



Corps responds to terrorist attacks on Pentagon, World Trade Center

By Bernard Tate
Headquarters

Liz Finn was in a training class when the first hijacked airliner crashed into the north tower of the World Trade Center on Sept. 11. The assistant vessel master with New York District joined her classmates on the pier at the district's Caven Point facility and watched the tower burn.

At the same time, three crewmen from Wilmington District, Capt. Billy Cuthrell, Capt. Ray Bleam, and Assistant Master George Loveless, were also taking a class at the district's New York Harbor Facilities. They looked out their classroom window and saw the first airliner hit the tower.

When the second airliner struck the south tower, Finn and her crew boarded the *Gelberman*, a converted tugboat used for drift collection, and got underway to lend assistance. Cuthrell, Bleam, and Loveless went to the *Hayward*, also a drift collection boat.

The *Gelberman* and *Hayward* were two of seven Corps vessels which joined a spontaneous armada that evacuated people from Manhattan who had no other way home. The Corps boats evacuated more than 2,000 people. Many of them were covered with concrete dust, and many were visibly shaken, but the transport went smoothly and without incident.

"Everyone was so great," said Finn. "No one got hysterical, there wasn't any pushing or shoving, and every small boat in the harbor was helping."

That day, Corps boats also carried more than 200 firefighters and emergency personnel from New Jersey to Lower Manhattan, and refueled New York City fireboats with 3,300 gallons of fuel, much of it transferred by hand in five-gallon buckets.

New York response

From the first hours after the hijackers crashed into the World Trade Center and the Pentagon, people from the U.S. Army Corps of Engineers have worked on the scene and behind the scenes to assist the recovery effort. USACE is part of a federal team headed by the Federal Emergency Management Agency (FEMA) which is assisting New York City. The Corps' mission during a disaster is Emergency Support Function 3 (Public Works and Engineering).

The Disaster Field Office is at Pier 90 in Manhattan. To date, FEMA has assigned USACE missions to assist New York City with emergency power, technical assistance, debris-removal assessment, and structural safety assessment. As of press time, FEMA had authorized \$4.41 million for USACE to accomplish these missions.

At the height of the deployment, 164 Corps personnel from around the nation were in New York City to support recovery efforts. Every Corps division, all Corps labs, and the 249th Engineer Battalion (Prime Power) were represented. In addition, the 105 personnel of North Atlantic Division and 632 New York District personnel who work in the New York City area were fully engaged in the recovery.

Twenty structural experts and four surveyors from throughout the Corps were on-site in New York City to help the city evaluate some of the more complicated building situations. Those who are skilled at urban search and



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Bob Chapman of Fort Worth District works at Ground Zero. Corps people were at Ground Zero two hours after the hijacked airliners struck the World Trade Center. (Photo by F.T. Eyre, Headquarters)

rescue evaluated areas which were safe for rescuers to enter, and recommended ways to secure the unsafe areas.

Corps people completed a debris operations plan for consideration by New York City and FEMA. Another significant mission was to develop a total debris estimate for the city and FEMA. A USACE debris management cell of 24 people (six of them contract personnel) provided that technical assistance to the city.

USACE sent two Deployable Tactical Operations Centers (DTOCs) to New York City for command-and-control. DTOCs are two 37-foot tractor-trailers designed to function as a field office for a 38-person staff working at a disaster site. FEMA received one for their use. The Corps also deployed two Rapid Response Vehicles (RRVs) to New York City. RRVs are self-contained mobile command-and-control centers packed with communications and computer gear to support a seven-person staff. FEMA and the Corps used the DTOCs and RRVs to form a linked communications network around the area of destruction in New York City.

Thirty-eight DTOC and Logistics Planning and Response Team personnel are in New York City working a 24-hour operation at Ground Zero to support FEMA and the New York Fire Department.

Seven Corps public affairs personnel deployed to New York City to support FEMA and Corps news media operations. They were extremely busy providing information reported by the media about Corps involvement, and providing talking points and information to ensure the consistency of Corps messages. Due to their exper-

tise, FEMA requested a couple of them to remain to help man the Joint Information Center.

As of press time, 139 USACE personnel support FEMA missions in New York City. The federal mission continues to decrease as the city takes over full responsibility for the response and recovery mission.

The dredging mission for the Corps has concluded after around-the-clock operations. Greater barge access will significantly speed the removal of debris.

The Corps has completed the final draft of the USACE part of the debris operation plan for FEMA approval. Part of the debris challenge is to determine what material can be recycled, and what can be placed in landfills or offshore disposal areas.

Emergency permits

New York District has also set records granting emergency dredging permits to provide vessel access to the World Trade Center area and financial district.

On Sept. 13, New York City requested a permit to dredge 120,000 cubic yards of material from around Pier 25 to allow large boats to support rescue and recovery operations. Brig. Gen. Stephen Rhoades, North Atlantic Division commander, gave permission in record time to dredge and place material in the Newark Bay Confined Disposal Facility.

Five days later, the city sought permission to dredge

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Editorial

'Your finest hour is a chapter...to be written'

On Tuesday, Sept. 11, 2001, I watched in horror with the rest of the nation as the cowardly acts of terrorism brought death and destruction to thousands of Americans in New York City and at the Pentagon. I watched as the twin towers of the World Trade Center burned and eventually fell, and I watched as the Pentagon, a landmark representing our nation's military might, burned long into the night.

Intuitively, long before any official numbers were released, we knew that these carefully calculated acts of terror had claimed the lives of thousands of innocent people who were in and around the three buildings and aboard the four hijacked passenger aircraft. With a level of success that probably far exceeded their expectations, the terrorists achieved their goals of shock, murder, and destruction of glass and mortar.

Spirit not broken. What they *did not* achieve, and *could not*, was their goal to destroy America's spirit, will, or resolve. Those qualities are woven into the character that makes this nation great, and no cowardly deed will ever steal that from us.

Much has been said and written about the heroic acts in the moments following each of the attacks. Of the hundreds of brave firefighters and policemen in New York City who selflessly threw themselves into the mission of saving people at the World Trade Center, only to lose their own lives when the towers fell. Of the heroic military and civilian personnel at the Pentagon who immediately responded to help injured and fallen coworkers escape danger. And, finally, of the brave passengers aboard the fourth hijacked aircraft whose courage in trying to retake control of their destiny apparently resulted in that aircraft crashing in a Pennsylvania field far from the terrorists' intended targets in Washington, D.C.

As New York City and the Pentagon dealt with the crises in the hours immediately following the attacks, the U.S. Army Corps of Engineers prepared to help the nation respond. That response was one more reason to add to a list of many that make me so proud to be the 50th Chief of Engineers. Corps employees called from every division and district to say they were ready, willing, and volunteering to do whatever was needed to support the coming mission.

Response. When every member of the Corps family had finally been accounted for, we were all grateful. But in the coming days, as we learned the names of the dead and missing, many of us had lost colleagues and friends in the attacks. I believe this only added to the determination of the Corps to meet this challenge head-on.

As I write this, more than 160 Corps members have deployed from across the nation to New York City, and there will be many more in the months to follow. Structural engineers skilled in urban search and rescue, debris management specialists, logistics and contracting personnel, and the soldiers of the 249th Engineer Battalion (Prime Power) are just some of the exceptional people answering the call to duty.

These great Americans have joined the more than 750 North Atlantic Division and New York District employees who call New York City home in the fight to help the city recover as quickly as possible.

At the Pentagon and in Corps Headquarters, more volunteers have come to join the effort to speed along the recovery process.

It is with great pride and admiration that I've watched the citizens of New York City come together to recover from the disaster. I was amazed at the utter devastation that I saw on my first trip into the city after the attacks, and I'm in awe of what the city has accomplished in a very short time under difficult conditions.

New Yorkers are proud of their city, and they are determined to do everything they can to get the city back on its feet without the assistance of anyone else. Through our mission with the Federal Emergency Management Agency, I want New York City to know that the Corps is prepared to do more to help.

There are many reasons for the Corps to be proud of its role thus far:

- In the hours following the WTC disaster, seven Corps vessels ferried more than 2,000 people from Lower Manhattan when they had no other way to leave, and brought many emergency personnel into the city on return trips. Crewmembers pumped crucial fuels and oil to the city's emergency response vehicles, much of it by hand in five-gallon buckets, so those vehicles could remain on station and not waste valuable time travelling elsewhere for re-supply.

- Urban search and rescue experts have assisted the city in determining areas that are safe for rescue parties to enter, and offered advice on ways to make dangerous areas safer.

- The soldiers of the 249th Engineer Battalion assisted the local power company with the installation of emergency generators and the evaluation of crucial power grids needed to get the heart of the nation's financial sector back into operation.

- Debris planners have developed a draft debris operations plan to assist the city.

- At the Pentagon, the Pentagon Renovation director publicly credited force protection measures the Corps recommended with significantly limiting damage in the newly renovated portion, compared to the damage in the older portion.

- Corps structural experts have extensively studied the damaged areas of the Pentagon, and the results of their study will be used to enhance research into even more effective ways of providing future force protection design.

The Corps built the Pentagon in 16 months, completing it in January 1943. I've told the Army and Department of Defense leadership that the Corps stands ready to assist with the restoration of the damaged area in any way needed.

Pride. I mention each of these things because of the great pride I have in the Corps, its people, and its heritage of service to the nation. In just this year alone, the Corps has answered the nation's call in response to an earthquake in the Pacific Northwest, and significant flood events along the Red River of the North, the Upper Mississippi, in Houston, and in West Virginia.

Difficult times no doubt lie ahead as the nation grapples with the uncertainties of what happened, how to respond, and how to prevent future acts of terrorism.

On Sept. 19, I had the privilege of accompanying the



Lt. Gen. Robert Flowers, Chief of Engineers, pauses near Ground Zero in New York City. (Photo courtesy of New York District)

Secretary of the Army, the Hon. Thomas White, on a trip to New York City where he viewed the affected area and saw the outstanding work being done by the Corps to accomplish its FEMA mission. Afterward, White came to Headquarters in Washington, D.C., to receive a briefing on Corps capabilities.

'Your finest hour.' One statement made by the Secretary in particular made everyone in the room take notice. White stated, "While your history is impressive, given the current situation, your finest hour is a chapter yet to be written."

I couldn't have said it better myself. Of one thing I'm certain - I'm privileged to be the leader of an incredibly dedicated and talented group of people. When America calls again, the 35,000 men and women of the U.S. Army Corps of Engineers will be ready. *Essayons!*

ROBERT B. FLOWERS
Lieutenant General
Commanding



Insights

Bullying unacceptable for America

Article by Col. Lowell Moore
Chaplain, U. S. Army Corps of Engineers
Graphic by Jan Fitzgerald
Headquarters

While riding the Metro to work this morning, the subway emerged from its tunnel and rumbled along the track that carries it over the Potomac River. From the window of the train, I could see the Pentagon and the depressing, dark pall of smoke still rising from the fire that resulted from the terrorist attack just 24 hours earlier.

I felt a lump growing in my throat as I wondered how many innocent Americans were lying in the debris at the source of that smoke, and in the rubble in New York City that just yesterday was the World Trade Center. As I watched the smoke, I thought about all the pain and sorrow that has been inflicted on so many people by a few evil cowards.

Gradually my thoughts turned from the grief of the victims to anger toward the vile people who deliberately caused this horrendous pain. With anger rising in my heart, like many Americans, I contemplated a just (and very painful) fate for such criminals.

Then my mind went to a friend of mine, Kay Kanayama. As a girl, Kay lived with her family in California. Shortly after the bombing of Pearl Harbor, there was a knock on their door in the middle of the night. She and her brother were told they could each have one toy. Kay picked a doll; her brother grabbed a toy truck. Then they hurried off with her family to a detention camp in the desert.

Her crime — she looked Japanese. I remember how angry I was while Kay told me about life in the camp. I wondered why that didn't happen to my parents. After all, we are of German descent, and we were fighting a war with Germany in Europe at the same time.

History has proven that Kay's family was completely American and as loyal as mine. Kay spent her entire life



UNITED WE STAND

in the service of the United States as a civil servant; her brother retired as a colonel after 30 years of service as a chaplain in the Army.

As I thought of Kay, I realized that the anger growing in my heart was dangerous. Just as not every German approved of the attempt to annihilate the Jews, and not every Japanese approved of the attack on Pearl Harbor, not every Arab approves of terrorism. In fact, there are millions of Arabs and Arab-Americans who are just as outraged by these attacks as I am.

If I direct my anger at people based on the color of their skin, their facial features, the clothes they wear, or the way they worship, I'm as guilty as those people who

took Kay and her family out of her home to live in a detention camp.

Misdirected and generalized anger is *dangerous*.

I encourage everyone to resist vigilantism or prejudice of any kind. I pray that if any members our Corps family sees any signs of these evils, they will have the courage to take a stand and speak out against them. Let's leave it to our governmental officials to learn who the true villains are, and trust them to take the appropriate course of action at the right time.

Don't worry — they will.

When this happens, I hope we will not give in to the temptation to rejoice in the suffering inflicted upon others, even if they are guilty. That will only reduce us to the level of those who danced in the streets over our tragedy. Instead, let us rejoice that we are one step closer to preventing those who delight in causing suffering from acting again.

If we strike back just to get even, we adopt their values and their way of life. If we adopt their philosophy and their values, then their way of life will have triumphed over our values and our philosophy of life.

If we hurt others just to inflict pain and sorrow, we join those who bully to get their way. Even if we can get better at bullying and become bigger bullies than the terrorists, we will have forsaken our values and accepted theirs. If this happens, we are no better than bullies anywhere and, again, their way of life triumphs.

We must *not* let this happen!

I'm still hurting and very angry. I'm asking God to help me keep my anger in check and to direct it at *only* those who deserve it.

God bless America, our values, and our way of life!

(The views expressed in this article are those of the author and do not reflect the official policy or position of the U.S. Army Corps of Engineers, the Department of the Army, the Department of Defense, or the U.S. government.)

Response

Continued from page one

60,000 cubic yards of material between the Governor's Island ferry terminal and the downtown heliport. The existing depth of the East River at that point (about eight feet) was not enough to accommodate boats operating there after the attack. Again, the district granted permission quickly.

More boat action

Corps boat crews in New York also continued to support rescue and recovery efforts in New York City. Their work included:

- Continued fueling support.
- Provided antifreeze and lubrication oil for New York City fire trucks.
- Transported 1,000 gallons of potable water for the New York Fire Department.
- Transported shovels and two forklifts to Manhattan.
- Ferried emergency personnel to Lower Manhattan.
- The survey boat *Hatton* ferried respirators from Pier 40 on New York's west side to North Cove near the World Trade Center. The respirators protect searchers at Ground Zero from heavy dust and asbestos.

Pentagon response

Although the Corps' response to the Pentagon disaster was much smaller than in New York City, USACE played a role there as well.

FEMA gave USACE the mission of technical assistance for debris removal at the Pentagon. Structural experts also evaluated the damage to the Pentagon, with emphasis on the effects of the airliner impact, explosion, and fire on the old and renovated sections of the building. At the Pentagon, nine 249th soldiers set up 500-kilo-



Soldiers from the 249th Engineer Battalion (Prime Power) work with ConEd employees to lay out cable. (Photo courtesy of the 249th Engineer Battalion)

watt emergency generators to provide power and lights to recovery operations there 24 hours a day. As of press time, two 249th soldiers remain on-site to keep the generators running.

The Disaster Field Office for the Pentagon operation is in Arlington, Va. Ten personnel were deployed to the Pentagon, and 67 (including 26 Army reservists) were at USACE Headquarters in Washington, D.C. Seven more Corps personnel were on the Emergency Support Team at FEMA headquarters in Washington, D.C.

Prime power

The 249th Engineer Battalion (Prime Power), the only Army unit assigned to the Corps, deployed 31 personnel to New York City — 16 from Fort Belvoir, Va., and 15

from Fort Bragg, N.C. The 249th soldiers were led by their battalion commander, Lt. Col. Kevin Wilson, but worked under the direction of FEMA.

Consolidated Edison, New York City's utilities company, asked these soldiers to help install 50 1,500-kilowatt generators supplied by the city. Each generator is housed in a 40-foot container. They were used to power medical triage facilities and transient housing.

In particular, on Sept. 17 a team of nine ConEd personnel augmented by five 249th soldiers installed two generators at Water Street to provide power for several buildings in the financial district, including New York Mercantile Exchange and the NASDAQ Electrical Hub. "This is a temporary measure until ConEd gets reliable commercial power established," Wilson said. "This is typical of what our unit has done at all disaster sites."

Soldiers from the 249th were also provided technical assistance to evaluate the city's power grid. As of press time, all 249th soldiers had returned to their home bases.

"Finest hour yet to come"

On Sept. 19, Hon. Thomas White, Secretary of the Army, visited Ground Zero (the rubble area where the World Trade Center collapsed) in a group that included Lt. Gen. Robert Flowers, the Chief of Engineers. Later, White came to Corps Headquarters for a briefing.

"Everything the President said about this country being at war, that we are in a new security environment, and that we are in a fundamental change to a new way of life, is true," said White. "To the Corps of Engineers I would say...while your history is impressive, given the current situation, your finest hour is a chapter yet to be written. The nation will look to your extraordinary capability to protect and sustain our infrastructure against a wide variety of threats."

West Virginia flood

'Then it began to rain. I never have seen rain like that.'

Article and Photo
By Steve Wright
Huntington District



Although it is quiet now, the bank of this stream in Mullins, W.Va., shows its ferocity at the height of the flood. The earthmover at far right is repairing the streambed.

In Pineville, W.Va., the heavens opened up on July 8. Mike Goode, Pineville resident and Wyoming County Clerk, said the morning was extinguished by the storm.

"Day turned to night with a sky so dark that it blocked out the sun," Goode said. "Then it began to rain. I never have seen rain like that. Over 11 inches fell in less than four hours."

The storm brought normally quiet mountain streams and rivers raging out of their banks, destroying everything in their path. Before the day was done, floodwaters had destroyed homes and businesses throughout seven counties in southern West Virginia. For many areas, it was the flood of record.

In Mullins, W.Va., 62 of the town's 64 businesses were destroyed. Other tiny communities ceased to exist, with every home placed on the demolition list. In total, the flood destroyed 1,500 buildings and damaged another 3,500, leaving thousands of people homeless. It cut through roads and rail lines and knocked out utilities, which slowed flood recovery.

High water. The flood-ravaged area is in Huntington District. The district first responded by dispatching seven two-person teams to identify high water marks. Team leader Gene Barr had previously established high water marks in the record 1977 flood.

"I went to some of the places that I'd been to in 1977, which was the flood of record, and placed high water marks almost *two feet* higher this time," Barr said. Other teams confirmed record high water marks. A gauge on the Guyandotte River above the Corps' R.D. Bailey Lake recorded a peak flood flow of 30.7 feet, four feet above the previous high flow.

The Federal Emergency Management Agency (FEMA) assigned four missions to the U.S. Army Corps of Engineers. These missions were debris removal, temporary housing, generators for temporary showers, and demolishing buildings.

Debris removal. Debris removal was an early high priority. Carl Miller, the district's Emergency Management Chief, said rapid debris removal is required for almost every disaster.

"People need to get rid of the debris before they can start to clean up," Miller said. "Removing it is important to health and safety. In this disaster, people piled all their soggy and mud-laden furniture, carpets, appliances, and everything else on the roadside in front of their homes. Besides the smell and potential for sickness, these piles attracted bears and small animals, so it was important to public health and safety to remove it."

Army National Guard troops collected household flood debris from the roadsides and transported it to central collection points. The Corps then hauled it to landfills as much as two hours away. This was

accomplished despite long distances to the landfills on winding mountain roads made worse by flood damages, and long waits for road repair crews.

Another early priority was placing temporary showers in the hardest-hit communities. Many people were left without running water, and the showers were a great help. The General Service Administration placed showers in five communities, and the Corps provided generators for electricity to pump and heat the water.

Demolition. The demolition mission also involved trucking thousands of tons of material to the landfill. At the request of West Virginia, FEMA agreed to demolish and remove structures condemned by the state fire marshal, and assigned the mission to the Corps. Using three contractors, the Corps demolished and removed 631 structures, mainly houses and mobile homes, in just under 60 days.

Nelson Sanchez, demolition mission manager from Mobile District, said that getting the demolition mission organized and moving was a challenge early in the program. "We started slow in the first two weeks, but soon got our production up to 15 to 20 structures per day, and finished on schedule in mid-September," Sanchez said.

Save the piano. The demolition mission involved one interesting incident. Terry Gallion of Huntington District was inspecting a 100-year-old white stucco house near McGraws, W.Va. for asbestos the day before its demolition.

The next-door neighbor told him that it contained a million-dollar piano. Gallion found the piano on the second story of the home, a beautiful square grand piano made by Wm. Knabe and Company of Baltimore with a patent of Aug. 14, 1866.

The owners had built a drawing room around the piano, and it could not be moved without tearing out the room walls. Gallion talked to the Corps contractor and they agreed to remove the piano. The crew used an excavator to tear out the side of the house, then fitted slings under the piano and lifted it out with the excavator arm.

Temporary housing. The Corps got a temporary housing mission and completed six housing sites that will accommodate 153 mobile homes. Finding level land was difficult.

"We had to comb the area," said Dave Humphreys, who managed the mission. "Southern West Virginia is a series of small, narrow mountain valleys, and the valley floors are normally consumed by roads and railroads. Housing is often squeezed close to streams and rivers. Finding suitable sites was the most difficult task. We wanted accessible, level land above the 100-year floodplain in the immediate proximity of the flood-damaged communities."

"Once FEMA and the state bought off on the site, we designed the site," Humphreys said. "We then had the challenge of bringing in utilities, building access roads, and site construction."

"All of this work was done quickly," Humphreys added. "Governor Wise dedicated the first site 30 days after the flood, and all the sites will be done within 60 days of the flood."

The flood brought other challenges to the Corps. R.D. Bailey Lake on the Guyandotte River was hit with record water flow. With the floodwater came driftwood and debris that almost totally covered the 630-acre lake surface. Many sewage plants in the 500-square-mile drainage area were overtopped and added to pollution from straight pipes already contaminating the Guyandotte River and its tributaries.

As a result of the drift and debris, the lake was closed to the public after July 8 and reopened Sept. 26 for fishing and boating. The lake's 168 campsites will remain closed until next May. Kim Johnson, lake resource manager, said the cleanup would not be completed soon.

"So far we've spent \$600,000 on the cleanup and that's unprogrammed," Johnson said. "Hundreds of acres of debris have to be sorted through and the natural material separated from the manmade. We burn the wood and landfill the rest."

"The July 8 flood was the latest in a series of four floods in 2001," Johnson added.

Flood fight facts

- Pineville, W.Va., recorded 11.3 inches of rain in four hours.
- 3,000 people homeless.
- 1,500 homes damaged.
- 784 structures (mainly homes and mobile homes) condemned.
- Debris removal — 35,000 tons.
- Temporary housing — 153 pads in six locations.
- Demolition — 631 of 753 condemned structures.
- 154 Corps people responded, 64 from Huntington District.

"Each one brought more debris into the lake and undid everything we've done to clean up from the last flood. For example, the July 8 flood deposited 18 inches of silt into our campground, on our roads, and parking lots."

The relatively small size of the lake and high flow into R.D. Bailey Lake often results in dramatic increases in the lake's elevation which floods recreation facilities. In May the lake was 50 feet above normal pool, and in July again 46 feet above normal.

Regulatory challenge. The July flood was a challenge for the district's regulatory program. It was the first big test for regional permits the district had recently put into place for stream restoration. The district worked closely with the Natural Resource Conservation Agency and the West Virginia Soil Conservation Agency to fast-track permits for restoring streams.

"The permits allow the Natural Resource Conservation Agency and the West Virginia Soil Conservation Agency, the two agencies with solid stream restoration experience, to engineer sound solutions for flood damaged streams with a minimum regulatory delay," said Mike Gheen, the district's regulatory chief. "Whatever they've needed to do, they've been able to do, with the involvement of the appropriate resource agencies."

Herculean effort. The Corps' response to the devastating July floods was exceptional, according to Col. John Rivenburgh, Huntington District Commander.

"The whole Corps responded to the needs of West Virginia by sending 164 of its best and brightest from 18 districts, the Lakes and Rivers Division, and the Waterways Experiment Station to serve the people of West Virginia," said Rivenburgh. "I think what we did was best described by Steve Kappa, the West Virginia Director of Emergency Services, when he said that what we accomplished was a Herculean effort."



A Coast Guard vessel pours water on the burning *CIC Vision*. Two crewmen from the Corps' dredge *McFarland* responded to the fire. (Photo courtesy of Philadelphia District)



McFarland Third Mate Michael Hass, (left) and Third Assistant Engineer Michael Whitney in firefighting gear just before boarding the *CIC Vision*. (Photo courtesy of Philadelphia District)

Dredge sailors fight fire on cargo ship

McFarland crewmen took lead in fighting container ship fire

By Rick Starr
National Park Service

Two crewmembers of the dredge *McFarland* put their lives on the line when they helped extinguish a fire aboard a cargo vessel recently.

At 10:30 a.m. the *McFarland* and other ships in the vicinity received a radio distress call from the *CIC Vision*, which reported a fire on board. The *Vision* was near the Mississippi River Gulf Outlet on its way to Mobile, Ala. The *McFarland* notified the U.S. Coast Guard that she was in the area and on the way.

At 10:50 a.m. the *Vision* radioed that the fire was under control, but this proved to be premature, because at 12:45 p.m. the *Vision* sent another distress call requesting assistance.

The *McFarland* notified the Coast Guard that she had trained firefighters and equipment on board, and was on the way.

'The firefighters are here!'

Capt. Karl Van Florcke, master of the *McFarland*, asked Third Mate Michael Hass and Third Assistant Engineer Michael Whitney to help put out the fire aboard the *Vision*. Without hesitation, Hass and Whitney accepted the assignment and suited up. By 2:15 p.m., the *McFarland* arrived on the scene.

Twelve minutes later, Hass and Whitney boarded the burning vessel. What they heard and saw surprised them.

"The firefighters are here! The firefighters are here!" yelled some of the embattled crew of the *Vision*.

Smoke was everywhere. The ship, because of the amount of water already poured into the hold, was listing to port.

And yet, the two men noticed that the *Vision* crew was doing very little. Some crewmembers were inside the vessel eating, they reported, while others were having a smoke on the stern.

"It was eerie," said Hass.

One crewmember showed them where the fire was located. With the assistance of



Capt. Karl Van Florcke, master of the *McFarland*, with Third Assistant Engineer Michael Whitney (left) and Third Mate Michael Hass with some of the gear they used to fight the fire aboard the *CIC Vision*. (Photo courtesy of Philadelphia District)

one of the ship officers, Hass and Whitney found the ship's fire plan. With their recent Corps fire training fresh in their minds, the two men quickly devised a plan of action.

It became very apparent that they would have to take the lead in putting the fire out, but they were ready for the task.

Challenges, danger

The fire was in the cargo hold, and consisted of burning redwood wrapped in plastic. They faced four problems in fighting the fire:

- It was difficult to see the fire, particularly with all of the smoke in the hold.
- The source of the fire was under other layers of redwood, making it difficult to put water directly on the flames.
- The fire kept moving from one place to another, looking for pockets of oxygen.
- If they pumped too much water into

the hold, the ship might become unstable.

"The fire traveled through open air spaces," Hass said. "Because of the way the lumber was stacked, there was plenty of surface area."

The two men were onboard the *Vision* about eight hours. There was one very anxious moment while they were onboard. Hass went into the hold with a crewmember from a nearby oilrig. Whitney was standing by just above the hold, in case there was trouble.

Suddenly, a shot of superheated steam rolled back toward the two men. Hass was submerged about knee-deep in water when the steam came by.

'Too hot! Too hot!'

"Too hot, too hot!" the other man yelled, and quickly retreated back up the steps and out of the hold, leaving Hass by himself.

"I had my mask on," Whitney said, and was waiting for his friend to emerge from the hold. It seemed like an eternity. "I know you're going to make it," Whitney kept thinking to Hass. "I know you're going to make it!"

Because of the heavy smoke, visibility was poor. "It was hard to find the door," said Hass. He found the hose that had been lowered into the hold, and followed it out. Hass was one level further down than he thought. It was about the longest 20 seconds either man could remember.

Pride

Van Florcke is proud of his two firefighters.

"They did nothing except what I expected them to do," Van Florcke said. "They took over, and didn't let anybody talk them into doing something stupid. They were well-trained, and had the best (firefighting) gear around."

Fortunately, a Coast Guard boat and helicopter were also involved in the effort, as well as other vessels including the *C Atlantis*, *Seabulk Arizona*, and *Battle River*. The *McFarland* launch assisted by shuttling about 350 gallons of firefighting foam to the other ships. By 8:50 p.m., both men were safely back on board the dredge.

Neither crewman was hurt. Hass sustained a minor burn to his arm, and Whitney had a daylong headache the following day.

Glad to help

Both were glad they had recently received firefighting training, and that their gear was both more plentiful and superior to the gear available on the *Vision*.

Would they do it again?

"Sure," Whitney said. "We hope someone would do it for us."

(Rick Starr is an interpretive park ranger at the Independence National Historical Park. He was on a one-month developmental assignment with Philadelphia District last July.)



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Engineer Research and
Development Center

The 2,000 employees of the Engineer Research and Development Center (ERDC) collect cosmic dust in Antarctica, advise the NATO Supreme Command in Europe, evaluate mud slides in Honduras, combat the brown tree snake in Guam, develop new technologies for the warfighter, and do a variety of other work benefiting the Army and the nation.

ERDC's seven unique technical laboratories are responsible for the Corps' diverse research and development mission.

Mission areas

ERDC's \$570 million annual program focuses on five mission areas:

- Military engineering.
- Topography.
- Facilities and infrastructure.
- Environmental quality.
- Water resources.

Because of the Corps' extensive capabilities, ERDC has the science and technology lead for all Department of Defense laboratories in nine areas:

- Survivability and protective structures.
- Airfields and pavements.
- Sustainment engineering.
- Facilities and infrastructure.
- Environmental cleanup.
- Environmental conservation.
- Topography and terrain.
- Cold regions engineering.
- Water resources.

Unique capabilities

The organization is well equipped to execute its research and development leadership role. ERDC has more than \$1.3 billion in research equipment and facilities including the world's largest research centrifuge, one of four DoD High Performance Supercomputing Centers (one of the top 15 in the world), a large tri-axial shock test facility (an earthquake simulator), and large refrigerated buildings for ice engineering.

ERDC has more than three million square feet (68 acres) under roof. The organization's main assets are its employees, which include more than 1,000 engineers and scientists — 300 of them hold doctorate degrees. Many researchers are world-renowned experts in their field.

Emphasis on military support

With 75 percent of its work related to "green suit" military activities, ERDC plays a major role in Army Transformation. Transformation emphasis focuses



on installation support and the warfighter.

"Fort Future" and "Fort Smart" are short- and long-term solutions using powerful modeling and simulation capabilities to help transform Army installations. The Army of the future will need these improved installations and support facilities, and ERDC products are helping

transform the decision-making processes at installations by allowing the evaluation of multiple scenarios and alternatives.

Warfighter support focuses on deployment, sustainment, survival, and maneuver of a lighter, more mobile force. Expedient airfield construction, logistics-over-the-shore, base camp survivability, and

joint virtual battlespace technology for maneuver support are some research areas current receiving emphasis.

Organization

ERDC has seven technical laboratories in four locations:

- Construction Engineering Research Laboratory in Champaign, Ill.
- Cold Regions Research and Engineering Laboratory in Hanover, N.H.
- Topographic Engineering Center in Alexandria, Va.
- Vicksburg, Miss., is the home of the Environmental, Information Technology, Geotechnical and Structures, and Coastal and Hydraulics laboratories.

Despite the four scattered locations, ERDC uses advanced communications systems to operate as one organization. Teams assemble in cyberspace from across laboratory lines to address research needs.

ERDC is headquartered in Vicksburg, but the support staff chiefs are dispersed at all four locations. Staff meetings by video teleconference, plus common business practices and the CEFMS database allow the decentralized organization to function effectively.

Computing power to increase

By Wayne Stroupe
Engineer Research and
Development Center

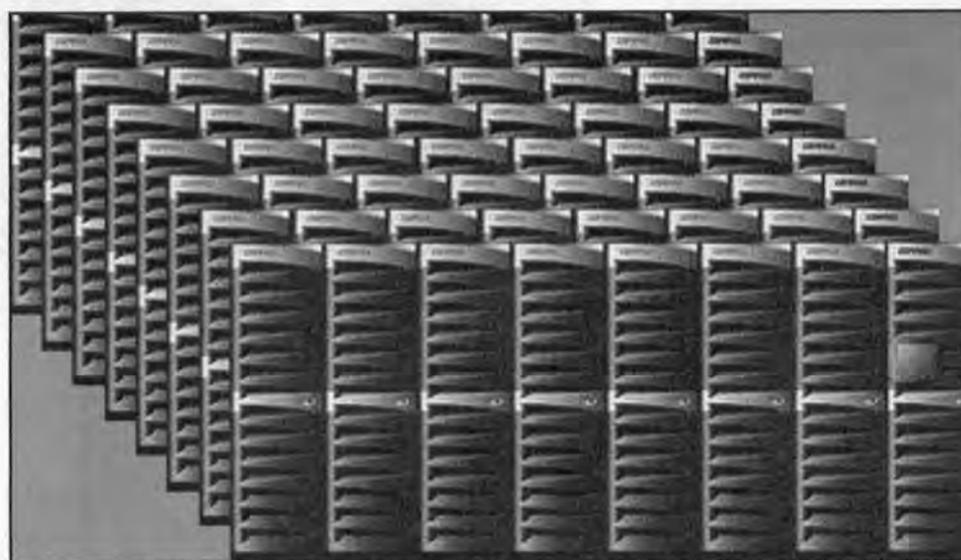
On "Star Trek," the power of the starships' computers is measured in tera-quads.

Reality has taken a step closer to science fiction with the teraFLOP.

A teraFLOP (or TFLOP in computer slang) is actually a measurement that equals 10 to the 12th power. That's an armful of zeros behind the one. Only a few years ago, supercomputing power was measured in millions of calculations a second, then billions of calculations a second, and now trillions (tera). Thus TFLOPS. (FLOPS stands for floating point operations per second.)

There are four Major Shared Resource Centers in DoD. These centers are the "supercomputer" centers that support more than 5,000 engineers and scientists conducting high-performance computing for DoD research and development.

One Major Shared Resource Center is in Vicksburg, Miss., at the Engineer Research and Development Center (ERDC). Established almost 10 years ago in the Information Technology Laboratory, the center has constantly improved its supercomputer systems to stay abreast of today's computing needs.



New Compaq units will join the Corps' stable of supercomputers. (Graphic courtesy of ERDC)

The ERDC Center just announced that two new high-performance computing Compaq systems will be added, one this fall and one next spring. These two systems, with a price tag of more than \$11 million, will join the Silicon Graphics Inc. Origin 3800 and the Cray Inc. T3E supercomputers currently in the center.

Together, these four high-performance computing systems will push the total peak computational capability of the ERDC

Center to a total of 2.8 TFLOPS. This will allow enormous capabilities for DoD researchers and will advance science and engineering areas that are critical to national defense.

Now you know how many calculations are in 2.8 TFLOPS.

Still not sure how many? Okay, it's 2,800,000,000,000.

Not quite in the same league with the starship *Enterprise*, but getting there.

Erosion endangers economy, habitat

By Debbie Quimby
Engineering Research and
Development Center

America's coastal waters support 28.3 million jobs and generate \$54 billion in goods and services each year. The coastal recreation and tourism industry is the second largest employer in the nation, serving 180 million Americans visiting the coast every year. In addition, commercial fish and shellfish industries contribute \$45 billion to the economy each year, and recreational fishing contributes \$30 billion annually.

But all of this is endangered by a simple natural process — *erosion*. If we consider both inland and coastal areas, excessive erosion and deposition across North American causes about \$16 billion in damages each year.

There are 30 coastal states in the U.S., and all have some type of erosion problems, created by both natural and human causes. Wind, waves and tides create and destroy beaches, and have done so throughout time. Structures like breakwaters or jetties that calm waters in and around harbors, dams that control flooding, and navigation locks may trap sand that would normally be deposited on a beach. Inland, excessive sediment transport can clog waterways, causing flooding, and slow commercial navigation.

The U.S. Army Corps of Engineers is turning to Regional Sediment Management (RSM) as a means to more effectively balance the scales between the demands of a growing society and the importance of protecting and enhancing our environment.

RSM in its simplest form is working with nature to improve the environment and quality of life, while maintaining the function of our waterways. RSM is concerned with beach preservation, wetland creation, navigation, inland flooding, and ecosystem stability.

An important component of the Corps' mission is to manage its water resources in such a way that they provide services our nation needs, including support to marine transportation, bountiful fisheries, storm damage and flood reduction, recreation opportunities, and a healthy ecosystem.

The task to ensure our nation's waterways remain navigable and reduce flood damage is particularly important, but complicated, because it often involves removing, transporting, and placing sediment, and in some cases providing material to support other missions.

Research and development

The Engineer Research and Development Center (ERDC) is conducting research to develop engineering tools for treating riverine, estuarine, and coastal processes on a regional scale. One goal of this research is to enable engineers and scientists to move from viewing things in the traditional project-scale (the effects of an individual project to a specific location), to seeing the bigger picture, such as



A satellite photo of the Atchafalaya Bay in Louisiana shows one of the few areas of coastal growth on the Gulf Coast. (Photo courtesy of the Coastal and Hydraulics Laboratory)

the project's effect on an entire watershed and/or ecosystem.

"In the past, many water resource projects were designed and operated to remedy local sediment problems," said Bill McAnally, manager of ERDC's RSM research program. "Sometimes these local remedies have resulted in undesirable sediment deposition or erosion at another location. The key to the RSM program is understanding the riverine, estuarine, and coastal system in a holistic manner, and collaborating with local and state governments to manage sediments over regions that encompass multiple projects.

"For a project to be fully successful, sediment issues need to be resolved at both the local and regional levels," McAnally said. "However, resource managers lack the information and tools they need to make informed decisions. The result can adversely affect navigation, flood and storm damage efforts, and environmental quality in water resource projects. The purpose of the RSM R&D program is to provide the information and tools needed to manage projects within a regional context."

The goals of the RSM research program are:

- To improve sediment management in the Corps.
- To document unique elements of RSM and provide guidance for implementing future actions.
- To engage in cross-mission objectives, where projects will be designed and built to achieve multiple benefits, e.g., storm protection, navigation, and environmental restoration.
- To define environmental and economic benefits for RSM.
- Adapting technology to support RSM.

To reach these goals, RSM research concentrates on five related focus areas — processes, modeling and assessment, engineered solutions, informatics, and technology transfer and insertion.

Processes

Processes will provide the fundamental knowledge and technologies. Specifically, local and regional scale sediment transport and deposition processes will be examined for both short-term and long-term time scales. Short-term time scales (minutes to decades) are important for project design and operation. Long-term scales (decades to centuries) reflect the impacts of individual projects on regional processes. In addition, the influence of engineering works (dams, reservoirs, jetties), on these projects will be measured. These efforts will fill the scientific gaps that other tasks will need to successfully advance the Corps' RSM capabilities.

Modeling and assessment

Modeling and assessment provides methods, analytical techniques, and numerical models to evaluate the local and regional impacts of proposed projects on sediment yield, transport, and fate. For example, we do not presently have a model to predict how engineering projects, like building a jetty, will affect large coastal, estuarine, and riverine regions during long-term time scales. This model is being developed within this focus area.

Engineered solutions

Engineered solutions will provide guidance for planning, design, construction, operation and maintenance of Corps water resource projects within RSM objectives. For example, developing methods like integrated flood plain design, soft and hard bank protection, and training structures to maintain "natural" sediment transport practices in a river system.

Informatics

This focus area will produce knowledge management and a decision-making framework complete with data, software tools, and procedures needed for effective Corps business practices in RSM. This framework will provide managers, stake-

holders, and technical specialists the necessary field, analytical, and numerical data on projects to make decisions. Informatics tools will be graphically based and Web accessible.

Technology transfer and insertion

An important result in research and development efforts is technology transfer to stakeholders, and putting the technology into practice. The goal is to provide products to Corps districts and divisions and other users, and give information to stakeholders. RSM research also fosters reciprocal information and an exchange of ideas with other local and federal agencies.

Demonstration programs

Corps' districts and divisions are conducting RSM demonstration projects. A significant source of regional information for the R&D program comes from these ongoing demonstrations.

In 1999, Mobile District initiated a coastal RSM demonstration program. In late 2000, the program expanded to include demonstration sites in Jacksonville, Philadelphia, New York and Detroit districts, as well as the South Pacific Division. In addition, Vicksburg District has conducted a riverine RSM project along the Yazoo River basin.

Benefits

The demonstration projects have already produced a wide range of measures that will benefit the RSM program. For now, the actions are fairly broad in scope, but still provide important data for future program development.

For example, one broad area in the demonstration projects is accretion and erosion management. The natural flow of sediment has been disrupted, and too much sediment clogs channels and storm water systems, while too little leads to erosion and threatens property and habitat. Measures to balance sediment movement include methods to bypass sediment naturally or artificially, and restoring natural flows that have been impeded.

Environmental restoration is another area of interest in the demonstration projects. There are a number of threatened and endangered species in the demonstration areas that will benefit from restored habitat under RSM.

Studies have also identified new efficiencies when dredging coastal projects, such as scheduling maintenance for adjacent projects to share costs, and using more refined technologies like pinpoint dredging systems.

Recognizing sediment as a valuable resource will save money as well. Dredged material can be used for more beneficial uses, rather than placed in disposal areas.

"Sediment is a valuable resource," said Julie Rosati, co-manager of the RSM program. "By managing it to benefit an entire region, we have the potential to save money, use natural processes to provide engineering solutions, and improve the environment."



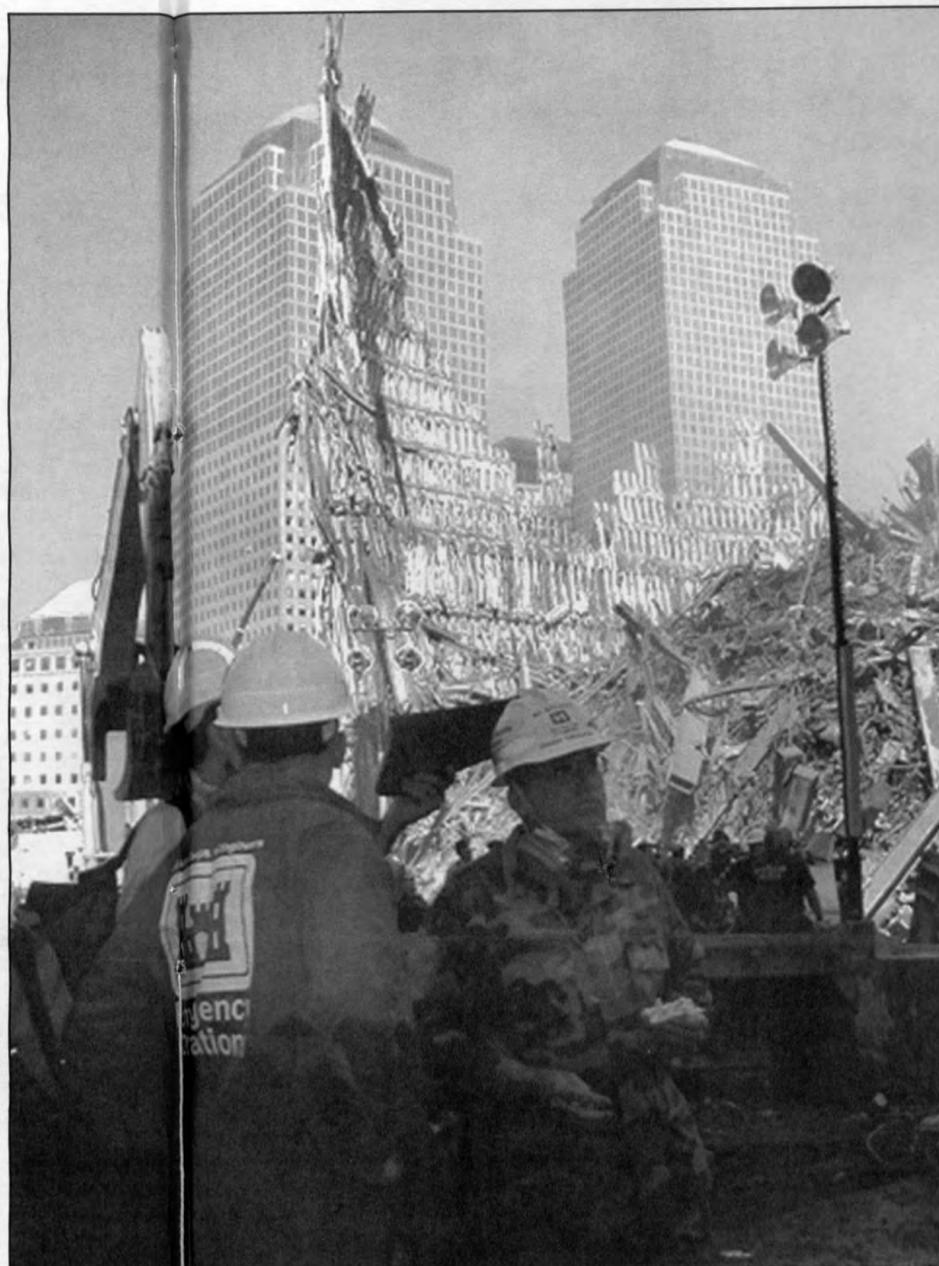
Research & Development

New York City action

Corps people are hard at work in the recovery efforts at the World Trade Center



The Secretary of the Army and other senior officials tour Ground Zero. From left in foreground are Dominic Izzo, Principal Deputy Assistant Secretary of the Army (Civil Works); Lt. Gen. Robert Flowers, Chief of Engineers; and Hon. Thomas White, Secretary of the Army. (Photo by F.T. Eyre, Headquarters)



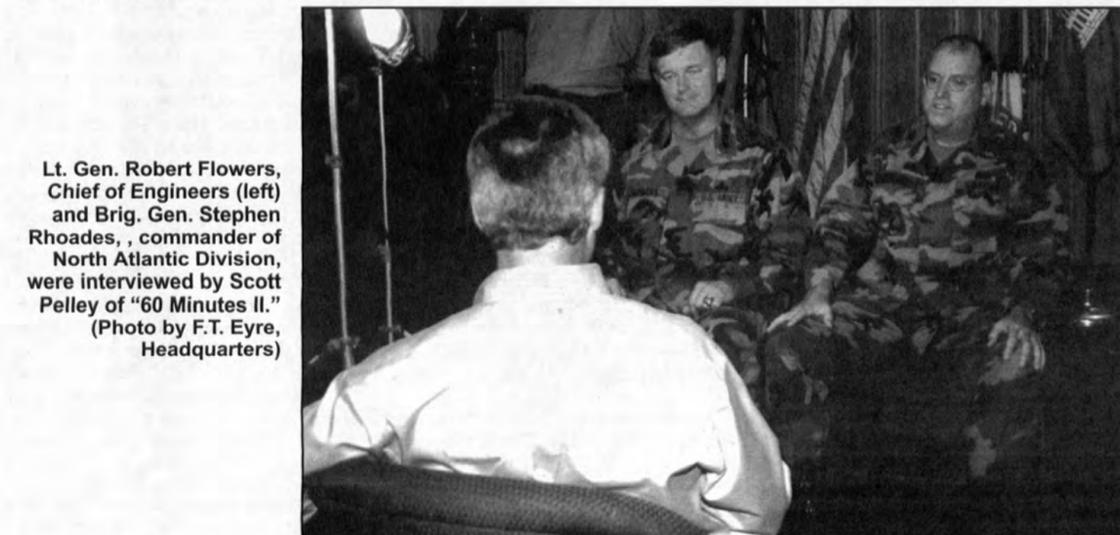
The task facing responders at Ground Zero seemed overwhelming. From left are Dominic Izzo, Principal Deputy Assistant Secretary of the Army (Civil Works); and Brig. Gen. Stephen Rhoades, commander of North Atlantic Division. (Photo by F.T. Eyre, Headquarters)



The MV *Hocking* heads across New York Harbor toward the smoke and dust of Lower Manhattan on the day of the terrorist attacks. (Photo courtesy of New York District)



New York City firemen relax at a Deployable Tactical Operations Center near Ground Zero. The Corps loaned the DTOC to the NYFD for use as a command post. (Photo by Pete Shugert, New York District)



Lt. Gen. Robert Flowers, Chief of Engineers (left) and Brig. Gen. Stephen Rhoades, commander of North Atlantic Division, were interviewed by Scott Pelley of "60 Minutes II." (Photo by F.T. Eyre, Headquarters)



The MV *Hayward* carries a load of stranded people. Thousands were stranded after the attacks on the World Trade Center, and Corps boats responded to evacuate them from the area. (Photo courtesy of New York District)



Staff Sgt. William Broadus (left) and Sgt. Micah Points of the 249th Engineer Battalion (Prime Power) connect cables inside a generator. (Photo courtesy of the 249th Engineer Battalion)

Coastal surveying proves military worth

By Wayne Stroupe
Engineer Research and Development Center

Those realistic battle scenes of the Normandy beaches during the opening act of "Saving Private Ryan" are hard to forget. Chaos and confusion killed almost as many men as the German bullets. Troops landed on the wrong beaches; landing craft offloaded their soldiers in deep water where many drowned under their equipment loads.

That was 1944. Today, the same questions that plagued D-Day loom for locations across the globe. How close can big ships get to the beach? What is the water depth and beach slope where the landing craft will offload troops? How will the beach terrain affect defensive and offensive battle plans?

This information will be provided in the near future by BATS (Bathymetric and Topographic Survey system), a multi-million dollar Engineering Research and Development Center (ERDC) research effort, in collaboration with the Naval Meteorology and Oceanography Command, and Canadian contractor Optech, Inc.

BATS will be an unmanned airborne sensor that will provide mapping and charting information of coastal areas. BATS development will incorporate and improve the technologies and experience gained from the Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) system. SHOALS uses an airborne laser system to map and determine water depth and other coastal features rapidly and accurately.

"SHOALS has been used to survey over 350 projects worldwide, surveying thousands of square kilometers," said Jeff Lillycrop, director of the Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX).

The center manages and operates the SHOALS program as a joint partnership between the U.S. Army Corps of Engineers and the Naval Meteorology and Oceanography Command. JALBTCX is based at Mobile District with support from ERDC, including ERDC employee Lillycrop, who works out of Mobile.

Revolutionary system

"I started working with the SHOALS concept in 1986," said Lillycrop. "We had no idea it would be such a revolutionary technology. The Operations Division in Corps Headquarters deserves a lot of credit for taking a gamble and funding the development of SHOALS."

SHOALS was a cost-shared development project between the Corps and the Canadian government. The Coastal and Hydraulics Laboratory is the Corps' lead for developing, testing, and improving the SHOALS system and its products. The system was accepted and became operational in 1994.

The heart of SHOALS is an airborne transmitter-receiver that aims laser pulses at the water. Some of the laser energy is reflected by the water surface, while the



NATO troops embark from a landing craft during exercise Linked Seas 2000. (Photo courtesy of ERDC)

remaining light energy travels through the water and reflects off the sea bottom. Accurate water depths can be quickly determined by the time lapse between the water surface reflection and sea bottom reflection.

Flying 300 meters (984.25 feet) above the water, the SHOALS system scans a swath 110 meters (360.8 feet) wide. Vertical accuracy is plus or minus 15 centimeters (5.9 inches). Depending on water clarity, the maximum survey depth is around 60 meters (196.8 feet). The survey rate can be as high as 16 square kilometers (9.92 square miles) per hour.

To map beaches, dunes, and above-water structures, topographic survey capabilities were added to SHOALS in 1996. Using on-the-fly GPS technology, both horizontal and vertical sounding positions provide extensive measurements of adjacent beach and dune areas.

Military interest

The military importance of airborne beach surveys was demonstrated last year when SHOALS supported a NATO amphibious training exercise, named Linked Seas 2000, in Portugal. The exercise involved Greek, British, Spanish, Portuguese, French, Romanian, and U.S. forces. The action included 80 warships and several thousand men landing on the beaches.

A SHOALS team deployed to demonstrate airborne survey capabilities to rapidly provide accurate, detailed terrain and bathymetric (water depth) maps during the exercise.

The SHOALS team was scheduled to work together with normal ship-based survey operations. However, the first day of surveying had winds of 25 to 30 knots and sea swells of three to five meters (9.4 to 16.4 feet), and poor weather was forecast for several days. So the ship-based survey teams had to wait out the weather, but the SHOALS team could still go to work.

Even in the adverse weather, each four-hour SHOALS flight covered a 16-kilometer (9.92 mile) section of beach, up to 14 meters (45.9 feet) above the low water line and down to water depths of 22 meters (72.1 feet). Each square kilometer (.62 mile) had about 100,000 measurements. Besides the land elevation and water depth information, the survey flights also took video and digital photos of the areas.

For this exercise, a total survey package required 24 to 36 hours to complete with three people processing the data and generating maps and charts. Each SHOALS plot, about the size of a normal nautical chart, included color-contoured depths, beach elevations, and beach survey cross-sections plotted on several transect lines along the map.

The data was mapped using a standard computer-aided design package, and the digital photos were incorporated into comprehensive planning charts for the amphibious teams. The operation planners were provided all data (including a digital version of the down-look video) on CD-ROM for use.

This information let the large naval transport vessels approach the beach as close as the water depth allowed, minimizing the travel distance for the landing craft. Closer to the beach, the water depth measurements enabled troops to exit the landing craft in the shallowest water possible without stranding the landing craft. The beach and dune system information aided troops in making maximum use of the terrain for cover, and provided the most effective attack routes, and the most efficient routes off the beach as the forces headed inland.

The multinational forces landed smoothly on the Portuguese coast, thanks in large part to the information provided by the SHOALS survey.

Military system

Based on SHOALS successful support to the Linked Seas 2000 exercise in adverse weather conditions, the military recognized the value and need for a specialized version of SHOALS. In late July, the Corps and the Naval Meteorology and Oceanography Command awarded a contract to develop the generation-after-next airborne technology and systems to support Department of Defense coastal charting and mapping requirements.

"ERDC will be the program manager for this effort," said Lillycrop. "Our job is to make sure that what we learned from SHOALS is used to make two steps forward, both technologically and operationally."

ERDC will work with the Optech Inc., of Canada to produce BATS, the military version. BATS will operate from an unmanned aircraft, but will provide basically the same information as the manned SHOALS teams. The project will involve developing advanced and lightweight components. By operating on a tactical unmanned aerial vehicle, the BATS system will be able to safely survey denied, hostile, or covert areas with the same accuracy and speed of the SHOALS system. BATS will be operational in early 2004.

Military actions, crisis response, peacekeeping missions, and humanitarian interventions all create unique amphibious operations challenges. The D-Day planners had years to work, but today military operations can develop in weeks or even days in unknown locations like Somalia, Kuwait, or East Timor. In such situations, BATS will provide rapid, accurate support to the Navy, Army, and joint commands, including special operations and Joint Logistics Over The Shore requirements.

"The BATS system will soon provide the critical information needed by military planners to successfully develop and execute amphibious operations with optimum success," said Lillycrop.



Research & Development

Lab helps Army balance training with environmental stewardship

A sustainable environment is the foundation for all civil and military activity. Both law and common sense point us toward developing a long-term strategy to monitor and understand both the recovery characteristics of ecosystems, and their ability to function as part of larger environmental systems. Environmental stewardship is one of five goals set by Lt. Gen. Robert Flowers, Chief of Engineers.

As a result of the increased emphasis placed on environmental stewardship, natural resource managers require more comprehensive information on land conditions to make informed land management decisions, and to support conservation and compliance. Significant resources are expended yearly by DoD to develop models or systems to assess the health and viability of an installation's land resources.

Military land managers, such as the Natural Resources and Environmental Affairs Office of the Marine Corps Air Ground Combat Center (MCAGCC) in California, and the Directorate of Environment at Fort Bliss, Texas, are responsible for sustaining natural resources to support the training mission.

"Healthy training ranges enhance mission readiness through realistic training," said Randall Karalus, a civil engineer at the Topographic Engineering Center (TEC) in Alexandria, Va. "DoD's effort to predict the consequences of training/testing and the landscape's ability to accommodate it is sound environmental stewardship balanced against military readiness."

DoD manages more than 25 million acres. The installations are home to more than 220 threatened and endangered species; some exist *only* on DoD lands. Urban encroachment has exacerbated the problems by destroying habitat "outside the fence."

Further, there exist significant natural and cultural resources throughout DoD lands that impact mission activities.

Consequently, a major challenge to military trainers and land managers is to balance training objectives and costs with environmental stewardship and constraints.

To accomplish these goals, managers need accurate, affordable ways to assess the viability of their training lands. They need to understand land condition—past and present. They need the ability to project into the future.

Remote sensing is an essential part of the solution.

Joint venture

"Emerging and Contemporary Technologies in Remote Sensing for Ecosystem Assessment and Change Detection on Military Reservations" is a project of the Strategic Environmental Research and Development Program. TEC is coordinating the efforts of the Construction Engineering Research Laboratory, the Oak Ridge National Laboratory, Utah State University, and the Universities of Nevada Reno and Illinois Urbana.

This research consortium is evaluating a range of remote sensing technologies to assess the condition of military training and testing lands, leading to sustainable land use. The research is being conducted at three military installations in the U.S.—Fort Bliss, MCAGCC, and Camp Williams, Utah.

"These installations were chosen because they represent different aridity in three major U.S. desert environments," Karalus said. "They reflect the varied land-combat training of different service branches—Army, Marine, and National Guard."



The frequency and intensity of training is increasing, and so are the requirements for environmental protection. Remote sensing technology can help preserve ecosystems without reducing training tempo. (Photos courtesy of TEC)



These locations also provide a disparity in size, and the environmental staffs there show a high degree of interest, expertise, familiarity, and cooperation.

"Remote sensing imagery is a vital resource, whether for spatial databases or historical context," Karalus said. "Archived satellite imagery is available, relatively inexpensive, and capable of determining the past status and trend of landscape changes."

However, when ecological processes bring about changes at small scales, the archived datasets are limited. But emerging sensing platforms provide better spatial and spectral resolution.

"Simply put, you may be able to 'see' some surface phenomena better with emerging platforms than with historic imagery," said Karalus. But the disadvantages of emerging high-resolution platforms are their limited history of collection, their higher cost, and their smaller visual "footprint."

Retrospective Analysis

One approach is Retrospective Analysis, which studies training lands by looking for historical land degradation to evaluate change from human-induced and natural variation. This research also seeks to determine the landscape's ability to return to pre-impact conditions.

Ecological integrity is studied in relation to military training and other land impacts like grazing and fire. One of the most destructive outcomes of any disturbance is the reduction of vegetative cover and the loss of native species. So the retrospective study has focused on issues related to monitoring past vegetation disturbance and recovery, with an eye toward future monitoring.

"The retrospective study, led by Utah State University and Oak Ridge National Laboratory, uses a 28-year series of satellite images to paint a dynamic picture of a landscape," said Karalus. "The research is assessing the vegetation condition and trend using 1972–2000 wet and dry season imagery."

This research plays a role in predicting ecosystem variation and explaining the behavior of processes that alter ecological systems. Using land management information and historic imagery, the researchers attempt to model the behavior of ecological systems. Such understanding is vital to the success of predictive modeling, because change detection techniques are critical to calibrate and validate predictive models. Without an understanding of the past, further refinement of such models is questionable.

Products from this research will allow managers to evaluate proposed and past management options. Preliminary results at several sites that were impacted by burns and drought show near recovery to initial conditions by 1997. Furthermore, there is an indication that these ecosystems are influenced by El Nino and La Nina.

"This information helps resource managers identify ecological behavior and establish the time line for recovery," Karalus said.

Ecotones

Another research approach is Ecotone Condition Analysis, led by Nevada Reno, Illinois Urbana, and CERL. It evaluates the ability of air and space emerging sensors to characterize the environment on a more intimate level. Ecotones represent subtle changes in an ecosystem. Vegetation composition and changes are being studied in relation to military training and other land impacts.

"The research will provide methodology for image exploitation and data gathering," Karalus said. "Emerging remote sensing technologies have primary relevance to this research because their higher spatial and spectral resolutions are amenable to more detailed environmental characterization and monitoring."

The remote sensing platforms used include airborne digital camera, airborne multi-spectral sensor, airborne hyperspectral sensor, spaceborne IKONOS imagery, spaceborne Indian Remote Sensing imagery, and spaceborne Landsat TM imagery.

High-resolution imagery from these sources allow both detailed census of individual species and communities, and detailed estimates of vegetative cover.

"Observations at these scales are unattainable through contemporary remote sensing systems," Karalus said. "With more detailed terrain information, timely decisions can be made to rectify land degradation or, at least, become aware of the extent of the land disturbance."

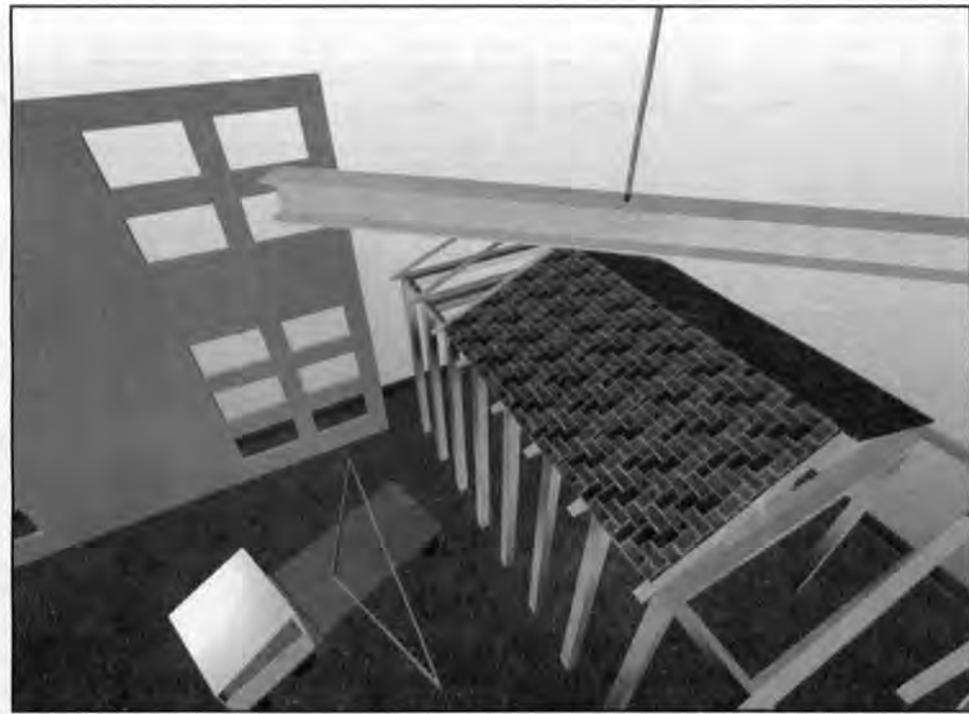
Samples of degradation and ecotone boundaries were studied using "nested" imagery from several platforms. This research mapped species composition, cover, and standing biomass along environmental and disturbance gradients. Classification identified disturbances and plant succession. Several ecotones, including between impacted and less impacted sites, were identified, including changes in species composition and vegetative cover. Such information is critical to resource managers who need information on land condition and composition.

"Although focused on the southwestern U.S., these techniques are adaptable to other regions," Karalus said. "At the conclusion of this project, we hope to provide the capability to identify change that is contrary to management goals."

(Contributors to this article were Jackie Bryant, Public Affairs Officer of the Topographic Engineering Center; Dr. Paul Tueller, University of Nevada, Reno; Dr. R. Douglas Ramsey, Utah State University; Dr. Thomas Frank, University of Illinois Urbana; Dr. Robert Washington-Allen, Oak Ridge National Labs; and Scott Tweddle, CERL.)



Research & Development



Advanced simulation technology allows planners to visualize new installations before brick and mortar are laid. (Graphics courtesy of the Center for Integrated Facility Engineering, Stanford University)

Planning for Fort Future under way

By Dana Finney

Construction Engineering Research Laboratory

Research by the Engineering Research and Development Center (ERDC) will provide decision-support tools to shape installations as the Army transforms from Legacy and Interim Forces to the Objective Force. This supports "Fort Future," the Army's work to address future, long-term installation needs for the Objective Force.

The research and development will provide an installation modeling and simulation program to enable planners to use virtual technology to decide among multiple, complex options in building Army posts to meet emerging needs.

ERDC's systems development supports the Office of the Assistant Chief of Staff for Installation Management (ACSIM), the proponent for the Installation Line of Operation in the Army Transformation Campaign Plan. The U.S. Army Corps of Engineers is supporting ACSIM with a Transformation Task Force that is studying (besides systems) strategy, public works, and master planning issues.

The Fort Future systems concept parallels that of the acquisition community's Simulation and Modeling for Acquisition, Requirements and Training (SMART) initiative. SMART uses modeling and simulation (M&S) to assess many different scenarios related to Future Combat Systems (FCS) development. It allows planners to make informed choices at the early concept, design/engineering, and training phases, before committing to a strategy.

Using the same approach for modeling future installations will ensure greatest flexibility and life-cycle performance, while reducing costs for development, operation, and sustainment.

The installation challenge

In transforming to the Objective Force, Army leadership cited the need for a lighter, faster, more lethal force that fully exploits technology. The target date for this transformed Army is 2032. The Legacy Force (current division structure, equipment, and doctrine) will continue to exist and train for national security needs.

They are augmented by the Interim Brigade Combat team, which reflects some of the changes that will shape the Objective Force. Central to the Objective Force is FCS development. Future weapons, tactical vehicles, communication systems, and all other trappings of warfare could be reinvented. The Army has challenged industry teams to propose their best solutions for the FCS. In this radical approach, proposals will be weeded out through fiscal year 2006 until the most promising suite of tools has been selected for refinement and fielding.

What does this mean for installations? In simple terms, it means the traditional long planning process must be expedited to accommodate a rapidly evolving force.

Yet the terms are hardly simple when planning involves everything from quality living facilities to new motor pool designs to unique training ranges with potential environmental impacts. The installation must be able to project the new force's power via adequate infrastructure, while ensuring readiness through realistic training on lands that are already stretched to the limit.

These issues are affected by complex, interdependent factors, like energy supply, the surrounding community, and environmental stewardship. And a new consideration must be added to future installations in America — protection for the garrison.

Fort Future's Tools

The result of the Fort Future R&D effort will not be a single system, but a system of systems. The intent is to augment ACSIM plans to integrate many existing and emerging data sources, and to exploit sophisticated information technologies — GIS/CAD, visualization/advanced computer graphics, M&S, database, communications, networking, and web programming.

Users at multiple levels will access various tiers of information to model planning options and gain insight that supports decisions. Fort Future adds the capability to analyze possible results of decisions five, 10, or even 20 years into the future.

For example, suppose a newly equipped infantry division will move to Fort Benning, Ga. Fort Future systems could help evaluate issues such as:

- What infrastructure is vital to force projection?
- How vulnerable are new or existing facilities to terrorist attack?
- What impact will more troops and new training have on the community?
- What is the effect on the environment?

ERDC researchers have identified three levels at which Fort Future systems could be useful — strategic, operational, and tactical.

Strategic installation planning tools — During transformation, how will the Army assess an installation's capacity to accommodate Objective Force facility, training, projection, protection, and sustainment requirements, and analyze a surrounding community's economic and social vitality? Also, how will the Army analyze impacts of joint stationing and projection capability of forces in a regional context?

Operational Installation Planning Tools — Once "where" is determined, major commands and installations must determine "what." Fort Future M&S tools will provide analytical capabilities to define facility requirements through planning and design charrettes, and translate them into design schemes that automatically generate program documents and cost estimates.

Also, it will allow planners to determine which facilities need to be modified, built new, relocated, etc., how facilities can be procured faster, and how they can better support missions and operations.

Installation tactical installation planning tools — These tools will evaluate available resources, perform constraint scheduling, and help planners decide which competing requirements to fund for optimal performance at least cost, and at what consequence if *not* funded.

Fort Future's future

The Fort Future technology development team in ERDC has proposed several existing and emerging products to serve each level of planning. This fall ACSIM will lead a joint forces group of garrison commanders and other senior-level stakeholders to conduct installation games to determine and prioritize challenges that will face installations during Army Transformation.

Research and Development

Bringing Science from the Laboratory to the Field



Riptide!

Corps man trapped by nature's killer tide and survives

By Jimmy Gautreaux
New Orleans District

(Editor's note: On July 24, Jimmy Gautreaux, Chief of Management Support Branch in New Orleans District nearly drowned when he got caught in a rip tide while swimming with his family in the Gulf of Mexico. This is Gautreaux's first-hand account of the ordeal, and how he saved his life.)

The emergency medical technician in the ambulance said, "We're coming in with a 47-year-old white male, near-drowning victim, caught in a rip tide."

That was the first time I ever heard of riptides. But now I know more than I ever wanted, from first-hand experience, about the phenomena that nearly took my life on July 24, and that of a 17-year-old boy swimming with me.

Here's what happened:

We were starting a four-day vacation in Destin, Fla., and were just getting into the Gulf of Mexico around 5 p.m. We had been in the water less than an hour, and my 19-year-old son Chris, my daughter's boyfriend Brad (who turned 17 that day), and I were standing in chest-deep water.

We felt safe. The waves out farther were big, but we were in-between those breaking whitecaps and the waves breaking closer to shore. We were just in the swells, having a good time bouncing up to rise with the swells, and coming down after the swell passed.

Twenty minutes of terror

My son said he was going in and walked to a sandbar without any problem. A few minutes later I told Brad that I was going in, too. Another swell passed and I realized I wasn't touching bottom any more, so I treaded water and paddled in a little to get to where I could stand up again. I stretched my leg down, but still wasn't touching bottom.

So I figured I'd just time a wave and swim it in. I did this, then stretched my leg down. Still no bottom.

So I said to myself, "Gotta swim harder on the next one" and did so with good cupped hands, a determined stroke, and strong kicking.

But I *still* couldn't touch bottom. After a couple more waves, I knew I was in trouble and told Brad so. My arms were fatiguing by this time.

Brad helped me for awhile, then he realized that he was having trouble himself and I told him to take care of himself.

Then, Smart Move Number One — Brad hollered to my son and others around that we were in trouble.

The in-shore waves were big and crashing hard. My son and another man were unable to get to us against the waves. My arms had fatigued-out, so I said to myself, "Go under. You're done. July 24, 2001. This is it."

Underwater, in my thoughts, I said goodbye to my wife and kids and I remember clearly the sadness I felt. But

then I thought about my wife, about my three kids growing up without their Dad and my mind yelled, "Get back up! You're **not** going to quit! Go 'til your arms spasm out!"

I think I was under for only a brief moment. I came back up and heard my son holler, "Dad, we're trying to get to you, but can't."

I was treading water again, and one of the ugliest thoughts a father could have flashed through my mind — I knew those who try to help a drowning person often end up drowning themselves. So I hollered, "Don't come out here! Chris, don't you *dare* come out here!"

Brad was still treading water, but struggling. He later told me that he was going under a lot and popping back up to get a suck of air. I thought to myself, "You've got three more good waves. Go three waves, see what you got left, and then take 'em one at a time."

Then, Smart Move Number Two. Chris hollered at us, and I heard him clearly, "Dad, swim to the side! Swim parallel to the shore!"

I told Brad, "Chris said to swim parallel to the shore. Let's go."

I turned 90 degrees in the water, glanced over my left shoulder, and saw another big wave coming. Before it got to us, I put my head under, gave my best overhand stroke, and kicked hard.

My arms must have rested underwater for the few seconds I went down, because I didn't feel as arm-weary. I actually felt kind of strong again.

"I think I'm alive!"

I don't know how many waves passed over us, or how long we swam parallel to the beach. My next clear thought came when a wave sent Brad and me crashing onto a sandbar. I thought, "I think I'm alive!"

Brad grabbed me under my arms and pulled me onto the beach. I was exhausted and just wanted to lay face-down in the sand. I didn't care where I was; I was just relieved it was over. I've been told the ordeal lasted about 20 or 30 minutes.

Without the two boys to help me, I'm convinced that I wouldn't have made it.

My daughter Jamie had called 911 and the emergency medical technicians (EMTs) that answered the call recommended I go to the emergency room.

The lead EMT said he was concerned about "secondary drowning," death caused by shock, exhaustion, and low blood oxygen. He said he had seen near-drowning victims in better shape than me die from secondary drowning.

The emergency room physician and another doctor didn't like my low blood oxygen level (they said it should have been higher since I'm a non-smoker), and recommended admittance overnight.

They gave me oxygen, a drug called lasix, and hooked up 15 sensors to my chest. All went well that night, and I was released from the hospital the next day.



Jimmy Gautreaux of New Orleans District and Brad Keller, his daughter's boyfriend, fought a rip tide and won. (Photos courtesy of New Orleans District)

Riptides

And I set out to learn more about what nearly killed Brad and me.

A rip tide is a narrow, river-like current, from five feet to 50 yards wide, heading from shore back out to sea. It is water collected at the shore that is trying to return to sea, but is usually blocked by sandbars. This water finds breaks in the sandbars and flows under the surface back out to sea in those narrow currents.

A rip tide can carry a swimmer out as far as 100 yards. The National Weather Service (NWS) says that a rip tide will *not* try to pull you under and, from my own experience, we didn't feel anything different in the water, such as an extra underwater pull.

Another important note from the (NWS) — "The worst thing to do when caught in a rip current is to swim directly to shore. It is impossible, yet many people instinctively head towards land and wear themselves out."

I can swim, tread water, and float, and so can Brad. Moreover, Brad is a high-school cross-country runner and in good enough condition to run 10 miles. But the rip tide overmatched us both. What still amazes me is how deceptive and tricky a killer rip tide is. Remember, the conditions changed in just a matter of minutes after Chris went back to shore.

Riptide survival

The EMT in the ambulance told me that not even an Olympic swimmer can fight a rip tide. You have to beat it *mentally* by knowing what to do, then staying calm enough to do it.

Based on my experience, and on what I've read, if you have trouble getting to shore, or the water level is suddenly over your head:

- *Don't panic!*
- Tell yourself, "I may be caught in a rip tide."
- Do **NOT** try to swim straight back

in toward shore!

- Swim parallel to the shore until you exit the rip tide, then gradually work your way in to shore.

- And please remember — even just shouting the correct instructions to someone in trouble could save their life.

Prevention

Of course, prevention is the best way to deal with any emergency. Don't get in the situation in the first place.

Indicators that riptides may occur:

- Red flags are flying on the beach.
- Rip currents are caused by wind conditions. The wind pushes water toward the beach, which then must flow back to the sea. Riptides are more likely after the wind has blown hard for a long time, and when the wind blows at an angle to the shoreline.

- If the waves are hitting the beach at a sharp angle, the likelihood of rip currents increases.

- And the NWS recommends that you should not go in water above your knees unless you can swim hand-over-hand for 15 minutes. That's how far you may be from shore if a rip tide takes you out.

Danger

The NWS says, "Forget hurricanes and tornadoes... rip currents are the deadliest weather-related event known to man." About 10 people a year die in Florida because of rip currents. In the early 1990s, 25 people a year drowned, but good public education has reduced this statistic.

(However, the NWS believes that rip-tide drownings are underreported, and that the statistics may be higher.)

After my ordeal and what I've learned about riptides, I can't understand why people are so afraid of shark attacks this year. Sharks attack relatively few people. The real killer, the one that takes more lives year in and year out, is **RIPTIDE**.

Managing Everglades restoration project not 'business-as-usual'

By Barry Vorse
Jacksonville District

Coordinating the efforts of a U.S. Army Corps of Engineers' district, a division, and Corps Headquarters on one of the world's largest-ever civil works projects, the Comprehensive Everglades Restoration Plan (CERP), is a task almost as Herculean as implementing the \$7.8 billion series of projects itself.

Maj. Gen. Phillip Anderson realized this when he took over command of South Atlantic Division (SAD). He proposed a method to improve communication and execution through vertical integration of the district, division, and Headquarters levels of command in the Corps.

The vertical integration involves using a horizontal integration at each level to include every functional element of the organization, forming what has been termed Matrix Teams.

"The CERP is not business-as-usual for the Corps," said Lt. Gen. Robert Flowers, Chief of Engineers. "It must be managed outside the normal stovepipe way of doing business to ensure continuity between projects, and must make effective use of the Project Management Business Process (PMBP) to integrate efforts across functional areas. The process requires a vertical matrix team concept that involves people from all levels, from the district to the Assistant Secretary of the Army (Civil Works)."

"The scope and complexity of this program requires the talents of the entire Corps team," said Col. Greg May, Jacksonville District commander. "Vertical integration of the Matrix Teams supports this need."

The Jacksonville team leader is Dennis Duke. Mike Magley and Gary



The \$7.8 billion Comprehensive Everglades Restoration Plan will restore or preserve scenic beauty like this. (Photo courtesy of the South Florida Water Management District)

Hardesty serve in the same capacity for the SAD and Headquarters, respectively.

According to Mike Ornella, senior project manager in Jacksonville District, all operating functions of our commands are now involved in program implementation and decision making, regardless of their individual role in the process. Since deciding upon this approach, a great amount of work has already taken place.

"Our current status is that the teams have been formed and members have been assigned," Ornella said recently. "We conducted briefing and field orientations tours in June and July for both the Headquarters and Division Matrix Teams. Our first In Progress Review was Sept. 13."

The Headquarters team tour was "very informative," said Gary Hardesty, Head-

quarters project manager. "Those team members at Headquarters now have first-hand knowledge of today's Everglades. For the Headquarters, division, and district Everglades Matrix Team to function as one unit, we must all share the same information and the same vision of a restored Everglades."

A weekly conference call is held every Friday to coordinate and resolve issues and to provide an update on the latest progress and activities occurring at each organizational level.

The goal of the Matrix Team is to provide a seamless channel of communication to the various levels that will facilitate a continuous flow of information both vertically and horizontally.

"The goal is to eliminate the linear and

sequential way of doing business," Ornella said. "By using this method, we can have various organizations at each level examining the same information at the same time, rather than the traditional staffing from office to office. It will promote concurrent problem solving as well as sharing of ideas."

Ornella explained that the Matrix Team system should work especially well in the formal business process.

"Under the Matrix Team system, we can use the expertise across the Corps for this program," Ornella said. "Should we be faced with a complex, technical issue, we can use teleconferences and the web-based 'CERP Zone' to communicate the issue with division and Headquarters. This will expand the 'One Door to the Corps concept.'"

"Strategic Communications' is the label we chose to help focus our team on providing the right information, to the right individuals, in a timely manner," said Tony Brunner of the Headquarters Matrix Team. "This can be in the form of hard data associated with detailed engineering aspects of CERP, or general information that is shared with a unique audience that may be overlooked without our commitment to be proactive in keeping all customers and stakeholders informed."

"The Matrix Team concept is based on the Chief's Vision of People, Process and Communication," May said. "This approach captures many of the concepts that the Chief outlined in his Jan. 10 letter to all USACE employees — empowered people, a more unified process, and improved internal communication and situational awareness."

(Homer Perkins of the Public Affairs Office at Corps Headquarters also contributed to this article.)

HR Corner

Jobs available for young people

By Tony Whitehouse
Headquarters

If you are a student interested in federal employment, a parent interested in your child being gainfully employed during the summer, or an organization who could use the additional help of a student, you may want to add a new web site to your list of favorites. The Office of Personnel Management (OPM) created www.studentjobs.gov as a new one-stop Web portal for anyone interested in the employment of high school and university students.

In addition to providing general information on the various types of programs and appointing authorities, and instructions on how to apply for jobs, the site lists a number of vacancies for which many federal agencies are actively recruiting.

This Website should be a mainstay in the U.S. Army Corps of Engineers' arsenal of recruiting tools. Experience indicates that waiting to compete for graduating se-

niors for our professional and scientific positions is not wise because there is intense competition from many private corporations who can often offer higher salaries.

However, if a graduating college senior has been working in your organization as a co-operative education student, with the ability to non-competitively convert to a formal intern program, you are more likely to keep that student in your organization.

Many of us began our government careers after being hired as a high school student. The Corps offers many challenging and rewarding opportunities to make a difference, and studies show this is often more important than salary to college graduates.

Exposure to the Corps before graduation can make all the difference, particularly when the student is given meaningful and challenging assignments that augment their college studies. When coupled with the promise of continued education and development, and perhaps even student loan repayments and recruitment incentives, students will choose the Corps.

Another new feature of the USAJOBS Website (www.usajobs.opm.gov) is USAJOBS by e-mail. OPM has made it easier for applicants to conduct job searches. Rather than visit the Website every few days, an applicant can register for a vacancy and be notified by e-mail anytime a job that meets pre-selected criteria is posted.

Current employees looking for opportunities in their own organization, or in other Corps locations are encouraged to register. Not only will it save you from spending a lot of time searching the Website for new job listings, you are less likely to miss an opportunity to apply for a specific vacancy.

This feature is free and can be found under USAJOBS by e-mail on the Website. All Corps vacancies are posted on this site except for those restricted to internal competition only, which is relatively rare.

If you know of individuals looking to work for a great organization, tell them about this Website and the new feature, which allows them to get job announcements automatically forwarded to their personal e-mail.

Around the Corps

Bangladesh

Two groups of engineers, scientists, and planners from Bangladesh spent two weeks each at the Institute for Water Resources (IWR) in June and July. The Bangladesh government requested the "Integrated Water Resource Planning" training to teach the groups how the U.S. and Corps approach integrated water planning, and how it can be applied to Bangladesh.

Training began at IWR at Fort Belvoir, Va., with the principles of water resource planning, followed by plan formulation and plan evaluation methods. The groups got hands-on instruction using software developed by IWR and the Hydrologic Engineering Center (HEC). IWR and HEC staff conducted most lectures.

Their field trips included tours to New Orleans District, the Poplar Island project in the Chesapeake Bay, and Richmond, Va.

Clifton flood control project

The flood in Clifton, Ariz., in 1983 destroyed 24 businesses and more than 150 homes at a cost of around \$20 million. The new Clifton Flood Control Project will prevent that from happening again. The project is in its final phase, recreation construction.

It will include 56 recreational vehicle campsites, two ramadas, three comfort stations, a dump station, a softball field, a playground, concrete sidewalks, an irrigation system, benches and picnic tables, new gas and water lines, and underground electrical utilities.

Los Angeles District designed the project, and is monitoring its construction.

Project delivery conference

In August more than 300 Corps people attended the 2001 Project Delivery Team (PDT) Conference hosted by Pittsburgh District. The conference theme was "Synergy: People, Process, & Communication," and each day of the conference one of the three aspects.

Breakout sessions included "Military Program Issues," "Civil Works Issues," "Environmental Issues," "Business Management Office Issues," and "Contracting Issues." Site tours included Braddock Dam, the Monongahela River, and Conemaugh River Lake.

At the awards dinner, the PDT Excellence Award for 2001 went to the Dredging Operations and Environmental Research Program, the PDT Honors Award went to the Spring Valley Project Delivery Team, and the PDT Merit Award was awarded to the Badger Army Ammunition Plant Environmental Restoration Team.

Presentations given during the conference are available at www.lrp.usace.army.mil/pdt/pdt2001.htm. Next year's conference is scheduled for the week of Oct. 21 at the Beau Rivage in Biloxi, Miss. Contact Donna Brannan at (334) 690-2511 for more information.

Lewis and Clark

More than 120 people key to the Kansas Lewis and Clark Bicentennial rode an excursion boat down the Missouri River from Atchison, Kan., to Leavenworth, Kan. The trip was sponsored by the U.S. Army Corps of Engineers and the Kansas Lewis & Clark Bicentennial Commission.

They made the trip in part to see what could be done to highlight the portions of the route which crossed Kansas and Missouri.

Chugging along at 10 to 15 miles an hour, the visitors saw many modern facilities, but there are also places along the river that are similar to what the explorers saw 200 years ago.

"We don't have nearly the same trees, bushes, and plants as they saw then," said Karen Seaberg, chairwoman of the Kansas Lewis and Clark Bicentennial Commission. "There are some places along the river where we want to restore the sites to what they would have been. We want to make history come alive."



The Castle Co-op team from Pittsburgh District and Freddie the Fish took part in the Relay for Life to raise money for the American Cancer Society. (Photo courtesy of Pittsburgh District)

Relay for Life

Spaced around a quarter-mile track stood white paper bags filled with sand and a lit white candle. On each bag was the name of someone who battled cancer. The sun had set and the candles glowed in the darkness.

Those who won the battle and those who didn't were honored and remembered as 35 cancer survivors took a turn around the Bethel Park High School Track on June 23. Some walked, others were pushed in wheelchairs by their caregivers during the American Cancer Society's (ACS) 24-hour walkathon, Relay for Life.

In the bleachers were more than 150 people from 21 teams who walked the relay's other 23-plus hours, including 12 Castle Co-op team members from Pittsburgh District. The relay rules required a team member be on the track walking during the entire 24 hours, rain or shine, high noon or pitch dark, hot or cold.

The relay included a funny pajama lap, a funny hat lap, a backwards lap, a limbo lap, and a mascot lap featuring Freddie the Fish.

The Castle Co-op team raised more than \$1,300. Fundraisers included donations; sales of luminaries, hoagies, used books, crafts, and baked goods; a rubber ducky race; a silent auction, and raffles of Kennywood tickets and a Pittsburgh Penguins rocking chair.

"Relay for Life is the signature event of the ACS," said Kathleen Evans, who organized the Castle Co-op team. "It gets bigger every year. Last year this event had eight teams and raised \$13,000. This year 21 teams raised \$55,000."

"Cancer affects us all in one way or another," said Cynthia Papuga, Contracting Division. "The love, encouragement and support among the survivors and teams was overwhelming. We walked. We talked. We laughed. We cried."

Scout volunteer

Joe Elwell of Pittsburgh District gave up 11 days of annual leave to served on the staff of the Boy Scout Jamboree 2001. The jamboree, with 32,000 scouts and 8,000 staff, was fifth largest city in Virginia for 10 days.

Elwell, assistant scoutmaster of Troop 1515 in Centerville, Penn., was a member of the commissary staff in Subcamp 3. He and 15 other staff members worked 24 hours a day to provide food for three meals each day for the 1,800 scouts in the subcamp.

AMSC awards

Two Corps people recently received awards on Aug. 10 during graduation ceremonies at the Army Management Staff College (AMSC) at Fort Belvoir, Va. Three top honors are given to graduates of the 12-week Sustaining Base Leadership and Management (SBLM) program offered three times a year at AMSC.

Paula Wise, a physical scientist in Galveston District, received the Academic Excellence and Leadership Award

for academic excellence in all areas of the curriculum. She received an engraved plaque and the Commander's Award for Civilian Service.

Pamela Sleeper, an environmental engineer with Europe District won the Excellence in Writing award, presented by the Federal Managers Association (FMA). In making the presentation, Didier Trinh, FMA's government and media relations representative, said Sleeper's article provided the best insight into a sustaining base issue.

For more information about the AMSC and its SBLM program, please visit their Web site at www.amsc.belvoir.army.mil

Oakland Harbor

Wetlands in the San Francisco Bay Area will benefit from an agreement between the Army and the Port of Oakland that clears the way to deepen federal channels in Oakland Harbor and port-maintained berths from 42 to 50 feet.

The \$252 million project will open the way for the latest container vessels to call at the port, but what sets this project apart is that it is one of the first to use nearly 100 percent of the dredged material for wetlands restoration and habitat enhancement.

Initiated by San Francisco District in 1990, the Long Term Management Strategy is a partnership between federal and state agencies, navigation interests, fishermen, environmental organizations, and the public to find acceptable alternatives to dispose of dredged material.

About six million cubic yards of dredged material will be placed at Oakland's Middle Harbor to restore 180 acres of shallow water habitat. Another 2.5 million cubic yards of materials will be placed at the former Hamilton Army Airfield on San Pablo Bay in Novato, Calif., where the Corps is working with the California Coastal Conservancy to restore a 700-acre parcel of inactive runways and taxi areas to wetlands. About 2.9 million cubic yards of material will be placed at the Montezuma Wetlands Restoration Project at Suisun Marsh. That project is slated to begin construction this year and may receive material from the port as early as 2003.

TOBY award

Mississippi Valley Division and the Mississippi River Commission (MRC) were honored on Sept. 5 when the MRC building received the international commercial real estate industry's most coveted and prestigious award — The Office Building of the Year (TOBY) Award.

The MRC Building was recognized for excellence in office building management and operations in the Historical Building Category at the Building Owners and Managers Association International's 94th Annual Convention and The Office Building Show in Baltimore, Md.

The MRC Building was built in 1894 and extended in 1914. Owned by the General Services Administration and managed by the Corps, the building has 48,650 square feet and is located in Vicksburg overlooking the Mississippi River.

Since July 1944, this building has been the home of the MRC and Mississippi Valley Division. These offices are the focal point of the Corps' navigation, flood control, environmental, and related programs throughout the Mississippi Valley.

Umatilla

The Umatilla Chemical Agent Disposal Facility is complete. On Aug. 13, a crowd of more than 700 people watched a construction completion ceremony at the Umatilla Chemical Depot in Oregon. Huntsville Center managed the entire life cycle design and construction. This is the second facility that Huntsville Center has managed; the first was the Anniston Chemical Disposal Facility in Alabama completed in June.

Both facilities are designed to safely and completely destroy chemical weapons.

Corps ideas protected Pentagon

By Bernard Tate
Headquarters

When a hijacked airliner slammed into the Pentagon on Sept. 11, the scene inside the building was chaos and fear, but also discipline and courage.

"We were fortunate that we were in a staff meeting and all in one place," said Chip Smith of the Assistant Secretary of the Army (Civil Works) office. "When we heard the impact and felt the vibration, we all sat very still for a long moment. It was like we expected more and that we might be in *big* trouble.

"Then dust or something starting falling from the ceiling, so we looked out in the hall and saw smoke billowing our way," Smith said. "I felt something burn my eyes, and people were running our way yelling 'Bomb!'"

"So we grabbed our admin staff and in several groups started working our way away from the smoke," Smith said. "By luck, we were only a short distance from an emergency exit that someone had opened. We ran outside, two of us carrying Renea (a co-worker) who had collapsed in the hallway.

"We milled around outside for a few minutes in a daze, then started moving north along a road to Arlington National Cemetery," Smith said. "Around noon we sorted ourselves into groups and headed home by foot, Metro, or cab.

"We were lucky," Smith concluded. "Looking at a diagram, the plane crashed less than 100 yards from us. Luckier still, the plane made a direct hit on our new renovated office space, space we were to move into on Oct. 11. We were to have been there last spring, but the contractor was running behind."

Corps response. There are 189 people unaccounted for and presumed dead in the Pentagon disaster, including 64 on the airliner. Although the U.S. Army Corps of Engineers' presence at the recovery operation is much smaller than in New York City (see story on page one), we still have a role to play there.

Corps structural analysis experts are actively analyzing the levels of damage to the old and renovated sections of the Pentagon. This information will be used to design future facilities that need force protection measures.

In addition, the Military District of Washington requested assets from the 249th Engineer Battalion (Prime Power) to consolidate the power needs for the entire recovery effort at the Pentagon. (The 249th is the only Army unit assigned directly to USACE.) The battalion deployed two of its 500-kilowatt generators to the site, and nine soldiers set up the system.

As of press time, two 249th soldiers are working full-time at the Pentagon to maintain the power system.

According to Lt. Gen. Robert Flowers, Chief of Engineers, the Corps already has the mission to design a memorial that will stand outside the Pentagon.

World War II. This is just the latest chapter in the Corps' long involvement with the Pentagon. The Corps built



The flag of the Military District of Washington Engineer Company flies at the Pentagon. (U.S. Army Photo)

the Pentagon during World War II, and force protection measures designed by the Corps for the current Pentagon Renovation (PenRen) reduced the damage and the number of casualties during the terrorist attack.

In 1941, the War Department workforce in the Washington, D.C., area numbered more than 24,000 civilian and military personnel scattered among 17 different buildings.

Providing office space for the workers was part of the military construction mission of the Army Quartermaster Corps'

Construction Division, so the Quartermasters originally had the mission. Facing the pressure of wartime, Quartermaster architects designed the Pentagon during one July weekend in 1941. The plans were quickly approved, and construction began on Sept. 11, 1941, 60 years before the hijackers crashed into the building.

On Dec. 1, 1941, President Roosevelt signed legislation transferring the military construction mission from the Quartermaster Corps to the Corps of Engineers. One section was completed by the end of April 1942 and the first tenants moved in.

The basic shell and roof were finished in one year, and the Pentagon was completed on Jan. 15, 1943. Construction took just 16 months and cost \$63.4 million.

The building was not modernized to any great degree until the PenRen program began in 1994. In 1999, Baltimore District managed the design of Wedge One, the area where the hijackers struck. Pentagon officials had planned to install blast-proof windows, but had no plans to upgrade the exterior walls.

More protection. Site investigations by district engineers and architects identified the need to upgrade the wall as well. Independent technical reviews by the Corps' Force Protection Center of Expertise in Omaha District and Penn State University insisted on a systems approach where the wall and windows worked as a unit to resist a blast.

According to Lee Evey, director of the ongoing renovation, damage to the renovated area was not nearly as bad as to the older area, and he suggested that the new steel girders and a sprinkler system saved lives.

"This was a terrible tragedy and people lost their lives," Evey said. "But I'm here to tell you that had we not undertaken this effort in the building, this could have been much, much worse. We undertook a significant amount of work to try to make the building much more blast resistant than it was before renovation."

The PenRen project will not be completed until 2012, and it could take several years just to repair the damaged area, according to Evey. The Pentagon repairs and renovations are estimated to cost more than \$1 billion.

Germans hold candle vigil

Article by Alicia Gregory
Photo by Grant Sattler
Europe District

From the instant the first images of the terrorist attacks on the U.S. were transmitted across the ocean, the Germans have showed support for their American brethren. Whether it was through the tens of thousands of signatures expressing their condolences, or the many flowers that adorn the gates of the American installations, the empathy of our host nation was evident.

The Wiesbaden community, where Europe District is headquartered, showed their support to their American neighbors through a church service and solidarity march on Sept. 13. Several other German communities, like Frankfurt, Mainz and Berlin, had similar events.

Earlier in the week, the Lord Mayor of Wiesbaden, Hildebrand Diehl, cancelled public and private events in Wiesbaden, and displayed a condolence book in which citizens could express their sympathy for Americans.

In a press release before the march, Diehl said, "As the capitol city of the state of Hessen, and also as garrison for a large number of American installations, we



A German girl holds a candle during a candlelight vigil in Wiesbaden, Germany, on Sept. 13.

want to show a sign of solidarity and give the feeling for the about 15,000 American friends who live in our city that they are not alone in their sorrow."

Immediately preceding the silent march, St. Bonifatius Catholic Church in

downtown Wiesbaden was filled to capacity to mourn those killed or injured in the attacks on Sept. 11. Many of those waiting for the march to begin listened to the hour-long service through speakers outside the church.

In spite of the rain and cold, more than 3,000 people showed up for the march, which would took them about one kilometer (.62 miles) from the church through downtown Wiesbaden area to the city hall. The streets were closed to vehicle traffic.

The pedestrian zone was packed with marchers and those who came to watch the procession. With a candle in one hand, and an umbrella in the other, the participants weathered the rain and slowly walked in silent tribute to those who perished. Marchers ranged from young children to senior citizens.

Once at city hall, attendees listened to several speakers including Hessen's Minister President Roland Koch, Diehl, and Maj. Gen. Ricardo Sanchez, commander of the 1st Armor Division.

"We sincerely appreciate the commitment of the German people in assisting us in ensuring the protection of our soldiers, families, and installations," said Sanchez. "As guests in this great country, your support is indispensable to our success."