell: The Arctic. We're very concerned with what's happening in the Arctic with regard to the loss of sea ice and shipping, oil exploration and drilling. It seems like it's very much a “full speed ahead” process—something that concerns us. We need to step back and figure out what the impacts are on this very sensitive environment and on the communities that depend on it—what should be allowed



LEFT: A bag of shark fins illegally removed from living sharks. *Oceana/LX*

BELOW: Estimates suggest that between 26 and 73 million sharks are finned each year, all for the Chinese delicacy, shark fin soup.



and what shouldn't. Right now, there are plans in place to move ahead with offshore oil development without having any technology in place that can clean up oil spills in the Arctic's frigid environment.

Before anything moves forward, we need a comprehensive science-based plan in place for the Arctic. The plan should include a comprehensive scientific assessment of the health, biodiversity and functioning of Arctic ecosystems, as well as the benefits and consequences of specific industrial activities. A precautionary, science-based approach must be applied to all oil and gas leasing, exploration and development activities in Arctic waters to determine if those activities should be conducted and if so, when, where and how.

I would also like to talk about the Shark Conservation Act. Right now in the U.S., we have finning restrictions in place for the Atlantic Ocean and the Gulf of Mexico. These restrictions require fisherman to "land" sharks with their fins still attached. Fishermen on the west coast are not bound by these restrictions. There are different fishery

Shark Finning & The Shark Conservation Act

ANOTHER GROUP OF animals in great danger due to today's fishing practices are sharks. Sharks now represent the greatest percentage of threatened marine species on the International Union for Conservation of Nature's "Red List" of threatened species.

Sharks are at the top of the marine food chain, making them essential for a healthy marine ecosystem. Because they are slow-growing, late-maturing and give birth to few young, they are extremely vulnerable to overexploitation.

Like sea turtles, many sharks are inadvertently captured as bycatch. But the largest threat to the global shark popula-

tion is the killing of sharks for their fins, and dumping the bodies overboard, also known as "finning." Shark fin soup is a delicacy in China, and as the Chinese economy continues to grow, so does the demand for this food. Shark's fin soup is virtually tasteless; but because the fin is said to have medicinal qualities, and because it is expensive and prestigious, its consumption has continued to soar.

The Shark Finning Prohibition Act of 2000 was passed to prevent the practice of finning, but this act contains loopholes, is difficult to enforce, and allows fins to be imported from countries that don't have finning bans. Oceana is currently working to pass a fins-

attached bill, known as the Shark Conservation Act. If enacted into law, it would provide consistent and enforceable shark protection, and would allow the U.S. to take action against countries that allow finning.

Meanwhile, Oceana is working for more effective shark management in the European Union, including fins-attached regulations, catch limits and quotas, bycatch reduction, the elimination of shark discards and the implementation of a European Plan of Action for Sharks.

For more information, go to www.oceana.org, and click on "Our Work," and "Protecting Marine Wildlife."

Beth Lowell (left) poses with actress January Jones, Senator John McCain and Oceana staff member Elizabeth Griffin. Jones is a spokesperson for the Shark Conservation Act.

Oceana



management councils in place on the west coast and they are not required to land sharks with their fins attached. But we have proposed a bill—the Shark Conservation Act—which would require all sharks in U.S. waters to be landed with their fins still attached. The bill would also permit the U.S. to take action against countries that don't have this finning restriction in place.

Currents: Why is the shark fin significant?

Lowell: Shark fins are the most lucrative part of the shark. In a lot of Asian countries, shark fin soup is a luxury item—especially in China where more and more people are moving into the middle class and have more disposable income. It's always been something they serve at special events like weddings and, now that people have more money, it's being consumed more often.

So instead of catching and hauling the entire shark onto their boats, fishermen slice off the fins and throw the shark—usually alive—overboard. It will eventually die. Fishermen can fill their entire holds with shark fins.

Sharks are very long-lived, slow-growing animals. Each year, commercial fishing kills more than 100 million sharks world-wide—including tens of millions just for their fins. As a result, many shark species have declined to levels where they are unable to perform their roles as top predators in the ecosystem, causing drastic and possibly irreversible damage to the oceans.

The bill has passed the U.S. House of Representatives twice and the U.S. Senate's Commerce Committee. We are hopeful that it will pass the U.S. Senate this year and be signed into law ending shark finning once and for all in U.S. waters.

The Shark Conservation Act will establish consistent requirements for landing sharks in all U.S. waters. And we can become a global leader on this issue.

Currents: Among the threats to the ocean—pollution, climate change and overfishing—which is the most pressing?

Lowell: That's like asking me to choose among my children! I think they are all important. Pollution is an ongoing problem. It affects health and development, and it is tied to climate change. And climate change is a very big issue—getting something accomplished will be very difficult. Regarding sound fishing practices, that's an area where we can have an impact. But we need the U.S. government to be a leader and make the hard decisions to ensure that our own fisheries are adhering to their limits. Of course, our fisheries



are governed by fishery management councils that are mainly run by fishermen, and it's hard for fishermen to say, "I'm going to catch less fish this year so I can catch fish in the future." There are some fishermen that get that. But when you have a boat, it's really hard to make that decision. So I think the government needs to step in and be an enforcer. And then the U.S. really needs to encourage other countries to do the same. Oceana is working in its offices around the world to promote responsible fishing practices in other countries. Responsible fishing is something that we can do something about. We just need to step up and do it.

Currents: Thanks for your time today, Beth.

Lowell: Thank you. 🍷

Northwest Partnership Helps Restore Olympia Oyster

Project Improves Habitat in Puget Sound

PERSONNEL FROM NAVY

Region Northwest (NRNW) partnered with personnel from the Puget Sound Restoration Fund (PSRF) to help bring back the Olympia Oyster to Puget Sound.

The Navy's environmental stewardship in the Pacific Northwest is a key part of its mission. In the state of Washington, much of this stewardship is focused on restoring Puget Sound. Home to a wide array of marine animal species, Puget Sound is most recognizable as the large body of water that seeps into the northwest corner of the state.

Up until European settlers arrived, the Olympia Oyster played a central role in the diets of Northwest Native American tribes. It also enhanced the environment, filtering seawater and creating livable habitat for crabs, anemones and salmon.

However, once settlers arrived in the Pacific Northwest, this cultural resource was devastated. Olympia Oyster harvesting became a booming industry, with annual harvests of up to 100,000 bushels. The oysters quickly began to die out in the 1900s. Pollution and habitat loss only compounded this dire situation.

water-pump. These large shells sink to the muddy flats of the bay, where they rest on the ground and give Olympia Oyster larvae a surface to latch on to and grow.

"It's that emergent structure we're trying to provide," said Betsy Peabody, the founder and executive director of PSRF who coordinated the event.

This essential structure is basically a layer of oyster shell that is two to four inches thick. Adding it to the environment makes the habitat more favorable for oyster larvae to thrive in. It also helps the Olympia Oyster become

Making sure Olympia Oysters survive is essential for maintaining the biodiversity of Puget Sound.

PSRF, a non-profit organization, has the distinct goal of taking action to restore the habitat of Puget Sound. To help complete this vision, the Navy provides logistics to support oyster "seeding" projects. These projects help to foster the growth of the Olympia Oyster, a native oyster species that has a long history in the Pacific Northwest.

But, since 2005, the Navy has provided the PSRF with two significant resources to help reestablish the Olympia Oyster: access to a pier and the use of a barge. These logistics are instrumental in achieving restoration success.

The actual "seeding" consists of loading Pacific oyster shells onto a Navy barge and then blowing them off into the water with a high-pressure

self-sustaining, which is the guiding vision for the restoration project.

"It's so they can re-colonize the area they've used historically," said Peabody.

Making sure Olympia Oysters survive is essential for maintaining the biodiversity of Puget Sound. If common oysters were merely grown in a hatchery and then dumped into the



The last vestige of approximately 700 cubic yards of Pacific Oyster shell is loaded onto a Navy barge on the second day of oyster seeding. Shortly after this, the barge made its way into Dogfish Bay, where the shells were blasted into the water.

“For this reason, the Navy’s natural resources program has viewed Olympia Oyster restoration as a key part of the nearshore habitat enhancement effort,” he said.

Peabody expressed that receiving help from the Navy contributes to the success of the restoration. “It’s great to get support from the U.S. Navy,” she said. “It’s a huge help.”

In June 2009, NRRW facilitated the spreading of approximately 700 cubic yards of oyster shell into Puget Sound. The shells were loaded onto a barge by an excavator at the Naval Undersea Warfare Center Division Keyport pier.

Peabody noted that having access to a Navy barge also makes the operation very efficient. The quantity of shell that is seeded into Puget Sound has grown over the years, and a barge is now needed to handle the scope of the project.

Other Partnerships in Puget Sound

NRNW PERSONNEL WORK with other organizations to ensure that Puget Sound is on the path to being as healthy as possible. NRRW is a charter member of the Puget Sound Federal Caucus (PSFC), whose focus is to coordinate federal actions to protect and recover the Puget Sound ecosystem.

The PSFC consists of 13 federal agencies with the basic premise that working together is the most efficient way to get complex projects done. Each agency is tasked to develop initiatives to be implemented in Puget Sound. These initiatives, whether they are focused

on restoration, protection or research, all align with another agency’s plan for the Sound, that of the Washington State Puget Sound Partnership (PSP).

The aim of the PSP is achieving a healthy Puget Sound ecosystem. It was commissioned in 2005 by Washington State Governor Chris Gregoire, with a vision of restoring the Sound by 2020. By pooling resources and synchronizing environmental stewardship, the members of the PSFC are working toward realizing this vision.



TOP: The Navy barge leaves the Pier at Naval Undersea Warfare Center Division Keyport on the second day of oyster seeding. After a short voyage to Dogfish Bay, the shells were seeded into a carefully marked area of tidelands.

ABOVE: James Travers, NBK executive officer, seeds oysters into Dogfish Bay with a high pressure water pump. Gregory Leicht, Naval Facilities Engineering Command Northwest, back left, and Brian Allen, PSRF ecologist, back right, look on.

“It’s been a great partnership,” said Peabody, referring to the Navy. “They help us out with all our little crises.”

Commander James Travers, executive officer of Naval Base Kitsap (NBK), visited the site of the seeding and approved of the project. “I found the visit to be very educational and enlightening,” he said.

He also said the Navy is proud of the part it can play in the project, and that the PSRF has “an extremely worthy cause.”

Other partners that made this collaboration successful include the Washington Department of Fish and Wildlife, the Washington Department of Natural Resources, the U.S. Department of Agriculture, The Nature Conservancy, the

The Basics About the Puget Sound Restoration Fund

PSRF IS A non-profit environmental organization located in the state of Washington. Its single focus is, "restoring the marine habitat, water quality, and native species in Puget Sound." To accomplish this, the PSRF implements action-based projects. The PSRF has been working toward its objectives since 1997, collaborating with a variety of partners to achieve restoration success.

The results of the PSRF's work include the following:

- Planted ten million native oyster seeds at 80 sites with over 100 partners.
- Enhanced 25 acres of native oyster habitat with either shell or seed.
- Planted 100,000 Pacific Oysters in Eagle Harbor to mitigate nutrient pollution.
- Restored 575 acres in Drayton Harbor to conditional shellfish harvest.

The PSRF has won numerous awards as well, including:

- The Local Hero Award, Governor Gary Locke, 2003.
- Environmental Excellence Award, Washington State Department of Ecology, 2005.
- Native Oyster Project showcased at the White House Conference of Cooperative Conservation, 2005.
- Excellence in Restoration Award, National Oceanic and Atmospheric Administration, 2006.

In addition to Olympia Oyster restoration, the PSRF completes other projects that improve Puget Sound. These projects include:

1. Saving the pinto abalone, a native mollusk species.
2. Managing three community shellfish farms.
3. Restoring the intertidal zone.



4. Monitoring toxicity levels in shellfish.
5. Setting up shellfish gardens with citizens.
6. Helping conduct surveys about the economic relevance of shellfish populations.
7. Researching Geoduck planting.
8. Raising awareness about bacteria levels in Manzanita Bay.

For more information, visit PSRF's web site at www.restorationfund.org or email Betsy Peabody, PSRF's Executive Director, at betsy@restorationfund.org.

National Oceanic and Atmospheric Administration, Delta Marine, the Fish America Foundation, the Suquamish Tribe, the Squaxin Island Tribe, the Port of Poulsbo and Kitsap County.

Kalina stressed the value of partnering for environmental causes. "It strengthens the bond between the Navy and other groups," he said.

"When you partner, you get things done that you can't otherwise do."

Today, Puget Sound is home to the third largest fleet concentration, and provides a favorable environment for Sailors to safely operate. ⚓

Wesley DeShano made significant contributions to this article.

Photos by Wesley DeShano

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Navy Earth Day: 22 April 2010

What's Goin' On?

Navy Earth Day 2010 will take place on 22 April 2010. Navy and Marine Corps commands worldwide will participate in activities on or around that date to celebrate environmental stewardship.

Tell Us What's Goin' On

Let *Currents* know about the activities your command is doing for Earth Day. We will help you spread the word, either through the magazine itself or via our social media presence on Facebook (search for "U.S. Navy Currents Magazine" and become a fan) and/or Twitter (<http://twitter.com/navycurrents>). You can contact us on our social media sites, or reach Chris Dettmar via e-mail at cdettmar@egginc.com or by phone at 703-418-3017.

Get Free Stuff

If you need posters, factsheets, and other materials to hand out at your Earth Day event, send an e-mail to Chris Dettmar (contact information above). Let Chris know the type of event, the planned date(s), how many people you expect, and the mix of adults & children, and he'll send a customized package of environmental outreach materials to support your event.

Don't Miss Out

Whether it's a tree planting, neighborhood cleanup, school visit, 5K run, or other creative "green" activity, Earth Day is a perfect opportunity to partner with your community and showcase the ways in which the Navy and Marine Corps make the environment a priority. Take advantage of it! Tell us what's goin' on!

THE 2010 EARTH DAY THEME WILL BE ANNOUNCED NO LATER THAN 22 MARCH 2010.



ONR Partnering in Research to Battle Ghana's Eroding Coastline

Office Upholds Navy's Strategic & Humanitarian Focus

DESPITE THE TROPICAL temperatures, the beach at Ada Foah on the eastern coast of Ghana is much like the tip of an iceberg. As anyone knows, most of the ice in an iceberg is hidden below the surface. Similarly, for Ghana, the real story of coastal erosion is not about what lies at the water's edge, but what occurs beneath the waves offshore. The Office of Naval Research (ONR) is hard at work, investing and partnering in research that could lessen or even stop the

capital city of Accra, an estimated 70 percent of the beach is eroding at rates exceeding three feet per year.

Ghanaian scientists and students attending the University of Ghana are working with investigators from the Coastal Geosciences Program at ONR to expose the hidden workings of Ghana's largely unexplored nearshore environment. The new research effort, under the support of the U.S. Navy's Africa Partnership Station (APS), has two goals:

research? "This research is key to helping Ghana protect and sustain the ecology and economic vitality of its coastline. This investment underscores the Navy's commitment to the humanitarian and partnerships elements of The National Maritime Strategy, which is about opportunities, optimism and confidence in uncertain times," said then-Deputy Assistant Secretary of the Navy for the Environment, Donald Schregardus.

ONR's sponsorship of this research provides a mutual benefit for us and our West African partners.

—Donald Schregardus, then-Deputy Assistant Secretary of the Navy

impacts of Ghana's eroding coastline such as loss of structures, human life and economic well-being.

A tremendous amount of sand lays just offshore many beaches, as invisible as the bulk of an iceberg—until the supply of sand is disrupted and the shoreline begins to disappear. A small fishing village near the mouth of the Volta River, Ada Foah is only one of many beaches on the coast of Ghana that are slowly eroding—in the

1. Accelerate the introduction of scientific tools to Ghanaian scientists to improve their ability to observe and govern coastal waters, and
2. Establish a self-sustaining educational program to train coastal oceanographers in maritime technologies.

Why are the Navy and the Department of Defense interested in pursuing Ghanaian oceanographic

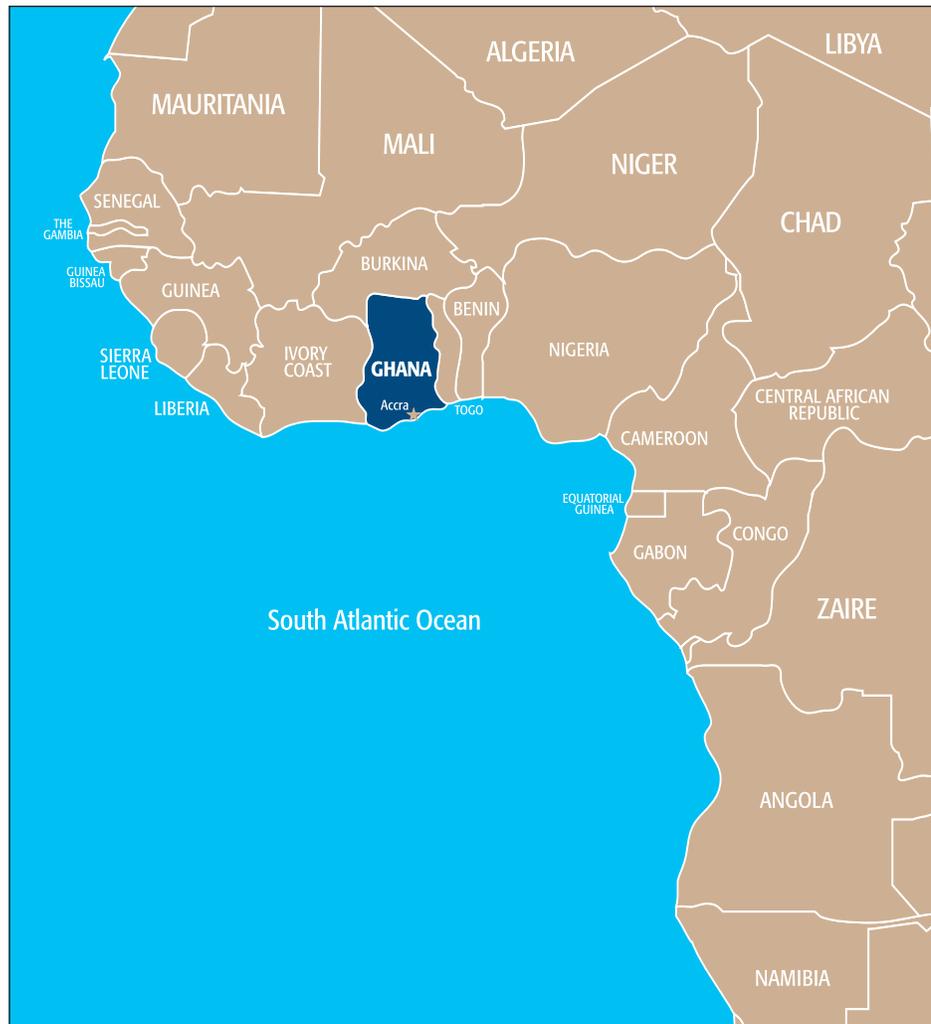
The Navy's interest in West African countries was sparked by adoption of innovative approaches to regional policy by the new U.S. African Command (AFRICOM), established in 2008. Unlike traditional unified commands, AFRICOM will focus on building African regional security by leveraging existing non-governmental organizations' relationships with African governments.

APS is a key component of the Navy's role in AFRICOM, and employs ship

visits to African ports to conduct joint exercises and provide hands-on practical courses in maritime safety and security, among other programs. APS deployed the HSV-2 SWIFT to several West African countries in spring 2008; a follow-up deployment of the USS NASHVILLE was underway in spring 2009.

Schregardus went on to say, “ONR’s sponsorship of this research provides a mutual benefit for us and our West African partners. This technology promises to improve the ability to monitor coastal zones, manage fisheries and reduce environmental damage resulting from illegal activities such as over-fishing and coral harvesting.”

Dr. George Wiafe, a biological oceanographer from the University of Ghana, is one of several driving forces behind the coastal program’s rapid progress. At the behest of Dr. John Mittleman, then science advisor to U.S. Naval Forces Europe-U.S. Naval Forces Africa/U.S. 6th Fleet and Dr. Melanie Jarvis, from the U.S. Navy’s Space and Naval Warfare Systems Center, Dr. Wiafe and several West African scientists were invited to meet with ONR scientists in Barcelona, Spain to discuss research interests. Dr. Wiafe, head of the Department of Oceanography and Fisheries at the University of Ghana, delivered a short lecture to ONR scientists on the rewards and difficulties of doing scientific research in West Africa. In return,



Typical local fishing vessel “The Ghana Boat” launched manually off the beach and used extensively for fishing in Ghana.

Dano Roelvink





Fishing boat's precarious position illustrating rapid erosion, a serious problem widespread in the Cape Coast region.

Dano Roelvink

International research collaborator collecting real-time ground penetrating radar data to reveal the underlying geology at Mukwe Beach near Accra.

Cheryl Hapke



Wiafe was invited to write a proposal to ONR to bring his scientific and educational aspirations to life.

With APS as the backdrop for the Ghana research effort, the pieces of the research puzzle rapidly came together under the leadership of Dr. Augustus Vogel, the Maritime Partner Liaison for U.S. Naval Forces Europe. Dr. Wiafe's team in Ghana was matched with ONR investigators who could bring years of research expertise to bear on a range of

coastal issues. Joining Vogel on the first APS deployment were Dr. Tom Lippmann from the University of New Hampshire and Dr. Dano Roelvink from the United Nations Educational, Scientific and Cultural Organization—International Institute for Hydraulic and Environmental Engineering for Water Education in Delft, The Netherlands. Lippmann is an expert in the field measurement of beach processes and is one of the developers of shore-based video observations of waves. Roelvink is an

expert in computer modeling and prediction of nearshore processes. Lippmann and Roelvink brought their skills to the University of Ghana and soon had a crew of beach-savvy students and faculty eagerly measuring the slopes and other properties of beaches near the capital of Accra and feeding it into state-of-the-art open-source computer models for beach change authored by Roelvink. Nightly strategy sessions mapped out a plan to bring new techniques and technologies to Ghana to incrementally build the University's nascent coastal oceanography program.

A great deal of discussion was needed to shape the coastal research questions into a suitable plan. A key initial goal suggested by ONR officials, for example, was the introduction of satellite remote sensing techniques to provide a continuous picture of shipping and fishing off of the Ghanaian coast. At present, only vessels within eyesight of the shoreline can be counted—leaving Ghana's productive coastal fisheries at the mercy of illegal fishing boats from other countries. ONR is a world-leading developer of remote sensing capabilities for maritime governance and oceanographic observations—an obvious top priority for international exchange among researchers. Dr. Hans Graber, director of the Center for Southeastern Tropical Advanced Remote Sensing (CSTARS) at the University of Miami and a long-time ONR researcher came to the table with suggestions for remote sensing collaborations, but discussion quickly exposed a significant roadblock: moving bulky satellite image data from satellite ground stations to Ghana for analysis requires a high-data-rate internet connection. As Wiafe explained, "We have access

to the internet, but our connection is rather poor—we usually send email only in the early morning or late in the evening to avoid the traffic.” In fact, the connection for the entire university community of about 40,000 students and faculty is slower than that in a single typical U.S. household.

With the long-term remote sensing goals still firmly in mind, the Ghana-ONR team decided to exploit available aerial photos and coastal imagery to determine trends in coastal erosion as a first step and guide to focusing the University’s new nearshore observational skills. The second APS deployment of the USS NASHVILLE in spring 2009 brought two new ONR researchers into the team. Dr. Cheryl Hapke from the U.S. Geological Survey, an expert in analysis of historical aerial photographs of the coast, was paired with Dr. Andrew Ashton, a coastal geomorphologist from the Woods Hole Oceanographic Institution (WHOI), to bring a historical and geological component to the effort. Hapke brought Geographic Information Systems software for installation on workstations at the University, and demonstrated how to extract coastal erosion rates from aerial photographs. Such analysis will reveal erosion hotspots and guide the deployment of instrumentation that will in turn be used to predict future beach response.

Ashton brings a geologist’s long-term perspective to the problem of local beach evolution. Ashton’s research emphasizes the importance of the underlying and adjacent geology in determining the fate of Gulf of Guinea beaches. On a field trip to areas near the mouth of the Volta River, he demonstrated the use of ground-penetrating radar to map the underlying rock structure as well as ancient delta deposits. The Volta River, dammed in the early 1960’s, created a huge lake that covers nearly four percent of Ghana. While providing hydroelectric power and irrigation water, the dam also traps the sediment that formerly nourished beaches adjacent to its mouth. The effect of disrupting the supply of sediment to

beaches may take decades to fully manifest itself in the form of beach erosion, and the framework of historical aerial photographic and geological analysis presented by Hapke and Ashton will provide a basis for future coastal development and mitigation issues.

Two key components of successful introduction of new research capabilities and technologies are persistence and self-sustainment, and a major emphasis of Vogel’s work with APS is the development of a lasting foundation for continued development. As the only program participant with experience in West Africa, Vogel has repeatedly emphasized the pitfalls of short-term relationships among U.S. researchers and those in other

Scarp and undercut asphalt indicating high rates of erosion at Ada Foah beach, Eastern Ghana.
Cheryl Hapke





As a result of extensive erosion, tombstones and graves are being washed away at an abandoned town near Ada Foah.

Cheryl Hapke



Rapid beach erosion resulting in destruction of the principal coastal road east of the Volta River mouth.

Dano Roelvink

countries. The ONR core team is one part of a much larger collaborative program that has connections to U.S. Department of State and various non-governmental organizations. Ghanaian government agencies including the Ghana Environmental Protection Agency and the Ghana Geological Survey have joined the original University of

Ghana participants from the Department of Oceanography and Fisheries and most recently the Department of Geography.

Growing Ghanaian maritime governance capabilities into the future requires a commitment to training students in Ghana who will then transfer their knowledge to the next

generation of researchers. A host of researchers and students led by Dr. Wiafe are forging international ties that bode well for the program's future: Mr. Selorm Ababio, one of Dr. Wiafe's graduate students, visited WHOI on a WHOI fellowship in summer 2009. Dr. Wiafe will be visiting the U.S. through the Department of State's International Visitors Leadership Program. Another graduate student, Mr. Kwame Adu Agyekum will be joining a research cruise of the tropical Atlantic, headed by Dr. William Johns of the Rosenstiel School for Marine and Atmospheric Research at the University of Miami. Agyekum presented original research at the International Geoscience & Remote Sensing Symposium in July 2009, and then proceeded to the U.S. for several months to train on a variety of computer programs for analysis of satellite imagery.

Lippmann returned to Ghana in August 2009 to continue working with the Ghanaians; one key task was to plan for the deployment of a newly acquired wave buoy, which will provide the measurements of wave height and direction needed for coastal erosion predictions. The vast fleet of artisanal fishing boats may solve one of the remaining problems, that is, making measurements of the seafloor shape or bathymetry needed for effective predictions. Rather than relying on custom surveying vessels that can cost tens of thousands of dollars per day, the ONR researchers have devised inexpensive echosounders that can be mounted to fishing boats, which can then make continuous depth measurements during their coastal fishing excursions. Although the measurements will lack the complete coverage provided by a survey vessel,

University of Ghana field crew and international collaborators ferrying Global Positioning System and ground penetrating radar equipment across a coastal river mouth ahead of the incoming tide at Mukwe Beach.

Cheryl Hapke



University of Ghana students removing frame and pump from the surf zone after installing instruments to measure nearshore waves and currents.

Dano Roelvink



they are perfectly suited for making progress in the right direction. The ONR and APS program started with small achievable goals, but still has its eye on the prize—the in-house capability to remotely sense Ghana’s maritime environment. Only recently have large oil deposits been discovered in the seafloor offshore Ghana, further bolstering the need for the tools to effectively govern the country’s ocean resources. 

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SOME OF MY Best Shots



Because the Virginia Beach/Norfolk area has plenty of beaches and other natural areas for everyone to enjoy, garbage left behind can contribute to environmental degradation and decrease the natural beauty of the area. To combat this, the Chesapeake Bay Foundation sponsored a "Clean the Bay" event on 5-6 June 2009 at Naval Amphibious Base (NAB) Little Creek.

A total of 235 volunteers, both service members and civilians, participated in the event, which saw them head out to the beaches and other areas on the base to clean up debris. The turnout was impressive considering it was a Saturday and

threatening to rain. Volunteers collected a total of 24,390 pounds of trash, the most common of which was cigarette butts and included vehicle parts, crab traps and a refrigerator door.

Volunteers came from the Navy School of Music, Admiral Joel T. Boone Clinic, Explosive Ordnance Disposal Unit 2, as well as civilians from the local community. Volunteers were also tasked with picking up trash on the Installation Restoration areas on the base.

I volunteered to capture images of Sailors and Marines participating in this event. I used a Nikon D2X camera with a Nikkor 18.0-200.0mm f/3.5-5.6 lens, set on manual exposure.

Photos by Robin Hicks • Visual Information Specialist • Naval Network Warfare Command/NAB Little Creek • robin.hicks@navy.mil

Submit your own Best Shot to Bruce McCaffrey, Currents' managing editor, at brucemccaffrey@sbcglobal.net.



Naval Base San Diego Finds Creative Ways to Save Water

Efforts Include Artificial Turf & An Irrigation Water Audit

PERSONNEL FROM NAVAL Base San Diego (NBSD) has slashed water consumption through an ambitious plan that addresses water usage across the base.

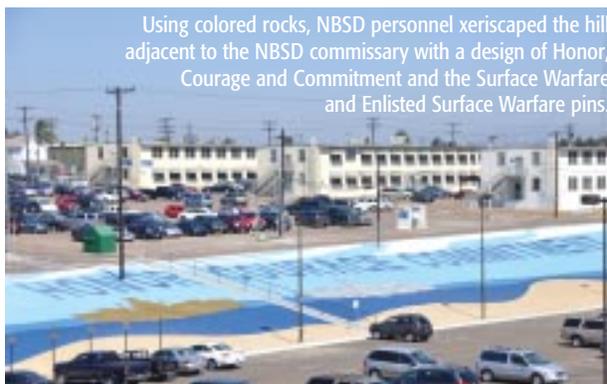
In the beginning of Fiscal Year 2008, Executive Order 13423 stated that federal agencies are required to reduce water consumption by two percent annually or a total of 16 percent by the end of fiscal year 2015. In an effort to meet and surpass this goal, NBSD personnel set astonishing goals for water reduction by the end of September 2009.

When the Executive Order was published in 2007, NBSD's baseline for water consumption was just under 230 million gallons. This figure included NBSD, located along Harbor Drive and 32nd street, the Broadway complex, including 1220 Pacific Highway, and the Admiral Baker Facilities in Mission Valley. In just one year, NBSD's consumption decreased to just under 204 million gallons, an 11.42 percent reduction. As of September 2009, total water usage was at 128,133,000 gallons, which was 26,867,000 gallons below the September 2009 target goal usage of 155,000,000 gallons.

Captain Rick Williamson, Commanding Officer of NBSD, knows that water resources in California are at a critical level, especially these days when San Diego County is in a Level 2 drought alert. "Efforts were put into place back in 2007 to start the



A combination of artificial turf and xeriscaping on NBSD helps conserve water and beautify the industrial area.



Using colored rocks, NBSD personnel xeriscaped the hill adjacent to the NBSD commissary with a design of Honor, Courage and Commitment and the Surface Warfare and Enlisted Surface Warfare pins.

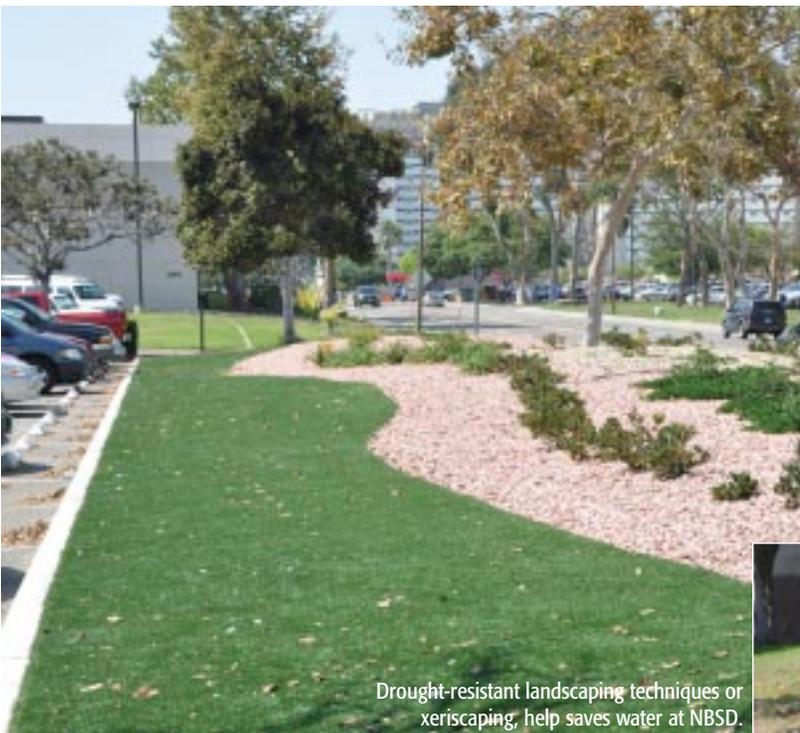


Artificial turf and xeriscaping in front of Building 72 on NBSD.

For More Info

XERISCAPING INVOLVES THE growth and cultivation of drought-resistant vegetation. For more insights into the use of xeriscaping, see our article entitled, "Pearl Harbor Navy Exchange Employs Practical Landscape Design: Xeriscaping to Help Region Meet Water Reduction Mandates" in the spring 2009 issue of *Currents*. You can browse the *Currents* archive and subscribe to the magazine via the Naval Air Systems Command's environmental web site at www.enviro-navair.navy.mil/currents. Visit the magazine pages on Facebook and Twitter by searching for "US Navy Currents."





Drought-resistant landscaping techniques or xeriscaping, help save water at NBSD.

conservation process. We had a great result last year of almost an 11.5 percent reduction and we want to continue to aggressively reduce our water footprint and save taxpayer dollars.”

Some of the creative initiatives completed by NBSD in 2008 include an artificial turf and xeriscape project, which is estimated to save 2.17 million gallons a year, and the installation of 104 waterless urinals with an anticipated savings of 2.8 million gallons annually. Additionally, the first phase of smart irrigation controllers and the replacement of showerheads in the barracks with 1.5 gallon/minute low-flow fixtures have saved an estimated 7.3 million gallons of water annually.

Another innovative project undertaken in 2008 was an irrigation water audit. Dennis Brazell, NBSD’s Resource Efficiency Manager, began to study irrigation needs and patterns base-wide. “We were trying to find unique ways to reduce water on NBSD. We knew irrigation was a major water consumer. In order to evaluate NBSD’s water usage and determine how to irrigate in the most efficient manner, we secured it and monitored it on a day-to-day basis for 18 days.” This project allowed NBSD to reset the watering schedule, reduce usage by 40 percent and save an estimated 16 million gallons of water and over \$80,000 dollars annually.

As of July 2009, NBSD has reduced its water irrigation usage by 34.3 percent from last year, saving over 15.5 million gallons of water, leading the irrigation reduction in the San Diego Metro area. This is a direct result of the water audit, the installation of irrigation controllers, artificial turf and xeriscaping.

Current water conservation initiatives on NBSD’s plate for 2009 include the second phase installation of smart irrigation controllers and the installation of one-pint low-flow urinals estimated to save 17.4 million gallons of water annually. The planned projects for 2010 through 2012 include eight artificial turf and xeriscape projects and washing machine upgrades to energy-efficient models, both saving over 2 million gallons of water a year.



Located on NBSD, this CalSense irrigation controller was installed as a part of the water conservation effort.

NBSD personnel continue to take the water reduction initiative seriously, and even with the successes the base has had so far, there is more to do. “We are doing a great job, but I know there is more we can do,” explains Williamson. “The water crisis isn’t going away anytime soon. As good stewards of the environment, we want to continue to lead the way and think of innovative ways to be green.” ♣

Photos by Maile Baca

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NETWARCOM Cuts Travel Costs, Saves Environment

Sanctioned Vanpool Helps With Traffic Mitigation

DEPARTMENT OF THE Navy (DoN) employees at Naval Network Warfare Command (NETWARCOM) made the choice to save money by participating in an innovative program that can reduce traffic and help the environment.

The Transportation Incentive Program (TIP) offers active-duty Sailors, Marines and DoN civilian employees vouchers to purchase monthly public transportation passes. The vouchers can also be used toward other transportation services, such as vanpools or commuter trains.

“I made the initial inquiry into TIP and the other five members saw it as a ‘no brainer’,” said Karen Barnett, management analyst with NETWARCOM’s Force Manpower and Personnel directorate. “Saving money, helping with traffic mitigation and cutting down on environmental pollution are the biggest benefits of the program.”

Barnett was concerned at first as to whether or not she could find enough people to join her vanpool, but once she leased the seven-passenger van from Hampton Roads Transportation (HRT), she was able to fill it up within days.

Barnett said the process was fairly simple. She completed a TIP form and rented a van through her supply department, the Commanding Officer of Naval Amphibious Base Little Creek, Naval Base Norfolk, and then the Department of Transportation in Washington.

“I think most people feel a bit apprehensive about starting such a program, because of pick-up and drop-off points, but once they find out that they receive a reimbursement check from the government (up to \$115 a month per person) the savings sink in.”

Ruth Fox, a paralegal in NETWARCOM’s Force Judge Advocate’s office, said she saves money on gas and keeps the mileage down on her car. “It takes a little longer to get to work, but I think it’s worth it,” said Fox.

TIP has a few strings attached, such as:

- Riders must travel 11 out of 21 consecutive workdays to receive their checks.
- Reimbursement checks are paid quarterly and total \$345.
- There can be no more than a \$250 “total” surplus in the account (which is set up by the leaser to handle expenses).



Six NETWARCOM employees are participants in the TIP in the Hampton Roads area. MCI(SW/AW) Corey T. Lewis

“We put 87 miles a day on the van,” said Barnett. “Each of us has saved so much with TIP—from the leasing costs, which include maintenance and insurance, to gasoline and wear and tear on our personal vehicles. Now our personal vehicles are only used for personal trips.”

Her present costs include \$237 per month to lease the van, an 11 cent per mile fee, plus the cost of gas.

Barnett gets on the road at 5:50 a.m. from Moyock, NC, and picks up her last passenger in the Greenbrier area of Chesapeake, VA, arriving at work by 7 a.m. She completes a daily log, which includes mileage, time on the road, gas receipts and a record of passengers. The group departs work at around 3:30 p.m. and Barnett pulls up to her front door at around 4:30 p.m., repeating the log entries at the end of her day.

The pick-up and drop-off points are similar to that of a school bus—within walking distance of one’s home. And should the primary driver be off, there are alternates. “If for any reason—be it an emergency or someone having to

stay late at work—there are alternate means of transportation available,” explained Barnett.

HRT has a “Guaranteed Ride” program to prevent anyone from being stranded. Up to four times per month, participants can call for a ride for a charge of three dollars. And, if this is not enough of an incentive to use TIP, all participants can earn gift cards through NuRide and affiliated businesses. (Note: NuRide is the nation’s first rideshare network that rewards riders for sharing rides. For more information, visit www.nuride.com.)

“In the end, it’s all about commitment to the program,” concluded Barnett. “You only get out of it what you put into it. Maximum participation in TIP earns maximum rewards in savings.”

Different variations of TIP are available in all 50 states, Guam, Puerto Rico and the U.S. Virgin Islands. The program began as part of the Transportation Equity Act of the 21st Century.

To sign up for this program, contact a local base representative or go online at www.fmo.navy.mil/services/tip/tip.htm to complete and submit a TIP application form. The enrollment process takes about one month. ↴

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Currents Web Page HAS NEW LOOK & FEEL

Visit NAVAIR’s Environmental Web Site to View & Download Past Issues

The *Currents* web page on the Naval Air Systems Command’s environmental web site has a new look and feel—sleeker and easier to use than its predecessor. Visit www.enviro-navair.navy.mil/currents for direct access to the most recent issue of *Currents* and to subscribe to the magazine. Past issues back to and including our winter 2001 issue are also available for browsing and downloading.



Decision Tree Helps Aircraft Maintainers Pick the Right Compound

Flow Chart for Corrosion Preventative Compounds Now Available in Aircraft Maintenance Manual

ENGINEERS FROM THE Naval Air Systems Command (NAVAIR) have developed a process flow chart—called the “CPC Decision Tree”—to be used as a reference guide to help aircraft maintainers identify and select the right Corrosion Preventative Compound (CPC) for a specific purpose.

It is very important that aircraft maintainers use CPCs to protect the metal in aircraft. There are thousands of CPCs to choose from, each serving a unique purpose. Due to the environment in which the Navy and Marine Corps operate, CPCs are extremely important in keeping the aircraft fleet ready for tasking.

The CPC Decision Tree is an interactive flow chart that requires the user to know and be familiar with the function of the part/component. Then, depending on the functionality, the flow chart recommends a CPC for a particular application. The CPC Decision Tree was implemented via

Interim Rapid Action Change #1 to the NAVAIR 01-1A-509-2 Aircraft Cleaning and Corrosion Control Manual (the “509 manual”) in October 2007.

Aviation Electrician’s Mate Chief Raybourn Nutter from Fleet Training explained, “Often aircraft manuals will direct an aircraft maintainer to ‘apply CPCs’ without specifying a particular product. The CPC Decision Tree is a simple and easy-to-use tool that helps the maintainer to quickly determine the correct CPC to apply in these situations.”

“The CPC Decision Tree was developed to be a quick reference to help the maintainer determine the proper CPC when no specific CPC is called out. The culture of using more CPC will start to change as more attention is placed on them, and that culture change will help prolong the life of the aircraft,” said Donald Beasley, Senior Materials Technologist at Navmar Applied Sciences Corporation.

CPCs are used to preserve and protect metal aircraft parts against corrosion. These materials can prevent new corrosion from forming as well as suppress corrosion areas where the original protective coating has degraded. Also, they are a relatively quick and inexpensive way of protecting against corrosive environments. CPCs function by preventing corrosive materials from contacting and corroding bare metal surfaces. Many of these compounds are also able to displace

BE PART OF OUR SUMMER ISSUE

Submissions Are Due by 23 April

We’re already planning our summer 2010 issue. And you can be a part of it! If you have a story that you want us to consider, you need to submit your final text and images by 23 April 2010.

We look forward to reading your stories about all the great work you’re doing as the Navy’s stewards of the environment.

The power of your experiences is even greater when you share them with our readers.

Your chances of being published in *Currents* are dramatically increased if you follow our article template. Simply request this easy-to-use template by sending an email to Bruce McCaffrey, our Managing Editor, at brucemccaffrey@sbcglobal.net. Bruce is available at 773-376-6200 if you have any questions or would like to discuss your story ideas.

Currents Deadlines

Summer 2010 Issue: Friday, 23 April 2010
 Fall 2010 Issue: Friday, 23 July 2010
 Winter 2011 Issue: Friday, 22 October 2010
 Spring 2011 Issue: Friday, 21 January 2011

You can also refer to your *Currents* calendar for reminders about these deadlines.



water and other contaminants, and some provide lubrication as well as corrosion protection. Thicker CPCs provide the best corrosion protection, are longer lasting, but are more difficult to remove. Thinner materials provide some lubrication and do not crack, chip, or peel but must be removed and replaced regularly to provide continuing protection.

The aircraft industry has used CPCs for many years as a means of protecting metallic surfaces against corrosion, thus extending the life of the aircraft structure. CPC treatments provide an extra layer of protection and are often recommended in maintenance manuals as a way to help prevent the onset of corrosion in specific areas of the aircraft. Corrosion prevention and control is a regular part of the scheduled maintenance cycle, occurs during unscheduled maintenance and is used to stop corrosion that has already begun.

“Corrosion control improves operational readiness and minimizes costly repairs,” said Louise Nicoloff, Senior Materials Engineer at NAVAIR North Island and the technical point of contact for the 509 manual.

Corrosion prone areas of aircraft include fasteners, two connecting metal surfaces, crevices, flat and slat recesses, wing fold joints, hinges, relief tube areas, water entrapment areas, bilge areas and electrical connectors. CPCs are effective only if no moisture, dirt or active corrosion is present. Therefore, the surface must be thoroughly clean and dry before applying the material. Because of their temporary nature, CPCs must be regularly removed and reapplied to provide continuing corrosion protection. Refer to the 509 manual for recommended time intervals for interior and exterior outdoor CPC application.

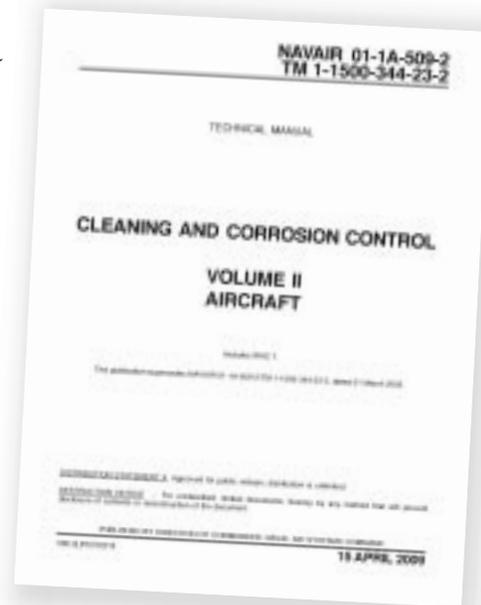
CPCs are separated into two categories: water displacing and non-water displacing materials. Water displacing CPCs can be used to remove water, sea water, or other electrolytes present on metal surfaces, leaving behind a corrosion inhibiting film to provide corrosion protection. They are usually very thin coatings and are clear or translucent. MIL-PRF-81309, MIL-DTL-85054 and MIL-PRF-32033 are examples of water displacing CPCs that have been qualified to the appropriate military specification. Most water displacing compounds (except MIL-DTL-85054) are soft, oily compounds which cannot provide long term protection outdoors or in areas that are frequently handled. These CPCs are able to penetrate into cracks, crevices, voids in faying edges, around fastener heads and into hinges.

Non-water displacing CPCs may be used on dried surfaces or on surfaces which have been first treated with a water

displacing CPC. MIL-PRF-16173 Grades 1, 2 and 4 are examples of non-water displacing CPCs. They are heavier oils or greases which provide long term corrosion protection. These CPCs provide thicker coatings and are light brown to very dark brown in color with a tack-free, waxy, greasy appearance. They provide good corrosion protection in areas where large amounts of water collect and during long term storage.

Application of CPCs is as easy as brushing, dipping, fogging, and spraying. The area of application, viscosity of the material and conditions under which they need to be applied are factors that determine which method of application is most suitable. Low viscosity materials are best applied by spraying or fogging, whereas high viscosity materials are more suited for brushing or dipping. Spraying with aerosol cans is convenient and the most popular method of applying CPCs. The spraying method is very effective for application to large areas and where confinement is not a problem. Most of the recommended CPC materials are available in the aerosol can unit of issue.

The CPC Decision Tree is found in chapter 8 of the 509 manual and reproduced on the following pages for your convenience. The manual can be accessed through the Naval Air Technical Data and Engineering Service Command web site at <https://www.natec.navy.mil> using a Common Access Card and password. 

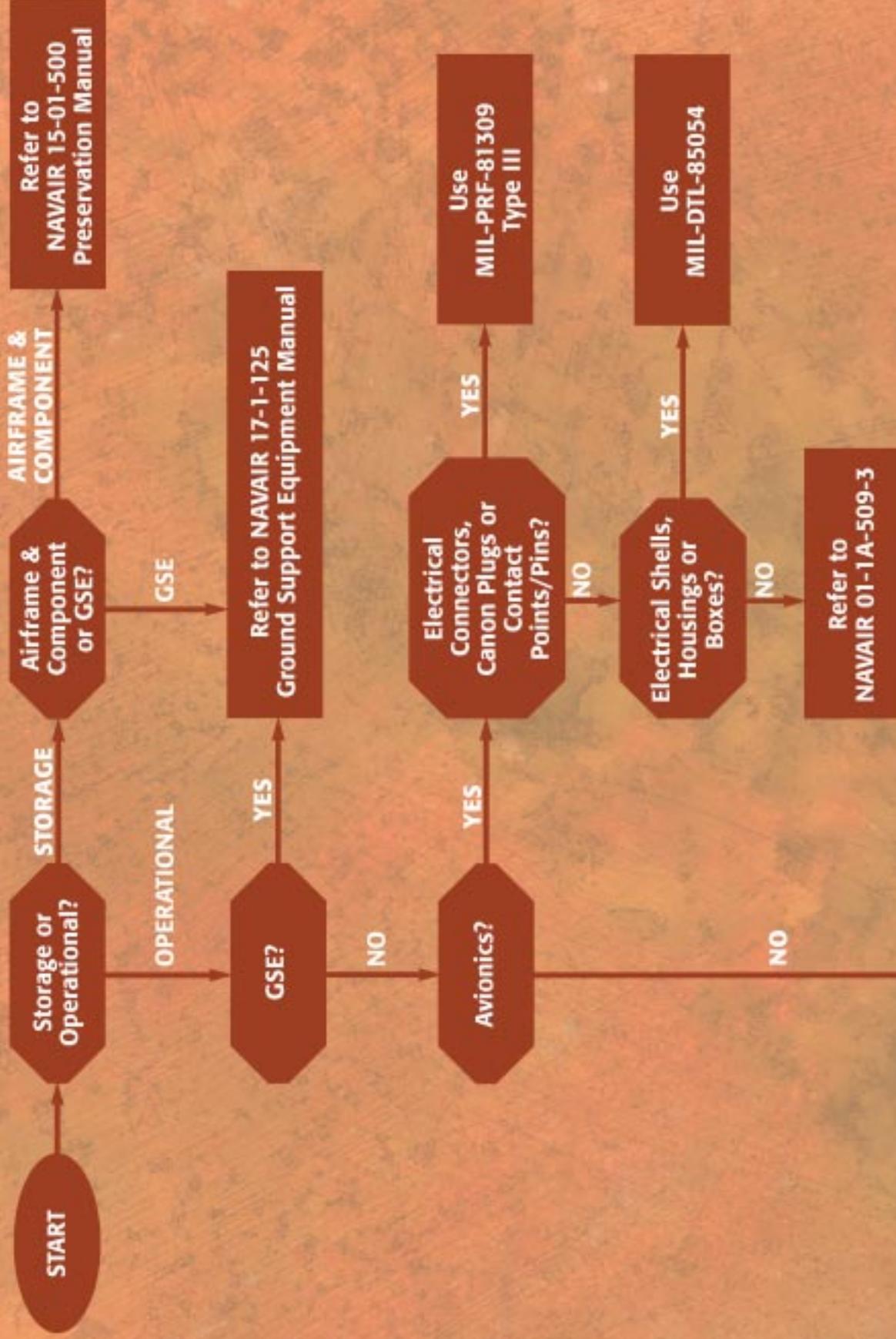


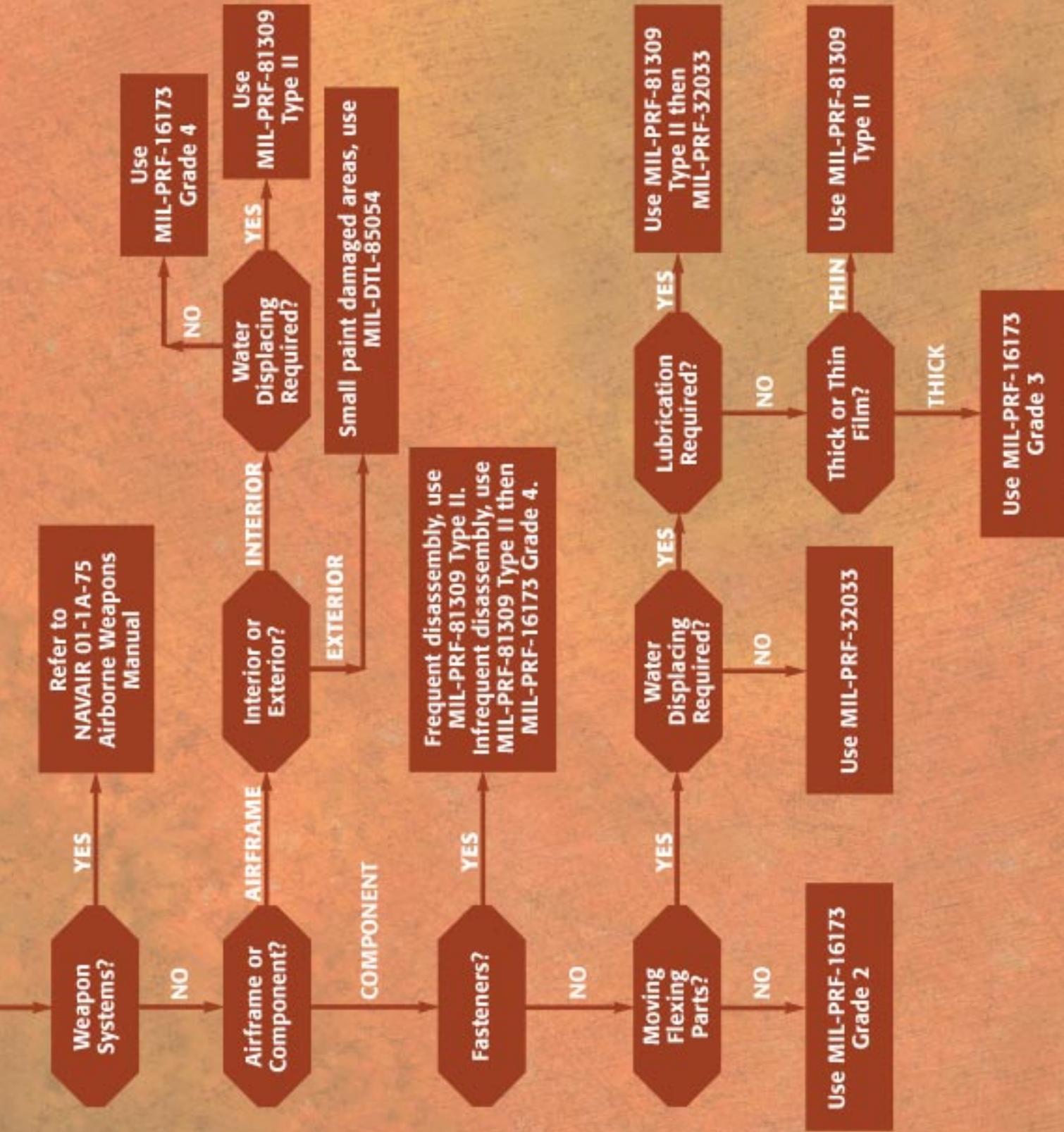
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CPC Decision Tree





Common Errors to Avoid in EPCRA Reporting

Reporting Deadlines Approaching

EMERGENCY PLANNING AND

Community Right-to-Know Act (EPCRA) reporting deadlines are fast approaching, and now is the time for installations to begin preparations for calendar year (CY) 2009 reporting requirements. As a result of errors in prior reporting, Navy installations now face greater scrutiny from the Navy, Department of Defense (DoD), the public and the U.S. Environmental Protection Agency (EPA) on the information they report.

Reviews of submitted reports and forms often find issues with overlooked or misunderstood sections of EPCRA, especially Sections 302 and 311, or poorly documented application of exemptions (e.g., batteries under Section 312). Navy personnel should understand all EPCRA reporting requirements and be familiar with DoD and Navy policy. Accurate reporting and concise documentation may avoid compliance issues in the future.

EPCRA Hot Topics & Common Errors

A review of Toxic Release Inventory (TRI) submissions identified a number of hot topics and common errors in EPCRA reporting which require additional attention when preparing EPCRA reporting submissions.

1. Batteries

Batteries exempted under Sections 312/313 as consumer products are NOT exempt from Section 302 reporting as there is no consumer product exemption under Section 302. Therefore, sulfuric acid in batteries must be included in a threshold planning quantity calculation to determine if reporting under Section 302 is required.

2. Section 311 Updates

Although Section 311 reporting is a one-time submission, increases in the amounts of hazardous chemicals present at the installation or new chemicals exceeding thresholds may require an update of the Section 311 submittal. At a minimum, installations can compare their most recent Section 311 submittal to their Tier II report when completed for CY 2009. Since the same hazardous chemicals are reported under Section 311 and 312, the submittals should match. If the Section 311 submittal is missing a hazardous chemical reported on the Tier II, then an update is required.

3. Non-hazardous Wastes

Non-hazardous wastes such as used oil in tanks and wastes stored on-site prior to being sent off-site are often overlooked in Section 311 and 312 compli-

ance efforts. Non-hazardous wastes may require Material Safety Data Sheets (MSDS) under the Occupational Safety and Health Act (OSHA) and would be considered hazardous chemicals under Sections 311 and 312. Only hazardous wastes are excluded from the OSHA MSDS requirements. Work with your safety organization to determine if an MSDS is required.

4. Ranges

Ranges that are adjacent to, contiguous with, or wholly encompassed by a facility are considered part of the facility for purposes of Section 313 and are included in facility Section 313 threshold determinations. For example, if a facility has an adjacent outdoor small arms range that uses lead in munitions fired, and the facility also uses lead in non-exempt equipment maintenance activities, the threshold determination for lead is based on the lead from the non-range activities PLUS the lead used in the range activities because it is all part of a single facility. If reporting is triggered, two Form Rs must be prepared for toxic chemicals that are released from both the installation (non-range) and range activities. One Form R would be completed for lead where the facility name is given to include the installa-

tion (or non-range activities) and a second Form R would be completed where the facility name is given to include ranges (or range activities). In both cases, the Form R would identify the report as being for “Part of the facility” and for “A federal facility” in Part I, Section 4.2.

5. Reporting Releases of Exempt Toxic Chemicals

Once a toxic chemical is exempted from Section 313, it is exempt from BOTH threshold calculations and release estimates even if the toxic chemical triggers reporting based on other non-

exempt activities at the installation. For example, batteries exempted under motor vehicle maintenance or as an article are not included in threshold calculations AND are not reported on the Form R (e.g., do not report a transfer off-site for recycling) if reporting is triggered for a toxic chemical in the battery. As another example,

the amount of fuel issued to non-transient motor vehicles is exempt; therefore, the releases from these fuel transfers to the vehicles are also exempt. In contrast, fuel issued to non-motor vehicle Aerospace Ground Equipment (AGE) is otherwise used; therefore, these releases from these fuel transfers to AGE are also NOT exempt

and must be estimated and included on Form R if reporting is triggered.

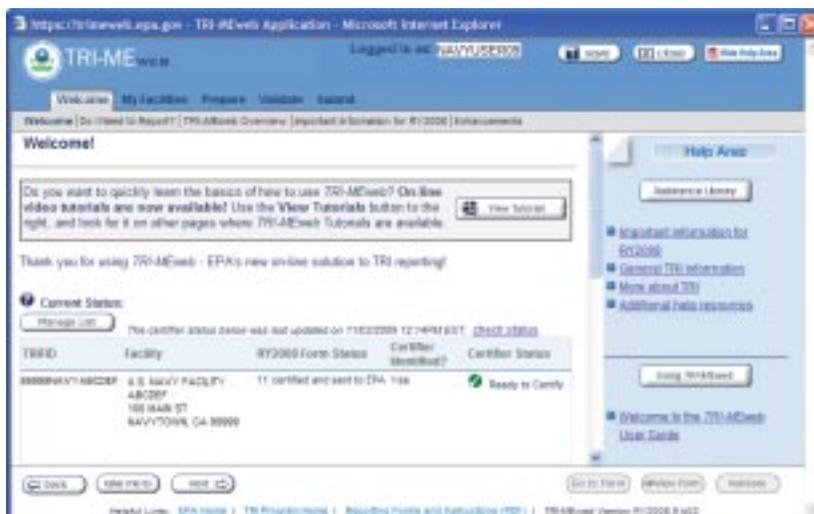
6. Certifying Official

The Certifying Official should establish his/her own account (i.e., username and password) in Toxics Release Inventory-Made Easy (TRI-MEweb) as soon as possible. Once the account is established, the person entering the Form Rs for the installation must enter the name and e-mail address for the Certifying Official. TRI-MEweb will then post a message to the Certifying Official within their TRI-MEweb mailbox notifying them that they have been nominated and that they must complete and mail an enclosed certification form to EPA. The Certifying Official is the only person that will receive this message. The Certifying Official must print and review the provided form, sign the form, and mail it to EPA at the provided address. Once received by EPA, the



Hazardous materials storage.

Courtesy of Navy Other Accrued Environmental Liabilities Program



TRI-ME Welcome Page.

EPCRA Sections

EPCRA CONTAINS FIVE major sections, each of which covers different chemicals, thresholds, exemptions and reporting requirements.

1. Section 302—Emergency Planning Notification

One-time notification letter indicating a listed Extremely Hazardous Substance (EHS) is present above its Threshold Planning Quantity (TPQ) and identifying the facility emergency coordinator.

2. Section 304—Emergency Release Reporting

Immediate verbal notification to the State Emergency Response Commission, Local Emergency Planning Committee and the National Response Center, of a release to the environment of an EHS or Comprehensive Environmental Response, Compensation and Liability Act hazardous substance above its Reportable Quantity with written follow-up.

3. Section 311—MSDS or List Reporting

One-time submission of MSDSs (or a list, grouped by hazard category) of all hazardous chemicals stored in quantities above 10,000 pounds. If the hazardous chemical is an EHS, the threshold is the lower of 500 pounds or the TPQ.

4. Section 312—Hazardous Chemical Inventory Reporting (Tier II)

Annual submission, due 1 March, of Tier II or state equivalent form for all hazardous chemicals (including EHSs) that exceed EPCRA Section 311 thresholds.

5. Section 313—Toxic Chemical Release Reporting (Form R)

Annual submission, due 1 July, of Form R report for all listed toxic chemicals that exceed activity thresholds. The activity-specific thresholds are:

- Manufacture (including import)—25,000 pounds/year,
- Process—25,000 pounds/year,
- Otherwise use—10,000 pounds/year, or
- Chemical-specific thresholds for Persistent Bioaccumulative Toxic (PBT) chemicals—range from 0.1 grams/year for dioxins to 100 pounds/year for lead, lead compounds and other listed PBT chemicals.

original signature is maintained on file and the Certifying Official status is shown as APPROVED within TRI-MEweb. Once the Certifying Official is approved in TRI-MEweb, the Form Rs may be submitted. The Certifying Official and Technical Contact will receive an e-mail that the Form Rs are ready for certification. The Form Rs are not considered submitted until they are certified. The only time to wait to establish a Certifying Official is when a change in personnel is anticipated prior to the reporting deadline. The closer to the reporting

deadline, the longer it may take for approval to be granted due to the volume of requests.

7. Transient Fuels

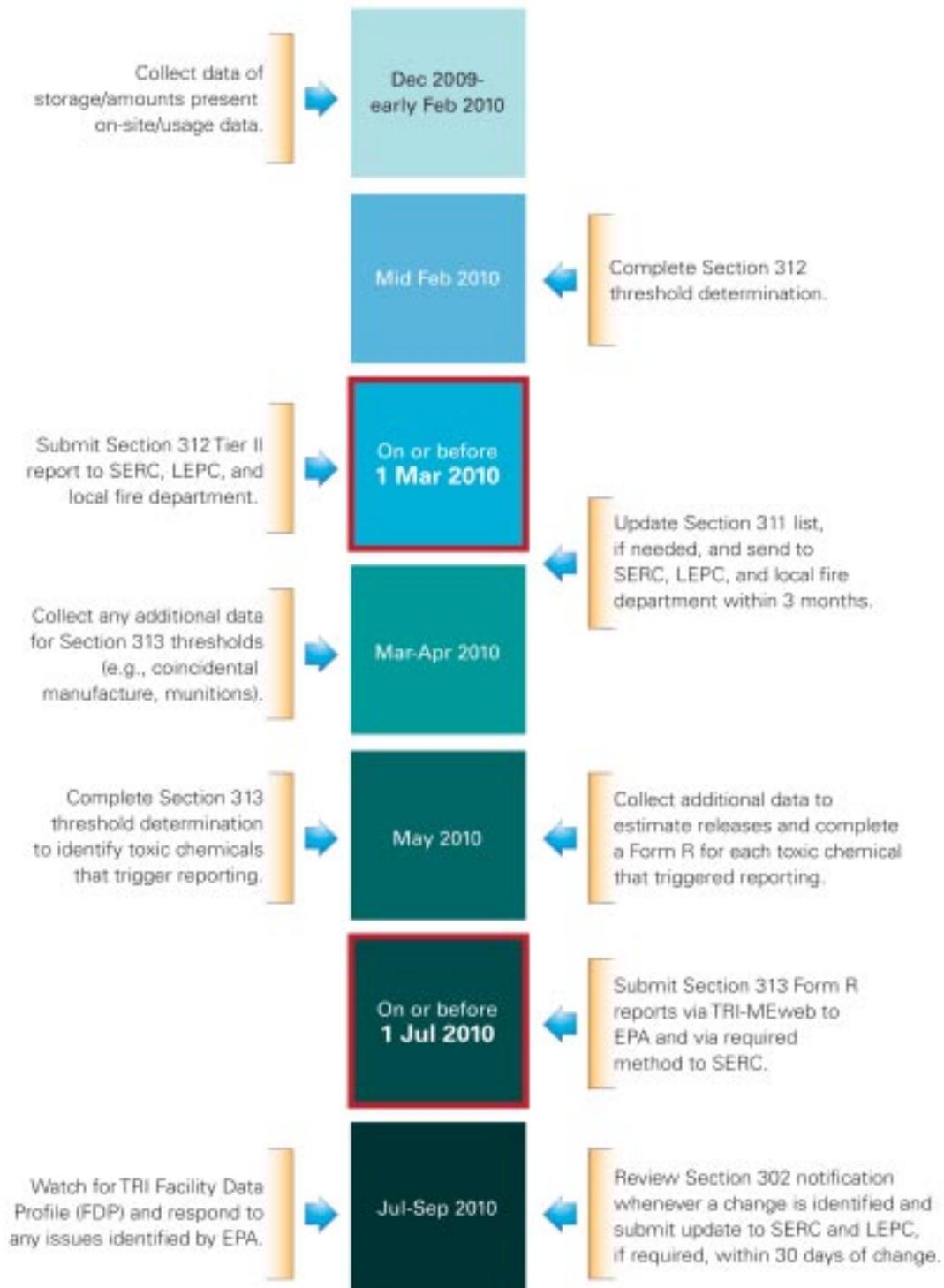
The term 'transient' means one thing under Section 313 (a vehicle at the installation for fueling purposes only; does not include vehicles for any other mission-related purposes such as training, supplies, or troop deployment) and another thing to Fuels personnel (any vehicle not based at the installation). Fuel amounts provided for mission-related activities

versus gas-n-go stops should be clearly documented.

EPCRA Training Opportunities & Resources

The Naval Civil Engineer Corps Officers School (CECOS) conducted refresher courses on EPCRA Sections 311/312 (on 7 January 2010 and 14 January 2010) and will hold EPCRA Section 313 refresher courses (on 10–11 March 2010 and 17–18 March 2010). Additional EPCRA resources include the Navy's EPCRA Helpline (NavyEPCRA@urscorp.com) which

RY 2010 EPCRA REPORTING TIMELINE



**Compile and complete all EPCRA documentation for the reporting year as soon as practicable following submittals.*

Andrea Snyder



Smokey Sam rocket is shot off in support of Operation Desert Talon 2006.
Lance Cpl Cory Tepfenhart

New Executive Order Expands Environmental Requirements

EXECUTIVE ORDER (EO) 13514, "Federal Leadership in Environmental, Energy, and Economic Performance, issued on 5 October 2009, builds on and expands the energy reduction and environmental requirements of EO 13423 and promotes pollution prevention and waste reduction. This new EO sets several reduction targets, including 50 percent recycling and waste diversion by 2015 and 30 percent reduction in vehicle fleet petroleum use by 2020. It also re-emphasizes the language included in EO 13148 of "reducing and minimizing the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of..."

is staffed by the CECOS Navy EPCRA training instructors from URS Corporation. EPCRA questions may be emailed to the helpline and a response or request for more information or discussion will be sent by the next business day. The Navy also maintains an EPCRA email list used by the Chief of Naval Operations to distribute EPCRA information such as announcements and reporting deadline reminders. To join, Navy personnel should send an email to NavyEPCRA@urscorp.com with 'Navy EPCRA e-mail list' in the subject line.

Calculation Manual Revamped

The Navy is updating the EPCRA Calculation Manual to provide guidance in developing information/calculations required for EPCRA reporting

for several common activities to Navy installations (e.g., batteries, nitrates). The update is expected in time for CY 2009 EPCRA reporting. The calculation manual will serve as a companion guide to "Getting Started with The Emergency Planning and Community Right-to-Know Act (EPCRA)" which can be obtained by contacting the Navy EPCRA Helpline at NavyEPCRA@urscorp.com. [↓](#)

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Developments of Interest: July to October 2009

THIS ARTICLE HIGHLIGHTS significant environmental regulatory changes and indicators suggesting future changes to the regulatory landscape.

The U.S. Environmental Protection Agency (EPA) has proposed new thresholds for greenhouse gas (GHG) emissions that define when Clean Air Act (CAA) permits under the Prevention of Significant Deterioration (PSD) and Title V operating permit programs would be required for new or existing emission sources. The proposed thresholds would “tailor” the permit programs to reduce the number of facilities that would be required to obtain PSD and Title V permits while still covering nearly 70 percent of the national GHG emissions from stationary sources. EPA’s position is that this proposal is necessary because the rules EPA is developing under the CAA to control GHG emissions from light-duty vehicles will trigger PSD and Title V applicability requirements for GHG emissions.

The PSD program is intended to prevent new or modified emission sources from contributing to degradation in air quality by requiring an analysis of the potential impact from increased air emissions and application of Best Available Control Technology. The Title V permit program consolidates all applicable CAA requirements for a facility into a single permit. The CAA specifies PSD major source applicability thresholds at 250 tons per year (tpy) for a “regulated pollutant” on a potential to emit basis for most sources, or 100 tpy for specified source categories. The Title V applicability threshold is 100 tpy for most sources but it can be as low as 10 tpy depending on the particular section of the CAA where the pollutant is regulated.

If the 250 or 100 tpy levels were applied to GHG emissions, millions of small stationary sources would be subject to PSD and Title V permitting, creating an unmanageable administrative burden for regulatory agencies with little environmental benefit. Therefore, EPA has indicated that their proposed rule

would provide regulatory relief by establishing an initial (Phase 1) applicability threshold at 25,000 tpy carbon dioxide (CO₂) equivalent levels, and significance levels (for major modifications) between 10,000 and 25,000 tpy CO₂-equivalent levels. EPA selected these thresholds by analyzing various industrial sectors and estimating the additional permitting workload that would be placed on the regulatory agencies. Phase 2 of the rulemaking, which EPA may propose after five years, would potentially revise the applicability and significance thresholds.

The CAA Services Steering Committee reviewed the proposed rule and provided comments that were submitted to EPA by the Deputy Assistant Secretary of the Navy-Environment (DASN(E)). DASN(E) is the Department of Defense’s (DoD) executive agent for the CAA. Once the rule is promulgated as final, all sources will need to work with their regulator to determine the impact of the rule on current and future CAA permitting. The promulgated rule may differ significantly from the proposal, based on the comments received from the public.

Visit <http://edocket.access.gpo.gov/2009/E9-24163.htm> to read the proposed rule and <http://www.epa.gov/climatechange/initiatives/index.html> for other proposed and final EPA regulatory initiatives related to GHGs.

Additional regulatory and environmental news items of interest (July to October 2009) include the following:

Greenhouse Gases

Executive Order 13514—Federal Leadership In Environmental, Energy, and Economic Performance

For a detailed summary see:

http://www.p2sustainabilitylibrary.mil/p2_documents/EO13514reqsum.doc

<http://edocket.access.gpo.gov/2009/E9-24518.htm>

Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards [Proposed Rulemaking] (06-October-09)

<http://edocket.access.gpo.gov/2009/E9-24159.htm>

Easy Access

FOR EASY AND direct access to many of the web addresses included in this regulatory summary, select the “Digital Currents” button from the *Currents* page on the Naval Air Systems Command’s environmental web site at www.enviro-navair.navy.mil/currents.



EPA Mandatory Greenhouse Gas Reporting Rule [Final Rule] (22-September-09)

In advance of formal publication in the Federal Register, EPA released the text:

<http://www.epa.gov/climatechange/emissions/ghgrule-making.html>

EPA Renewable Fuels—Lifecycle of Greenhouse Gas Emissions Analysis (05-August-09)

<http://www.epa.gov/otaq/renewablefuels/420f09024.htm>

Air

Power Plants to Face New Air Pollution Control MACT Rules (EPA Signs Consent Decree) (23-October-09)

<http://online.wsj.com/article/SB125631670552304223.html>

Emissions Factors Program Improvements (14-October-09)

<http://edocket.access.gpo.gov/2009/E9-24684.htm>

PM 2.5 Nonattainment Areas Designated [Notice] (08-October-09)

<http://yosemite.epa.gov/opa/admpress.nsf/0/C7EA2F8196F225748525764900706D2F>

Pollutants Covered by the Federal PSD Permit Program—Reconsideration [Proposed Rulemaking] (07-October-09)

<http://edocket.access.gpo.gov/2009/E9-24196.htm>

Hospital/Medical/Infectious Waste Incinerators: Standards of Performance for New Stationary Sources and Emissions Guidelines [Final Rule] (06-October-09)

<http://edocket.access.gpo.gov/2009/E9-22928.htm>

Federal 2nd Circuit Court Reinstates Suit of Eight States vs. Five Largest U.S. Utilities over CO₂ Emissions (21-September-09)

Full text of the decision is available at:

<http://climateprogress.org/wp-content/uploads/2009/09/CTvAEP.pdf>

<http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE58K4VT20090921>

Primary National Ambient Air Quality Standard for Nitrogen Dioxide—Revised [Proposed Rulemaking] (15-July-09)

<http://edocket.access.gpo.gov/2009/E9-15944.htm>

Court Rejects Regional Ozone Cap and Trade Provisions of 8-Hour Ozone NAAQS (10-July-09)

Text of the decision is available at:

http://www.earthjustice.org/library/legal_docs/ozone-court-opinion.pdf

Water

Drinking Water; Perchlorate Supplemental Request for Comments [Notice] (23-September-09)

<http://edocket.access.gpo.gov/2009/E9-22927.htm>

Drinking Water—Emerging Contaminant Sampling Program (18-September-09)

Participating large water providers must sample for chemicals such as pharmaceuticals, personal care products, detergents and endogenous hormones.

<http://edocket.access.gpo.gov/2009/E9-22569.htm>

Preliminary Notice of Total Maximum Daily Load Development for the Chesapeake Bay (17-September-09)

<http://edocket.access.gpo.gov/2009/E9-22410.htm>

Airport Deicing; Effluent Limitation Guidelines and New Source Performance Standards [Proposed Rulemaking] (28-August-09)

<http://edocket.access.gpo.gov/2009/E9-20291.htm>

Coast Guard Standards for Living Organisms in (Commercial) Ships' Ballast Water [Proposed Rulemaking] (28-August-09)

<http://edocket.access.gpo.gov/2009/E9-20312.htm>

Energy

California to Increase Renewable Energy Portfolio Share to 33 Percent by 2020 (15-September-09)

<http://gov.ca.gov/press-release/13273/>

Energy Conservation Standards for Refrigerated Bottled or Canned Beverage Vending Machines Final Rule (31-August-09)

<http://edocket.access.gpo.gov/2009/E9-19392.htm>

EPA Renewable Fuel Standard Program Changes; Expert Peer Review (17-August-09)

<http://edocket.access.gpo.gov/2009/E9-19466.htm>

Arizona Renewable Energy Portfolio Standard Upheld (21-July-09)

The Arizona state Supreme Court threw out a lawsuit challenging the state's renewable electricity portfolio standards.

<http://www.azcentral.com/business/articles/2008/09/24/20080924biz-goldwater0924.html>

Health & Safety

EPA to Review Lead Dust Hazard Standards and Lead Paint Definition [Notice] (22-October-09)

<http://www.epa.gov/oppt/chemtest/pubs/petitions.html>

Occupational Safety and Health Administration
Combustible Dust; Proposed Rule [Proposed Rulemaking,
Advanced Notice] (21-October-09)

<http://edocket.access.gpo.gov/2009/E9-25075.htm>

Peer Review Draft Toxicity Equivalency Factors, Dioxin &
Dioxin-Like Compounds (16-October-09)

The draft guidance document is available at:

http://www.epa.gov/raf/files/hhtef_draft_082709.pdf

<http://edocket.access.gpo.gov/2009/E9-24926.htm>

Exposure Factors Handbook: 2009 Update
(07-October-09)

[http://oaspub.epa.gov/eims/eimscomm.getfile?](http://oaspub.epa.gov/eims/eimscomm.getfile?p_download_id=492239)

[p_download_id=492239](http://oaspub.epa.gov/eims/eimscomm.getfile?p_download_id=492239)

<http://edocket.access.gpo.gov/2009/E9-24189.htm>

Guidance to Communities on Polychlorinated Biphenyls
in Caulk of Buildings—Between 1950 and 1978 [Notice]
(25-September-09)

[http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/28c8384eea0e67ed8525763c0059342f!](http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/28c8384eea0e67ed8525763c0059342f!OpenDocument)
OpenDocument

Updating Occupational Safety and Health Administration
Personal Protective Equipment Standards Based on
National Consensus Standards [Final Rule]
(09-September-09)

<http://edocket.access.gpo.gov/2009/E9-21360.htm>

Recommended Toxicity Equivalency Factors for Human
Health Risk Assessments of Dioxin and Dioxin-Like
Compounds (02-September-09)

<http://edocket.access.gpo.gov/2009/E9-21194.htm>

Carbon Nanotubes; Withdrawal of Significant New Use
Rules [Notice] (21-August-09)

<http://edocket.access.gpo.gov/2009/E9-20150.htm>

Deaths, Lung Damage Linked to Nanoparticles in China
[Notice] (19-August-09)

<http://www.nanowerk.com/news/newsid=12209.php>

Planning Guidance for Recovery Following Biological
Incidents [Notice, Guidance] (17-August-09)

The guidance is available at:

<http://edocket.access.gpo.gov/2009/E9-19688.htm>

Acetylene Standard; Revision [Final Rule] (11-August-09)

<http://edocket.access.gpo.gov/2009/E9-18644.htm>

Materials

Green Products Compilation Available from Federal
Environmental Executive Office [Notice] (30-September-09)

[http://www.fedcenter.gov/Documents/index.cfm?id=](http://www.fedcenter.gov/Documents/index.cfm?id=11767&page_id=1854)

[11767&page_id=1854](http://www.fedcenter.gov/Documents/index.cfm?id=11767&page_id=1854)

Consideration of Electronic Data Sharing in Lieu of Paper
Hazardous Materials Shipping Documents [Meeting]
(08-September-09)

<http://edocket.access.gpo.gov/2009/E9-21415.htm>

Ordinary Glass Wool Fibers Not Recommended for Listing
as Carcinogenic [Notice] (12-August-09)

<http://edocket.access.gpo.gov/2009/E9-19329.htm>

Voluntary Labeling Program for Bio-based Products
[Proposed Rulemaking] (31-July-09)

<http://edocket.access.gpo.gov/2009/E9-17610.htm>

Other

EPA to Develop Preliminary Remediation Goals for Dioxin
in Soil [Notice] (16-October-09)

[http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/5f8b4675ae8772a385257650005b51f5!](http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/5f8b4675ae8772a385257650005b51f5!OpenDocument)

[OpenDocument](http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/5f8b4675ae8772a385257650005b51f5!OpenDocument)

Vessel & Facility Response Plans for Oil; 2003 Removal
Equipment Requirements & Alternative Technology
Revisions [Final Rule] (31-August-09)

<http://edocket.access.gpo.gov/2009/E9-20311.htm>

Lead Wheel Balancing Weights; Toxic Substances Control
Act Section 21 Petition to Prohibit Manufacture
(15-July-09)

<http://edocket.access.gpo.gov/2009/E9-16815.htm>

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NFESCRegulatorySupportDesk@navy.mil. 

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Quantum Change in Environmental Compliance in Naval Region Europe

New EMS Simplifies Procedures

IMAGINE TRYING TO keep your installation in compliance with environmental regulations with a staff that has very little corporate knowledge, multiple sets of rules and the expectation that environmental regulators are unlikely to conduct inspections.

That's the challenge that has faced environmental programs in Commander, Navy Region Europe, Africa, Southwest Asia (CNREURAFSWA) for years. Add to those factors a high staff turnover rate,

stewardship occurred across the entire installation population.

The OCONUS Culture

Due to limitations on lengths of overseas tours, Outside the Continental United States (OCONUS) installations have a much higher employee turnover rate than facilities within the U.S. Typical civilian tours range between two and five years, and military tours typically rotate more

environmental regulatory requirements, it is, for the most part, non-specific. For example, a backflow prevention program protects drinking water systems from materials that may contaminate the system. Some U.S. states have dedicated several pages of regulations instructing utilities on how to manage their backflow prevention program; however, the FGS provides only a single sentence directing installations to establish an effective backflow prevention program.

EMS is basically a management system that integrates environmental concerns and issues into the organization's management processes.

and it's no wonder that these installations failed environmental compliance audits for many years. In fact, external auditors routinely found the same problems at each installation, even on a three-year external audit cycle. Compliance audits and self-reporting mechanisms were employed in an effort to fix the problem, but they all fell short in maintaining a healthy environmental program. It was only when an Environmental Management System (EMS) was implemented that a fundamental shift in attitudes toward environmental

frequently. This impedes critical corporate knowledge retention for operations and facilities. Some corporate knowledge, however, is retained by host nation personnel, who generally do not rotate in and out of positions like civilians or military.

Environmental compliance for OCONUS installations is governed by a document called the Final Governing Standards (FGS). Although this document incorporates the most protective of U.S. or host nation envi-

For years, CNREURAFSWA tried to establish a healthy environmental program by using external and internal audits and self-reporting mechanisms to help installations maintain environmental compliance. These avenues relied upon inspections and self-enforcement, which resulted in limited success. What seemed to be missing was a commitment to go beyond the minimum, to make environmental issues a priority for the installation, and to engage process owners.

EMS to the Rescue

It was evident that a real change was needed to make environmental issues a priority to OCONUS installations. The answer came from Executive Order (EO) 13423 entitled Strengthening Federal Environmental Energy, and Transportation Management which, among other items, required EMS implementation at all appropriate organizational levels. Under this guidance, the Navy then required all appropriate installations to incorporate EMS by 30 September 2009. Appropriate facilities in CNREURAFSWA include:

- Naval Support Activity (NSA) Naples, Italy,
- Naval Station (NAVSTA) Rota, Spain,
- NSA Souda Bay, Greece,
- NSA Bahrain, and
- Naval Air Station (NAS) Sigonella, Sicily.

EMS is basically a management system that integrates environmental concerns and issues into the organization's management processes. It helps organizations avoid environmental problems by increasing awareness, and by developing and implementing sustainable activities and processes. Quite simply, it's a framework that evaluates and prioritizes those activities that can have a significant impact on the environment. EMS provided the impetus to shift outdated perceptions of base environmental programs from one as an enforcer to one as an enabler of environmental compliance.

In order to implement EMS, several elements have been incorporated into the organization's day-to-day business.



Installation Commanding Officer for NAS Sigonella signs his EMS self declaration memo. LEFT TO RIGHT: Barbara Tissier, Captain Thomas J. Quinn, Scott Horwitz and Cora Mata.

Norman Stiegler

One important element included identifying operations that can significantly impact the environment (i.e. generation of hazardous waste, petroleum spills, etc). Standard Operating Procedures (SOP) for those operations were established for process owners to educate them on how they can minimize their impact. For example, if a facility determined that preventing oil spills was a priority, then the facility would identify all areas that use oil, produce appropriate SOPs and work directly with the process owner to identify how they can minimize the risk of spilling into the environment.

To produce meaningful SOPs, environmental personnel needed to understand how each department interacts with these operations. Environmental staff worked with operators to understand how they do their jobs in order to determine how best to incorporate environmental controls into their work processes. A fairly simple idea, yet it would require a culture shift and an effort on everyone's behalf. The relationship between environmental

personnel and process owners had historically been strained, even adversarial, due to environmental personnel enforcing various requirements that may not have always made sense to other employees.

At CNREURAFSWA, EMS was embraced by Installation Commanding Officers (ICO), and their leadership. Enthusiasm quickly spread throughout the entire installation, from shop workers to white collar workers, from Port Operations to Public Works, from new enlisted sailors to veteran Naval Officers, civilians, local nationals and contractors. This new environmental awareness is driving a quantum change in environmental compliance.

An About-face in Attitude

The changes in attitude became quite clear with EMS conformity audits for Europe and Southwest Asia installations. Operators greeted the auditors with enthusiasm and were proud to show how they had incorporated environmental controls in

their workplaces. Environmental personnel were greeted like they were old Navy buddies as employees discussed what they were working on, and talked about exchanging new ideas. Workplaces contained SOPs that were readily available and easily accessed. Some shops used colorful posters and were actually excited to see auditors arrive. Shops that auditors were unable to visit expressed open disappointment.

It's still too early to measure exactly how well EMS is working, but CNREURAFSWA is beginning to see evidence that EMS is making a difference in environmental compliance. Fewer compliance problems are being found during internal audits and data calls. Outstanding compliance issues are being corrected, and



The Auto/Wood Skills Center staff at NSA Naples Support Site, with assistance from the Public Works Department Environmental Office, has integrated environmental management into their daily work lives. Gino Spirito, an employee at the shop, reports that spills have been reduced by 100 percent. Scott Horwitz

new ways of conducting business are being considered to create a better way to run operations.

Driving the Change

So how did CNREURAFSWA drive these critical changes and become the first multi-installation region within the Commander Navy Installations Command (CNIC) to achieve 100 percent EMS conformance? Leadership commitment and visibility were critical.

In 2008, CNREURAFSWA made EMS conformance the number one environmental priority, and installation environmental staffs worked steadily on implementation. One important concept of EMS, though, is that roles and responsibilities regarding EMS extend beyond the Environmental Office and require coordination across the entire installation. As ICOs became engaged and began communicating EMS importance to tenant commands, the momentum accelerated.

In Their Own Words

Once tenant commands understood their role, and that the EMS was a systematic process to ensure that they had the tools and information they needed to maintain compliance with environmental requirements, their relationships with the Environmental Office began to strengthen. Barbara Tissier, Installation Environmental Program Manager at NAS Sigonella, states, "EMS has helped us build a better working relationship with both our top management as well as our process owners. We have not only been out in every building and shop, but we are now known by first name in the ICO's office, talking with everyone about how to make environmental management improve-

ments at Sigonella. When everyone communicates, things happen."

NAVSTA Rota's Commanding Officer Captain William F. Mosk is an EMS proponent. "The implementation of EMS at NAVSTA Rota has been a huge success. You don't have to look hard to see the tangible improvements," said Mosk.

In addition to awareness and compliance, another benefit is fiscal savings. "NAVSTA Rota's utilities conservation efforts have resulted in over \$350,000 in savings this fiscal year, and we have an opportunity to save even more. Our environmental focus has resulted in less spills and increased recycling. Everyone is involved and doing the right thing."

Rudy Criscuolo, from the Public Works Transportation Department at NSA Naples, thinks EMS is a good system because it helps define environmental goals for the base and his department. Rudy reports that "since implementing EMS, SOPs for various processes have been updated and employees are reminded of the importance of preventing spills, reducing the amount of energy and water usage and recycling. Also, employees are more aware of the importance of maintaining training records and documentation." ⚓

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2. Click on the Currents logo or the page name.
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4. Share with friends! Click on 'Share' at the bottom of the page.

The screenshot shows the Facebook interface for the "U.S. Navy Currents magazine" page. At the top, there's a navigation bar with "facebook", "Home", "Profile", "Friends", "Pages", and "Search". Below that, a prompt says "Link Your Page to Your Twitter Account". The page name "U.S. Navy Currents magazine" is prominently displayed with tabs for "Wall", "Info", "Photos", "Discussions", "Events", and "Notes". The main content area features a post with a "Currents" magazine cover image and several news snippets, including "Rocket Science Leads to New Whale Discovery" and "Robotic Spy planes go green". On the left sidebar, there's a "Like Page" section with "Friends with an 'L'", "Support to Friends", and a description of the magazine as "the Navy's award-winning environmental magazine". Below that is an "Information" section with the address: "CNO Governmental Addressing Div, Code 4402, 2000 Navy Pentagon Washington, DC, 20380-2000" and phone number "770-276-4200".

We'll provide links to interesting stories and quick access to the features in each of our issues.

You can also follow us on Twitter at www.twitter.com/navycurrents.

The screenshot shows the Twitter profile for "navycurrents". The header includes the Twitter logo, the name "navycurrents", and the bio "U.S. Navy Ocean Stewardship Magazine". Below the header, there's a "Following" list with names like "Navy", "Navy Ocean Stewardship", and "Navy Environmental". The main content area shows a tweet with a "Currents" magazine cover image and the text "New Seal Search to Go Green Using AUSA Funds [http://bit.ly/1Vcm9Ud](#)". The bottom of the page shows the "About" section with the website "www.navy.mil/oceans" and the location "U.S. Navy Ocean Stewardship Magazine".

Taking Marine Biodegradable Mainstream

Eliminating Plastic Waste Afloat through Marine Biodegradable Plastic

THE NAVAL INVENTORY Control Point (NAVICP) through the Plastic Removal in the Marine Environment (PRIME) program is exploring marine biodegradable alternatives to replace traditional plastic packaging and disposable materials afloat. Teaming with the U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC), NAVICP has identified and tested a new plastic that maintains the physical characteristics of petroleum-based plastic but safely biodegrades in the ocean. This testing has resulted in the development of a new American Society for Testing and Materials (ASTM) standard that could pave the way for incorporating marine biodegradable plastics into the supply chain. In turn, this could significantly decrease the effort needed to process plastic waste, free up valuable space and reduce cost associated with plastic disposal.

Background

Environmental regulations and laws prohibit the discharge of plastics into the ocean. The International Convention for the Prevention of Pollution from Ships (MARPOL) Treaty specifically prohibits discharges of all plastic waste at sea

and has since been adopted into U.S. public law. The Navy compresses plastic waste into disks using a Compress Melt Unit (CMU) and must store it aboard until the next opportunity to offload occurs. This can result in unpleasant and unsanitary working conditions if the plastic is not handled and treated properly. Additionally, space is at a premium aboard ships and plastic waste waiting for offload often takes up valuable space. Several Waste Characterization Studies conducted by NAVICP and the Naval Sea Systems Command (NAVSEA) indicate that a fully manned Carrier Vessel Nuclear (CVN) will generate approximately 1,200 pounds of plastic waste daily.

ASTM D7081

NAVICP, in conjunction with NSRDEC and the Woods Hole Oceanographic Institution, has performed studies to evaluate the biodegradability and toxicity of polymers and other potential plastic replacement materials in the marine environment. Analysis of these tests and studies indicate that some polymers show significant biodegradation in the marine environment and are non-toxic based

on U.S. Environmental Protection Agency (EPA) accepted testing procedures. This

research has resulted in the development of ASTM standard D7081, *Standard Specification for Non-Floating Biodegradable Plastics in the Marine Environment*. The specification outlines the criteria necessary to validate plastic biodegradability in the marine environment, which can be quite different than soil or compost biodegradability. The dynamic characteristics encountered in the ocean include a lack of microorganisms, low temperatures and high pressures. The rates of biodegradation in the ocean are generally slower in comparison to other environments.

ASTM D7081 will serve as the starting point for identifying additional marine biodegradable materials. This new ASTM standard can be used to develop new plastics that will not persist in a marine environment. These alternative bio-based or biodegradable plastics could provide replacements for a number of products manufactured using conven-





Plastic waste can accumulate quickly aboard an aircraft carrier.

If marine biodegradable plastics are incorporated in sufficient quantity into mainstream manufacturing, this could ultimately halt and potentially reverse the level of plastic pollution already in the world's oceans.

tional, petroleum-based plastics. Target applications include stretch film, plastic banding, foams, food containers and paper coatings. If marine biodegradable plastics are incorporated in sufficient quantity into mainstream manufacturing, this could ultimately halt and potentially reverse the level of plastic pollution already in the world's oceans.

Product Development

In an effort to address some of the issues associated with replacing conventional products with environmentally friendly alternatives, a pilot product development effort was completed that focused on the standard Navy paper drink cup. The paper cup replaced polystyrene foam cups in the 1990s, but while being environmentally friendly,



Plastic pucks produced by the CMU are placed in odor barrier bags to prevent unsanitary conditions.

the cup has performance issues that include leaking and poor heat insulation properties. Because of these issues, alternative configurations were being investigated. One potential alternative was to use a marine biodegradable polymeric coating, which could improve the performance of the cup while retaining its green environmental footprint. In early 2006, NAVICP, along with Concurrent Technologies Corporation (CTC), began to examine alternate configurations of the paper cup that would retain all of its beneficial environmental characteristics while offering improved performance.

This testing has resulted in the development of a new ASTM standard that could pave the way for incorporating marine biodegradable plastics into the supply chain.

A marine biodegradable plastic coating was identified that would potentially improve the performance of the cup while retaining all of the environmentally friendly aspects of the pure paper cup. The material selected was a Polyhydroxyalkanoate (PHA), with a trade name of Mirel™, produced by the Telles Corporation. PHAs are a family of biobased, biodegradable natural plastics that have the potential to functionally replace over 50 percent of the plastics used today. PHA-coated items are candidates for broad replacement of current plastic packaging materials due to their durability in use and wide spectrum of properties. PHAs range in properties from



NAVICP has patented the "Happy Dolphin" symbol to assist in identifying items that will degrade in the ocean.

strong, moldable thermoplastics to highly elastic materials to soft, sticky compositions, and can be made as resins or as latex with excellent film-forming characteristics. PHAs are biodegradable in aquatic (ocean, river, wetland), soil and municipal waste treatment environments, and they can be both hot and cold composted. PHAs also meet the requirements for Biobased Products established by the U.S. Department of Agriculture (USDA) under the Farm Bill of 2002.

The PHA-coated paper cups were subjected to a full series of marine biodegradation and toxicity tests,

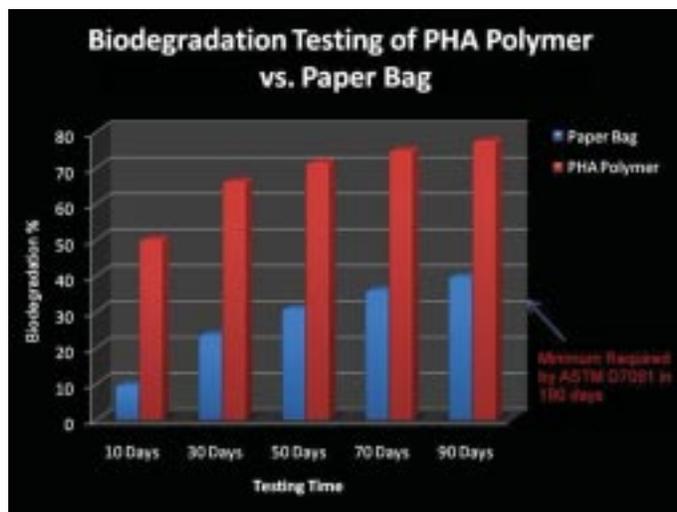
pulping trials, and CMU trials. Based on the results of the CTC evaluation, the National Defense Center for Environmental Excellence recommended in a 2008 report that the implementation of the PHA-coated cups be further pursued.

The Path Forward

Despite successful testing, several issues remain involving the implementation of the PHA-coated cup and further development of PHA products. Additional testing may be needed to satisfy EPA and/or USDA regulatory concerns

before moving forward to create a new category of biobased or biodegradable plastics. At this time, international and U.S. laws do not differentiate between marine biodegradable plastic and conventional petroleum-based plastic. Thus, the benefits of marine biodegradable plastics cannot be realized as they are not treated differently than their environmentally unfriendly counterparts.

Additionally, replacing materials with marine biodegradable alternatives may result in extra cost as the current cost of marine biodegradable plastic resin is greater than petroleum based counterparts. This disparity will change over time as more marine biodegradable products enter the commercial market, allowing for a decrease in manufacturing cost. However, this process can be helped by



PHA biodegrades significantly quicker than a paper bag in marine conditions.



A Sailor using the CMU to compress plastic waste.

ensuring that preference is given to purchasing products that meet Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management. This will provide an impetus to manufacturers to develop more applications, increase volumes and help to drive costs out of the system.

NAVICP and NSRDEC are continuing to raise awareness and educate the U.S. Navy about marine biodegradable plastics, and garner the support necessary to create legal provisions that address the differences and benefits of new families of marine biodegradable plastics as they become more common in the commercial marketplace. NAVICP continues to investigate new technologies and products to improve solid waste management afloat.

For more information, contact Trey Kunkel at 717-605-6638 (DSN: 430-6638) and john.kunkel@navy.mil.

NAVICP, a field activity of the Naval Supply Systems Command, procures, manages and supplies spare parts of naval aircraft, submarines and ships worldwide. NAVICP has two locations, one in the Lawncrest section of North-east Philadelphia and the other in Mechanicsburg, PA. 

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The head and back of a male dense-beaked whale.
Ari Friedlaender

Principal Investigator for the Navy's Marine Mammal Monitoring Program Outlines Priorities & Projects



SHARING THE SPOTLIGHT for this issue of *Currents* is Dave Moretti, of the Naval Undersea Warfare Center (NUWC) in Newport, RI. Mr. Moretti is the principal investigator for the Marine Mammal Monitoring on Navy Ranges program sponsored by the Chief of Naval Operations Environmental Readiness Division (CNO N45). The focus for this spotlight interview is a study of whale activity in relation to sonar that's being conducted at the Atlantic Undersea Test and Evaluation Center (AUTEC) in the Bahamas.

Tracey Moriarty, N45's Director of Environmental Outreach and Information, conducted this interview on 15 May 2009 during a visit to the AUTEC range. Mr. Moretti modified the original interview transcript to reflect updated information about his research efforts subsequent to that original interview.

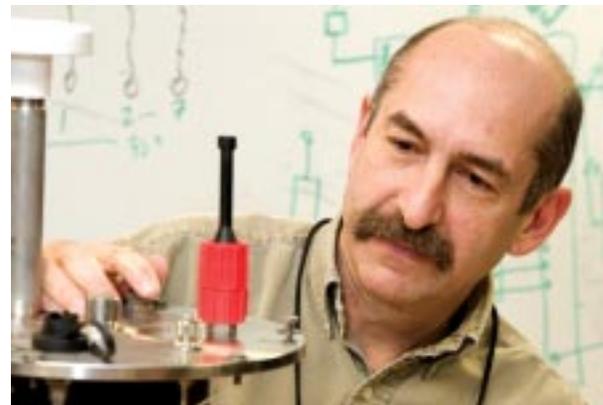
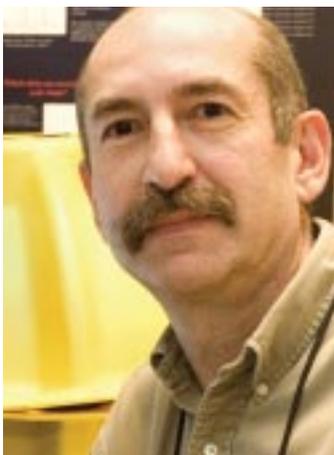
CURRENTS: Good morning Dave. Thanks for speaking with us today. Could you provide us an overview on the study you're involved with and its goals?

There's been the perception that sonar is a sort of "death ray."

DAVE MORETTI: Yes, what we're attempting to do is use the infrastructure of the Navy ranges that have sensors on the ocean bottom to monitor marine mammals in situ and study their behavior with and without the presence of Navy sonar. We're interested in the overall behavior of these animals juxtaposed against Navy sonar given that these animals have been associated with some stranding events in the past, in particular one in the Northwest Providence Channel in the year 2000.

CURRENTS: You're speaking of the incident in the Bahamas when 17 beaked whales stranded themselves near naval exercises.

MORETTI: Yes. And since that stranding in particular, there's been the perception that sonar is a sort of "death ray." The notion is that these animals when exposed to sonar will immediately be injured or die.



One thing that we do know is that there appears to be a population of these animals at the AUTEC range at densities far higher than anyone anticipated which is counter-intuitive given the perception of sonar and beaked whales. Given that this is an active Navy range where sonar is used, you wouldn't anticipate these species, especially beaked whales, present here if you believe the popular press. It's a good sign that they are here, and it's also a great opportunity to study these animals and their reaction to sonar.

CURRENTS: Are beaked whales the most plentiful species in this area?

MORETTI: There are about 20 species of beaked whales, and we've done a



The Basics About AUTEC

THE ATLANTIC UNDERSEA Test and Evaluation Center (AUTEC), located on Andros Island, Bahamas, provides the Navy with an ideal environment for researching, testing and developing maritime weaponry. "AUTEC serves the United States and our allies in support of Anti-Submarine Warfare, Anti-Surface Warfare, and Overseas Contingency Operations missions," states Harriet Coleman, head of AUTEC's Ranges, Engineering and Analysis Department. "We understand the importance of testing and evaluation and pride ourselves on the accuracy of our data."

AUTEC's Bahamas location, with its semi-tropical climate, quiet acoustic environment and extensive capabilities make it an ideal year-round test facility. The location was chosen because of its close proximity to The Tongue of the Ocean (TOTO), a unique, deep water basin, approximately 110 nautical miles long and 20 nautical miles wide, varying in depth from 4,500 to 6,000 feet. The basin floor is relatively smooth and soft, with very gradual depth changes. TOTO is bounded on the west by Andros Island; on the south and east by large areas of shallow, non-navigable banks; and on the north by the Berry Islands.



The gradually varying depths of the Berry Islands area make it a particularly suitable location for littoral (close to shore) warfare training exercises. AUTEC also has a second testing facility off the east coast of Florida.

For more information about AUTEC, visit www.globalsecurity.org/military/facility/autec.htm.

Contact: Harriet Coleman, Atlantic Undersea Test and Evaluation Center, 401-832-6767, DSN: 948-6767, harriet.coleman@navy.mil

lot of work to identify what species are here. We know that the Blainville's beaked whale is found on range, which is one of the two species involved in stranding episodes. To a lesser degree, we detect the Cuvier's beaked whale, which is believed to be the most sensitive whale to Navy sonar. Most recently, the Gervais' beaked whale has been detected acoustically and verified by Charlotte Dunn at the Bahamas Marine Mammal Research Organisation (BMMRO).

CURRENTS: The 2000 stranding event took place about 40 miles north of the AUTEK ranges. Why aren't the animals on AUTEK stranding?

MORETTI: It's an interesting question. Given the popular presumption of the reaction of beaked whales to sonar, you wouldn't anticipate finding a population of beaked whales on a weapons range in the Tongue of the Ocean,



when 50 miles north there was a mass stranding event in the year 2000. So one of the questions we have to ask is, “Why did that stranding event occur?”—especially since we haven’t seen any mass strandings here (in the Tongue of the Ocean). One of the differences we’ve considered is the overall size of the range. Although it’s 500 square nautical miles, it’s relatively small as compared to the overall dimensions of the operations that took place in the Northwest Providence Channel—operations that, by the way, have never been repeated since that 2000 stranding. The AUTEK range is narrower than the Northwest Providence Channel and the overall size is smaller.

You wouldn’t anticipate finding a population of beaked whales on a weapons range.

Secondly, if you look at operations on range, one of the things that has been postulated is that animals here are “habituated,” where animals in the Northwest were naïve. And without doing the long-term tagging of the animals and getting a handle on what their range is, it’s very difficult to say whether that’s true or not. It may be that the animals that we’re seeing in the Tongue of the Ocean move back and forth from the Northwest Providence Channel or they may be residents of the Tongue of the Ocean and they never go out. We just don’t know.

The second thing that seems plausible is that if you look at the distance over which ships move during an operation on the AUTEK facility, it’s quite a bit smaller than the Northwest Providence Channel. During range operations, ships are confined within the range boundaries. If the animals move off the range in response to the operation, there is little chance of ships inadvertently following behind.

One of the things that was striking in the Northwest Providence Channel, was that the ships started on the east coast and moved through the channel in a westerly direction. But the distance that they covered was significantly larger than the size of the weapons range, roughly four times the distance traveled. So one of the theories

that has been postulated is that the animals get out in front of the ships and because of the narrow canyon-like environment, they don’t have a way to avoid the ships. The animals may get pushed ahead of oncoming ships with their active sonar engaged.

Three dense-beaked whales surfacing in front of the AUTEK range vessel Ranger, AUTEK range, Bahamas.
Ari Friedlaender



But again, we really don’t know. This is what we’re trying to understand. Our methodology has been to study animal movements during these operations on the range and extend that study to include long-term tracking of animals so that we get some notion of their overall range of motion. Perhaps that will help us understand the differences between operations at AUTEK as opposed to what occurred in the Northwest Providence Channel.

David Frome at the Naval Research Laboratory completed a thorough investigation of the acoustics in the Northwest Providence Channel. But if you look at the acoustic propagation in the Northwest Providence Channel and in the Tongue of the Ocean, chances are there are times of the year when they are quite similar. So I’m not sure that acoustic propagation is the difference. At the moment, I can’t give you a definitive answer about why the animals at AUTEK aren’t stranding. We really don’t know. It’s one of those puzzles that remain unsolved and something we’re actively studying.

CURRENTS: How do you know when there are Naval ships in the area?

MORETTI: Our displays allow us to track ships on range that are equipped with standard U.S. Coast Guard Automatic Identification System (AIS) beacons. However, for Navy operations, the range has very precise ship tracks so that during an operation they know where the ships are at all times—both surface and sub-surface vessels. After the operation, the range has provided ship track data which we are able to combine with marine mammal detection data. Marrying these data sets allows us to better understand how animals react to both the sounds that the ships produce and the movement of the ships themselves.

CURRENTS: Can you describe the different instruments you're using in this study?

MORETTI: The instrumentation we're using includes hydrophones—or underwater microphones—that were installed in the Tongue of the Ocean in the Bahamas to aid in the test and evaluation of undersea vehicles. (See our sidebar entitled, "Satellite Tracking of Whales.") Typically, the Navy will place a "pinger" on an undersea vehicle that emits a known signal at a known repetition rate. The ping is received on multiple hydrophones, detected, and precisely time-tagged, and these data are used to determine the vehicle's position.

We've tried to adapt this technology for the study of marine mammals using passive acoustics, which basically means we listen for vocalizations from the animals. Different animals have different vocalizations, and over the years we've been able to send out trained observers in an attempt to associate these vocalizations with particular species. We've also worked in collaboration with a number of

Satellite Tracking of Whales

UNLIKE THE DIGITAL tags (D-TAGs) used previously in the BRS, the new satellite tags are intended to track a whale's movements. In May 2009, the first batch of these tags was deployed on three species of whales in the AUTEK range.

One of the principal research scientists on the project, John Durban, reported particular success in following one whale before and during AUTEK exercises. "It didn't move very much in the week prior to the exercise," Durban commented. After exercises commenced, "it appears the whale moved a bit further north; away from the range," he said. "It's possible that it's a reaction to exercises that are going on." However, Durban cautioned that it is too early to draw conclusions. "It's very hard to know what one whale is responding to. These tags don't have acoustic capability."

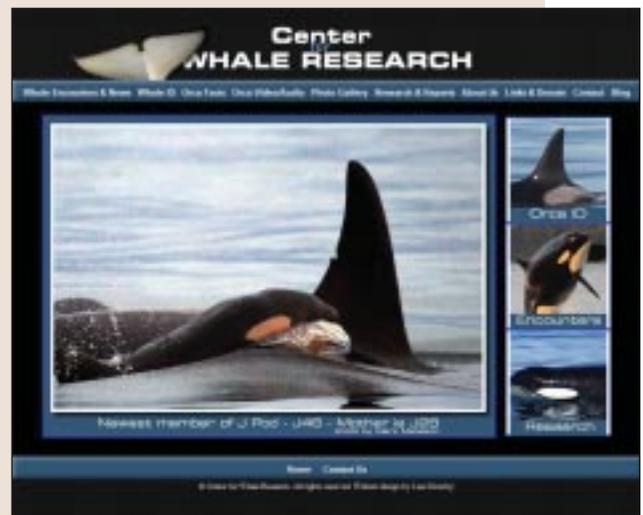
The new tags send a signal to a satellite and the satellite triangulates where the whale is. One thing this tracking system will do is to help explain the mystery of why whales are "going quiet" during exercises. "There are a couple of alternative hypotheses to explain this: one is that the whales are moving off the range; the other is that they're staying but not foraging using their echolocation," Durban said. "Hopefully this tag will allow us to test between these."

Durban, a research biologist from the Center for Whale Research in Washington State, is working under contract with the National Oceanic and Atmospheric Administration. He has been conducting research on marine mammals for 16 years. Much of his career has been spent working alongside the BMMRO, but working with the Navy is still relatively new to him. "The ability to work on the range with the undersea warfare unit and to have access to real time acoustic detection of beaked whales is invaluable," Durban says. "These guys are really great at directing us to whales. That makes our work that much more efficient."

Durban holds a Ph.D. in Zoology from the University of Aberdeen (UK), and has authored more than 20 research papers on published more than 20 papers on research topics such as the population ecology of killer whales, bottlenose dolphins, right whales and harbor seals, as well as novel techniques for data collection and new statistical approaches for data analysis.

To learn more about NOAA's research involving marine mammals, visit <http://swfsc.noaa.gov> and click on "research" and "marine mammals."

For more about The Center for Whale Research, visit www.whaleresearch.com.



different scientists at various institutions, including Peter Tyack and Mark Johnson from Woods Hole Oceanographic Institution. They've developed a new recording tag that's attached to animals with suction cups. It records animal vocalizations, along with pitch, roll, depth and heading; which helps reveal their swimming and diving and vocal patterns. Peter [Tyack] and Mark [Johnson] have provided us with clips—different recordings for different animals—that have allowed us to program our equipment for particular species including beaked whales.

We've also worked directly with the BMMRO, which is headed by Diane Claridge. (For more information about the BMMRO, see our sidebar.) They're particularly versed in the different species of animals that reside in the Bahamas. They've been the primary observers on our tests here on the AUTECH range. Under a typical scenario, we use the sensors and hardware and algorithms to

localize the animals, then Diane and company will go out and try to find the animal on the surface and identify the species. This gives us the ability to associate the animal with the particular vocalization. By doing that over a number of tests, what we've been able to do is come up with methodologies and tools—both software and hardware—to monitor animals and understand their location both in time and space.

By associating vocalizations with behaviors, we can start to say something about things like foraging behavior especially for beaked whales. We know from the data that Peter [Tyack] and Mark [Johnson] are getting from the tags on beaked whales that they're very deep diving cetaceans. They dive in excess of 1,000 meters.

Every couple of hours they'll execute a deep foraging dive. It's quite fantastic actually. They'll hold their breath for an

The Bahamas Marine Mammal Research Organisation

THE BAHAMAS MARINE Mammal Research Organisation (BMMRO) was founded in 1991 for the purpose of describing the distribution and habitat use of different marine mammal species.

"The ultimate purpose of the organisation is to promote the conservation of these species and their habitats," states Diane Claridge, BMMRO's director. A native Bahamian, Claridge has been with BMMRO since its founding.

"We use systematic boat-based surveys for describing the distribution and habitat use of marine mammals," states Claridge, who serves as a field biologist as well as the BMMRO's director. "We use photo identification techniques to investigate patterns of distribution, residency and social structure," she says. The goal is to help assess the whales' vulnerability to noise derived from human activity.

The most unique among the beaked whale species is the Blainville's beaked whale. "This species is the only one of its kind worldwide," Claridge states. The team has identified 165 individuals from over 9,000 photographs taken over the last 11 years.

"We're really on the cusp of what we're going to learn," she says, "because we're just getting into the analysis of all the survey data.

We have genetic analysis just starting too. It will be really exciting to see how the beaked whales of the canyon are related to whales elsewhere."



Claridge holds a Master's in Zoology and is completing her Ph.D. in Biology. In addition to being the BMMRO's director, she works as a field researcher, and is the co-principal investigator on the Behavioral Response Study.

For more information about BMMRO, visit www.bahamaswhales.org.

hour and dive to these great depths. And they'll stay at these depths foraging in excess of 30 minutes. Because they only vocalize during foraging, that's when we hear them. So whenever we hear them, we know they're foraging and that they're in deep water.

By monitoring these animals over the entire range, we get an idea of their distribution in time and space, and we can tell when they're foraging. That's the overall goal and objective of the program—to know where the whales are and what their behaviors are when there is no sonar present. So we can compare this to what happens during active sonar operations and afterwards.

CURRENTS: What are the benefits to having this collaborative relationship with other organizations?

Every couple of hours they'll execute a deep foraging dive. It's quite fantastic actually. They'll hold their breath for an hour.

MORETTI: NUWC's core expertise is in acoustics signal processing, which means we develop the systems for detecting and analyzing signals as they travel underwater. In trying to apply acoustic signal processing to the study of marine mammals, we benefit greatly from the expertise of researchers such as Diane Claridge and Charlotte Dunn at the BMMRO, Peter Tyack and Mark Johnson at Woods Hole, Ian Boyd at the University of St. Andrews, John Hildebrand at Scripps, and Chris Clark at Cornell to name a few. We need a collaborative team with expertise in different areas, all of which are necessary to provide a cohesive understanding of the biology of these animals, and the reaction of these animals to sonar.

Diane [Claridge] and the BMMRO have been able to identify species at the surface after we'd detected them on our equipment. They've actually gone beyond that by taking photos of individual whales. Diane can tell the animals apart based on photo identification. By running these tests over and over again, we begin to assemble a catalogue of animals that are present. Diane can then do different types of studies that will allow her to understand whether they are residents or whether they migrate. No one really knows for sure.

CURRENTS: Can we talk about what animals have been tagged so far? And what kind of information have you been able to gather from them?

MORETTI: Well, first of all, the process of tagging a whale is difficult because it's extremely weather-dependent. In order for the observers in their small inflatable boats to approach these animals and attach tags, the weather conditions have to be ideal. Basically the winds have to be very low and the seas have to be very flat, especially for beaked whales. When they come to the surface, they have a very small profile and spend only minutes above water. So the observers have to be able to find the animals and attach a tag in a very short period of time.

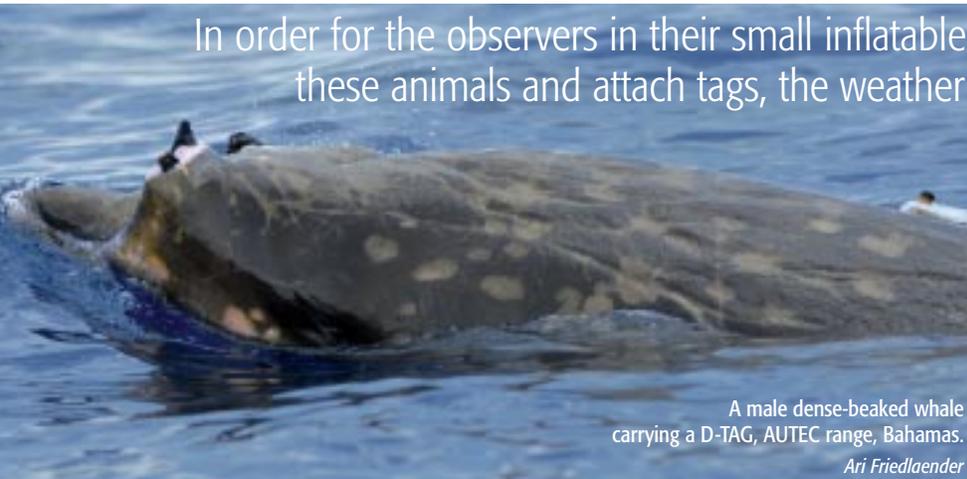


A short-finned pilot whale (*Globicephala macrorhynchus*) mother and calf seen on the AUTECH range.
BMMRO

The "D-Tag", or digital tag, I mentioned earlier gives us a lot of information. In addition to movement, it records sound on a pair of hydrophones. But the tag only stays on for about 19 hours. It's a phenomenal device. Mark Johnson designed it. It's helped immeasurably with the passive acoustics and was an integral part in playback experiments known as the Behavioral Response Study (BRS), the first two phases of which were conducted at AUTECH in 2007 and 2008. That was a collaborative effort that included a number of organizations. We were joined by teams led by Chris Clark from Cornell University, Ian Boyd who heads the Sea Mammal Research Unit at St. Andrews, Peter Tyack at Woods Hole, Angela D'Amico from the Space and Naval Warfare Systems Command, Diane Claridge at BMMRO, and Clay Spikes from Marine Acoustic among others.

That study involved putting the D-Tag on an animal, playing back a particular sound, and recording an animal's

In order for the observers in their small inflatable boats to approach these animals and attach tags, the weather conditions have to be ideal.



A male dense-beaked whale carrying a D-TAG, AUTEC range, Bahamas.

Ari Friedlaender

response. For instance, in 2007, we did a playback study on a Blaineville's beaked whale. During a deep foraging dive, we played a sonar-like signal through the D-Tag. When exposed to the signal, the animal foraged for a time, but then appeared to break off. It ascended to approximately 600 meters, stopped, then moved a significant distance away from the source vessel before surfacing. The animal remained in the area, and about two hours later went on another deep foraging dive. It was then exposed to a playback of orca calls. The animal stopped foraging as soon as the sound was discernable above background noise. It again ascended to the same 600-meter depth, stopped, and again continued to ascend slowly even further from the source vessel. However, upon surfacing, it moved in a straight path north and didn't forage again for nearly four hours, which, based on tag data, is highly unusual.

Because the sonar effect and orca calls were played on successive dives, it is impossible to definitively separate the effect of one from the other.

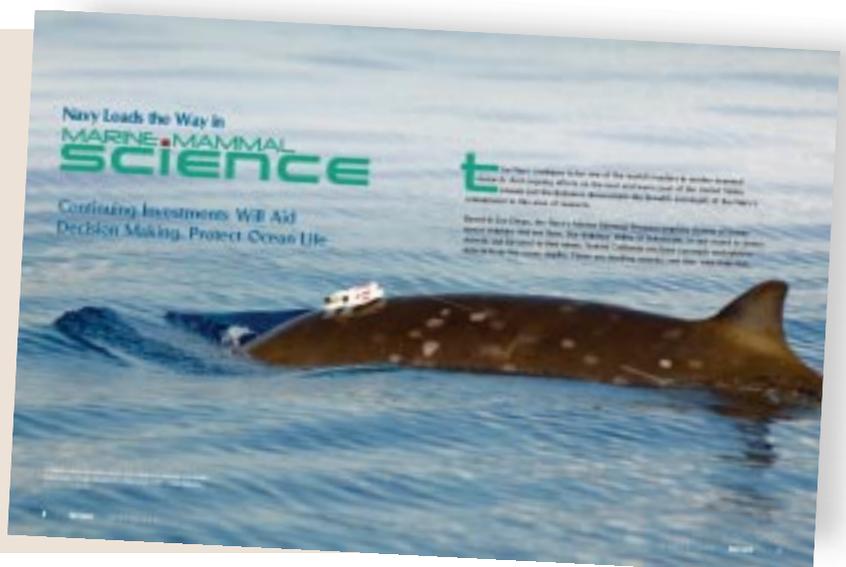
In 2008, another animal was tagged, but this time during its deep foraging dive it was exposed to a pseudo-random noise signal which featured the same time and frequency characteristics as the sonar signal but sounded nothing like it. As with the sonar-like signal, the animal broke off its foraging dive, ascended slowly to around 600 meters and paused. At this time the tag fell off, but the animal was acquired visually on the surface at a distance from the ship. From the tag and visual data, it appeared that its reaction was similar to that of the year before, suggesting that these animals react to loud sounds regardless of their structure.

The data from these tests, though interesting, are somewhat limited. There is much that we still do not know. For example, it may be that context is important. It is hard to know if for instance the position or movement of the source ship is important.

What the D-Tag doesn't reveal is the range of motion of the animal. The question that we're trying to answer now is, "Do these animals move off range during our operations?"

Marine Mammal Research and the Navy

THE NAVY HAS done more to fund marine mammal research than any other organization in the world over the last five years. For more about the Navy's work in marine mammal research including the use of D-Tags and their role in tracking the movement of marine mammals, see our story entitled "Navy Leads the Way in Marine Mammal Science: Continuing Investments Will Aid Decision Making, Protect Ocean Life" in the winter 2009 issue of *Currents*. You can browse the *Currents* archive and find a digital version of the magazine at the Naval Air Systems Command's environmental web site at www.enviro-navair.navy.mil/currents.



We believe they avoid the sonar and actually move off the range then return after operations are over. We have opportunistic data based on acoustics that strongly supports this theory. But once the animals are off the sensors we really don't know where they go. I can't say definitively that the animals that leave the range are actually the same animals that come back.

We have started using satellite tracking tags which have a longer duration—these tags will last upwards of four months. We are working to tag and track animals with John Durban and Bob Pittman from the National Oceanic and Atmospheric Administration (NOAA) on the AUTEK range, and Greg Shorr and Erin Falcone from Cascadia Research on the west coast. We had a tag that stayed on a Cuvier's beaked whale on the west coast for 121 days. So what we're hoping to do is put these tags on animals that will give us some information on the extent of their movements, both with and without sonar.

Unlike the suction cup tags, these tracking tags are applied with a dart that is shot into the dorsal fin of the animal. The tag is pretty small so all it provides is position via satellite. To date, three tags have been placed on beaked whales in the Northwest Providence Channel—two were on Blaineville's beaked whales and one is on a Cuvier's beaked whale. Currently in the Tongue of the Ocean, there is a Blaineville's beaked whale which is continuing to provide data. We're hoping it will stay on through the course of an active sonar exercise, which is about to happen in a couple of days. [NOTE: The tagged whale provided data

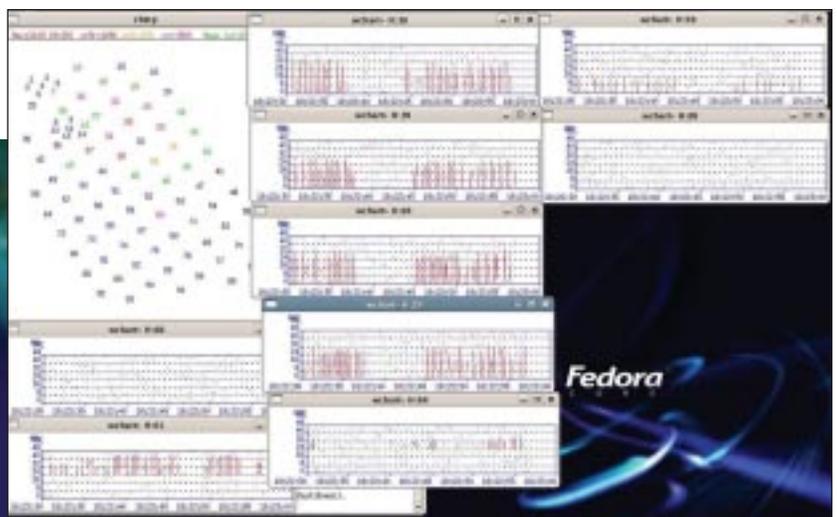
through an active sonar operation and for nearly two weeks afterward. As of November 2009, there were tags on five pilot whales in the Bahamas.]

CURRENTS: Have you come up with any conclusions regarding which animals are residents of the area?

MORETTI: We think these beaked whales are resident but until we complete these studies and get enough data, it's hard to make a definitive statement. The same is true of sperm whales that we see at AUTEK, typically every few weeks when we're here. They seem to come and go within the Tongue of the Ocean. We think they're probably resident within the Bahamas covering a larger territory than beaked whales but we don't know for sure. Again that's where things like the photo identification work that Diane [Claridge] is doing come into play.

CURRENTS: We're looking at some images of computer screens right now that display data from some of the hydrophones. Can you describe what we're looking at?

MORETTI: Sure. There are 91 hydrophones on the range, spaced about two miles apart. We monitor their signals, as they're cabled to shore, with the M3R signal processor. The processor attempts to delineate signals from different animals including clicks from sperm whales or beaked whales and whistles from different types of dolphins. Once we get precise time of detection (on the order of



ABOVE: These graphic displays show information picked up by AUTEK hydrophones. Each chart represents the echolocation clicks recorded by an individual whale.

LEFT: This map shows the M3R localization display. The numbers represent the range sensors, and the red and blue whale icons represent localizations of marine mammal vocalizations.

milliseconds) we can use the data to try to localize the animal. So what we typically look at on our display is a map of the hydrophones, numbered 1 to 91. Then we color the phones based on the number of detections we're receiving at any one time. From there, we're able to click on a particular hydrophone and that will pull up a display that gives us a graphic view of the frequency versus time for a particular hydrophone. Often times, at least in the world of passive acoustics and marine mammals, people prefer to look in frequency versus time because it gives you an indication of the type of signal the animal is producing. So our displays revolve around that concept.

The processor attempts to delineate signals from different animals including clicks from sperm whales or beaked whales and whistles from different types of dolphins.

Many of the displays here were designed and implemented by my colleague Ron Morrissey along with Nancy DiMarzio and Susan Jarvis. They give us the ability to monitor in real-time a 500-square mile nautical area, and if an animal is present and vocalizing, detect that animal and graphically view the nature of the call. It turns out that with practice you can start to associate the call type with the particular species. At the same time, we've also been developing a classifier tool that will automatically associate call type with species type.

If we're able to localize an animal, we'll put a dot on a screen in a Google Earth display that allows us to track the distribution of individual animals in real time. Today we were trying to put tags on sperm whales. Our passive acoustics tracked the whales during their deep foraging dives, and Diane [Claridge] and company boarded observer boats and took positions where we expected them to surface. And that's basically what happened today. Unfortunately because of the weather, they haven't been able to get tags on animals but they've been following animals for the course of the day.

CURRENTS: What are your next steps?

MORETTI: There are several things that are happening right now. First, we're going to continue the work we're doing at AUTECH. This particular test was intended as a first step—a starting point for us to develop the methodologies



A pantropical spotted dolphin (*Stenella attenuata*) leaps out of the water at AUTECH.

BMMRO

that will allow us to attach tags and monitor these animals over a longer period of time. But we really need to affix a greater number of tags so we have a large enough set of data with sufficient statistical power to say something meaningful about the movement of these animals once they move off our sensors. Once they move off our sensors, we can't hear the animals and we don't know where they're going or what they're doing.

We need to have a sufficient number of whales tagged so that we can say something meaningful about their movements relative to the sonar.

Out on the west coast, we're doing similar tests on the Southern California Offshore Range (SCORE). We're trying to use our signal processing expertise combined with the skills of our west coast collaborators to understand the animals in their environment—to study them both with and without sonar. We work very closely with Cascadia Research, headed by John Calambokidis. They serve as primary marine mammal observers on SCORE when we do these kinds of tests. In addition, we're working closely with John Hildebrand from the Scripps Institute of Oceanography, who has spent years studying vocalizations and historical acoustics for animals on the west coast. There's a

different set of species present on the west coast that you don't see here and their expertise has been invaluable.

CURRENTS: What other work is being done out there? Or elsewhere?

MORETTI: The folks at Cascadia are doing the same thing as Diane [Claridge] and the BMMRO are doing at AUTEK. They're creating a photo identification catalogue of the animals—studying their calving rates and understanding their social behaviors. And if we can combine these data with data we're providing about things like animal motion relative to sound sources, we'll begin to understand the health of the population long-term. We need to imbed within the facilities the capability to monitor these animals over the long-term so that we have data that point to the overall health of the population.

Also, off Hawaii, NOAA sponsored a fairly large study in concert with the Navy. Satellite tags were placed on multiple individuals from several different species before a large operation.

Within the last ten years, because of the Navy's intense interest, our knowledge of Blainville's and Cuvier's beaked whales has improved immeasurably.

We are also gathering data from our opportunistic study with active sources that lines up with the BRS results. When we look for cases of animals exposed to actual sonar and we estimate the levels of sonar at which beaked whales continue to forage, we find our maximum level was 157 decibels with an average of 130 decibels. This is similar to levels at which animals broke off foraging during the 2007 and 2008 BRS when exposed to pseudo-sonar and pseudo-random noise signal.

Within the last ten years, because of the Navy's intense interest, our knowledge of Blainville's and Cuvier's beaked whales has improved immeasurably. But to some extent, we're playing catch-up to other species—we need to devise better quantitative methods to characterize their behavior.

The hope is that by combining opportunistic studies which provide broad-scale data with fine-grained BRS movement data, we can get a better understanding of

how animals move and react relative to active sources. And if we know that, we might be able to avoid conflict situations down the road.

Another factor that is important for the ranges like AUTEK, SCORE and the Pacific Missile Range Facility (PMRF) in Hawaii, is the development of tools to study the health of these populations over the long-term. We'd like to be able to understand the animals that are present, how they move in their environment, and whether the population is stable and healthy over time.

In order to do that, we have to start to combine data from these different studies to come up with a model that helps both predict population health and can be used to study it long-term.

A D-TAG attached to the back of a male dense-beaked whale.
Ari Friedlaender



We need data on animal movement and calving rates and an understanding of predator-prey relationships. For instance there's a study funded by the Office of Naval Research led by Doug Novachek from Duke University that's trying to map prey fields juxtaposed against beaked whales so that we have some understanding of how they relate to their prey. The initial field work for the study took place during the BRS in 2008. Doug was able to produce some pretty interesting statistics on the overall prey field within the Tongue of the Ocean relative to these animals.

In implementing long-term population monitoring, you have to be conscious of environmental data. Changes in population health may have as much to do with changes in the environment as they do with naval operations.

To draw conclusions, we need a fairly comprehensive picture of the environment. That has other benefits

because it helps us understand the environment in which we're operating and allows us to better manage it.

CURRENTS: Regarding the specific projects you mentioned, what's the timeframe for some of them?

MORETTI: We did a test on the west coast on the SCORE range in the summer of 2008 that was similar to the test we ran at AUTECH. The intent of this test was to identify species on range, map the species to their vocalizations, get observers on the animals so we can get data on their behavior relative to their vocalizations and attach tags. So we can monitor the animals long-term both with and without sonar. A tag was placed on an adult Cuvier's beaked whales and four fin whales. The Cuvier's whale moved about 100 miles south and was off the coast of Mexico when the tag stopped transmitting. This was somewhat of a surprise, but we really don't have much data about this species. The fin whales all stayed within a 50-mile radius of the range.

Ultimately, we'd really like to determine the health of the population.

There are two disparate data sets that we're trying to combine. We've accumulated a fairly large data set based on opportunistic monitoring during active sonar operations on ranges. These data show broad movement of populations. What we're observing here at AUTECH are the animals on range—in particular beaked whales. We're able to project or measure the overall movement of populations (not individuals) on and off the range relative to the sources of sound. Remember, when we hear beaked whales, we're hearing a group of them. We know from our observer tests that they tend to associate in groups of three at AUTECH. And they also dive as a group—we know that from surface observations, tags that have been put on the animals. So when we hear them, we're actually hearing a group of animals. So we get broad scale movement, lots of data. Tests like the BRS give you very fine detailed data but those data are very sparse because our ability to get tags on animals is somewhat limited.

For instance, during the six-week studies in 2007 and 2008, there was a single playback each year. Tagging an individual gives you very fine detail of motion, so we got some very significant data but it's sparse.

Ian [Boyd] from St. Andrews championed the idea of combining the abundant opportunistic data with the sparse data from the BRS to produce a model of the animal behavior relative to the sound. If this effort is successful, perhaps it will lay the groundwork for a future tool that planners could use in advance of exercises to predict if there's going to be a problem and to take appropriate steps or choose different sites to avoid such a problem.

Any way that we can combine these data will allow us to say something more significant in terms about how these animals react. We may also gain more insights into the physiological effects of sound on the animals and whether the behavior itself puts these animals in danger or causes secondary effects that lead to these stranding incidents.



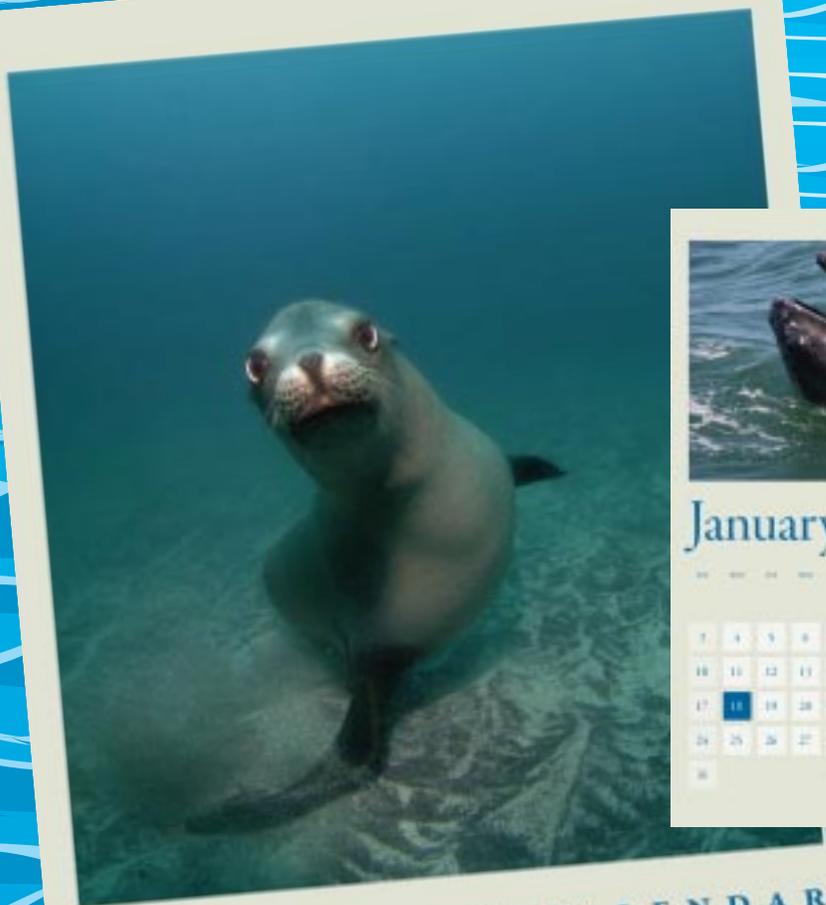
CURRENTS: Is that what you see as the ultimate goal of all this research?

MORETTI: Ultimately, we'd really like to determine the health of the population. We'd like to get away from individual animals and focus on how navy operations affect the population as a whole. In order to do that you need several sets of skills—signal processing, passive acoustics, animal biology, and statistical modeling—in particular population modeling.

We hope to incorporate all our data into statistical tools which will allow us to say something about how sound affects long-term population health—that's the Holy Grail. But that's going to take a significant amount of work from our team and scientists at other universities and research institutes that have expertise in these areas.

CURRENTS: Well, thanks for updating us on your work.

MORETTI: My pleasure. 📍



January

SU	MO	TU	WE	THU	FR	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Fin Whale
The largest whale in the world, the fin whale is a true giant. It can reach a length of 100 feet and weigh up to 100,000 pounds. The fin whale is a baleen whale, which means it has a comb-like structure called baleen in its mouth that it uses to filter small fish and crustaceans from the water. The fin whale is a highly migratory species and is found in all the world's oceans. It is a very important species in the marine ecosystem and is a key component of the food web. The fin whale is also a very important species for commercial whaling, and it has been hunted extensively in the past. Today, the fin whale is considered a vulnerable species and is protected by international law.

Currents



October

SU	MO	TU	WE	THU	FR	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Hawksbill Sea Turtle
The hawksbill sea turtle is a species of sea turtle that is found in the western Indian Ocean and the western Pacific Ocean. It is a highly migratory species and is found in all the world's oceans. The hawksbill sea turtle is a very important species in the marine ecosystem and is a key component of the food web. The hawksbill sea turtle is also a very important species for commercial whaling, and it has been hunted extensively in the past. Today, the hawksbill sea turtle is considered a vulnerable species and is protected by international law.

Currents

2010 CURRENTS CALENDAR Sharing the Seas



Currents

It's a **whale** of a calendar!

2010 Currents Calendar Highlights Marine Life

Have you received your 2010 Currents calendar yet? It is a whale of a calendar, highlighting some of the marine life with which we share the seas.

Naval operations and training events frequently occur in areas inhabited by federally protected marine life, particularly whales, dolphins and sea turtles. U.S. Navy policy and federal regulations require that Navy activities minimize the potential to harm protected species. To help achieve our military mission

while minimizing our environmental footprint in all operating areas, the Navy has become a world leader in marine mammal research. We have implemented rigorous protective procedures while at sea. In addition, selected dolphins and sea lions are important partners in our underwater work.

With this close relationship, we want to introduce you to some of the species you might encounter while at sea or at naval installations. From the immense fin whale, the second largest mammal in the world which can weigh up to 160,000 pounds, to the relatively small hawksbill sea turtle, the 2010 calendar provides

information about the species and where Navy personnel might see them.

If you subscribe to the magazine, you should have already received your 2010 calendar. If you are not a subscriber, contact Lorraine Wass, our distribution manager, at ljwass@surfbest.net or 207-384-5249 to receive your own copy of the calendar, request additional copies and sign up for *Currents*.

We hope that the 2010 Currents calendar informs your understanding of these fascinating creatures and how the Navy is working to protect them.

Undersecretary of the Navy Presents 2009 Energy & Water Management Awards

Seven Commands Recognized for Saving Energy & Water, Reducing Environmental Impact

THE HONORABLE ROBERT O. Work presented the 2009 Secretary of the Navy (SECNAV) Energy and Water Management Awards for outstanding performance in addressing federal energy policy on 27 October 2009 at the Navy Memorial and Naval Heritage Center in Washington, D.C. During his keynote speech, Mr. Work emphasized the secretary's new goals for energy reduction, and stressed the importance of energy management. "This year, Secretary Mabus has declared the reduction of the Department's consumption of fossil fuels to be one of his three top priorities," said Work.

There has been no shortage of new federal energy policy in recent years. The Energy Policy Act of 2005, The Energy Independence and Security Act of 2007, Executive Order 13423, renewable energy provisions in the National Defense Authorization Act of 2007 and the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding all contributed substantial new requirements. The policies invoke wide-ranging and aggressive energy and water initiatives, including:

- Reduce installation energy consumption per square foot 30 percent by 2015 relative to 2003,
- Reduce installation water consumption per square foot 16 percent by 2015 relative to 2007,
- Require Leadership in Energy and Environmental Design Silver or higher certification required for new facilities,
- Construct new facilities 30 percent more energy efficient than American Society of Heating, Refrigerating and Air-Conditioning Engineers standards,
- Reduce fossil fuel use in new and renovated buildings by 55 percent by 2010 and 100 percent by 2030,
- Meter all facilities with advanced time-of-use electrical meters,
- Purchase Energy Star or Federal Energy Management Program-designated

equipment—written justification required to deviate, and

SECNAV Announces Energy Goals

THE SECRETARY OF the Navy, at a Naval Energy Forum in October 2009, announced more goals for the Department:

1. Change the way the Navy and Marine Corps awards contracts. The lifetime energy cost of a building or a system, and the fully burdened cost of fuel in powering those, will be a mandatory evaluation factor used when awarding contracts.
2. By 2012, demonstrate in local operations a Green Strike Group composed of nuclear vessels and ships powered by biofuel.
3. By 2015, reduce petroleum use in our 50,000 strong commercial fleet in half.
4. By 2020, produce at least half of our shore-based energy requirements from alternative sources.
5. By 2020, half of the Department of the Navy's (DON) total energy consumption for ships, aircraft, tanks, vehicles and shore installations will come from alternative sources.

- Generate/procure renewable energy equal to 25 percent of electrical energy consumed by 2025.

Innovative energy staff is key to meeting the steep and ever increasing federal energy and water reduction goals. Government energy managers and contract resource efficiency managers at several commands across DON are rising to the challenge. These leaders create a plan, follow their plan, check progress and implement course corrections as necessary. In particular, they:

1. Take advantage of internal and external funding sources to survey for opportunities,
2. Implement cost-effective energy and water infrastructure improvements,
3. Implement new technologies,
4. Review designs for new construction and major renovations to ensure energy efficiency is incorporated, and
5. Engage workers to be energy conscious in their daily jobs.

At the highest performing commands, everyone knows to do their part and shut off office and shop equipment when it's not in use, keep doors and windows closed when the heat or air conditioning is on, shut off unnecessary lights and report energy or water waste (such as missing weather stripping, broken door closers or leaking plumbing fixtures) when they see it.

Here are a few of the accomplishments of the commands that rose to the top in the prestigious SECNAV Energy and Water Management Awards competition for 2009:



The Honorable Robert O. Work, Under Secretary of the Navy, emphasized the Secretary's new goals for energy reduction.

Freed Photography

Navy Large Shore Category

Naval Base Kitsap, Bremerton, WA has reduced energy intensity by 17 percent from their Fiscal Year (FY) 2003 baseline and water consumption by 24 percent from the FY 2007 water baseline. The installation maintains an energy waste hotline and rewards reporters with small energy efficiency program materials. Projects include upgrading Heating, Ventilation and Air Conditioning (HVAC) systems with improved equipment and controls, installation of variable frequency drives on boiler feed water pumps, installation of automatic high-speed roll-up doors at industrial buildings, lighting upgrades, including replacing 32-watt lamps with 25-watt lamps, installation of advanced boiler controls in the Bangor site steam plants, upgrade of chillers to state-of-art variable-speed oil-free chillers and duct

sealing of the HVAC ducts at the Bremerton Bachelor's Quarters.

Navy Small Shore Category

Naval Submarine Base Kings Bay, GA achieved a 45 percent reduction from their FY 2003 baseline and an 11 percent reduction from their FY 2007 water baseline. They awarded a financed energy project that replaced 240 horsepower of electric aerators and blowers with solar aerators for the wastewater treatment lagoons and replaced several areas of failing medium temperature hot water distribution lines. They also installed a cooling water blow down recirculation system for the central chilled water plant, solar powered sump pumps for thermal manholes and solar powered stop signs. A total investment \$4.5 million in energy and water saving initiatives is avoiding \$550,000 in utility costs per year.

Secretary of the Navy Energy & Water Management Awards Winners



2009 SECNAV Energy and Water Management Award winners along with Platinum and Gold commands.

Freed Photography

Navy Industrial Category

Naval Undersea Warfare Center (NUWC), Division Keyport, WA has reduced energy use by 12 percent from an FY 2003 baseline. The NUWC Keyport energy web site not only provides energy efficiency information and resources, but also lists energy projects and on-going initiatives that are planned, in progress or recently completed, allowing all base personnel a window into this important facet of institutionalizing energy savings and implementing new technologies. FY 2008 projects included converting the antiquated and problematic steam heat system in Building 84 to high-efficiency, direct-fired, natural gas unit heaters and installing remote boilers to remove six additional buildings from central steam. Additionally, Keyport installed rapid access cargo doors, lighting upgrades and HVAC system upgrades.

Marine Corps Large Shore Category

Marine Corps Air Station Miramar, San Diego, CA has reduced energy intensity by 14.5 percent from an

FY 2003 baseline and water intensity by 15 percent compared to an FY 2007 baseline. Energy projects included implementing an HVAC replacement and re-commissioning program. Miramar also completed a project that tied existing irrigation controllers to a centralized system, and completed multiple projects that tapped into the City of San Diego's reclaimed water line, avoiding \$1 million in annual potable water costs. Miramar was selected as the pilot location under the Department of Defense/Department of Energy Joint Venture Toward Net Zero Energy Installations and developed a "Green Installation Campaign Plan" to serve as a strategic vision for the air station.

Marine Corps Small Shore Category

Marine Corps Recruit Depot Parris Island, SC has reduced energy intensity by 14 percent from an FY 2003 baseline and water intensity by 15 percent compared to an FY 2007 baseline. Parris Island completed a \$1.5 million Energy Conservation Investment Program project that implemented multiple facility energy

upgrades and also executed a \$1.4 million chiller replacement program using variable frequency drive, frictionless magnetic compressor equipped chillers. Parris Island has installed 1,395 tons of air conditioning to date using the highly-efficient chiller technology that was demonstrated and given a "Green Light" by the Navy's Technology Validation Program. Parris Island supported Energy Star's "Operation Change-out" by giving out 212 compact fluorescent lamps during their Energy Fair. The base continued their building energy monitor program and adjusted landscape water schedules for high visibility areas associated with the recruit graduation areas.

Large Ship Category

USS BONHOMME RICHARD (LHD 6) saved over 26,000 barrels of fuel in FY 2008 over the LHD 1 class average. All hands employed a comprehensive energy strategy that included inspections, training and actions. The commanding officer encouraged all hands to adhere to the Naval Sea Systems Command's (NAVSEA) ENCON Program guide, check list and SECAT software for fuel

management. The Commanding Officer and Executive Officer conducted weekly tours through all engineering spaces, assessing methods to reduce energy use. The navigation officer selected optimal courses and speeds, considering the shortest route and the effects of the wind and current. Crew calibrated over 1,000 critical pressure and temperature gauges, which enhanced the efficiency of the engineering plant. These and other actions produced a cost avoidance of nearly \$4.5 million.

Small Ship Category

USS HALSEY (DDG 97) saved over 34,000 barrels of fuel compared to the DDG 51 class average. HALSEY achieved this unprecedented cost avoidance among DDG class ships despite a high rate of deployment during the rating period. This great result is partly because HALSEY attended all NAVSEA ENCON training classes and used program's energy conservation strategies and techniques. The ship's commanding officer regularly addressed the importance of fuel economy in his night orders directing crew to operate at trail shaft and maximum fuel economy. HALSEY pioneered the concept of Single Generator Operation as an energy-saving strategy. HALSEY's commitment to maximum fuel economy resulted in a cost avoidance of nearly \$6 million.

In addition to recognizing the above winners, Mr. Work acknowledged platinum, gold and blue energy and

USS BONHOMME RICHARD (LHD 6).



USS HALSEY (DDG 97).



water management levels of achievement across the Department of the Navy. [📍](#)

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Bremerton Setting the Standard for Medical Waste Disposal

Command-wide Pilot Program to End Improper Flushing & Dumping

JUST AS WATER seeks its own level, so does the disposal of medical waste products and hazardous pharmaceutical waste. Naval Hospital Bremerton's (NHB) Environmental Division is making sure that water and waste don't mix. NHB has implemented a ambitious command-wide pharmaceutical waste pilot program

Hallmark states the three main concerns for the pilot program are to:

1. Protect human health;
2. Protect natural resources such as water, ground and air; and
3. Promote environmental stewardship.

Reduction Specialist for the Washington State Department of Ecology Hazardous Waste & Toxics Reduction Program. Fisher notes that the Washington State Department of Ecology has provided statewide technical assistance for pharmaceutical waste management over the last couple years, including two site visits to NHB.

I am impressed with the continued progress in implementing the pharmaceutical waste program as part of NHB's overall effort to ensure a safe working environment for staff and others.

—Chad Fisher, Washington State Department of Ecology

to effectively end the flushing, dumping and removal of medical and pharmaceutical waste that could pollute the local environment.

"Instead of throwing pills or some liquid medicine down the nearest drain or dumping into a landfill, we're ensuring that anything that is not going to go back to the pharmacy goes into containers specifically set up in ten places throughout the hospital," explained Jean Hallmark, NHB Environmental Protection Specialist and Pharmaceutical Waste Program Manager.

To that end, since February 2009, over 1,200 pounds of pharmaceutical waste from NHB has been diverted from a landfill or a local water source. Approximately every three months a load out is shipped to a site in Utah for incineration. "It's a great start to keeping our environment clean and changing our mindset," said Hallmark.

"I am impressed with the continued progress in implementing the pharmaceutical waste program as part of NHB's overall effort to ensure a safe working environment for staff and others," stated Chad Fisher, Toxics

"NHB has a well developed pharmaceutical waste program," he said. "Significant improvements have been made over time. The NHB Environmental Division staff of Robert Mitchell, Jean Hallmark and Ramon Calantas are committed to a proactive approach and continuous improvement of the program. Toward that end, they have an open and engaged relationship with the Washington State Department of Ecology."

Examples of hazardous pharmaceutical waste include absorbents used in the cleanup of pharmaceutical spills;



NHB's command-wide pharmaceutical waste pilot program is designed to provide a viable option for the safe and effective removal of medical and pharmaceutical waste.

Douglas Stutz

powders; tablets and pills; test strips; throat and nasal sprays and syringes. There are also creams, pastes and ointments, eye drops, inhalers, intravenous (IV) bags and tubings and lotions. "But if an IV and IV tubing have normal saline, dextrose, dextrose with saline or lactate ringers, it is not considered hazardous pharmaceutical waste," said Hallmark, "and neither are outside baggies, unit dose packaging or container caps."

"It's extremely important to prevent pharmaceutical waste products from getting into our water," observed Hallmark. "There have been water samples taken in the past from several Puget Sound areas that have proved that medications have been hazardous to aquatic life and impact water quality."

Fisher added that nationwide there have been U.S. Geological Survey

studies that have shown multiple pharmaceutical compounds and/or their metabolites in virtually every waterway tested. These compounds can enter waterways in various ways including agricultural uses, animal wastes and wastewater treatment plant effluent. Wastewater treatment plants have multiple sources as well, including the unused pharmaceuticals dumped and flushed to the sewer. The business practice of flushing and dumping unused pharmaceuticals in the sewer is not only illegal but introduces unnecessary chemicals into our waters. Diverting pharmaceutical waste from the sewer system can only help the aquatic environment.

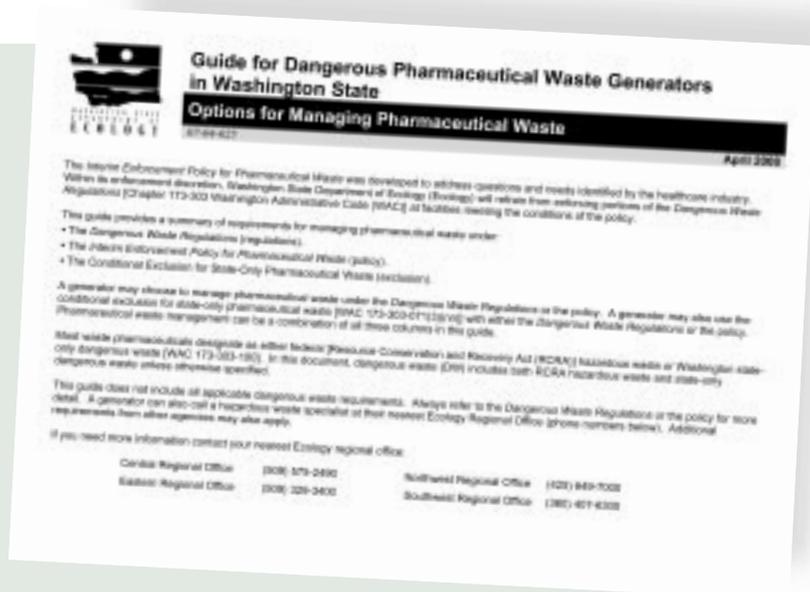
"It will take the collective effort of individuals and the business community to reduce and eventually eliminate that

concern," stressed Fisher. "Education and outreach at all levels will help promote proper management. For example, a recent Washington State program for unwanted household medicines has collected and disposed of nearly 21,000 pounds of pharmaceutical waste. NHB is making similar strides. Together, we can promote and expand pollution prevention programs to eliminate the concern posed by pharmaceutical waste in the first place."

According to Robert Mitchell, NHB Environmental Program Manager, this pilot program will not only comply with state and federal pharmaceutical waste handling regulations, but having such a program in place is also a Joint Commission (JC) mandate. And the Washington State Department of Ecology is considering NHB's program

Managing Pharmaceutical Waste in Washington State

BUSINESSES, INCLUDING HOSPITALS, have options for managing pharmaceutical waste in Washington State—all currently focus on incineration as the method of disposal. Incineration ensures that pharmaceutical waste is managed properly to prevent poisoning, abuse and contamination of local and regional waters.



For a summary of the requirements for managing pharmaceutical waste in Washington State, visit www.ecy.wa.gov/pubs/0704025.pdf.

More information on how pharmaceuticals enter the environment and related concerns is available at www.ecy.wa.gov/programs/hwtr/pharmaceuticals/pages/pie.html.

as a blueprint for other programs. “They were impressed that we were doing the right thing,” said Mitchell, noting that the JC requires an organization to have a program for the management of hazardous materials and waste, including medication waste.

“Getting the correct items into the receptacles is important,” Mitchell said. “Segregation is very important. Each waste stream disposal has a cost. Materials such as aluminum cans and product wrappers can be improperly placed in medical waste containers. Fortunately, we haven’t had any concerns like that—duly noted by the Washington State Department of Ecology.”

“The staff has been very supportive of where we have placed the pharmaceutical waste container boxes,” Hallmark commented, noting that the process is

a simple one for staff members. Every location with a container has a waste coordinator and is periodically inspected by Environmental Division staff. Ongoing training on the importance of using the program and the supplied resources is also provided.

Waste container boxes are located at the Intensive Care Unit, Inpatient Pharmacy, Operating Room, Emergency Department, Family Medicine, Multi-Service Ward, Same Day Surgery, Obstetrics-Gynecology, Recovery Room and Physical Therapy. Once filled, the Environmental Division transfers the container to a secure storage area where it is safety sealed and stored until ready to be shipped.

“The proper management of pharmaceutical waste ensures that people and the environment are protected,” commented Fisher, who noted that

NHB’s pharmaceutical waste management program dovetails nicely with related efforts to collect household pharmaceutical waste. (Visit www.medicinere turn.com for more information.) He continued, “Together, these programs will minimize the impact on the aquatic environment, and ensure that the pharmaceuticals are not abused.”

With NHB’s Environmental Division making such an effort to mitigate the spread of waste today, the water of tomorrow will be able to continue to seek its own level, unfettered by harmful medicines and pharmaceuticals. 

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