

The Corps

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Home removed at Spring Valley site

Complicated search continues

By Brittany Bangert
Baltimore District

As the excavator scraped the side of the stately colonial brickhouse at 4825 Glenbrook Road N.W., Washington, D.C., people gathered to watch the long-awaited demolition in Spring Valley.

"Today marks a milestone of an extremely complicated project that continues with a strong collaborative partnership with our regulatory partners and other stakeholders," said Dave Morrow, deputy district engineer for Programs and Project Management for the U.S. Army Corps of Engineers, Baltimore District.

This property is part of the Spring Valley Formerly Used Defense Site (FUDS), which consists of approximately 661 acres in the northwest section of Washington, D.C. During the World War I era, the U.S. government used the site, known as the American University Experiment Station, for research and testing of chemical agents, equipment, and munitions. Today, the site encompasses approximately 1,600 private homes, including several embassies and foreign properties, as well as the American University and Wesley Seminary.

The Army Corps of Engineers has been actively investigating and cleaning up the Spring Valley FUDS for almost 20 years. This work includes the identification and removal of arsenic contaminated soil, a groundwater investigation, and the search for additional munitions, both in burial pits and isolated items on residential properties.

Crews from Demolition Services Inc. began work on Nov. 29 and by noon on Nov. 30, all that remained was one lone-standing chimney at 4825 Glenbrook Road — which sits on a piece of property believed to be the site of the Sgt. Maurer Burial Pit.

"In the mid-1990s, the Corps of Engineers received a 1918 photo from the Maurer family depicting Sergeant Maurer disposing of chemical-filled carboys," said Brenda Barber, project manager for 4825 Glenbrook Road. "This is the only historical photo we have that shows disposal at the American University Experiment Station."

The team used a technique called photogrammetry, which is the science of making measurements from photographs, to pinpoint the location of the

Sgt. Maurer pit by comparing historical aerial photos to current day maps.

"In addition to the historical photos, we started investigating the Korean embassy property next door in 1999 and realized that items of concern also were present on 4825 Glenbrook Road," Barber said.

The 4825 Glenbrook Road property has since been the focus of two thorough investigations (2000-2002 and 2007-2010).

"More than 500 munitions items, 400 pounds of laboratory glassware, and more than 100 tons of contaminated soil were recovered and safely removed during the two past investigations," Morrow said.

During these previous investigations the Corps of Engineers discovered the materials of concern not only on the lot, but adjacent to the foundation of the house and encased into the foundation of a portion of the retaining wall on the site.

"Based on these previous investigations, we knew there would be a greater chance of finding more materials," Barber said.

The Corps of Engineers, along with its partners on the project, the Environmental Protection Agency and the District Department of the Environment, considered various cleanup alternatives for the property.

"Based on input from our partners, several government agencies, the property owner (American University) and the public, we chose to remove the house, cleanup, and restore the property to residential standards, providing for unrestricted future use of the property," Barber said.

"Removing the house allows for the best access to clean up any material that is immediately adjacent to the structure, as well as any material that might be under it."

Moving forward, Demolition Services Inc., along with Parsons, the project's prime contractor, will begin debris removal and clean up at the site to prepare for excavation.

"After the holidays, we will begin relocating site utilities and performing some limited low probability excavation work in the backyard of the property, where we do not expect to find American University Experiment Station materials based on historic and investigative field data," Barber said.

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Andrew Schwartz connects cables to the MetalMapper system used to catalog munitions. The data will be used later at remediation sites. (Courtesy photo.)

Capturing ordnance fingerprints

By James Campbell

U.S. Army Engineering and Support Center, Huntsville

The U.S. Army Engineering and Support Center, Huntsville, is capturing and cataloging what may best be described as the fingerprints of munitions items such as bombs, mortars, artillery projectiles and fuzes in an effort to improve how work is done at Formerly Used Defense Sites.

The Center's Environmental and Munitions Center of Expertise has begun to put together a library of ordnance signatures.

To help with Corps of Engineers cleanup work at the former Kirtland Bombing Range, N.M., a team of experts traveled to two Florida museums in September.

The National Naval Aviation Museum in Pensacola, Fla., and the Air Force Armament Museum at Fort Walton Beach, Fla. had what the team needed — inert bombs from the World War II era with fins, fuzes and metal intact. Since the museums couldn't release the exhibit pieces to the Center, the equipment to capture their fingerprints went to the bombs.

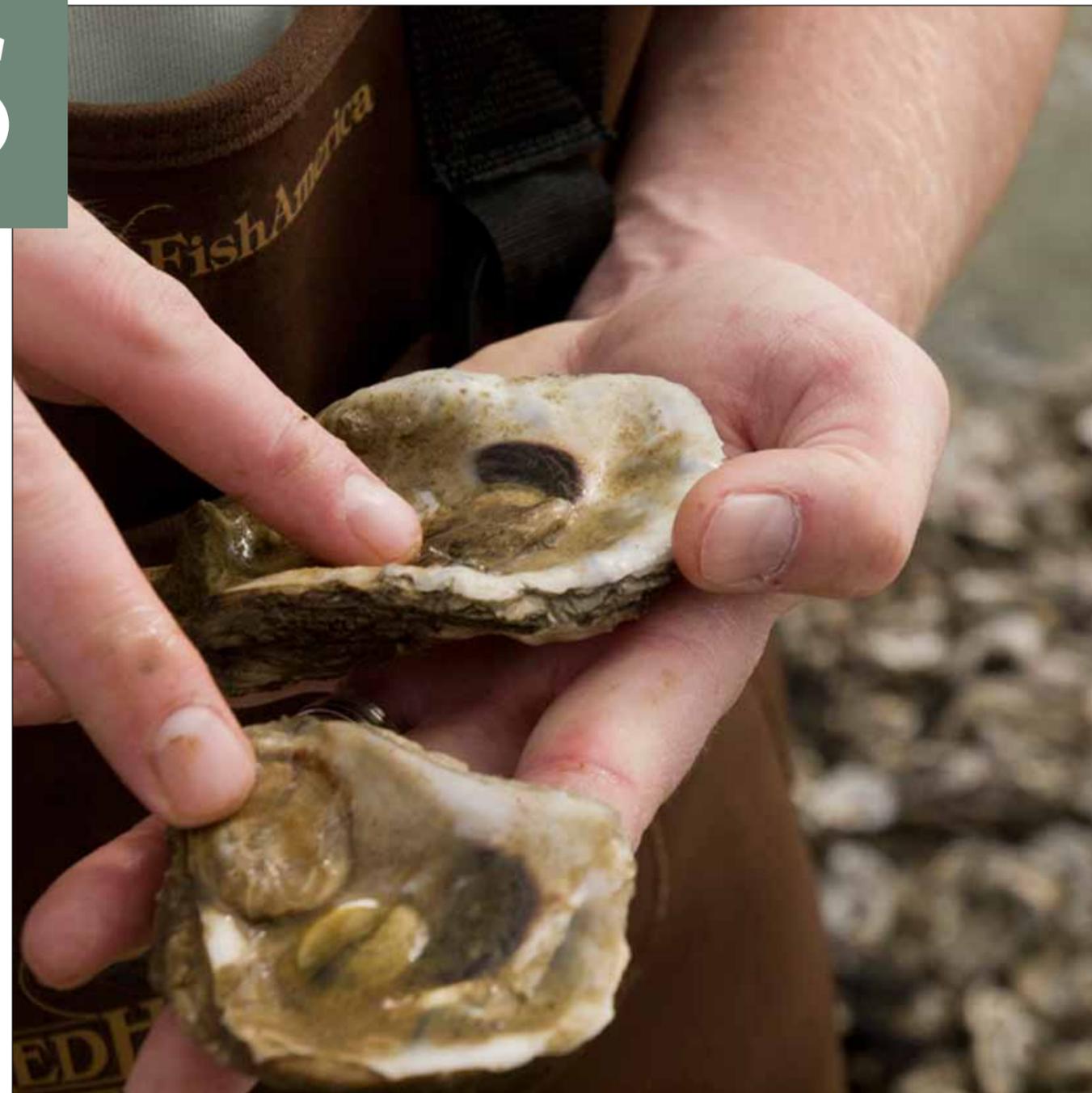
A central challenge when remediating sites where military live-fire training took place is properly classifying anomalies, or signatures from high-end metal detection equipment, said Andrew Schwartz, geophysicist, from the Center's EM CX.

"It's the difference between unnecessarily excavating an area and

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GIS inspires students



Jeff DeQuattro, a marine program director for The Nature Conservancy, examines young Gulf oysters. The U.S. Army Corps of Engineers, Galveston District, partnered with The Nature Conservancy in Texas to undertake an ecosystem restoration project that will create up to 12 acres of sub-tidal reef and habitat located within the northernmost extent of the Half Moon Reef in Matagorda Bay, Texas. With construction slated to begin in the spring of 2013, the \$1.3 million cost-shared Half Moon Reef project will result in increased water filtration, improved water quality in the bay, enhanced marine habitat and allow species of plants and animals to colonize. (Photo by Andrew Kornylak, The Nature Conservancy)



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Whenever possible, please enjoy
The Corps Environment
without using paper.



The way ahead

Managing our programs and our shared environmental legacy

By Christine Altendorf
Chief, Environmental Division

For quite some time, the U.S. Army Corps of Engineers has boasted that it has more than 6,000 professionals working its environmental programs, and that these programs touch the lives of almost every American at some point in time. Although many of us consider environmental work to be our “mission” within USACE, our environmental work is not limited to one discipline.

Environmental components can be found in several different USACE portfolios – the environmental division on the Military Programs side of the Corps, which I head; operations and regulatory on the Civil Works side, headed up by James Hannon; the planning and policy division on the Civil Works side, led by Tab Brown; and the U.S. Army Engineering Research and Development Center’s Environmental Laboratory, under the direction of Beth Fleming.

USACE environmental work can touch on one or all of these areas, and for the past 13 years, you have seen examples of that work within the pages of *The Corps Environment*. It’s quite impressive.

Within this publication, you’ve read articles about our initiatives in the sustainability and energy arenas, environmental cleanup, regulatory, recreation, research and development, ecosystem restoration, Leadership in Energy and Environmental Design, water resources, endangered species, habitat improvement, and the list goes on. Our projects are quite diverse, and we will continue to showcase them within *The Corps Environment*.

We also want to give our other environmental leaders the opportunity to share their perspectives and viewpoints with our readers. To that end, this will be my only column for calendar year 2013. Instead, from now on, each issue will feature a column from one of the four of us, focusing on initiatives within our various portfolios.

For us, within the environmental division, the biggest focus this year will be on customer relations – almost every program within my division is reimbursable – we do environmental work for someone else. Our major customers include the Army, the Air Force, the U.S. Environmental Protection Agency and other various federal and Department of Defense agencies. And our focus is on ensuring that our customers receive the high-quality environmental services that meet their needs and desires, that we are consistent in interacting with our customers and our communication channels are open and transparent.

In fiscal year 2012, the environmental division team provided outstanding program and technical support to our customers, executing more than \$1.58 billion. We achieved a 100 percent obligation rate in our DoD reimbursable environmental requirements of \$1.202 billion, including \$347 million in Environmental Quality, \$327 million in the Defense Environmental Restoration Program, \$135 million in the Base Realignment and Closure Act Program, \$3 million for the Deactivated Nuclear Power Plant Program, \$328

million for the Formerly Used Defense Sites Program, \$12 million in the Native American Lands Environmental Mitigation Program, and \$50 million in the Defense State Memorandum of Agreement Program. We also obligated more than 100 percent or \$387 million in Non-DOD Environmental programs including \$240 million in the EPA Superfund program, \$39 million in Environmental Support for Others, and \$108 million in environmental support to Civil Works Formerly Utilized Sites Remedial Action Program. And we expect to execute equally well in fiscal year 2013.

When it comes to our other environmental programs, the bar is equally high. We must be good stewards of our natural resources. The Corps of Engineers manages almost 12 million acres of public lands and waters in 43 states, an area equivalent to the size of Vermont and New Hampshire combined. These public lands and waters are homes to incredibly diverse habitats, and in some cases to species found nowhere else in the world. In carrying out our Regulatory mission, USACE must carefully balance decisions to protect our nation’s aquatic resources, ensuring no net loss of wetlands while issuing about 90,000 permits a year.

Perhaps one of the greatest environmental legacies that we can leave for future generations is ecosystem restoration. Across the country we are working with multiple Federal and non-Federal agencies and organizations in system-wide efforts

to leverage the national investment in the interest of ecosystem restoration.

The Administration has named five high-priority ecosystems for restoration – the Chesapeake Bay, the Gulf Coast, the California Bay Delta, the Great Lakes and the Everglades. These are diverse ecosystems that are different from each other in a number of ways. The goal is to restore degraded ecosystem structure, function and dynamic processes to a more natural condition.

Our environmental research program provides solutions to environmental challenges through environmental science and engineering research and development, conducting research in ecosystem science and technology, environmental resiliency, environmental sensing, ecological modeling and forecasting, risk and decision science, environmentally sustainable material, systems biology, climate change, and environmental security. The environmental lab partners with other government agencies, academia and industry to solve complex environmental systems problems.

The environmental challenges the Corps of Engineers faces are immense, and providing the solutions requires a complete team commitment and effort, which we hope is not only reflected in the pages of *The Corps Environment* but in this column.

Essayons!



Christine Altendorf

ENVIROPOINTS

Corps targets sediment, contaminants in busy waterway

By Sarah Gross
Chicago District

With one seamless swivel of a crane, a bucket of sediment was released into a barge the afternoon of Oct. 23 for the first time in more than 40 years in the Indiana Harbor and Canal, one of the busiest ports by tonnage and the number one area of contamination in the Great Lakes.

“This East Chicago waterway hasn’t been dredged since 1972, but thanks to a truly collaborative effort involving federal, state and local government, private industry and members of the local community, we have started to safely remove and contain sediment to not only restore deep draft commercial navigation but improve water quality in southern Lake Michigan,” said Chicago District Engineer Col. Frederic A. Drummond Jr.

During a period of eight to 10 years, the Indiana Harbor and Canal Confined Disposal Facility Project will produce an estimated 1.8 million cubic yards of dredged materials through mechanical operation of an environmental or closed clamshell bucket to securely place accumulated sediment backlog in barges where it is transported to the confined disposal facility and hydraulically off-loaded through pipes using re-circulated water from the CDF.

“By removing sediments from the canal, the migration of sediment into Lake Michigan, our largest body of fresh water, will be prevented,” said Rep. Pete Visclosky.

It is estimated that each year, more than 100,000 cubic yards of contaminated sediment washes to the lake, including approximately 67,000 pounds of chromium, 100,000 pounds of lead and 420 pounds of Polychlorinated biphenyls, often referred to as PCBs.

“You can see the effort and care the Corps has put into this complex project,” said East Chicago Mayor Anthony Copeland.

As the location for the CDF is an abandoned petroleum refinery site, it includes some unique features not typical of Great Lakes-area CDFs, such as a groundwater cut-off wall and a groundwater gradient collection system instead of the more typical passive liner, a sealed sheet-pile wall to complete the site isolation from the environment, oil booms in the canal to address historical discharges and an on-site wastewater treatment plant.

The U.S. Army Corps of Engineers and partners worked in close concert with the community from the project’s start and took concerns to heart to include: annually reviewing new and emerging technologies, including those proposed by the community, in the area of removal, transport, disposal and treatment of contaminated sediment; conducting quarterly community information sessions; and completing an evaluation report of property value impacts expected from the project.

“We are ensuring this project will have minimal negative effects on the

local community and environment through activities such as air monitoring and treatment of all groundwater and dredged material that leaves the site,” said Chicago District Project Manager Mike Nguyen.

The sediment contains a number of compounds of various types. The Corps is monitoring the air for the total number of volatile compounds and has also chosen naphthalene as the main compound for real-time air monitoring.

“Naphthalene was chosen because it is present in the sediment in fairly high concentrations, so it is more likely to be released. Also, it is not a compound known to be released from the adjacent petroleum industries, as we want to identify the potential air quality impact of the CDF as a unique source,” said Chicago District Environmental Engineer Jennifer Miller.

If any of the monitoring starts to show elevated concentrations of volatile compounds, the dredging operation will be changed or stopped until the concentrations are sufficiently low.

“We expect to release less than 1 ton per year, which is well below the facility’s permitted 25 tons of volatile emissions per year,” Miller said.

The Corps has monitored background levels of PCBs and other airborne pollutants for more than 10 years.

Twenty-four-hour samples of chemical parameters that fall into several chemical groups and particulate matter are collected from air sampling stations every six days, as part of long-term ambient air monitoring.

“We conducted extensive experimental measurements and modeling, and the model developed for Indiana Harbor is now used worldwide for estimating volatile releases from dredging projects,” Miller said.

After backlog dredging is complete, maintenance dredging will take place, as necessary, for approximately 20 years, to remove re-accumulated sediments and maintain navigable depths in the waterway.



Sediment is removed from Indiana Harbor and Canal, for the first time in 40 years on Oct. 23. (Photo by Jessica Majchrowski)



A worker installs oil booms at Indiana Harbor and Canal, Nov. 27. (Photo by Vanessa Villarreal)



The Corps of Engineers demolished this house Nov. 30 to clean-up and restore the site to residential standards. (Photo by Andrea Takash)

Search

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Following completion of the initial low probability work, contractors plan to place a large Engineering Control Structure over the site to prepare for high probability excavation, including removal of the basement slab, as well as continued excavation underneath the structure to competent saphrolite or bedrock. Historical and field data indicate the high probability areas of the property have a greater likelihood of containing American University Experiment Station debris and/or glassware items.

“The Engineering Control Structure will fully enclose the high probability excavation areas, and the use of three Chemical Agent Filtration Systems will filter the air leaving the control structure so that any person outside of the tent is safer than those working inside the tent,” Barber said.

“The basement slab and exterior basement walls remain in place and will be removed during high probability work,” Barber said.

Following completion of the high probability phase, the Corps of Engineers plans to finish up with the remaining low probability excavation areas. After completion of the low probability work, the team will restore the site and release it back to American University by spring 2014.

“The safety of our site workers and members of the community remains our number one priority and serves as the driving force behind each and every decision made on this Spring Valley Formerly Used Defense Site,” Morrow said.

(Andrea Takash contributed to this article.)

District celebrates new general permit

By Tracy Sanders, Biologist
Charleston District

The U.S. Army Corps of Engineers Charleston District developed and issued a regional general permit to allow certain types of work in an area both rich in history and biodiversity.

To address the complexity of the tidal impoundment ecosystem and its uses, the Corps of Engineers reached out to a broad base of stakeholders and formed an advisory committee for an area south of Charleston, S.C.

Representatives from Ducks Unlimited, The Nature Conservancy, U.S. Fish and Wildlife Service, South Carolina Department of Natural Resources, landowners, managers, and biologists, were invited to assist the Corps. This process would prove instrumental in providing the Corps with information to develop the general permit.

“Once the need was identified, the Corps brought together a diverse group of environmental professionals to objectively evaluate and formulate the General Permit,” said Mark Purcell, Wildlife Refuge Manager of the ACE Basin National Wildlife Refuge and a member of the Advisory Committee.

The area of coastal South Carolina is known for its pristine beaches, vast expanses of salt marsh, and abundance of wildlife. Perhaps lesser known are the areas where rice was historically grown and the unique wildlife that reside there.

These historic rice fields and plantations are located south of Charleston along the Ashepoo, Combahee and Edisto Rivers, an area called the ACE Basin, and near the City of Georgetown along the PeeDee, Black and Santee Rivers.

Rice production began in South Carolina in the late 1600’s and originated in the uplands. In the early 1700’s, rice production was moved to freshwater swamps and eventually to tidal areas by the end of the Revolutionary War. The collapse of rice production in South Carolina after the end of the Civil War left many of these rice fields abandoned. By the early 1900’s, private interests began purchasing the rice fields and plantations. Instead of growing rice, their intention was to manage the rice fields to attract waterfowl for hunting.

Today, many of these historic rice fields are maintained and managed as habitat for a wide variety of wetland dependent species, including endangered and migratory species. As a result, waterfowl and other



A Great Egret takes flight while a Roseate Spoonbill, Snowy Egret and White Pelican watch from a trunk. The wooden structures were installed to manage water levels for rice production. (Courtesy photo)

wetland dependent wildlife, most notably shore and wading birds, the bald eagle and the American alligator, flourish in these areas.

The ability to manage rice fields, also referred to as tidal impoundments, involves frequent ongoing maintenance and repair of the fills and structures in place. Embankments, which consisted of fill material, were constructed in tidal waters to create impoundments. Wooden water control structures, known as trunks and spillway boxes, were installed in various locations in the embankments to allow for control and management of water levels for rice production, which are now used for wildlife management.

The majority of the maintenance and repair activities that are necessary require authorization from the Corps prior to conducting the activity. In addition, no permit was available that could be applied for and issued immediately in an emergency situation when an embankment unexpectedly failed as a result of a storm or other unforeseen circumstances. The limited permitting options were often problematic for landowners and managers.

The new Managed Tidal impoundment General Permit peaked interest from the public. Letters of support were received from landowners, agencies, and organizations during the public comment period.

With input from other agencies and the public, a general permit was put into effect late this past summer. The permit not only authorizes routine and normal maintenance and repair activities, as well as emergency repairs, but also created an efficient and transparent permitting process for the public.

“The Corps of Engineers did the heavy lifting on this,” said Craig LeSchack, Ducks Unlimited, director of conservation programs for the Southeast. “They listened to the problems, and were willing to find a solution that helps everyone manage these local wetlands that host some important species.”

Ordnance

Continued from Page 1

finding junk metal or being certain of what's down there." Schwartz said. The newest sensors have the potential to reduce excavation on some sites by more than 75 percent."

That's one reason the team went to the museums in Florida where the team collected advanced electromagnetic induction signatures for bombs and bomb fuzes using MetalMapper and the Time-domain Electromagnetic Multi-sensor Towed Array Detection System, Schwartz said. The equipment gathers complex geophysical data about the objects – data Schwartz said he likes to call metal detector fingerprints. It's still metal detection, but the specialized equipment can determine metal types, thickness and symmetry.

The bombs in question at the former Kirtland site are 100-pound general purpose, practice bombs and spotting charges dropped at what was then a U.S. Army Air Corps bombing range, last used for this type of training in 1947.

Trent Simpler, project manager and Mark Phaneuf, geologist, representing the U.S. Army Corps of Engineers Albuquerque District, joined the team from Huntsville Center collecting the bomb data in Florida.

The former range is part of an area where an airport expansion is scheduled, and the Albuquerque District is managing the remediation project.

Once complete, this will be the first use of the technology on a FUDS project, Simpler said.

The trip to the museum to gather the old bomb's data fingerprints was funded by the Albuquerque District project, but it also benefits a library the team hopes will grow to be a standard classification for subsurface items that may be unexploded ordnance.

It's said that human fingerprints are

unique, but in the case of ordnance, multiple data sets are needed for one type of munitions. Schwartz said the current library has roughly 300 ordnance signatures that cover about 25 different pieces of ordnance and related clutter.

The EM CX is also working within the Department of Defense community of experts to standardize how the data is structured, Schwartz said.

"The library needs to be specific. For example, there are over a dozen different types of 81mm mortars, each with unique signatures, but if the library doesn't have the signature for the one you're looking for, you might not get a match," he said.

These signatures will help the Corps investigate sites where ordnance was used and determine which pieces of metal can be safely left in the ground, freeing up more resources so the FUDS program can get to more sites sooner, said Amy Walker, a geophysicist on the team from the Center's Engineering Directorate.

"In the larger sense, these new sensors provide advanced classification capabilities that weren't there just a few years ago," Walker said. "We're still in initial stages, building up the library so we can understand what these items look like to the new sensors, but this is what's next in munitions response. It's an exciting time for the industry."

Another member of the team, Nick Stolte, an environmental engineer with the EM CX, said he thinks the long-term benefits of a signature library will provide efficiency at multiple levels, including planning and reporting.

From helping with a project involving a World War II-era bombing range in New Mexico to building a library that can help at locations everywhere, the Center team is counting on these complex fingerprints as one way to meet the challenges of mitigating the risk from ordnance and Munitions and Explosives of Concern at current and former military sites.

Chief visits Everglades project

By Jenn Miller
Jacksonville District

Lt. Gen. Thomas P. Bostick, commanding general of the U.S. Army Corps of Engineers (USACE), visited the Everglades Oct. 10, to see the restoration work being performed by Jacksonville District and its partnering agencies.

"USACE has one of the largest environmental restoration and sustainability roles in the federal government, and the Everglades restoration is our largest project of this kind," said Bostick. "After viewing firsthand the enormous challenges facing Everglades restoration and meeting with our partners in this effort, I am absolutely convinced that working together, we can achieve restoration goals and improve this ecological treasure for future generations."

During his trip to the Everglades, Bostick visited the Tamiami Trail Modifications project site in Miami-Dade County, a project sponsored by the National Park Service. At the site, he met with Shannon Estenoz, director of Everglades Initiatives for the Department of the Interior; Dan Kimball, superintendent of Everglades National Park; Dave Sikkema, project manager for Everglades National Park; Bob Johnson, director of the South Florida Natural Resources Center; Col. Alan Dodd, Jacksonville District commander and members of the project team to discuss the ongoing construction at the site.

"Progress continues to be made in Everglades restoration," Dodd said. "This progress is contingent upon the commitment of this district and our partnering agencies. Through a dedicated and collaborative effort, we will not only continue to move forward in our restoration goals but also fulfill our obligation to the nation to preserve this



Tim Brown (left), Tamiami Trail project manager, tells Lt. Gen. Thomas P. Bostick, USACE commanding general, about the construction progress on the Tamiami Trail Modifications project. (Photo by Jenn Miller)

national treasure."

Construction of the \$81 million Tamiami Trail project, a key component of the Modified Water Deliveries to Everglades National Park, began in 2010. The project includes constructing a one-mile bridge and raising and reinforcing an additional 9.7 miles of road, allowing increased water flows that are essential to the health and viability of the Everglades.

"A major construction milestone for the Tamiami Trail Modifications project was reached July 13 as the first concrete pour on the bridge deck was completed," said Tim Brown, project manager. "This milestone signified the start toward the end of the project's bridge construction. However, there is still more work to do and it is our collective discipline that will ensure our project's success."

After seeing the Tamiami Trail Modifications project, Bostick, along with agency representatives, toured the Everglades National Park via airboat.

Corps worker shares new sustainable home

By Candice Walters
HQ, USACE Public Affairs

It is safe to say that 2013 will be a time of change for Nelson and Caroline Labbe as they move into their new *PassivHaus* in Falls Church, Va., a Washington, D.C., suburb.

Labbe, who works for the U.S. Army Corps of Engineers Formerly Used Defense Sites program, said he has been energy conscious since his high school days, and always said that if he ever built a house, “it would be nice if we could build one as energy efficient as possible.

“I also feel strongly that as a country we need to be more energy independent. One way to help achieve that is to reduce residential energy requirements.”

Of course, this was coming from a man who was living in a house built in the late 1700’s that “was pretty leaky” when it came to energy usage. “It was a bit cold at times,” Labbe said with just a hint of understatement. “We were feeling a lot of drafts, especially around the back door and the windows in the bedrooms.”

Thus, the *PassivHaus*, a German term for the rigorous energy efficiency building standard that results in a building that requires little energy for space heating or cooling. “What you are looking at is a house that has a heating and air conditioning system that is much smaller than normally found in most buildings but still providing comfort with lower energy costs,” Labbe said.

PassivHaus standard requires a number of techniques and technologies to produce a house that has very low energy requirements year-round while improving durability, comfort and interior environment, he said. Compared to a typical house in the United States, a *PassivHaus* can achieve a 90 percent reduction in heating and cooling costs.

“In many ways, this house and the *PassivHaus* standard are way beyond LEED (Leadership in Energy and Environmental Design)-type sustainability goals, since a major factor in LEED and sustainability is embedded energy in the construction and finish components,” Labbe said. However the embedded energy in a house is dwarfed by the operational requirements over the life of a house.

“We started planning it about four to five years ago, and the construction began in May. The key component was finding people (architects) who were willing to learn what a *PassivHaus* is all about,” he said. “When we started our project, there were less than 10 *PassivHaus* buildings in all of the United States, with somewhere in the hundreds now, and only a handful of architects trained to design a *PassivHaus*. Currently there is only one other *PassivHaus* in all of northern Virginia, which was just finished in June.

“It took us awhile to find the right people. Our architect, a fellow kayaker, was very interested in getting the chance to design a *PassiveHaus* and ended up taking *PassivHaus* training, and our contractor has been excited about the challenge from the beginning,” Labbe said.

When most people hear the term *PassivHaus*, they immediately think of Germany and Europe, where more than 200,000 *PassivHaus* buildings can be found, but the roots of this energy-efficient movement can actually be traced to the United States in the 1970’s, Labbe said. The U.S. movement faded in the 1980’s, but the Germans embraced it and it’s almost become standard there now. In fact, U.S. Army Corps of Engineers Europe District has incorporated *PassivHaus* technology in some of its family housing projects. One Europe District project manager likened the *PassivHaus* features of foot-thick insulation, triple-paned window and foam-sealed utilities to “energy efficiency on steroids.”

Labbe and his wife fully expect to find consistent temperatures within their 2,400-square-foot, four-bedroom, two-story house -- 68 degrees in the winter and between 75 and 78 degrees in the summer -- due to the triple-paned windows brought in from Canada, the thick walls, extra insulation and the foam on the house’s exterior. “Eventually the house will be sided,” Labbe said, “but for now the foam provides a good thermal break.”

And it’s safe to say that’s there a great deal of foam being used as part of the superinsulation techniques -- six inches of foam insulation under the basement slab, six inches on the outside of the basement walls, double stud exterior walls with 9.5 inches of space for cellulose insulation, two inches of continuous foam insulation attached to the outside of exterior wall sheathing and 24 inches of cellulose insulation in the attic.

A key feature of a *PassivHaus* is that it must be very well sealed to prevent the air from leaking in and out of the building. “Without a good air seal, the high levels of insulation would be a waste,” Labbe said.

The total air leaks in a typical home are equivalent to a hole that is about 2 feet by 2 feet. In the Labbe house, the latest tested total air leakage throughout the whole house was the equivalent to a hole less than 2 inches in diameter.

Since the house is so well sealed, fresh/ventilation air must be supplied to the interior -- a heat exchanger will be used so the cold air pumped in during the heating season is heated by the warm air being exhausted to the outside. A carbon dioxide monitor will be used to verify that interior air is sufficiently ventilated, he said.

Also on tap, later down the road, will be solar panels for the roof. “We want to wait a little while to see exactly how much energy we are using before going there,” he said, adding that he will be watching the mini-split



Architect Peter Henry explains *PassivHaus* concepts at the Labbe’s worksite. The stacks of thick foam insulation are one of the home’s key features. (Photo by Lara Beasley.)

heat pumps to see if they really are more efficient and effective at lower temperatures as advertised.

“To stay under the limit for whole house energy use, all the appliances we selected are energy star qualified, all lighting fixtures will use CFL or LED light bulbs, and a heat pump water heater was selected to minimize energy use for hot water,” he added.

While Labbe expects to reap energy savings, he did say that the construction costs ended up being “a little bit higher than we initially expected. For the Northern Virginia area, custom houses run about \$200 a square foot, while our costs were about \$240 to \$250 per square foot. However, our monthly energy costs for our other house averaged about \$150 a month for a house half the size of the new house, and with the energy efficiencies, we expect our new energy costs will be less than one-half of that. That will go a long way toward offsetting the construction costs,” he said.

“I feel pretty good about the project,” Labbe said. “We have had a lot of struggles, but we’ve learned quite a bit along the way. I would definitely encourage others to investigate the concept.”

Man-made marsh thriving after 16 years

By Hank Heusinkveld
Wilmington District

In 1996 Wilmington District biologists and engineers, with help from other North Carolina resource agencies, designed and constructed a former dredged material disposal island to offset impacts from construction of the Army Reserve Center in Morehead City, and turned it into a thriving coastal tidal marsh.

Sixteen years later the marsh is a sustainable ecosystem that has exceeded the Corps' goals and expectations. It has weathered numerous tropical storms and hurricanes, and it continues to support a wide variety of flora and fauna. By combining outside-the-box thinking, intuition and scientific studies the site has become a sustainable ecosystem.

"Sometimes it's hard to believe the site is a man-made environment and not a naturally occurring one," said Wilmington District Marine Biologist Chuck Wilson. "Basically we provided the building blocks and then we allowed those natural processes to occur in this site and for the site to mature in a way that Mother Nature intended."

Wilson said there are various attributes scientists look for to determine sustainability. A site needs to be resistant to impacts and stressors such as extreme tides and storms, and it needs to be able to withstand erosion.

"The tide rises and falls twice a day and the site can stand up to that," he said. "But you also want it to be resilient. That means if hit with a hurricane the site can repair itself. In this particular site a hurricane hit right after construction and it overwashed and poured sand into the areas where it had been recently planted with aquatic vegetation. But the site came back.

You want the ecosystem to be stable,

and it will change over time as new plant species colonize the area and put it on a path for ecological maturity."

Wilson said a good indicator measuring the health of the system is the abundance of colonizing plant species that are still alive after 16 years. After surveying the marsh-line all these years, he's found marsh grasses have spread down-slope.

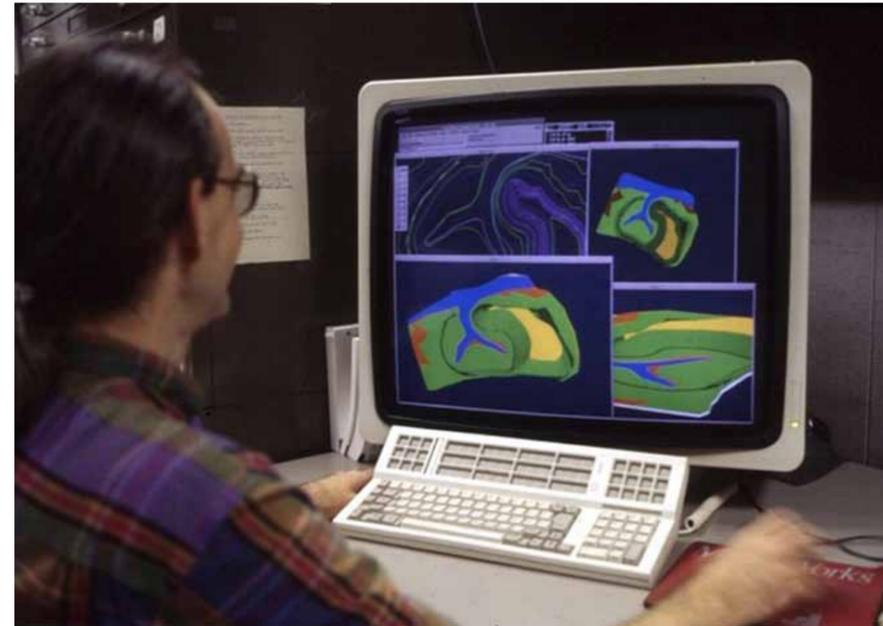
"We know now that organic material builds up over time and you would not expect to find high organic material in newly constructed marsh," Wilson said. "At this site that organic material began accumulating when plants began to grow and decay much like peat over the seasons."

Restoration doesn't happen overnight, and year-to-year analysis shows that once a system gets a good start it can slowly blossom into a thriving ecosystem.

"This is long-term development because marshes will take anywhere from 15 to 30 years to fully develop when they're restored correctly," said Dr. Martin Posey, a University of North Carolina at Wilmington marine biology professor. "If they're not restored correctly then they never really stabilize. We're monitoring this site to see how all the pieces gradually reach the final levels in recent comparison to adjacent areas. The mud flat systems usually equilibrate first, and then your oyster reefs, then marsh edge, and then the final pieces are the upper marshes. We're following that over time for the next decade or two to show how the various pieces begin to develop like a full, stable marsh."

Wilson said building the marsh correctly the first time gave the scientific community confidence to begin constructing other sites along coastal North Carolina.

"There are few examples of an ecosystem design that are 16 years old. This is a great place to be able look back and see how these sites develop over time."



Top: Doug Wall, a Wilmington District civil engineer, reviews the marsh design on a computer before start of the construction in the early 1990s. (File photo) Bottom: Workers plant marsh grass on an upland slope at the start of the marsh construction in 1996. (File photo) Left: Wilmington District marine biologist Chuck Wilson inspects seeding marsh grass. Wilson said the natural seeding and reseeded indicates the plants are growing and expanding, and the ecosystem is still maintaining the basic function for which it was designed (Photo by Hank Heusinkveld)



Europe district explores overseas LEED alternative

By Jennifer Aldridge
Europe District

Think global, act local. The phrase, popularized in the 1970s on the back bumpers and on the front of T-shirts, has evolved through the years and taken on a wider meaning.

The slogan is used by urban planners, environmentalists, government officials and business executives to describe a global mindset with a local focus.

Today, the U.S. Army Corps of Engineers Europe District is considering the adoption of local green building standards to meet the Army's worldwide environmental and energy performance goals.

The Army mandates all new construction projects must meet strict sustainability standards, according to an October 2010 memorandum issued by Katherine Hammack, assistant secretary of the Army for Installations, Energy and the Environment.

As the Army's construction agent, the Corps works with its customers to plan, program, budget, design and build facilities to achieve a minimum of Leadership in Energy and Environmental Design Silver or an equivalent overseas green building rating system certification per Army policy.

"Right now the Army has it right by specifying LEED or an overseas equivalent," said Kristen Stroh, a Europe District project manager. "It's important to stay away from being rigid and keep the policy goal driven so that it is more achievable."

Europe District, responsible for constructing facilities in Germany and throughout Europe and Africa, is exploring a German sustainability rating system as an alternative to LEED, said Rich Gifaldi, the district's sustainability engineering manager.

"USACE policy stipulates LEED or a host nation equivalent must be used," Gifaldi said.

LEED, developed by the U.S. Green

Building Council, is a well-known American rating system used to implement practical and measurable green building design, construction, operations and maintenance solutions. Germany has developed two similar, if not equivalent, green building assessment and certification systems, *Deutsche Gesellschaft für Nachhaltiges Bauen* or DGNB, and *Bewertungssystem Nachhaltiges Bauen* or BNB.

"The intent behind them is the same - to have a green building," Gifaldi said.

The district is conducting a pilot project to determine if one or both of the local standards — based on German building codes and written in the German language — can be substituted for LEED certification in the future.

"We are in Germany and they are not familiar with U.S. standards," Gifaldi said. "We want to find something local that will have less of an impact on the project schedule. DGNB is the leading standard in Germany, and the codes are familiar to the design team and the contractor."

By comparison, LEED references an erosion standard set by the U.S. Environmental Protection Agency. Europe District's German partners may not be familiar with the EPA, let alone the agency's standards, Gifaldi said.

Stroh said it can be challenging and time consuming for German architects, engineers and contractors to adapt to LEED.

The district is using a Child Development Center in Stuttgart, known to Germans as a kindergarten, to compare LEED, DGNB and BNB.

According to Stroh, the pilot will determine if flexibility can be worked into the certification process.



This illustration helps visualize what the Child Development Center will look like. (Courtesy illustration)

"If we have three standards we can pick from we gain flexibility," Stroh said. "It is good to provide options."

Thomas Honika, a LEED and DGNB certification consultant, will monitor the pilot project and track its progress through two rating systems simultaneously.

The major distinction between these standards is the economic quality criteria considered by DGNB and BNB but not by LEED. The measure takes project life cycle costs into account. The cost of building materials, operations, maintenance and upgrades to the facility are used to analyze economic quality in German systems, Honika said.

"Life cycle costs have a major influence on the certification," he said. "In the case of DGNB the economical quality comprises criteria like low life cycle costs, flexibility of the building and suitability for third party use."

In addition to economic quality DGNB and BNB focus on ecological, sociocultural, technical, process and location ratings.

"This standard could potentially lead to a better quality building," Gifaldi said. "LEED is not set up to capture life cycle costs at this point. It doesn't reward or penalize based on how much you spend to build."

The CDC pilot project, currently at 35 percent design, is still in the assessment phase. Gifaldi said he looks forward to reaching the study's final outcome.

"If the pilot project returns great results, then as a district we will consider using DGNB for the majority of our work in Germany," Gifaldi said.

All rating systems are applicable to the district's work and should be recommended for further projects, Honika said.

"The experience of the last year has shown that U.S. construction standards are no stumbling block anymore in Germany if the requirements are implemented early in the certification process," he said.

Editor's note: The pilot project received DGNB pre-certification and is on track to be the first Army project certified by a LEED equivalent German rating system.

Corps, partners explain estuary's value to students

By Vince Elias
New York District

Balancing the Port of New York and New Jersey and the environment are two components of a world class estuary – and on October 12, an alliance of partners with the support of elected officials conveyed this important initiative to hundreds of area school students at the 10th annual Estuary Day celebration.

Held near the Elizabeth River at the Peterstown Community Center in Elizabeth, N.J., students arrived by the bus load in what turned out to be a very successful interactive experience.

Orchestrated by Future City Inc., and sponsored by the Elizabeth River/Arthur Kill Watershed Association, the event's success is attributed to a concerted effort and steadfast partnership with strong local support. The program demonstrated the importance of education and community participation in preserving the environment.

Partnering organizations included the Elizabeth River/Arthur Kill Watershed Association, City of Elizabeth mayor's office, U.S. Army Corps of Engineers, U.S. Coast Guard, U.S. Environmental Protection Agency-Harbor Estuary Program, New Jersey State Department of Environmental Protection, NY/NJ Baykeeper, Green Infrastructure and support from the offices of U.S. Sen. Robert Menendez and Rep. Albio Sires.

In a setting, which was not a typical classroom, participating agencies staffed table displays and served as instructors, discussing with students their respective organization's mission as it relates to the port, harbor, estuary and about environmental stewardship.

Commitment to selfless service is one of the Army's core values, and volunteers from the Corps of Engineers New York District exemplified this value by sharing their expertise with students and affording them an opportunity to better comprehend the history of the estuary and its environmental state.

Using a variety of visual aids, William Slezak, Chief of the Corps New York Harbor Programs along with Lisa Baron, marine biologist lectured at the Corps education workshops about the New York and New Jersey harbor estuary and the significance of balancing the Port and the environment, ecosystem restoration and activities associated with restoration projects and studies.

Melissa Alvarez, Lisa Baron, Chonteau Johnson, Amanda Switzer and Thomas Wyche staffed the live marine animal interactive exhibit as Stephen Knowles interacted with students nearby at his model of an estuary exhibit.

"The Army Corps and its partners have many roles, and focus on improving the New York and New Jersey Harbor Estuary. This is another great opportunity to learn about the Estuary," said Slezak at the opening



*Melissa Alvarez, a New York District senior project biologist, shows a winter flounder (*Pseudopleuronectes americanus*) to students at the live marine animal interactive exhibit. (Photos by Vince Elias)*

ceremony. "It is our hope that each and every one of you can leave from today's workshops with a little bit more knowledge about the estuary and ways we can affect changes in our watershed."

"Estuaries are national treasures -- vital ecological and community resources whose health affects our health and the vibrancy of our communities and economy," said Baron who has been a participant for the past five years. "Estuary Day 2012 was another fabulous event that exemplified strong partnership with a common goal to inform our future leaders about the importance of sustaining and improving the health of the estuary."

It was especially rewarding to the Corps volunteers as it was another opportunity to provide pupils with information about the Corps environmental initiatives in the region. By sharing their knowledge, volunteers imparted how important the estuary is, and students were able to take with them their newfound knowledge to share with their friends and families on what they experienced and learned at Estuary Day.



*A northern puffer (*Sphoeroides maculatus*) displays its namesake characteristic.*

City park ecosystem vision becoming reality

By **JoAnne Castagna**
New York District

Thirty years ago, Elbin Mena was repairing a hole on his father's roof in Harding Park, Bronx, New York City. "I looked out at neighboring Soundview Park. It was filled with abandoned cars and burnt out shacks and I said to myself, 'Boy, this park could look beautiful if given some money and attention,'" said Mena.

It was at that time that Mena decided to make Harding his home and Soundview Park the place he envisioned. He used his own jeep to pull out debris from the park including abandoned cars and boats and beautified the grounds by planting seeds and painting benches.

Mena also became a park warden, president of the community's homeowners association and friends with local officials - basically the face and voice of his community. "When I start something I don't leave it until I'm finished," said Mena, today a retired New York City Police Detective.

Mena is now seeing his vision become reality. The U.S. Army Corps of Engineers, New York District, in partnership with the New York City Department of Parks & Recreation, is completing the Soundview Park Ecosystem Restoration Project.

The project is returning some of the park's lost marshland and creating an upland meadow and forest. This will provide a healthy ecosystem for wildlife to flourish and an aesthetically pleasing and safe place for residents.

The 205-acre Soundview Park is located in the South Central section of the Borough of the Bronx in New York City. The park lines one and a half miles of the Bronx River and visitors have a clear view of the nearby New York City skyline.

The park was built on a former landfill, but previously it was a network of 80-acres of salt marsh, 40-acres of open water,

upland meadows and forests.

In the early 20th century, it was a common practice to fill in marshland with soil and man-made debris. This destroyed most of the park's marsh and open water areas and degraded and hardened the shoreline.

In the second half of the 20th century the park basically turned into a public dumping ground. "Every day I would go out on my back deck, which by the way I built with debris that washed up to my home, and see smoke in the sky. People were bringing their cars to the park to burn and abandoned them. One day a dead body was even found on the shore here. It was real bad," said Mena.

In the fall of 2011, the Army Corps began construction on the Soundview Park Ecosystem Restoration Project in collaboration with the New York City Department of Parks & Recreation.

Additional agencies providing support include the New York State Department of State, which provided funding, the New York City Department of Sanitation, which provided mitigation funding and the New York State Department of Environmental Conservation.

The Corps excavated approximately 52,000 cubic yards of soil and fill material from one area of the site to create a 3-acre marsh where there hadn't been one before.

This material was placed northwest of the marsh area to create an upland meadow and forest. The soil in both areas was graded to proper elevations, invasive plant species, including the common reed and knotweed, were cleared and then a bed of clean compost, soil and sand was placed.

The marsh area was planted with six species of grasses as well as several species of upland shrubs, trees and an herbaceous mix. The upland meadow and forest will be planted with 1,000 upland shrubs and 5,000 upland trees.

Additional features were constructed on the site to make the park welcoming to area residents. An overlook area was created by the marsh that has an educational sign that informs residents about the marsh, its habitat, and animal residents.

"It's rewarding to perform an ecosystem restoration project in a densely populated urban area because there are few opportunities to perform this type of work where millions can benefit," said Ronald Pinzon, district project manager.

"We regularly observe the site and we've already spotted Mud Snails, Fiddler Crabs, Horseshoe Crabs, Great Blue Herring and Egrets," said Catherine Alcoba, district project biologist.

The portion of the park where the project is taking place is expected to be open to the public within two years after the plants' roots have taken hold.

Recently, the region was severely impacted by Hurricane Sandy, but the project area survived the blow very well.

"We were pleased that the new marsh at Soundview, which had just been planted in July, was completely intact aside from some debris that had washed up.

"Damage only occurred on the upland slope, planted a bit later, and it was far less than I feared for such a recent planting. When the team met on site after the storm, we all breathed a big sigh of relief," said Kathleen McCarthy, wetland and riparian project manager, Natural Resources Group, New York Department of Parks and Recreation. "It's these types of projects that are what builds resilience into our coastal areas."

Today when Mena looks out at Soundview Park he has a much better view. "This is a beautiful sight now for everybody. I spend hours in my backyard just looking at the Egrets. I can just imagine when the plants are fully grown, it's going to be a haven for wildlife."



Kathleen McCarthy, Wetland and Riparian project manager, Natural Resources Group, New York Department of Parks and Recreation, and Catherine Alcoba, project biologist, U.S. Army Corps of Engineers New York District, install a PVC pipe at the Soundview Park Ecosystem Restoration Project to mark sample locations for the post construction monitoring of the marsh area. (Photo by Hibba Wahbeh)

Investigating wetlands

By Bianca Jones
St. Paul District

On a plot of land in western Wisconsin this past summer, Dan Seemon, U.S. Army Corps of Engineers St. Paul District ecologist project manager, and Greg Larson, St. Paul District senior ecologist and soil scientist, were in the middle of a crime scene investigation, or CSI.

They weren't looking at an actual crime scene; rather, they were investigating the land to determine if it was a wetland. Larson compares the visits, known as wetland delineations, to a CSI because he's always trying to look for clues to determine what happened. In determining whether an area is a wetland, Larson said, it's about the basics. "I always tell people the first question you have to answer is 'is the site you're looking at a wetland?'"

Wetlands, though, can be difficult to identify. "There are many different kinds of wetlands. There are wetlands like sedge meadows, floodplain forests, wooded swamps, bogs and various other types," Larson said. "But that's one classification. Wetlands can be, depending on which classification system you use, characterized many different ways."

Seemon said regardless of the wetland type, the process starts out with a permit. "Usually someone calls us or someone is going to apply for a permit, and they've hired a consultant to come out and delineate their wetlands. They send us a letter [and] ask us if we can concur with the delineation."

Both Larson and Seemon said the primary tool used in their field investigations is the 1987 Corps of Engineers Wetland Delineation Manual and the appropriate regional supplement. The manual and supplement are part of the "nationwide effort to address regional wetland characteristics and improve the accuracy and efficiency of



Greg Larson, senior ecologist and soil scientist, and Dan Seemon, ecologist project manager, discuss wetland characteristics during a wetland delineation in western Wisconsin. (Photo by Patrick Moes)

wetland delineation procedures," Seemon said. "The [manual helps us] determine if there are hydrophytic vegetation, hydric soils and wetland hydrology." He added that if these three characteristics are present, the area is usually a wetland.

The regulatory investigation process begins with looking at surface features, such as the "lay of the land" and vegetation. These steps are done before holes are dug to examine below-ground features, such as soil. Seemon said he wants to see if water is present at the site. He said he then looks at a reference site which hasn't been disturbed and compare the two to determine whether or not the area is a wetland. "A lot of times it can be very convoluted, and a lot of times it's not black and white. [There is a] lot of gray area involved."

"When we get involved with them, many times, there are natural or human

interactions on the site," Larson said. "They've been dug up, filled, drained and there is no vegetation sometimes, so you need to reconstruct what was there."

Larson said examining reference sites helps him reconstruct the disturbed area. He said he uses soil and wetland maps, historical photos, soil borings and general observations to investigate the sites. "You basically connect the dots, and make a collective judgment with the team you're working with."

That collective judgment involves more than the Corps of Engineers. Seemon said he works with several state and local agencies, as well as consultants. "I think it's a partnership like a lot of things that the Corps is involved with," he said. "If we put our heads together along with the [departments of natural resources], too, we can come up with a consensus."

GIS demo inspires students

By Jo Anita Miley
U.S. Army Engineering and
Support Center, Huntsville

Perhaps, one day, one of the students from Ed White Middle School in Huntsville, Ala., will be part of a U.S. Army Corps of Engineers team remediating a Formerly Used Defense site or mapping out an environmental remediation project.

On Nov. 14, the students there saw up close what it is like to be part of a Corps team during a event that gave sixth-grade students a basic geography lesson using Geographic Information System technology.

Huntsville Center Engineering Directorate employees Michele Maxson, Molly Richardson, Beverly Richey and Kacey Tyra Directorate spoke about everything from their daily use of GIS to how the organization uses the technology on project sites, during natural disasters and around the globe.

GIS Day is held the third Wednesday in November during National Geography Awareness Week, a geographic literacy initiative sponsored by the National Geographic Society.

Richey, a geographer and GIS specialist at Huntsville Center, led two 90-minute discussions she said were intended to give students an introduction to geography that focused on spatial perspective and how to use maps as stories.

"When you write a story, the author (which is you) needs information. For example, your main character in the story needs a name, or an age or a certain color hair," Richey said. "Well, it's the same with maps. Maps need information -- this is what makes GIS. 'G' is a map front end or the 'picture' and the 'I-S' is the information, which is data, whether it is a road name or name of a

neighborhood."

"I think having a geography lesson using GIS technology is important because the students have been allowed to look at maps from textbooks, but today they are allowed to look at maps and research using technology," said Christine Hunt, a sixth-grade teacher.

During one event, the students were divided into teams and asked to construct their own "spatial map" by finding a library, post office, hospital, movie theater and mall. Afterward they loaded this information onto an online map.

"The GIS people showed me how we learn different things every day that help us to make our own 'mind maps,'" said student Kayla Black. "I didn't know we actually store these maps in our brain and use them to get around later. I want to learn more about how GIS works."

The school administrators said they were pleased with the career awareness part in the workshop.

Assistant principal Hovet Dixon said middle school age is where students either start getting involved in the mathematics and the science, or they get discouraged with it.

"The middle school age is that decision point when students decide what courses they're actually going to take in high school," Dixon said. "We want our students to know about unique STEM careers like geographers, geophysicists and GIS professionals. We include some of this into their school curriculum. However, it's always a plus for us when we can bring in outside resources to help reinforce this."

Emphasizing Science, Technology Engineering and Math, or STEM, is a priority for the Corps of Engineers, and has been integrated into the agency's outreach efforts nationwide.