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'We're all part of the same Army family.'

Assistant Secretary seeks unity between his office, Corps

Article by Bernard Tate
Photos by F.T. Eyre
Headquarters

(Dr. Joseph Westphal has been the Assistant Secretary of the Army (Civil Works) [ASA(CW)] for about two-and-a-half years, a time of great change in the U.S. Army Corps of Engineers. On Nov. 16 he sat down with the editor of the "Engineer Update" to discuss those changes, and the relationship between his office and the Corps.)

Update: *A lot has happened in the past two-and-half years. What would you like for the Corps' workforce to know about you and this office?*

Westphal: First, I want the Corps to think of us as part of one family, as an important part of the Army family. The Corps of Engineers represents the engineering component of the Army, so we have a dual responsibility — not just civil works, we also advance the requirements of the engineering component of the Army. We do this in a variety of ways by doing a good job in civil works nationwide, which helps maintain an engineering capability when the Army needs it during wartime. This office helps bridge the engineering capability of the MACOM and the regular Army.

So to me that's been important to think of all of us as a family, not to think of this office as something separate and different. We're all part of the same Army family, just different branches.

Second, the Corps of Engineers, and the civil works program in particular, is a vital part of the government workforce. When you look at what the Corps does in all these different areas, you see it is integral to many aspects of what the government does — cleaning up waste, maintaining infrastructure, enhancing trade, economic growth and development, and the list goes on.

And because of that, I believe the Corps needs to realize it doesn't operate in a vacuum; it operates within this tremendous entity we call the U.S. government. It's a partner with other agencies, and my hope and desire is that the Corps plays that role in an appropriate way, that it becomes a meaningful partner. Not just a vehicle for doing projects around the country, but a vehicle for progress.

Update: *Everyone on the outside seems to have an opinion of what the Corps is and does. How did you view the Corps before you came here?*

Westphal: I'm a little different in that regard. I had an opportunity as a university professor to do an Intergovernmental Personnel Appointment with the Institute of Water Resources at Fort Belvoir, Va. That was back in the mid-1980s. So I knew something about the Corps from that experience, even though it was just a short stint, maybe a year-and-a-half.

Dr. Joseph Westphal is currently the Assistant Secretary of the Army (Civil Works).

Then I worked for Congress for about 10 years, and you can't work in Congress and not touch the Corps, so I kept up the relationship that way. And then I went to the Environmental Protection Agency, and there's so much interaction there with the Corps on so many different issues.

So the Corps is an organization I have known for a long time.

I suppose the opinion I had of the Corps is that it's a very efficient organization. That's the perspective of a lot of people outside the Corps, an organization that's efficient and effective in getting its jobs done. I shared that view; you might even say I was in *awe* of it, particularly from the experience of working in the Department of Interior during the Reagan administration, and later

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Safety improves in FY00

By Bernard Tate
Headquarters

There were significant improvements last fiscal year in the safety and occupational health program of the U.S. Army Corps of Engineers. The fatality rate dropped, and the accident rate continued a six-year downward trend. In addition, the Safety and Occupational Health Office continues working to make safety part of the Corps' business practices.

In fiscal year 1999 (FY99), there were three accident fatalities to government employees, and nine contractor fatalities. In FY00, there was one government employee fatality (a head-on collision in a government vehicle), and two contractor fatalities (one drowned when a tugboat capsized; one killed when an articulated-arm man-lift fell).

"One fatality is too many but, nevertheless, in the context of history, one fatality is at the top end of our safety performance," said Connie DeWitte, Chief of the Occupational and Safety Health Office. "For the contractor fatalities, two is also a very low number, and that is very good progress over last fiscal year."

The Corps' civilian lost-time accident rate also continued to set records, dropping from 1.07 per 100 worker years in FY99 to .81 in FY00. (One hundred worker years is an industry standard of 100 people working a full year each. An accident rate of .81 means less than one workman's compensation claim involving lost time was filed per 100 worker years.)

"That is just superb; that's the achievement I'd like to emphasize," said DeWitte. "The other MACOMs in the Army average 1.81 claims per 100 worker years. Consistently for the past few years we've been at half (or less than half) of the Army-wide averages. To break through that psychological barrier of less than one claim per 100 worker years is really an achievement."

DeWitte credits the improvements to "the continued command tone that safety is important. The Chief of Staff of the Army has really pushed safety this year, and we have in the Corps, too. Our risk management process is a step-by-step process to identify risks and assess them. We've taught it throughout the Corps, so a lot of people are familiar with it. It's a way of thinking about risks, and if more and more people think that way, it will continue to cut our accident rate. And, of course, we've had the activity hazard analysis process on-going for a long time, and that ties nicely into risk management. So we have strong, proactive programs."

"Another thing we did was to look at where we were having problems and work with industry to call greater attention to safety at Corps projects," DeWitte added.

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Insights

Go into 2001 with a smile

By Col. Lowell Moore
Chaplain, U. S. Army
Corps of Engineers

It's 2001!

We are now bonafide survivors of the year 2000 and the Y2K bug.

I'm sure you remember all the talk last year about the Y2K bug. Many were afraid the ATMs wouldn't work on Jan. 1, 2000. Many were afraid our computers would think we were living in 1900, and somehow this would mess up our bills and cause a financial meltdown. Many were afraid that the Y2K bug could cause power failures and food and water shortages, causing rioting and bedlam throughout the country. Elevators and escalators would refuse to run. Cars with electronic ignitions would refuse to start.

Well, as far as I know the Y2K bug failed to disrupt so much as a single light bulb. Today we look back with a smug smile and think, "How could anyone have been that naïve?" But I wonder how many generators were purchased in December, 1999, and never run since. I wonder how many people filled containers with water, overstocked their pantries, and made sure they had extra cash on hand — then ate canned goods throughout last January.

I'll bet that even those who were publicly the most blasé about the Y2K scare turned on their computers for the first time in 2000 with just a *little* apprehension about what *might* have happene3d.

But Jan. 1, 2000, wasn't the only time we were led to believe the worst and the worst didn't happen. It happened to me in 1957 when Russia launched Sputnik, surging ahead of the U.S. in the space race and, in my 13-year-old mind, was winning the Cold War.

At that time I had my first paying job, a paper route, and my parents took seriously their responsibility of teaching their children about finances. They required me to open a savings account and, often against my will, deposit a portion of my meager earnings each week. Although my account never seemed to have an effect on Wall Street, it was mine and I was proud of it.

Then came Sputnik! Fear gripped my 13-year-old heart. I thought it was just a matter of time before the Russians would invade, take over America and, if I were alive to see it, they would probably take my savings account, too. I thought, "What good is a savings account if you don't have a future to enjoy it? I might as well spend the money now and enjoy it while I can." So I spent almost all my savings on two pet flying squirrels, which I planned to enjoy until the Russians got here.

Well, the Russians never came. One of the squirrels got away, so I let the other one go in hopes they would find each other, escape the Russians, and live to be free, happy, old squirrels. (And it would probably depress me to know what my modest savings account would be worth today if I had left it alone.)

It is surprising what fear and worry will cause us to do. Psychologists tell us that most of our fears and anxieties never come to past. They also say the worries that *do* come to pass are often not as fearful as we imagined. This has certainly been true in my life, and we can all see that it was true about the Y2K scare. In fact, there are probably a lot of things in each of our lives that we feared only to find out later that it wasn't nearly as bad as we feared. Fear of the future can rob us of our joy for today. It can cause us to make bad decisions and affect the way we plan for the future.

Maybe last year can provide us with a lesson for this year. We are beginning a new year and some of us are approaching it with worry. What will the new year hold? Where is the economy headed? Should I retire? If I retire will I be able to make it? And so on and so on.

Before you get too anxious, remember the Y2K scare and take heart in how 2000 turned out. Let us face the future with confidence and go into 2001 with a smile. Those who believe in the Bible can look up Jeremiah 29:11 for even more encouragement.

Have a Happy New Year! (It will probably be happier than you think!)

(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.)

Safety

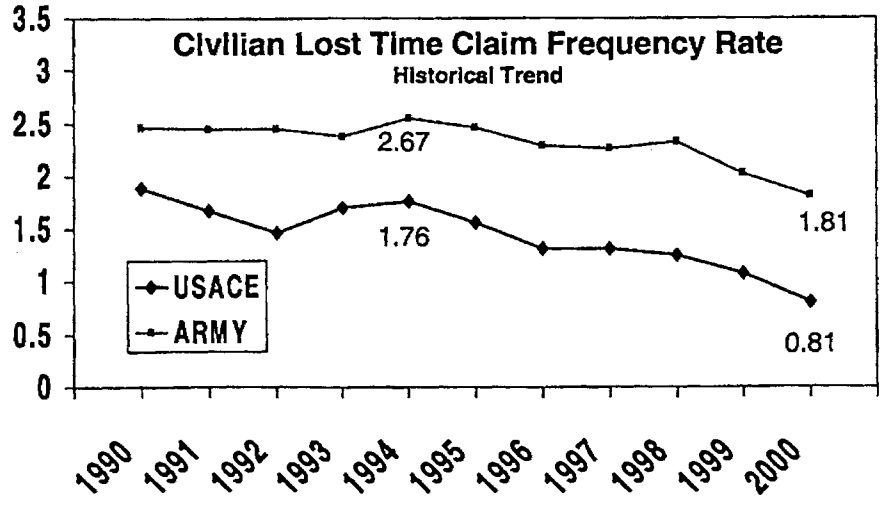
Continued from page one

Better management of new claims has also played a role in improving the accident claim rate.

"All of our commanders know the rules of workers compensation, and that's pretty unusual in an Army MACOM," said DeWitte. "We've improved our reporting practices so that claims that involve lost time are correctly categorized."

To ensure that the Corps safety program continues to improve, the safety and occupational health staff is working on further innovations.

"We're always working to integrate safety and health into the Corps' mainstream business practices," said DeWitte. "The Corps does business now through the program and project management process. We've examined this process for a couple of years, and this fiscal year we'll push further ahead in establishing the safety policy for the PM process, and in setting up all the pieces to integrate safety and health into the business process. For example, we just looked at what training courses will be necessary, and made initial contact with those who develop such courses.



"Raising the consciousness of safety as part of the business process is what we're after," DeWitte continued. "We did a safety restructuring study two years ago, and one big thing we found was that we need to ensure that safety and health were totally involved in the PM process.

"We also continue to relate occupational injury illnesses to the cost of doing business by closely managing workers' compensation costs," said DeWitte. "The fraud reduction program that started about five years ago continues, with Vicksburg District investigating whether totally disabled people who are on compensation are actually working at other jobs. So, because we help prevent new injuries, closely manage new claims, and prosecute workers' comp fraud, we're more involved in the fiscal stewardship and caring for people aspects of the USACE business process."

DeWitte pointed out that command emphasis on the safety and occupational health is continuous. For example, the Corps sponsored the Army Safety Conference in 2000.

"The theme was 'You Make a Difference,'" she said. "In safety that is so true. When every person has that kind of consciousness about their role in safety, that generates the synergy Lt. Gen. Flowers talks about. His command philosophy is to know your job, be situationally aware, stay healthy, and treat each person with dignity and respect. When you put each person into his or her safety role, it fits the first three items perfectly. Plus the fourth, when you consider watching out for the safety of those around you, which is an important part of safety awareness.

"So the Corps' success in safety matches up well with Lt. Gen. Flowers' command philosophies," DeWitte concluded.

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Commentary

Make happiness a resolution for 2001

By Christina Plunkett
Jacksonville District

Ahhhh, the start of a New Year! There's a special excitement that comes from getting a second chance — an opportunity to renew, reflect, set goals, and dream. I don't know about you, but I'm a big list-maker and this time of year I really go all-out. I have a career goal list, a body/mind improvement list, a dream list, and more. As I ponder my self-improvement desires, one element is in all of them – the desire to be happy (or content, or at peace) with myself, my life, the people in my life, and the way I view my community.

I'm not talking about happiness in the usual sense, which is based on external events, but rather joy that comes when your rise above day-to-day problems to see the bigger picture. Philosophers and psychologists have shown that true happiness is based on our attitude and increased awareness of what's really important.

Happiness does not come from success and material wealth. (Most lottery winners say their sudden wealth brought more headaches than happiness.) Instead, happiness is a state of mind.

This may sound like New Age gobbledy-gook, but I really believe what Barry Kauffman explores in his book, *Happiness Is a Choice.* Kauffman says we can change our life if we believe we have the freedom to choose happiness instead of unhappiness.

Here are Kauffman's six shortcuts to happiness:

Make happiness the priority. Don't depend on externals to make you happy, but instead make happiness itself your main goal.

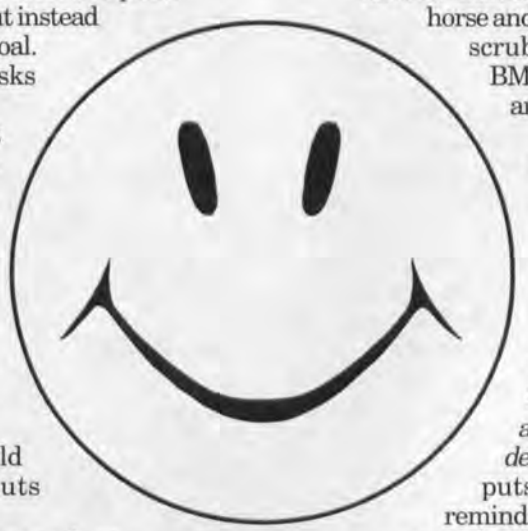
Be authentic. Let go of the masks to please others. Be yourself.

Don't judge. Judgements limit our thinking. The secret to happiness is not in events, but in our response to them.

Live in the present. Worry about tomorrow or yesterday causes much of our unhappiness.

Be grateful. To be grateful is to simultaneously recognize the blessing and wonder of an experience.

Decide to be happy. If we could do this, the other five shortcuts wouldn't be necessary.



In today's impersonal electronic age, where consumerism and pessimism have become a way of life, it can take more than introspection and determined focus to be happy. It's easy to get distracted when we are fed a continuous negative diet of violence and destruction in media news coverage, and when problems are glorified on mindless talk shows. It's easy to forget how good we have it. Less than a century ago we traveled by horse and buggy and washed our clothes on scrub-boards. Today we travel in BMWs and 747s, and machines wash and dry our garments.

But instead of being grateful, we feel pressured, stressed-out, and alienated. Maybe it's time to count our blessings and realize that if true happiness comes from within, *then you already have all it takes to be happy.*

When I feel pressured and frustrated, I like to recall the lessons in Robert Fulghum's book *All I Really Need to Know I Learned in Kindergarten.* Just remembering the title puts me in a better mood. Fulghum reminds us that even as adults we are forever relearning the basics, such as saying please and thank you, and the importance of the buddy system, and that the most important concept we have to continually work at is simply loving ourselves.

CERL model tests earthquake readiness

By Dana Finney
Construction Engineering Research Laboratory

An ambitious seismic research program in the Engineer Research and Development Center is producing results that will be critical in future decisions to upgrade the earthquake resistance of older buildings. A team at the Construction Engineering Research Laboratory (CERL) has just completed the first in a series of tests on a half-scale, three-story structure that mimics reinforced concrete frame-masonry infill construction.

Some 1,500 DoD-owned buildings in medium to high seismic zones could incur costs exceeding $2 billion to strengthen using current methods. CERL's tests using the new scale model will assess fiber-reinforced polymer (FRP) composites as an alternative retrofit method, and will also provide data on this type of structure's performance for evaluating other upgrade options.

The Army owns a massive inventory of buildings, with some 123,000 at military installations that support national defense and power projection. Under Executive Order 12941, all federal buildings were assessed to determine how vulnerable they would be in an earthquake. This mandate was in the interest of ensuring occupant safety, sustaining the building's mission, and providing emergency response and shelter after an earthquake.

Among the 49,000 Army buildings in medium to high seismic areas in the U.S., about 4,500 are vulnerable. Some 1,500 of these consist of reinforced concrete frame and masonry infill construction. According to CERL researcher Dr. Ghassan Al-Chaar, "This is typical 1950s wall construction and includes dormitories, administrative buildings, clinics, maintenance facilities, and others."

CERL researcher Dr. Ghassen Al-Chaar (right) adjusts the test structure at the lab's load floor with the help of University of Illinois graduate student Greg Lamb. (Photo courtesy of CERL)

Al-Chaar's research has two main goals — to learn how much capacity the test wall has to resist earthquakes, and to show whether FRP composite overlays are strong enough to use as a retrofit on this type of construction. CERL previously showed success in using the FRP on unreinforced masonry block walls.

The structure's ability to withstand earthquakes depends on the capacity and the demand on the building, said Steven Sweeney, also a CERL researcher. "The building's capacity depends on its shear strength and its ability to resist loads during earthquakes. The demand is the ability of the building to handle loads resulting from an earthquake."

Earthquake shear forces push a building sideways on a fixed base, while its wells resist. The structure has to accommodate both horizontal loads from earthquakes or wind, and the pull of gravity.

The test structure addresses a set of features not previously attempted. It is a one-half scale model with three stories. Each story of the wall has a hydraulic actuator attached, which is used to shake the model. The actuators receive feedback from each other and respond accordingly.

"The wall was a challenge to do correctly for three reasons," Al-Chaar said. "First, the system is complex because of its different components and the design. Then a major challenge was the scaling. It's not possible to go from full scale to half scale by just dividing everything in two. The behaviors and components all have to be accounted for. Finally, the loading had to be set proportionately for each floor."

Meeting these challenges resulted in a scale model that accurately mimics a full-scale wall. After breaking the walls in the lateral load tests, CERL is repairing them for the next phase of testing with the FRP composite overlays. These materials will be applied with special adhesive by wrapping them around the columns, and placing them in a U-shape under the beams. Exact points of application will be based on findings from the first tests. According to Sweeney, the FRP products used will represent those currently on the market.

Insight gained from the first tests will be critical in evaluating other retrofit methods besides composites. Sweeney, who serves on a DoD task force addressing mitigation strategies, said the information will feed into criteria needed to make decisions about which buildings should be upgraded and with what method.

"Buildings have to be assessed on a case-by-case basis because you can't apply a set of guidance to all facilities," Sweeney said. "In setting priorities for buildings to retrofit, we have to look at how many people occupy it, when it was built, where it is, and the type of construction."

CERL is conducting the project with assistance from the Mid-America Earthquake Center (one of three National Science Foundation centers), at the University of Illinois in Urbana-Champaign. The results of this research on concrete frame-masonry infill will be published in a Corps Technical Instruction in 2002.

For more information, contact Ghassan Al-Chaar at (217) 373-7247 or Ghassan.Alchaar@erdc.usace.army.mil. Or contact Steven Sweeney at (217) 373-6793, or Steven.C.Sweeney@erdc.usace.army.mil.

High-tech brute sniffs out pollution

By Larry Crump
Kansas City District

Their work is high-tech all the way. Using the most expensive piece of equipment the district owns, they make their way coast-to-coast to ply their trade. They nonchalantly use terms like trap mass spectrometer, fluorescent energy, and thermal desorption. And there is only a handful like them in the world.

They are the Kansas City District SCAPS team. SCAPS, for Site Characterization and Analysis Penetrometer System, detects hazardous, radioactive, and toxic waste. In simple terms, it is a truck-mounted system that can be driven to a site where it pushes the cone penetrometer, or probe, into the ground to detect contaminants. The probe contains sophisticated instruments and tools (such as a laser, an eloctrochemical sensor, or a soil-sampler), depending on the contaminant being investigated.

The U.S. Army Corps of Engineers developed SCAPS. In 1986 the U.S. Army Toxic and Hazardous Materials Agency (now the Army Environmental Center) asked the Waterways Experiment Station (WES) to develop a system that could detect and measure hazardous and toxic waste materials on-site. Development began in 1986 under a tri-service agreement that included the Army, Air Force, and Navy. The first demonstration was at Fort Dix, N.J., in 1992.

Since then SCAPS has come a long way, and the district's team has traveled thousands of miles.

Once the truck is on site, an on-board probe is pushed into the ground, up to 150 feet deep. Using the instruments and tools in the probe and a readout screen and other equipment in the truck, the probe can detect petroleum products (POL), volatile organic compounds (VOC) like trichloroethylene or chlorethene (universal degreasing agents found from motor pools to ammunition plants), and heavy metals or explosives. The probe even incorporates sensors to determine soil classifications and layering.

Kathy Older, SCAPS team leader, said the system is fast, clean, and less expensive that conventional methods. And it's relatively simple. For example, she says, when searching for POL contaminants, the laser induced fluorescence sensor inside the push probe emits a laser pulse through a sapphire window. The pulse causes nearby POL contaminants to glow. A sensor in the probe picks up the energy and transmits the information to equipment in the SCAPS truck for a real-time profile of POL contamination at that site.

The SCAPS equipment travels in a tractor-trailer rig. (Photo courtesy of Kansas City District)

The sensors used to locate contaminants depends on what is being investigated. Helium gas may be used to separate volatile organic compounds from groundwater. Or soil plugs collected through the probe may be heated to purge VOCs to determine the level of contamination.

A laser induced breakdown spectroscopy sensor searches for heavy metals. The laser beam forms a hot plasma spark and the resulting atomic emission spectrum reveals the metals present.

A real-time video can be used to visually give the investigator information on soil type and contaminants. Jim Campbell, field chief for the SCAPS team, said watching the video is fascinating. "One can read about the different soil types in books, but actually seeing below the surface is fascinating!"

Each section of the push probe is about three feet long and only 1.71 inches in diameter. The sections are assembled on-site for the depth needed. Campbell said the system can penetrate the soil up to 150 feet, but the district team has never drilled deeper than 80 or 90 feet. The Kenworth truck's 43,000 pound weight and hydraulic system provides force to push the probe into the ground.

Once a subsurface probe is finished, the hole is sealed with a mixture of cement and water pushed through a tube in the cone penetrometer. The push probes are steam cleaned to reduce waste that could contaminate the site.

John Hoyt, Chief of the Geology Section, is responsible for the SCAPS program. According to Hoyt, the system generates little waste. "There are no drilling fluids or cuttings to dispose of, and there's minimal exposure to contamination."

The equipment is not cheap, but millions of dollars have been saved because SCAPS is fast, clean, and precise. For example, Older said, at Lake City Army Ammunition Plant, the SCAPS team sampled 182 PowerPunch well points with the SCAPS HydroSparge Sensor in just 40 days of field work. They made 45 additional direct pushes to collect contaminant and soil composition data, then removed the well points and grouted the bore holes.

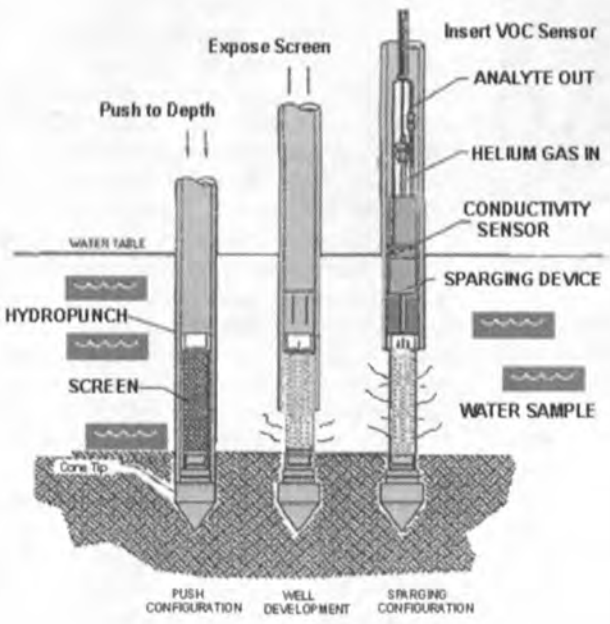
"That effort, including materials, labor, and laboratory confirmation, cost about $181,000," Older said. "We'd spend $455,000 to get similar results with traditional wells."

In fact, SCAPS costs about 50 percent less than conventional drilling and sampling techniques, despite the truck and its equipment costing from $600,000 to $1 million. The probes cost from $16,000 to $20,000 each, depending on configuration.

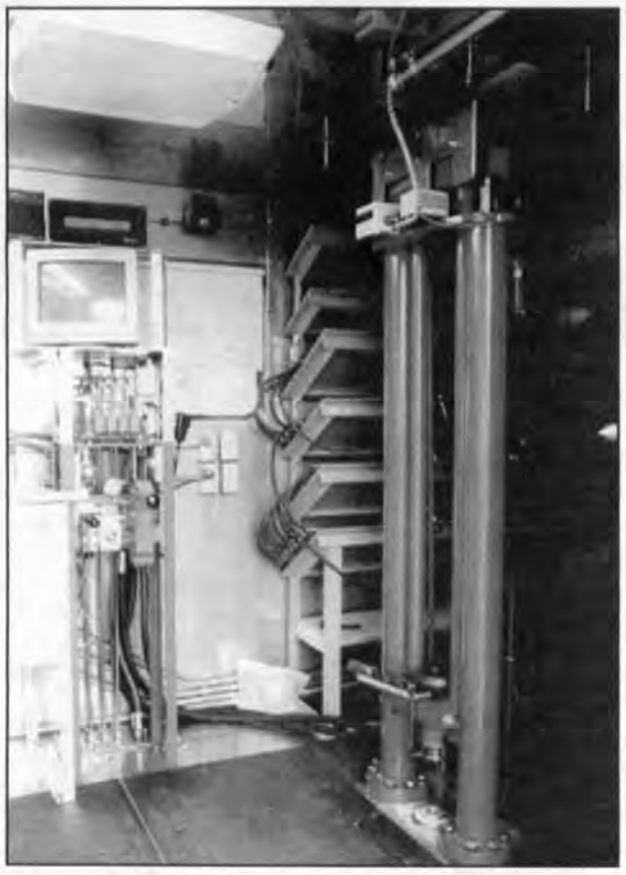
The team has taken the truck to 23 states from New England to Florida and Alabama, and through the northern half of the U.S. from Missouri to California. The team does most of its work is done for the Air Force Center for Environmental Excellence.

Tulsa and Savannah districts also operate SCAPS systems. WES has one used primarily for research and development. There are only seven such systems in the world, and the Navy operates the other three.

One advantage of SCAPS is that it is all-weather and not too much can cause it to cease testing. There are exceptions, however. Campbell said that during Hurricane Bertha they had to "batten down the hatches." Once at Cape Canaveral they had to cease operations during a shuttle landing. In Georgia they got caught up in a PGA golf tournament.



This illustration shows the probes' different configurations. (Graphic courtesy of Kansas City District)



These hydraulic cylinders push the sensor probes into the ground. (Photo courtesy of Kansas City District)

Flood Damage Reduction

Laws govern flood protection work

By Penny Schmitt
Wilmington District

In a state where flooding is a problem, Wilmington District exemplifies the U.S. Army Corps of Engineers' ability to work with a variety of agencies to create effective solutions. The district's flood control projects in North Carolina are important to those they protect, from fish and marine life in the Cape Fear River to human homeowners.

Section 205 projects

An important part of the nation's flood fighting arsenal is available to states, counties, and communities under section 205 of the Flood Control Act of 1948. This authority enables the Corps to develop structural and nonstructural approaches, after doing a feasibility study. The projects must be complete within themselves, offer benefits that exceed the project's costs, and result in a project cost with a federal share of no more than $7 million. The sponsoring government contributes 35 percent of the financing, and the federal share is 65 percent.

Projects being conducted by Wilmington District under section 205 include:

Burgaw Creek — The area around the creek has been subject to serious flooding during hurricanes, and repeated flooding even during milder weather. The Corps' project includes relocating threatened properties and building retention ponds for runoff.

Atkins Branch — This waterway, near Kinston in the Neuse River basin, will include channel improvements to help water move through the stream system.

Hominy Swamp — Located near Wilson, this small project involves installing a culvert under a railroad overpass, and some clearing and snagging work.

"These aren't projects people tend to think of as typical Corps work," said Ron Fascher of Planning Services. "They involve what sound like small improvements or changes, yet they can be too expensive for the budgets of county or regional governments without federal support. Our ability to help can make the difference between chronic flooding problems, and structural and nonstructural changes that improve the community's life."

Princeville Recovery continues

Wilmington District's newest flood control project centers on Princeville, N.C. Hurricane Floyd inundated the community in the fall of 1999, and the 500-year level flood overtopped the protective dike.

A small project to build a floodwall and berm protects an industrial plant from the Cape Fear River. (Photo courtesy of Wilmington District)

Under public law 84-99, the Corps has authority to restore flood control structures. So Wilmington District's first action was to rebuild the dike, which the district originally built in the 1960s to protect the community from a 300-year flood. The refurbished dike, completed before 2000's storm season, restores that level of protection.

The dike now has a gravel roadway for maintenance vehicles. A stoplog structure can be installed by two or three workers in less than two hours closes a small dip in the dike at a railway crossing. Previously, this gap had to be closed with sandbags, which took many workers and more time — not a good option when water is rising!

Congress has appropriated $1.5 million to study added flood protection for the Princeville/Tarboro area. North Carolina has matched those funds. Wilmington District is beginning a study of measures to protect the area. The district and the project sponsors will look at a wide variety of options including dike modifications, channel diversions, and reservoir sites that could provide not only flood control, but also water supply and water quality benefits.

Small project, big protection

Sometimes flood protection measures are tightly targeted to prevent major problems from a single source. Wilmington District recently helped an industrial facility near the Cape Fear River to floodproof itself, thus protecting the river basin in case of a flood-induced chemical spill.

The Chloride plant received a grant from the Department of Commerce. Working with the Natural Resources Conservation Service and the industry, the district developed conceptual plans for the project, which included a small floodproofing wall, pumps, and landscaping. The $200,000 project, carried out by the plant, now secures it from damage, and the Cape Fear River from potential spills.

Where will the water be?

North Carolina has expanded rapidly in the past 15 years. Mushrooming cities and coastal development changed the landscape, and with those changes came new flood patterns. Urban pavements and parking lots increase storm water runoff and damages water quality. Homes and businesses in vulnerable areas are more likely to get storm or flood damage. Old maps don't clearly show where it's safe to build.

The Federal Emergency Management Agency supports floodplain mapping, but funding is so modest that it would take North Carolina 100 years to update all its maps using FEMA funds. Gov. Hunt instituted a Cooperative Technical State Flood Mapping Program. "A lot of states are watching this," Fascher said. "It really is an aggressive initiative." The program aims to re-map the entire state by 2009.

Wilmington District represents the Corps on the Technical Committee, which also includes representatives from county and local governments and two contracting firms who provide mapping services. "We identify programs where we can cost-share with counties and state agencies," Fascher said. "For example, we're mapping Prince George and Ness creeks, two tributaries of the Cape Fear River for New Hanover County. We will also update the map for Figure Eight Island."

Challenge 21 and River Basin Studies

The Challenge 21 program is an initiative begun under the Clinton Administration. FEMA and the state work together to buy out people and businesses so they can move out of the floodplain.

"This initiative makes great sense to me," said Fascher. "Getting people away from danger and repeated damage is critical, and these agencies are doing great things. Unlike the Corps, they don't have to prove that the economic benefits of their actions exceed the costs, so they can move forward to get even the most modest households and properties out of harm's way.

"Our role is less likely to be in the initial phases of this program," Fascher continued. "I think we may be better able to serve when the time comes to restore floodplain areas. Our environmental authorities to do habitat restoration and water quality work enable us to bring renewed health to the river's ecosystems."

North Carolina has made several changes in its approaches to water quality in recent years, Fascher said. "We're part of a committee with the state, the Department of Agriculture, and the Environmental Protection Agency that's looking for ways to protect river systems from pollution."

The biggest problem is storm water runoff, which carries everything from pet waste to fertilizers, petroleum spills from parking lots, and other debris into river systems. "The state's approach since about 1997 has been to focus on creating vegetated buffer zones along stream beds," Fascher said. "These buffers can, if appropriately planted, act as a permanent natural filter that keeps undesirable materials and chemicals from reaching the stream.

"Our Neuse River Basin study identified a number of ways we could contribute to this effort," Fascher continued. "The Engineer Research and Development Labs can offer support by identifying the vegetation and soil management techniques to create the best buffer areas. We may propose building catchments high in the watershed to hold and filter storm water before it goes into the river."

Lasers scan levees from air

By John Hall
New Orleans District

New Orleans District is taking to the air to learn more about the ground.

For good reason – for large jobs flying surveys are faster and cheaper than ground surveys. And the eye-in-the-sky is particularly handy in New Orleans District's 30,000 square miles of coastal Louisiana, where "ground" is a relative term.

The district is using laser technology called *lidar*, for *LI*ght *D*etection *A*nd *R*anging. It is analogous to *radar*, which stand for *RA*dio *D*etection *A*nd *R*anging, except that lidar uses light beams instead of radio waves. A scanning laser rangefinder emits a beam of coherent light from a helicopter flying 45 miles per hour at an altitude of 220 feet. (The laser beam is invisible to the naked eye, and not intense enough to cause harm.) The beam bounces back and the lidar system's instruments gather vast amounts of data which can be sliced, diced, and served up in many forms. The process is almost effortless, compared to the labors of ground surveys in wetlands and bayous.

A laser scanning rangefinder makes a hefty instrument package in a helicopter. (Photo courtesy of New Orleans District)

Mike Brennan, civil engineer, projects lidar information on his computer. (Photo by Michael Maples)

New Orleans District's first use of lidar was on the Lake Pontchartrain and Vicinity Hurricane Protection Project. Total cost was $124,000, with most of the dollars going to the contractor, John E. Chance and Associated, Inc., which specializes in corridor mapping (electric lines, highways, and levees).

"We can rapidly determine levee heights without doing a ground survey," said Al Naomi, senior project manager of the hurricane project. "You can get a lot of data rapidly."

Indeed. The system produces 8,000 to 20,000 data points per second. But what does all this data really mean?

"It provides all three dimensions, the X, Y, and Z coordinates," said Terral Broussard, a district retiree who works for the contractor. This is trigonometry in action — three coordinates used to locate a point in space. The X and Y axis are length and width; the Z axis is the elevation.

Lidar surveys have been completed for all 125 miles of the Lake Pontchartrain and Vicinity project (www.mvn.usace.army.mil, click on hurricane box). These levees and floodwalls are in St. Bernard, Orleans, Jefferson, and St. Charles parishes. But lidar isn't limited to looking at levees. In New Orleans District, it is being considered for the Comite River Diversion Project, a flood control project to be built near Baton Rouge.

For land surveys, the laser is not the only sensor. Chance's helicopter also carries a video camera, and location is provided by the satellite-based Global Positioning System. The video provides high-resolution color images. On the computer screen, these pictures may be viewed as an overlay precisely placed amid the lidar data. Or, you can just turn the video loose and watch the levee roll by as if you were on the helicopter.

To illustrate, Mark Huber of Survey Section pulled up on his computer a lidar aerial view of the Causeway toll plaza in Metairie, La. Bright colors marked the elevations. In mid-screen, he overlaid a video picture with the tollbooths, parked cars, roadways, and even the bike path that circles underneath, all clearly visible.

"Lidar may not be quite as accurate as ground surveys," Naomi said. "But it's faster, cheaper and requires no landowner interface."

"Other (Corps) districts have used lidar for land mapping," Huber said. "We're the first to pull the final product from the raw data, creating levee cross sections and centerline profiles."

How extensively New Orleans District will use lidar is unclear. While lidar cannot retrieve data from water surfaces, vegetation *does* reflect its signals. That makes it a candidate for wetland surveys where ground surveying is inherently difficult.

Lidar apparently has a lot of use as a quick look, and for studies. The question is whether it will prove accurate enough for project design. But, according to Huber, no errors exceeding six inches have been found compared with ground surveys.

Flood Damage Reduction

Project gets green light in Fort Worth

By Judy Marsicano
Fort Worth District

Residents near Johnson Creek in Arlington, Texas are seeing a lot of green these days. Green because the Fort Worth District project got another green light on Dec. 1 when Texas Congressman Martin Frost presented the city with a ceremonial check for $2.675 million at the project cooperative agreement signing. The check represents the first installment of about 12 million of greenbacks to flow into Arlington from Washington, D.C., to help buy out homes in the 25-year flood plain.

Besides moving people to higher ground, the Johnson Creek plan calls for building recreation amenities and a greenway in the environmental restoration of 155 acres of undeveloped land that could become part of a corridor park and trail system.

News of the funding came none too soon for Johnson Creek homeowners still in harm's way. For Rosella Matthews, who has endured flooding for 32 years, the waiting game is almost over.

"We've had two major floods where we got at least 18 inches of water in the house," Matthews said. "The first time it flooded, we didn't have any insurance and we had to pull down walls, do repairs, and replace furniture at our expense. After that, I wanted to move out but, with all the bad publicity, no one wanted to buy."

Johnson Creek, which runs through the

Continued on next page

Johnson Creek overflows Abrams Bridge in Arlington, Texas, during the 1957 flood. (Photo courtesy of Fort Worth District)

System will give early flood warning

By Jason Miller
Philadelphia District

In America's floodplains, unwelcome surprises are still all too common. To help remedy this situation, Philadelphia District's Flood Plains Management Services Branch is using its Geographic Information Systems (GIS) expertise in a pilot program for northeastern Pennsylvania.

It began in 1999 as a joint venture of Philadelphia and Baltimore districts, the Flood Warning and Response System (FWRS) is now under design as part of Baltimore's Wyoming Valley Levee Raising Project.

What is FWRS? A GIS-based automated floodplain mapping system to be used as a planning and warning tool for part of the Susquehanna River.

The National Weather Service (NWS) routinely predicts expected river levels at specific points in the study area. FWRS will allow users to enter NWS predictions into the system and create an extent-of-flooding map based on those predictions. It can then determine the impact the flood will have on buildings and infrastructure (depth of flooding and expected damages.)

The user can use this information to begin the warning notification process, plan evacuation routes, estimate damages before flooding occurs, and evaluate other flood planning scenarios.

As the large volume of base information and modeling required for such a system is developed and compiled in a GIS environment, Philadelphia District is leading a cooperative effort with other federal, state, and local agencies to keep all parties informed about FWRS to ensure a smooth transition to a locally-operated system at the end of the project.

Partners include the Susquehanna River Basin Commission, Luzerne County Flood Protection Authority, NWS, U.S. Geological Survey, and the Federal and Pennsylvania emergency management agencies.

This digital terrain model has riverbed geometry included. (Graphic courtesy of Philadelphia District)

Digital photography

One of the first FWRS ingredients was the Digital Terrain Model (DTM), completed under contract by ADR, Inc., in early 2000. The DTM incorporates ground elevation (accurate to a two-foot contour interval), layout of streets, railroads, and bridges, location and size of all structures (about 84,000), and all water courses in the area. It covers from the southern boundary of Selinsgrove to the northern boundary of Luzerne County (about 110 river miles) and includes elevations up through the 500-year flood level. The DTM was compiled using aerial photography, complemented by digital orthophotographs (photos corrected for geometric distortions such as curvature of the earth and viewing perspective).

Flood Damage Reduction

Channel geometry

Because aerial photography is limited to surface features, the DTM had to be augmented with surveys of riverbed geometry. Last June, depths were measured in the Susquehanna River at intervals along about 110 sections. Then the riverbed elevation was calculated from those recorded depths, and from river stage elevations reported at stream gages in the study area.

This information was fed into "Channel," a software program designed by the district's Flood Plains Branch that uses riverbed elevations to create a terrain model including channel geometry. The completed model includes a two-foot contour interval for both ground and riverbed.

Structure inventory

November began the structural inventory data collection. Structures that are in the 100-year floodplain will be inventoried. Information collected includes owner name, building address, phone number, digital photos, first floor elevation, and building use.

Additional data for a FEMA elevation certificate will also be gathered for each building inventoried.

Assessments will be made to associate structure and content damage curves with each applicable structure. The damage curves will be used with the depth of flooding to calculate damage estimates for each building. These estimates can then be reported in different ways for county, community, or individual structure.

Hydrology and hydraulics

The Corps' Hydrologic Engineering Center (HEC) is developing an updated hydraulic model for the FWRS, using the DTM complete with riverbed geometry.

Once this model is complete, a series of flood profiles will be run and corresponding flood layers developed for flood events up to a 500-year flood. The flood layers will be separated into a minimum of one-foot increments and rendered as flood inundation maps for each increment.

A separate model will be developed to account for backwater due to debris and ice blockages along the study reach.

System use and interface

The system will use predicted river stages at the four existing stream gages in the study area as critical input data. Once a flood stage is predicted by the NWS at each stream gage, the system user will input the prediction, and FWRS will automatically generate the depth-of-flooding layer that corresponds to that stage prediction.

At this point, the user will have multiple output and viewing options accessible through a graphical user interface (GUI). The GUI will run on an ArcView-type platform and will make the system easy to use. Any number of additional options will be available, including generating depth of flooding maps in digital and hard-copy form, notification lists, and lists of impacted transportation features.

The system interface will be designed and tested by Philadelphia District and HEC. Local officials will be consulted to make the system user-frienbdly.

The final phase of the project will be the district assistance with local implementation. System launch is anticipated sometime in late 2001.

Fort Worth

Continued from previous page

center of Arlington, has a long history of flooding dating back to 1949, with 14 disastrous events on record. Arlington asked Fort Worth District to help develop a solution to the problem.

In 1995, after completing the Section 205 feasibility study, the district was ready to award the contract for a concrete and gabion-lined channel along more than 7,000 feet of the creek. It would have reduced flood damages along the creek by 70 percent and prevented $1.8 million in damages annually.

But, at the last moment, the Arlington city council passed a resolution, by a vote of 5 to 4, to end their participation in the project. The community was dead-set on a more environmentally sensitive solution to their flooding problems.

The city collected a group of professional engineers, architects, and landscaping specialists who called themselves the Consortium to develop a more elaborate, expensive plan which would incorporate the environment of Johnson Creek and create a showpiece.

"We looked at this as an opportunity to expand the scope of the study and formulate a multi-purpose project which would encompass flood damage reduction, ecosystem restoration, and recreation," said Gene Rice, project manager. "The Consortium came up with a corridor plan that would address all those needs. The cost of their plan was about $136 million, but voters rejected sales tax increases in two bond elections that would have helped fund the project."

In the end, the Corps' revised flood damage reduction plan includes buying and demolishing 140 homes in the floodplain, developing recreation trails, and other environmental restoration funded with $6.7 million in city funds and $11.7 million in federal dollars.

To accelerate the project, the city requested and received approval from the Assistant Secretary of the Army (Civil Works) to buy out 64 of the 140 homes based on the frequency of flooding, the homeowner's willingness to sell, and certain hardship cases. This advanced buyout was credited toward the non-federal share of the project.

So Patricia McCoy has learned there is life after Johnson Creek. She was the second resident to take the buyout and leave her home of 35 years. She has moved into a new home in Arlington far away from the memories of rampaging floodwaters and the fear she felt every time it rained. But she still has her good memories.

"I loved the old house and that it was so close to the creek," McCoy said. "We were right in the flight path of migrating birds as they flew south for the winter, and we watched as blue cranes, kingfishers, and blue herons settled to rest near the creek. I'll miss seeing those beautiful birds, and all the raccoons, foxes, opossums, and turtles."

The $6 million appropriated to date for the Johnson Creek Project will allow Arlington to continue its efforts to remove citizens from the avenging floodwaters. Additional funding expected during the next two years will complete the buyouts, build the recreation amenities, and restore the ecosystem within the creek corridor.

'The opinion I had of the Corps is that it's a very efficient organization.'

Continued from page one

working in the EPA.

But I didn't really know all the Corps *does*. I was pretty much like other people, thinking the Corps was just involved in flood control, hydropower, and navigation, and all that. But I had no clue how much more the Corps does around the country and around the world. So the big eye-opener in coming here was, "Wow! This agency is doing a lot more than I thought!"

Update: *Now that you've been the ASA(CW) for two-and-a-half years, and you have a more intimate knowledge of the Corps, has your view of us changed?*

Westphal: No. I still think the Corps is highly efficient, I think it is an organization with tremendous integrity and tremendous ability. In fact, if my view has changed at all, it is to have *greater* admiration of what the Corps not only has done but can do.

The thing that has changed the most is the tremendous increase in confidence that I have in the opportunities and service the Corps can provide the nation. If I thought that was limited, I now think it's ***un***limited.

Update: *What do you see as the Corps most significant accomplishments during your tenure as the ASA(CW)?*

Westphal: Primarily, we've turned the budget battle around. Before my coming here, the budgets were going down. Today budgets are going up. From the first budget I sent to Congress to the one we just got appropriated, there have been significant increases in funding. That can only bode well for future budgets, regardless of which administration is in office.

Second, we passed two big, significant water resources bills. In both cases, we had an uphill battle in the administration and in Congress. The competition for resources has been fierce. The challenges to the Corps from the media and from folks outside have been strong in the past year or so. Despite those challenges, we've sustained significant water resources authorizations and appropriations.

On the political front, I think a big accomplishment is that we've made headway in addressing policy issues that, before my coming, neither Congress nor the administration wanted to touch. We've confronted those issues and we're moving forward.

A lot of that had to do with establishing partnerships. And probably the most difficult thing we've achieved this year is allowing the Corps to again do what I think it does best — basic planning, studies, and doing comprehensive studies of river basins. It's a skill that only the Corps of Engineers can effectively manage, and now we've got authorization and the money that allows us to do it. It took a lot of hard work on my part to convince Congress and the Administration to allow the Corps to go forward with that.

In addition to that, I've done some things to stabilize this office. When I came here, there was a lot of chaos. We had lost a lot of staff; we had lost a significant skill level when people retired. We restored that; we put some great people in senior positions in this office. We've now got a stable workforce that can provide a great transition for the next Assistant Secretary to work with the Corps and with the new Chief of Engineers, and with future chiefs. We've got a staff that can sustain the workload that is ever increasing.

Again, that was a matter of fighting the budget battles and pushing forward to get the personnel positions.

And something I'm pleased with — I've traveled extensively around the country and visited the Corps' districts and divisions, and I've come to understand better how the organization works. In understanding it better, I've been a better messenger and a stronger advocate of what the Corps does and can do. I can sit at the table, whether it's on Capitol Hill or in the White House, as someone who knows his organization, understands what it can do, and can make quick decisions.

Update: *Do you see the Corps' civil works missions or emphasis changing in the near future, say in the next five years?*

Westphal: I don't see a major change in missions. I think we've now got the authorities from Congress that give us the resources we need to do the jobs required of us. We have extensive authorities now to do environmental work. Before, that authority was tied to our own projects; now we can independently do environmental work not associated with our projects. This is a great opportunity to make a significant contribution to our country's future. We can and should be great stewards of our water resources, and protect them for future generations.

There's one area that's still out there for debate from a mission standpoint, and that is environmental infrastructure — basically water supply and those aspects related to municipal water supply and quality. Neither Congress nor this administration has made a definitive judgement on that. Is it a purely local issue, or a federal issue? And if federal, then where does the federal role lie? That still has to be debated.

So if there is a future mission opportunity, it might be in that area. But I caution those who think that mission will be the Corps', there has to be more debate on that issue between the next Administration and Capitol Hill.

Update: *As an extension of that, what do you see as the biggest challenges facing the Corps of Engineers in the near future?*

Westphal: I think the biggest challenge will be getting the resources we need to handle the backlog of work. The '99 Congress passed a nearly $7 billion Water Resources Development Act bill. This year, a nearly $8 billion WRDA bill. Right there we've got nearly $15 billion of new work, and the Corps estimates we've already got about a $30 billion backlog. So we'll need significant appropriations for a long time, without any dips, to complete all the work that's on our plate.

Is that going to happen? I don't know. If you listened to the presidential candidates, they were not talking about infrastructure; they hardly talked about the environment. They talked mostly about education and health care. So will the next administration and the next Congress have the will and resources to allocate funds to our program to take care of the backlog? I don't know. I can only say that's a big challenge. There are people who expect us to do the work, members of Congress who put this stuff in legislation, and expect us to move forward with it. It's going to be a serious problem for us to address all that work without having the resources to do it.

Then there's a secondary challenge for the Corps. As the mission and priorities change, and our program becomes much more diverse, it will be a challenge for the Chief of Engineers and I to structure the Corps to meet those challenges, to have an organization that's flexible, creative, innovative, and technically capable.

Those are real challenges in today's economy, where you've got strong competition from the private sector for quality people, where you're dealing with hiring rules and bureaucratic procedures that sometimes do not allow you work quickly. So that's certainly something for the Corps to be aware of, and work carefully to craft, as we approach the diversity of missions and the demands to get all the work done.

Update: *Does that mean that the Corps of Engineers needs to be reorganized in the near future?*

Westphal: It depends on what you mean by "reorganize." I certainly think the current Chief of Engineers, and maybe future Chiefs, will have to look at some restructuring. But I don't think it necessarily calls for a major reorganization. It just calls for developing policies and guidelines to work within the structure you already have to meet those challenges.

In the personnel area, it means building a partnership between the Chief and the Assistant Secretary, because the personnel rules are not in the hands of the Corps; they're in the hands of the Department of the Army. The Corps works somewhat different from other

"The future is exciting for the Corps of Engineers, the mission is great. I say *Essayons!*"

MACOMs because of its unique work requirements, the nature of its funding, and other characteristics. To make changes to give flexibility to the Corps, the Chief of Engineers and the Assistant Secretary will have to be joined at the hip and say, "OK, we need flexibility here, we need help there. Secretary, you deal with these channels. Chief, you work those channels."

So I don't envision a reorganization for the Corps, but I think we'll need some restructuring as the workforce requirements change, as the missions change. Like the Army is changing, which needs a lighter, faster force to respond to international crises, the Corps also needs to adapt. The Corps is doing the same thing. The old traditional missions, the old stovepipe, won't work. It's time to be faster, maybe a little lighter. I think that's where some restructuring and re-examining how we do business might be necessary.

Update: *As the new Chief faces those challenges, what do you see as the Corps' strongest asset?*

Westphal: No question, its people. When I go to a district for an event, I always take the opportunity to meet a number of people. I've visited all but two of the 38 districts, and I've seen the tremendous skill, ability, capacity, and commitment these people have to their work.

And I'm not talking about just GS-14s and 15s; I'm talking about people who work in the trenches. They're enthusiastic about their work, they care about what they do, they look for common-sense solutions, they try to help, and they try to do the right thing. I've never been more impressed by an organization's people and their spirit. I've worked in other federal agencies, and I'm not putting them down. I'm just saying there's a unique spirit to this workforce that I don't think you find in other agencies.

Update: *On the flip side of the coin, what are the Corps' greatest weaknesses?*

Westphal: We're probably still a little too embedded in the traditional ways of thinking and doing business. When that happens you have a clash of cultures between those who desire to be more creative and innovative, and those who have always done things this way and want to continue because it worked in the past.

That's a challenge for managers, from the branch chiefs all the way up to the Chief of Engineers. You have to empower the folks who want to be creative and innovative, and at the same time work with your traditional element to maintain the traditions that are important to any long-lived organization, and the legacy of processes that have stood the test of time.

That culture clash is not uncommon for an organization this old, but it's something the Corps must pay particular attention to. We just discussed my views of the Corps before I came on board. Well, some people who have never had contact with the Corps tend to think of it as an old, inflexible organization. In fact, in a lot of negative correspondence I receive from people who are upset about something they aren't getting, they conclude "This is an intractable, inflexible, traditionalist organization that's not thinking in the 21st century." I say that's not true, but I *also* say that getting rid of that image, and making the organization more responsive, is a challenge we have to meet.

Update: *In your view, what is the proper relationship between the Corps of Engineers and the ASA(CW)'s office?*

Westphal: Let's start with the Chief and the Assistant Secretary. I like to use the corporate analogy. Let's say you have a corporation the size of this one (and there aren't many with the budget and size of the Corps, except the top Fortune 100). You'll have a chairman of the board and a board of directors; they run the company, make policies, give direction, and have the final say. In the Corps' case, that's the Secretary of Defense, the Secretary of the Army, and this office.

The president of the company is the Chief of Engineers. He's the chief operating officer; he runs the organization day-to-day. So when I say the Corps has challenges in personnel, real estate, and so on, they're really the challenges of a chief operating officer, who must check with the board of directors and make sure that what he does is OK with them. In some cases, they may direct him, but for the most part he operates the organization and answers to the stockholders, who in this case are the American people.

Now, that's the analogy I use for the relationship between the Chief of Engineers and me. If you look at the relationship between this office and the Corps of Engineers, that's a bit different. There, I think, this office basically does two things. One is to be the connection, the link, between the Corps and the Department of the Army, the Department of Defense, the Executive Branch, and the Congress. In that capacity, this office facilitates matters, answers questions, provides information. We're a conduit for information between the Corps' technical person who's working on a project or report, and the person on The Hill or in the White House or the press who is asking about the project or report.

A good part of what we do is information transfer. I'd venture to say that's one of our *major* functions. So our ability to defend, promote, sustain, and enhance the Corps of Engineers depends on how good, how quick, and how effective that information is that we get from the people who are working an issue. And, of course, on my office's ability to transfer accurate information, information that makes sense.

The other part of that linkage function is being a referee. So if there's a problem between the Corps and Congress, or the Executive Branch, or another federal agency, or a citizen, we help settle the dispute. We decide if we should make an exception to policy, or issue additional guidance, or simply nudge someone to move something along a bit faster. Or do we tell this person "No, we're sorry; what you want we can't give you."

Whatever the answer is, we're the arbiter. Sometimes we have to give an answer the Corps doesn't like, sometimes we have to give someone else an answer they don't like. So it puts my office often in the situation of being the bad guy.

So our the offices, the Corps of Engineers and the Office of the Assistant Secretary of the Army (Civil Works), have very different missions. But we both support the same idea — we sustain a program that's really great for America, and do it in a way that serves the best interests of the country.

Update: *Can you describe your relationship with Lt. Gen. Flowers?*

Westphal: I've gotten to know Bob Flowers well since I took this job. I was a big supporter of him becoming Chief of Engineers; I thought he'd do a great job. I think he brings tremendous experience, credibility, and sound judgement.

I'd say that my relationship with him is a good one — very professional, collegial, and friendly. We both realize that to be effective in our jobs we have to work together, we have to partner up in many situations, we have to help each other. We're very pragmatic in that respect.

Lt. Gen. Flowers says he is a bridge-builder, which to me means that he wants to connect with this office in a positive way. I think this relationship can only enhance the benefit we give the nation.

So I think, overall, we have an outstanding relationship. I know that somebody might read this and say, "Well, Flowers has only been in the job a few weeks, and they haven't hit any hard issues yet."

But we're establishing a strong confidence and trust in each other, and that's really the key. If we have confidence and trust in each other, then when we hit those difficult issues where we disagree, where we have different perspectives, where he's getting pressure from one side and I'm getting pressure from another, whatever the outcome is, it will based on mutual trust and respect. We'll support each other whatever the outcome is.

Ultimately, I think that's what the American people want in public servants — people who have confidence and trust in one another while they work together.

Update: *Recently, legislation was proposed to change the Corps of Engineers. That issue has come up before, and probably will again in the future. Do you see the need for legislative or executive changes in the way the secretariat directs the Corps of Engineers?*

Westphal: I believe the case has been made by the Secretary of the Army, and I believe everybody (the Chief of Staff of the Army, the Vice-Chief of Staff of the Army, the ASA(CW), the Chief of Engineers) agrees that the law governing the Corps' chain of command is pretty clear.

We may be required from time-to-time to clarify where responsibilities lie when questions arise about the chain of command, about who has the say here or the say there.

I don't think we need to make any legislative or executive decisions to change things, because we already have the tools, we have the law. I maintain that we simply need to operate within those principles, and we need to establish the confidence and trust between these two offices that I mentioned earlier in such a way that nobody needs clarification.

Update: *You've worked in the federal government in several different capacities. Based on your experience and what you know about the Corps of Engineers, would you recommend the Corps as a career for a young professional?*

Westphal: I couldn't think of a better place for a young professional in any discipline. Think of the opportunities in the Corps in the sciences like biology or engineering or zoology or archeology, or in business areas like planners or architects or economists or lawyers, even journalists. There's a place for all of those professionals in the Corps, which makes it unique.

So I would say absolutely. I think the experience a young professional would get in the Corps would give him or her an opportunity to venture out into a lot of different areas, deal with a lot of different issues, and see how the government works in ways that you won't see in a most other federal agencies.

Update: *Are there any other subjects you'd like to cover before we wrap up?*

Westphal: I think it's important to not always pat ourselves on the back. From time to time, we need to also talk about the challenges and difficulties of our job, and about difficulties we may have in the future, and with the future expectations of us. I think that's healthy.

In the past year, the morale of the Corps has been affected by things written in the press, by questions about the Corps' integrity and accuracy in studies. I believe in the integrity of the Corps. I believed in it before these articles came out, and I believe in it today. I believe in that because of the Corps' people. I think the people have integrity; I think they have a sense of commitment to this nation's needs.

So I think we need to never let experiences go by without learning something from them. And if we made mistakes or overlooked things, or we haven't been as tight in our processes as we should, we need to improve. We shouldn't just ignore it and go blindly into the future without making sure we're never challenged again on that basis.

Nobody should ever question the integrity of the Corps again, because once that crack gets deeper, it may ruin the Corps' foundations. We must not let that happen. We've got to tighten up our ship. I'm certain that's a concern of Lt. Gen. Flowers, and he'll support and help the Corps do that.

And I would add, hold your heads up. This is a great institution with great traditions and a great future. It's obvious that the nation places a lot of demand and responsibility on the Corps of Engineers.

Never forget that you are public servants. Even though I'm a Presidential appointee confirmed by the Senate, every two weeks I get a paycheck from the U.S. Treasury. Not from the Democratic Party, not from the White House, not from the Congress. From the U.S. Treasury, like a GS-7 or GS-9. We serve the American people — not a client, not a sponsor, not a congressman or a senator. The American people.

Update: *Any final messages for the folks in the Corps of Engineers?*

Westphal: The future is exciting for the Corps Engineers, the mission is great. I say ***Essayons!***

Blasting, and drilling holes in frozen rivers with tractor-mounted posthole diggers, are two proven methods of breaking up ice jams before they can cause flooding. (Photos courtesy of CRREL)

Ice jams cause severe winter floods

By Marie Darling
Cold Regions Research and Engineering Laboratory

For those who live in cold climates, ice jam flooding is as common as spring floods are elsewhere. However, hydraulic engineers at the Cold Regions Research and Engineering Laboratory (CRREL) are making major advances in ice jam flood mitigation.

An ice jam is an accumulation of ice in a river that acts as a natural dam and can flood low-lying areas upstream. Downstream areas also flood if the jam releases suddenly, releasing a wave of ice and water. Ice jams can damage roads, bridges, buildings, and homes, and cost the community thousands or millions of dollars.

But ice jam damages tend to be localized and often do not meet requirements for Federal Emergency Management Agency assistance. So the Corps plays a large role in ice jam emergency response and long-term mitigation.

In most northern regions, ice forms on rivers and lakes annually. The yearly freeze and breakup commonly take place without flooding. But many communities face serious ice jam threats every year, while others experience ice jam flooding at random. A recent engineering manual reported there were ice jam problems in 36 states, primarily in the northern U.S. Of these states, 63 percent reported that ice jams occur frequently, and 75 percent rated ice jams as serious to very serious.

The cost of ice jam flooding is high. Kate White, a CRREL hydraulic engineer, said, "Ice jams in the U.S. cause about $125 million in damages *annually*."

But the threat of ice jam flooding does not need to be a fact of life. Engineers now take a four-pronged approach to manage ice jam flood mitigation that includes early warning systems, advanced measures, permanent measures, and emergency measures.

Early warning is important for ice jams because water levels may rise rapidly, similar to flash floods. An early warning system, The River Ice Motion Detector, developed by Dr. Jon Zufelt and other CRREL engineers includes wires that connect the device directly to the ice. These wire circuits are read with a data logger, such as a Data Collection Platform (DCP) associated with a U.S. Geological Survey (USGS) recording stage gauge. A broken wire signals the ice has moved, and this data is transmitted to a satellite where it is available to researchers.

Another device developed by Zufelt and others, a Portable Battery Operated Power Managed Event Recorder and Interrogator System, is activated by ice movement, and records the time and day of the move. This system can run for up to six months on four AA-size batteries. "This equipment is not high-tech, is built with off-the-shelf parts that are inexpensive and easily deployable to the field," Zufelt said. "It's effective in giving early warning to the community."

Two photos from a web camera system show a creek backed up by an ice jam (left) and flowing as ice control structures break up the ice. (Photos courtesy of CRREL)

These types of ice movement devices work when used as part of an early warning system. Last winter, officials were concerned about a 10-foot-thick ice jam in the center of downtown Augusta, Maine.

Flood Damage Reduction

A team of CRREL engineers installed the ice movement detection system as part of an early warning and monitoring system. "The concern was there would be flooding if the river ice upstream broke up before the jam melted," Zufelt said.

CRREL, the USGS, and the National Weather Service (NWS) all participated, supported by New England District. The system was connected to phone lines with prerecorded numbers to alert officials if the ice jam moved. In two locations there were no available telephone lines, so modifications allowed connection to a cell phone.

In each case the first number called was the Emergency Operations Dispatch. This call would alert observers to verify that the ice had actually broken and thus activate emergency plans. Fortunately for Augusta, the ice in the river melted and there were no flooding problems.

Advanced measures are methods used directly to weaken the ice so that ice jams are less likely to form. These methods include drilling holes, breaking, trenching, cutting, or dusting. Oconto, Wis. undertakes a successful ice-weakening program annually. The Oconto River runs through the middle of the city and typically jams every year near its confluence with the Green Bay River. When spring breakup flows are high, more ice is flushed down the river, significantly raising water levels.

After a particularly damaging ice jam in 1986, Zufelt suggested weakening the ice by drilling holes in strategic locations before the normal breakup. This would allow the ice to travel further downstream before jamming, lowering upstream flooding levels. The city has tried several methods during the years including drilling holes by hand, with gas-powered augers, and with a trenching machine.

After years of experience, they now drill a pattern of holes in the historic jamming location about one month before the normal breakup. They use a posthole digger mounted on a small tractor that can drill 150-200 holes per hour through 16-inch-thick ice. This advance measure operation costs the city about $2,000 annually, just a fraction of the costs of a single ice jam flood.

Permanent measures are structures built into the river or stream to control or reduce ice jam the effects. CRREL researchers have developed several innovative ice control structures (ICS). An ICS was built in 1994 on the Lamoille River in Hardwick, Vt. Here, strong ice formed in a slow-moving reach of the river and impeded ice movement during breakup. Every year this ice jam caused a significant surge of ice and water through the downtown.

Hardwick officials contacted CRREL researchers requesting a low-cost, effective approach to their spring flooding problem. An ICS was built using four 42-ton granite blocks. These blocks were anchored to the riverbed so they could withstand the force of the ice and water, but the spacing between the blocks does not significantly affect open water flows.

This structure has been in place for six years, preventing flooding each year.

Emergency measures are performed to address an actual flood. These measures include blasting, excavating the ice, ice breaking, or setting up emergency levees.

(Kate White and Jon Zufelt contributed to this article.)

Projects protect lower Mississippi Valley

By Patty Bates
Vicksburg District

Year after year, "Ol' Man River just keeps rollin' along." And, each spring, residents in the Lower Mississippi Valley start watching the river. The Mississippi River has contributed much to the region's physical and economic well being but, during flood time, it can be the enemy of those who depend on it for their living and residence.

The Mississippi River and Tributaries (MR&T) project from Cape Girardeau, Mo., to below New Orleans protects the Mississippi Delta from floods. The flood control plan is designed to protect against the "Project Flood," the flood with the greatest probability of occurring.

An important part of the MR&T project is the Mississippi River Levees (MRL) project. Because this area drains 41 percent of the continental U.S. and two Canadian provinces, the levee system must be maintained to protect property, industry, transportation, agriculture, and 4.5 million people in the 35,000-square-mile floodplain.

The 1,610-mile-long MR&T project is still under construction. About 263 miles of levee must be raised, and almost 132 miles of seepage control works must be built at an estimated cost of $656 million. The entire project could be finished as early as 2020, if funds are available.

Led by the U.S. Army Corps of Engineers' Mississippi River Commission, the mainline Mississippi River levees have prevented more than $200 billion in potential flood damage. Three Corps districts manage the system:

- Memphis District oversees 1,182 miles of MR&T levees and floodwalls, including 638 miles of mainline Mississippi River levees.
- Vicksburg District oversees 1,554 miles of MR&T levees, including 460 miles of mainline levees.
- New Orleans District oversees 978 miles of MR&T levees and floodwalls in Louisiana, including 512 miles of mainline Mississippi River levees.

As one of the nation's environmental stewards, the Corps insures that all levee-raising work is environmentally sound by incorporating environmental design features into project design. A prime example is near Fitler, Miss., where underseepage had been a significant problem during flooding. It is considered excellent black bear habitat.

Flood Damage Reduction

Rather than follow the usual practice of building a berm, Vicksburg District installed a system of relief wells. This avoided excavating lands, saving about 275 acres of forest because no borrow material was required. Also, an additional 100 acres of forest and wetland were saved, since no soil berms were needed.

The were also economic benefits. The final cost of the relief wells was $1.8 million, saving about $2 million.

Handling borrow areas has also evolved into a science. Contractors used to take building material from wherever they wanted. But the Corps now specifies where they can get it, how deep they can dig, the shape of the borrow area, and what must be done with the borrow area once they've finished removing material.

The Corps, the levee board, and the landowner discuss goals for property management after the borrow material is removed. Within reason, the Corps will meet the landowner's goals. So some borrow areas are left for the river to fill for fishing. Some are allowed to drain so the land will be a combination of marshy and dry for waterfowl and wildlife habitat. Some are replanted in hardwoods, and some are left to regenerate naturally.

Despite much effort by the Corps to protect the environment, the Earth Justice Legal Defense Fund, Inc. filed lawsuits, challenging the Supplemental Environmental Impact Statement (SEIS) prepared by Vicksburg District.

Twice the courts found in favor of the Corps, the Board of Mississippi Levee Commissioners, and the Board of Levee Commissioners for the Yazoo-Mississippi Delta. The courts said the SEIS complied with the process required by the National Environmental Policy Act, because it had provided the public information regarding environmental impacts and explored and evaluated all reasonable alternatives.

So, come next spring, the Corps will continue raising the levees and strengthening the berms, while avoiding and minimizing losses to the environment. The completion of the MRL requirements is vital to protecting those living in the Mississippi Delta who depend on these flood control measures for their safety.

Corps district fights floods in paradise

Article by Alexander Kufel
Photo by Dan Meyers
Honolulu Engineer District

The Aleniao Flood Control Project functioned near capacity as it carried a torrent from 37 inches of rain which fell in two days.

Rains on the Big Island of Hawaii in early November built up to record-breaking levels. Concern mounted as streambanks overflowed and bridges washed out from the unprecedented torrent. And a number of Honolulu Engineer District (HED) employees anxiously watched three flood control projects the district designed and built — Alenaio Stream, Wailoa Stream, and Paauau Stream.

It was a great relief to everyone that the three projects successfully carried more water than the 100-year-flood levels they were designed for. Civil engineer technician Dan Meyers, Technical Branch of Civil Works, found that out when he boarded a plane and flew to Hilo, Hawaii, as soon as he could to do a preliminary "post-event" assessment.

"I had walked our flood control projects many times on our regular operations and maintenance inspection rounds and I wanted to see how certain sections performed under the pressure of 37 inches of rainfall within a very short period," said Meyers. O&M inspections are conducted regularly by HED together with the state of Hawaii. "Early reports said there was a lot of devastation along certain stream paths, so I also wanted to start the ball rolling toward releasing emergency funds if it was warranted."

Joel Hendrix, Chief of the Emergency Management Office, agreed. "We believe the flooding peaked about 2 a.m. Dan was on the phone very early in the morning seeking authorization to do an assessment. Our immediate concern was for the welfare of the residents of the hardest-hit areas," Hendrix said. "Dan confirmed early there was no loss of life and that, although there was some property damage to homes in areas other than our projects, major tragedy was averted."

Meyers also confirmed that, while the three projects performed as designed and protected surrounding homes and property, they did sustain some damage. Hydraulic engineer Jim Pennaz, Chief of Technical Branch and designer of the Alenaio Flood Control Project, said that all three projects were designed to carry the water of a 100-year-flood event, and that each performed very well considering this storm exceeded that.

Preliminary estimates by the Corps based on high-water marks in the project site areas and other data indicated that the Alenaio project, which cost nearly $16 million when completed in 1998, prevented losses estimated at more than $14 million, and nearly paid for itself during this one event.

But the Alenaio project did not emerge completely unscathed. It sustained erosion damage at various sites along the streambank throughout the project. Water overtopped the project at one location, but an adjacent channel contained the overflow and rapidly returned it to the project. Rehabilitation costs for this project are estimated at $368,000 and will be 100 percent federal funded.

Ten floods struck downtown Hilo from 1920 through 1994 when the decision was made to go ahead with the Alenaio project. This was the first real test of the project since 15 inches of rain fell on Hilo during a two-day period in August 1994 just before construction started.

According to similar preliminary estimates, the Wailoa Stream project prevented damages of nearly $1.5 million. A 150-foot stretch of levee was overtopped when the stream changed course at the upstream end of the project. Some 300 feet of rip-rap and 200 feet of concrete also washed away and will be replaced. Rocks and debris that ended up on the nearby University of Hawaii at Hilo baseball field are being disposed of by the state. Costs for rehabilitating this project are estimated at $1.6 million and are 100 percent federally funded.

The Paauau Stream project near Pahala prevented estimated losses that could have exceeded $1.5 million, although it, too, sustained damage to a number of locations along the channel. Costs for rehabilitation of the Paauau Stream project are estimated at $1.1 million and are 100 federally funded.

Hydraulic engineer Nani Bennett of Technical Branch, said that in addition to these sites, the flood control project at Waiakea Stream, which was built by the county of Hawaii in 1985, is eligible for public funds to repair an estimated $1.12 million. About 1,700 linear feet of natural side slope was scoured, as were portions of the channel bottom. Under Public Law 84-99, 80 percent of the estimated amount will be federally funded. A condition of eligibility for that money is regular maintenance and a joint Corps of Engineers/State of Hawaii O&M inspection every other year.

Repairs to all four projects are estimated at $4.19 million. HED project manager David Kern of Civil and Public Works said that reports have just been finalized. Rehabilitation plans and specifications will be initiated this month with awards for construction expected around March. The goal is to complete repairs before the start of the next flood season, which usually begins around the end of October.

Flood Damage Reduction

2000 fire may cause 2001 flood

By Dutch Meier
Walla Walla District

Devastating fires that ravaged Idaho forests last summer have left some communities like Atlanta, northeast of Boise, exposed and unprotected from possible floods next spring when snowpack melts in the Sawtooth Mountains. Flames consumed virtually all the protective vegetation that absorbs the runoff and slows potentially destructive flood water.

After narrowly escaping destruction in the summer's blazes, thanks to a last-minute wind shift, many homes, businesses, and historical structures around the mining and timber town now face yet another peril. This mountain community, established in 1854, is right in the path of Quartz Creek as it comes downhill, fans out, and drains into the Middle Fork of the Boise River.

Nature has historically and repeatedly tested the residents of this tiny town deep in the Boise National Forest with forest fires in the summer, heavy mountain snows in the winter, and the prospect of flooding in the spring. It makes some residents ponder.

"We hope nature isn't trying to tell us to leave," said Terry Applegate, owner of the Atlanta Sports Center. "The fires up here were something everybody was concerned about for years; we knew it was inevitable. But now we're worried about what's going to happen because we have no timber; we don't have any kind of growth of any kind on those mountains. The slightest bit of rain brings everything up there down, and that's going to come right through town."

The state recognized a potentially disastrous situation for the Elmore County town and called on Walla Walla District. The district's Emergency Management Office quickly dispatched one of its staff to the village to oversee construction of advanced protective measures to lessen the impact of flooding following a heavy winter snowpack runoff.

"The purpose for the U.S. Army Corps of Engineers being in Atlanta, Idaho, was to protect lives and property from flooding," said Herb Bessey of the district's Operations Division. "We brought contractors onsite to build projects to help reduce flooding next spring. We installed several trash racks in the streambed of Quartz Creek, and improved water passage by tearing out the old 36-inch diameter culverts and replacing them with new 54-inch culverts to better manage the volume. We expected the work to take seven to 10 days, but we finished several days ahead of schedule "

This forest fire destroyed all protective vegetation near Atlanta, Idaho. (Video still image by David Walsh, U.S. Bureau of Reclamation)

Advanced measures like those in Atlanta can be as much as 100 percent federally funded, according to Bessey. The effort he oversaw was a $106,000 investment to protect lives, homes, businesses, as well as civic, government, and historic structures from the creek as it makes its way through town. Runoff volumes next spring could be up to three times higher than normal.

"The Corps is enhancing the channel that Quartz Creek flows in," said Applegate. "If we have a flood, the creek can be breached. If it's a minor event, we have loss of structures. If we have a major event, we have loss of lives. Hopefully, what the Corps is doing will help prevent some of this, though we hope Mother Nature will prevent all of it. The way the Corps is working, hopefully they'll protect the properties around town."

Applegate is a retired upholsterer whose retirement project is making replicas of classic antique cabinets. He built his home in the mountain community to get away from life in the city and spend more time pursuing his passion for snowmobiling. He said he gets snow earlier in the year and later into the spring at the higher elevation.

But those fun-filled snows can also wreak havoc by carrying debris, mud, and destructive waters that destroy everything people have worked for. To cut back on the potential for such harsh impact to lives and property, the Corps' contractors placed trash racks to block debris that could choke the Quartz Creek culverts.

The racks are sets of six steel pipes, six inches in diameter, sunk deep into the ground and standing four to five feet above the creek bottom. Workers also replaced several long segments of culvert to increase water carrying capacity at four locations.

Besides the trash racks, and culverts, other efforts to protect the town include work to restore natural growth claimed in the fires.

"The U.S. Forest Service has done some protective measures up on the hillsides, as best they can. And now the Corps is in here trying to do some work in town. So, the two agencies, are kind of working together. One has worked up above us, the other is working down here with us. Hopefully, with the two working together, we'll still be here," said Applegate.

Herb Bessey of Walla Walla District inspects flood reduction work near Quartz Creek. (Photo by Mona Wright, Walla Walla District)

Unique bridge serves community

By Jeff Anderson
Portland District

The U.S. Army Corps of Engineers at Lookout Point completed a unique bridge construction project that both improved service to the community and lowered the project's operation and maintenance costs. The project was a joint effort between the Corps and the Northwest Youth Corps (NYC).

NYC used the land to conduct a bridge-building training and, in return, a member of the Lookout Point staff attended the training at no cost.

"Working within a highly technical engineering organization, it was enlightening to see what could be accomplished with low-tech labor, effort, and sheer determination," said Dan Cottrell, the Corps park ranger who participated in the training. "I gained new skills and a fresh perspective on how to get things done."

The Corps provided materials including rock, logs, and hardware while NYC provided the labor and expertise. Training leaders Darrel Kisser, Jeff Parker, and Jason Kerby took participants through the points of trail bridge construction. With an emphasis on environmental conservation and a long tradition of superior trail building, the NYC training was an excellent source of information on bridge construction techniques.

"The great team experience drew people from around the country and taught difficult skills, like building a bridge by hand," said Ethan Nelson, NYC program coordinator.

The training had a great turnout and a diverse group from around the nation. People came from the Vermont Youth Conservation Corps, West Virginia Youth Corps, State Department of Forestry, and Oregon State University School of Forestry. Participants had a first-hand look at progressive bridge construction and trail techniques using simple hand-tools with minimal power equipment.

The new bridge rests below Dexter Dam near the Middle Fork of the Willamette River. The structure spans a seasonal wetland that joins the east and west sides of the Red Cedar trail, beside the Middle Fork boat launch. The trail is accessible year round and is an excellent opportunity for multiple user groups. Visitors can use the trail for bird watching, hiking, and many other activities.

NYC is a non-profit organization based in Eugene, Ore. It offers a multitude of programs for at-risk youth. They provide both learning and work opportunities, with a focus on environmental conservation, to young people ages 13-17. Most of NYC's participation comes from the Summer Conservation Corps (SCC). SCC members work 40 hours a week on forest conservation projects in five-week sessions. During the work week, they camp and receive environmental education from their adult leaders. Successful SCC members learn work ethic, team skills, and effective communication strategies.

Founded in a gas station with used vans and surplus trail tools, NYC has grown to be an active part of the Eugene community, and even across the nation.

The crew and their bridge at Lookout Point (Photo courtesy of Portland District)

The Red Cedar Bridge was built in three stages — prep work, training, and finish work. Participants tore down the old bridge with hand-tools and brute manpower.

"The determination of the kids and attention to detail I observed were remarkable," said Cottrell.

To complete the project in under a week, several weeks of preparation were required. Kat Beal, Corps fish and wildlife biologist, coordinated the contract with NYC. After the existing bridge was demolished, site preparation included removing obstacles like boulders, stumps, overgrown limbs, and foliage.

Most of the bridge was completed during the training session. Native logs, used for the stringers and hand railings, were cut from cedar and douglas fir stands nearby. The existing bridge and abutments, which were in poor condition, were re-built and integrated into the new bridge design.

All materials were carried in, including two 35-foot stringers (supporting members that span the length of the bridge). Nearly two tons of rock was moved by hand in wheelbarrows from a stockpile a quarter-mile away. NYC historic preservation and rustic construction teams worked additional hours on hand railings and other carpentry work completed during the finishing stage.

Trail approaches (banked landings that tie the trail to the bridge) and streambank restoration were completed by NYC Outdoor School teams as a part of their practical environmental curriculum. The Outdoor School is an alternative high school program that attracts students from the local school district who want more from their education. It provides an opportunity for students to combine practical job skills and outdoor education in one high school experience.

The result is a bridge that met the needs of the Corps, NYC, and the public. This project provided a bridge in many ways. Most importantly, it laid the groundwork for future cooperative efforts between the Corps and NYC.

(Jeff Anderson is a ranger at Cottage Grove Lake.)

Ohio River may be next ecosystem restoration

By Susanne Fournier
Ohio River Division

The proposed Ohio River Ecosystem Restoration Program could be one of the largest ecosystem restorations in the U.S., second only to the Florida Everglades. Recently the Great Lakes and Ohio River Division submitted a final study report for the proposed restoration program to Corps Headquarters. The division completed this study with input from the U.S. Fish and Wildlife Service, Environmental Protection Agency, Ohio River Valley Water Sanitation Commission (ORSANCO), natural resources agencies from six states, American Rivers, and other regional environmental interest groups.

Human activities have influenced the ecological resources of the Ohio River and its floodplain for more than 200 years. Although in recent years much has been accomplished to improve water quality and lessen the impacts of human activities, this program is designed to restore and protect the habitats, species diversity, and wildlife abundance of the river and its adjacent floodplains.

This study identified more than 250 potential site-specific projects along the 981-mile Ohio River corridor from Pittsburgh, Penn., to Cairo, Ill. This includes Illinois, Indiana, Kentucky, Ohio, West Virginia, and Pennsylvania. These restoration projects would contribute to the restoration of 25,000 acres of bottomland hardwood forests, 1,250 acres aquatic habitat embayments, 25,000 acres of wetland, and protection of 40 islands and 100 miles of shoreline habitat.

If approved and funded, the Ohio River Ecosystem Restoration Program will preserve natural beauty like this. (Photo courtesy of Ohio River Division)

This recommendation is for authorization of a $307 million long-term program, with maximum federal funding of $10 million annually for each of the first five years and $15 million annually for the remainder of the program. Non-federal sponsors would fund 35 percent of site-specific projects and all operations, maintenance, repair, rehabilitation, and replacement.

If final approval is given and funding authorized, the corridor-wide ecosystem program will start by refining ecosystem goals and prioritizing restoration efforts with a partnership of representatives from government resource agencies, universities, and environmental groups.

The study evaluations and report findings will be reviewed by the Chief of Engineers and the Assistant Secretary of the Army (Civil Works), in coordination with federal and state agencies, before the Corps' report is finalized.

Corps to celebrate 200th anniversary of Lewis and Clark expedition

By Larry Crump
Kansas City District

Take a historic mission, enlist the aid of a young Indian woman, add a lucky rendezvous, mix in hardship and adventure, and one has an epic tale.

But this is the *true* story of the Lewis and Clark Expedition. A small group of tough men, and an Indian girl barely turned woman, endured a journey that had a profound impact on this nation's history. Their missions — find a practical transportation link across the newly-purchased western territory, map its geography, chart its resources, and meet and report on its inhabitants.

Lewis and Clark' achievement has been the subject of numerous articles and movies, plus a blockbuster TV special by renowned storyteller Ken Burns. Now, the U.S. Army Corps of Engineers and the rest of the nation are planning to celebrate the 200th anniversary.

The national kickoff of the commemoration is scheduled for Jan. 18, 2003, but planning has been underway for many years. In October 1998, the Corps was one of 15 federal agencies to sign a memorandum of understanding with the Lewis and Clark Bicentennial Council to collaborate in the event. As far back as 1969, the Lewis and Clark Trail Heritage Foundation organized to stimulate public interest in the expedition. In 1995 the Lewis and Clark Bicentennial Council was established to serve as the national center for promotion of bicentennial programs and publications.

The Corps' national coordinator for the event is Jean Nauss of Northwestern Division. She is assisted within NWD by Ken Wilk of Kansas City District, the Missouri River Basin Coordinator, and Craig Rockwell of Walla Walla District, the Columbia Basin Coordinator. Many other districts throughout the Corps have members who will work on activities dedicated to the event.

In 1803, the U.S. purchased the Louisiana Territory from France for about $15 million, or less than three cents an acre. The purchase about doubled the size of the U.S. Jan. 18, 2003 is the 200th anniversary of President Jefferson asking Congress to fund an expedition to the West. (Plans for the expedition began before the actual purchase.) The ending date, Sept. 23, 2006, is the 200th anniversary of the expedition returning to St. Louis.

The expedition was no small task. Lewis and Clark and their group traveled by foot, horseback, and boat. Boats were rowed upstream and portaged across mountains, food had to be captured or acquired wherever it was found. For all practical purposes, medical care was non-existent. But for the goodwill of the Indian tribes encountered along the way, the mission could have failed.

Leaving Pittsburgh, Penn., in August 1803, Col. Meriwether Lewis and a small band of recruits moved down the Ohio River, rendezvoused with Lt. William Clark at the Falls of the Ohio (near present Louisville, Ky.), then traveled to the Mississippi River, recruiting members along the way.

William Clark

Meriwether Lewis

The Lewis and Clark Expedition traveled more than halfway across the U.S.

After the complete assembly of the Corps of Discovery, they moved up the Missouri River. The group numbered some 45 members until it reached Fort Mandan, N.D., then 33 for the rest of the journey.

During their wintering at Fort Mandan in 1804, Lewis and Clark recruited two French-Canadian fur traders as interpreters, Jean Baptiste LePage and Toussaint Charbonneau. Charbonneau's Shoshoni wife, Sacagawea, and their newborn son, Jean Baptiste, also joined them. Sacagawea is believed to have been barely 17 years old, yet her presence proved valuable.

In April 1805, a small contingent of recruits returned to St. Louis with deserters, French voyagers, and plant and animal specimens. The permanent party continued up the Missouri River where they reached its navigable limits above Great Falls, Mont. From there they continued southwest to the Three Forks of the Missouri and finally reached Lemhi Pass. They crossed the Rocky and Bitterroot mountains to Clearwater River in Idaho, which led them to the Snake River and on to the Columbia River.

Sacagawea proved to be an expert in finding edible plants. When one of the boats capsized, she rescued the group's journals and records. As the group made their way through Lemhi Pass, they encountered a Shoshoni band, led by Sacagawea's brother, Chief Cameahwait. Under other circumstances, this encounter could have ended the expedition right there. But the emotional reunion of brother and sister, plus Sacagawea's translation skills, paved the way for Lewis and Clark to continue. In addition, the Shosoni took the presence of a woman as proof of peaceful intentions.

The group eventually made its way to the Pacific Coast in the fall of 1805, where it established Fort Clatsop in Oregon, named for a local Indian tribe.

The Lewis and Clark Corps of Discovery returned to St. Louis in 1806. (Sacagawea left the group at about the halfway point and returned to her people.) It traveled more than 8,000 miles in two years and four months, meeting danger daily and suffering hunger, fatigue, privation and sickness. In spite of all of the hardships, only one member died on the journey, apparently of appendicitis.

Of the mileage traveled, the Corps manages some 4,700 miles through Section 10, Section 404, levee management projects, fee title, or direct management.

Nauss said the commemoration is difficult to manage because it is a "moving, fluid kind of event. A date important to one place is not of the same importance to another." Yet, several projects are in the planning stages. Nauss said that four Corps Headquarters taskforce groups have been established. These include an Information Brochure Taskforce, a group working with the 15 agencies to write a brochure highlighting key Lewis and Clark sites and explaining each agency's role at various sites. The Army Brochure Taskforce clarifies that the Lewis and Clark expedition was an Army effort. The Mapping Task Force is working with the U.S. Geological Survey to compile a database of the maps of the rivers used by used by Lewis and Clark.

The Discovery Box Taskforce is developing a trunk of interpretative items that relate to the expedition. Nauss said the items are from the Army perspective and that they relate to the Army values of Loyalty, Duty Respect, Selfless Service, Honor, Integrity, and Personal Courage. Examples, Nauss said, include a sextant (Duty), a uniform coat (Leadership), and a tin of bear grease (Personal Courage).

Most agencies will have some sort of Discovery Box which they will use to tell the Lewis and Clark story, but only the Corps box will be used to demonstrate the Army values.

Corps park rangers will use the box in interpretative settings, at school programs, special events, etc.

The end result of all this planning will be to commemorate an expedition that had far-reaching effects upon national and international relations and boundaries, and is considered one of the greatest accomplishments in American history.

Around the Corps

Surplus program

Outdated equipment finds new life helping people in the Vicksburg District area. Through the Corps' Surplus Property Program, the district donates computers, furniture, and even vans to educational institutions and non-profit organizations.

The surplus program is one of several the district uses to fill community needs. "We have a lot of educators who come to us with requests, and we try to fill them as surplus becomes available," said Linda Cudo of the Logistics Office.

The program makes surplus federal property available to non-federal public agencies and private non-profit organizations that have education programs for the young, elderly, or homeless. The Good Shepherd Community Center recently received surplus computers.

"We needed computers to supplement the students' reading and math skills, and help them do research," said Rev. Tommy Miller, the center's director.

Since the program began in 1995, the district has donated about 6,000 pieces of data processing equipment to area education programs.

Installation support workshop

North Atlantic Division (NAD) recently held an Installation Support (IS) Workshop at Fort Monmouth, N.J. The three-day workshop brought together about 70 senior leaders and project managers from NAD's six districts, major command (MACOM) and DPW engineers supported by NAD, and project managers from other Corps divisions.

On the first day, attendees discussed MACOM and DPW customer needs, problems, and constraints. On the second and third days they divided into groups. Problems were identified and prioritized for workgroups to solve. The groups hammered out solutions and action plans, briefed the other workgroups, adjusted the plans, and briefed the top-priority plans to Brig. Gen. Stephen Rhoades, NAD commander.

Problem areas addressed by the workgroups included management, communication, accountability, personnel and training, IS funding, contracting tools, design and construction quality, timeliness, and cost-effectiveness. Solutions included periodic performance reviews, colocation, partnering within and across organizations, developmental assignments, and cross training.

Topographic model

The Topographic Engineering Center (TEC) recently began producing scale topographic models. Previously, these models were built by hand, a time-consuming, expensive task. Today, computerized machining and rapid prototyping can render terrain in model form in days.

TEC recently produced a large model of the National Training Center at Fort Irwin, Calif., for the 2nd Armored Calvary Regiment (ACR) at Fort Polk, La.

"Getting to know the terrain is always the hardest element of intelligence preparation," said Maj. Chris Irvin of the 2nd ACR. "We normally use a map board, but a terrain model is the next best thing to being there. The model from TEC gives us the ability to visualize the battlefield. It will allow us to war-game as many courses of action as we can visualize based on the enemy's tactics, without any setup requirements."

For more about terrain modeling, visit the website at www.tec.army.mil/products/od/stm.html

New headquarters

After 15 months, Charleston District finally has a permanent headquarters. Damage from Hurricane Floyd in September 1999 forced the district to move from the Federal Building in downtown Charleston to temporary offices in North Charleston.

Before the hurricane, the General Services Administration (GSA) had already decided to close the Federal Building and had begun relocating the Corps. The new building, Hollings Hall, is next door to The Citadel, The Military College of South Carolina.

Finalists

Huntington District and the Huntsville Engineer Support Center are finalists in the President's Quality Award Program. This year the Office of Personnel Management selected only nine agencies to compete. OPM manages the annual program, which recognizes high-performing federal organizations.

To qualify, both Huntington and Huntsville conducted an organization evaluation based on the Malcolm Baldrige Award Criteria. These criteria are the standard for quality-driven organizations in the private and public sectors.

Coast Guard award

Lynda Nutt works as if someone's life depends on it, because it does. The Walla Walla District employee is the Corps' National Water Safety coordinator. Her mission is to reach as many people as she can with the message to play it safe on or near the water.

To maximize the water safety message, Nutt has sought partnerships with other agencies. A recent effort with the Coast Guard Auxiliary resulted in an award.

"The Coast Guard Auxiliary came to me with a water safety workbook for children they wanted to partner with the Corps on producing," said Nutt. "But it wasn't the quality of product the Corps prefers to use. I convinced them that the Corps' National Water Safety Team could turn this first effort into a professional product that we could use in our life-saving educational programs."

Within months, the booklet was redesigned and tested at some 25 Corps recreation sites.

The Coast Guard Commandant presented Nutt with a Meritorious Public Service Award. It is the service's second highest civilian award, reserved for civilians not employed by the Coast Guard who make a significant contribution.

Groundbreaking

The Tucson (Ajo) Detention Basin Wetlands Development/Wildlife Habitat Enhancement Project is a long title for a small environmental restoration. About 12 of the 50 acres near Tucson International Airport will be freshwater marsh, riparian habitat, and open-water areas. The remaining 38 acres will also have wetlands, along with mesquite and ephemeral grassland. Upland habitat will add diversity and buffer zones.

The modifications will not affect flood protection provided by the basin, nor the existing pedestrian and bicycle trails. Los Angeles District will manage the project.

Value engineering

Pittsburgh District has developed an educational outreach initiative that uses value engineering to interact with students and faculty at colleges.

"Recruiting the best engineering students has become more competitive," said Les Dixon, Deputy District Engineer for Programs and Project Management. "This program gives Pittsburgh District the opportunity to interface directly with college students, and it gives a large number of students exposure to the Corps' work."

Two universities were chosen this fiscal year, the University of Florida and the University of Texas at El Paso. Each will do two value engineering studies.

The objectives of the Value Engineering College Initiative are to establish a Corps presence at colleges with accredited civil engineering programs, build and maintain relationships with faculty members and students, and use value engineering to introduce students to the Corps.

Each team consists of five students and one faculty member. The district's Value Engineering Officer gives the team 12 hours of value engineering instruction. The two projects used during the fall semester were Allegheny River Lock and Dam 4 Scour Protection, and Charleroi Locks and Dam Stilling Basin Extension. The students reviewed plans, specifications and reports; applied knowledge obtained from coursework; learned about value engineering; and interacted with engineers and other technical experts.

After completing the training and final report, the teams visit Pittsburgh District, visit sites, and present their study findings to a value engineering committee.

Recruiting office

A "recruiting office of the future" recently opened in Potomac Mills Mall, the largest mall in Virginia. The new station, some 20 miles south of Washington, D.C., is the first of several test facilities focused on presenting the armed forces in a contemporary, inviting atmosphere. All four uniformed services are represented in the new offices, which include interactive computers, flat-screen TVs, decorative plants, and exercise equipment.

Baltimore District acquired the space for the facility in Potomac Mills Mall, while the Omaha District Interior Design Center provided the design.

A number of similar facilities are scheduled to open in other regions. If successful, the new offices will create a brand identity for the military that appeals to potential recruits in a place where they gather.

Rillito

Phase three of the Rillito River Project in Phoenix, Ariz., is complete. It includes 16 pedestrian bridges, one equestrian staging area, and two rest areas along a 13-mile reach of river. The first two phases built bank protection for flood-control.

The bridges were not originally planned because the high cost was considered prohibitive. But Pima County, the local sponsor, reconsidered and secured funds for their share to install pre-fabricated bridges across washes and tributaries along the Rillito, providing an uninterrupted recreation trail. Los Angeles District managed the project throughout its 18-year life cycle.

ASCE Award

The American Society of Civil Engineers presented its prestigious Distinguished Constructor Award to Lt. Gen. (ret.) John Morris at the ASCE National Annual Conference and Exposition on Oct. 20 in Seattle. Morris, a former Chief of Engineers, received the award for leading the Corps during its work at Lock and Dam 26 on the Tennessee-Tombigbee Waterway, and in the Saudi Arabian Assistance Program.

Don't leave your desk without it!

Permission Slip

US Army Corps of Engineers

Ask yourself:

1. Is it good for my customer?
2. Is it legal and ethical?
3. Is it something I am willing to be accountable for?

If so, don't ask for permission. You already have it.

Just do it!

★★★

Chief's Philosophy

- Every USACE soldier and civilian has four individual responsibilities:
  - ✓ Know your job
  - ✓ Be situationally aware
  - ✓ Be healthy
  - ✓ Treat every individual with dignity and respect.
- Leaders set the example.
- Think through problems and let me know what *YOU* would do if YOU were the CG. *DON'T COMPLAIN!*
- Keep a sense of humor, enjoy your families, and have fun.

'Mr. Procurement' celebrates 60 years

By Patsy Knight
and Sally Anderson
Southwestern Division

At 80, John Brigance loves his life and sees no reason to change as he completes his 60th year of working for *one* agency — the U.S. Army Corps of Engineers.

"What would I do in retirement that I'm not able to do now," asked Brigance, the Director of Contracting for Southwestern Division (SWD). "I play golf about as much as I want and my body will allow. I go hunting during season. I get to play bridge with my cohorts at work during lunch, and I get to travel with my business meetings. Plus, I still enjoy my work! So why should I change things now?"

Brigance is called "Mr. Procurement." He got the title in 1989 from Lt. Gen. Henry Hatch, then Chief of Engineers. "John is the source we depend on for expert guidance for all our contracting efforts," Hatch said at the time.

Hatch said that because Brigance literally wrote the book on contracting. Between 1982 and 1995, Brigance chaired a Headquarters task force and penned many of the regulations governing Corps contract procurement procedures.

Brigance's executive assistant on the committee, James Rich of Baltimore District, called him "a role model for courtesy, civility, and professionalism. He is, quite simply, the most decent man I have met in my career, and a living example of what has made the Corps of Engineers a great organization."

Brigance leads an active, healthy life — golf Saturday mornings, ballroom dancing Saturday nights. His typical workday lunch for the past quarter century has included fruit, almonds or walnuts, and a hand of bridge. He and his wife take vitamins. He practices a little alternative medicine by drinking a tablespoon of apple cider vinegar in eight ounces of water each day, and eating some flaxseed. His sick leave balance is more than 5,100 hours, which equals about 2.5 years.

John Brigance has served with the Corps of Engineers for 60 years. (Photo courtesy of Southwestern Division)

But Brigance wasn't worried about health issues when he first stepped into the Corps' procurement picture as a GAF-1 clerk on Jan. 6, 1941, before the GS ratings began. He climbed the ladder to the top as a GS-14 about two decades ago.

It all started after Brigance graduated from high school in 1938. His buddies were taking a business college course on the civil service exam. He saw an announcement and decided to get experience in taking the exam. He packed up his typewriter, went in for the typing test, and his 60-words-per-minute typing skill earned him a job as a Corps purchasing office clerk in Galveston District.

In the early days, Brigance typed solicitations and purchase orders from requisitions for a large variety of things for the district's six dredges and crews. "It was like keeping a small community afloat out in the Gulf," he said.

But the fleet was being reduced in favor of a new way of doing business — contracting with private industry. A lot of things were changing, even in those days.

Another big change...Brigance had started dating a neighbor in his hometown of Sherman, Texas. Her name was Peggy, and they had known each other since their pre-school days. In 1941, Brigance wrote Peggy, saying that on his $1,260 annual income, he could afford to get married or buy a car to visit her, but not both.

They celebrated their wedding with a four-hour train trip back to Galveston.

On their first anniversary, Nov. 27, 1942, Brigance received his draft notice. He served three years with the Army — 18 months Stateside in training, and 18 months in the Pacific Theater working with an engineer parts supply outfit.

On Feb. 18, 1946, Tech. Sgt. John Brigance returned to civilian life. He got home on Peggy's birthday, and two days later Galveston District office called him back to work.

During his 60 working years, Brigance recalls many changes — from carbon paper and typewriter erasers to computers and the Internet.

"There's a lot less telephone tag, and it's much easier and quicker to get word out to all the districts at once with e-mail," he said. He can find things faster because he organized his computer file folders and doesn't have to worry about paper files. He and his two sons frequently correspond by e-mail and have a rivalry going about computer skills. Brigance even books his tee-times for golf on the Internet.

Golf has long been a big part of Brigance's life. He and Peg taught their two sons to play and, until recently, a Brigance foursome was a common family outing. Peg recently retired her golf shoes, but John Jr. still joins his father for a round of golf.

Brigance's love for golf is well known. He joined the SWD golf league when he transferred from Galveston in 1970, the year the league was established. His fellow golfers enjoy his uncanny ability to spot and retrieve lost golf balls.

"John will play an old beat-up, found ball rather than use one of the many new balls he has won in various tournaments or in competition over the years," said Jerry Smith, a long-time friend and co-worker.

Every November, Brigance goes hunting for more than golf balls. He's an avid deer hunter who takes an annual vacation to the Texas hill country to set his sights on venison on the hoof. He bagged an eight-point buck this year.

Brigance also collects stamps, a hobby that started at age 10. He claims collecting stamps was the best geography lesson he ever had. For decades co-workers and the credit union saved stamps for him from their mail. His favorites are the Penny Black (the world's first stamp issued in 1840 in England), and the first-day issue stamp of the Voyager Around the World Flight featuring pilots Dick Rutan and Jeana Yeager. They took 750 stamped envelopes with them, and Brigance has No. 560 signed by them.

He also collects rare and unusual coins and proof sets. Through the years, Brigance bought first-issue coin sets for his two sons. The older son, Terry, recently showed his coin sets to his stepson, who immediately took up the hobby. Now, instead of giving first-issue sets to each son, Brigance sends a set to his step-grandson.

As much as Brigance loves his hobbies, he still loves his job more. And he does more than work – he also teaches. In 1977, he was a guest lecturer on small business contract administration during an eight-week course at Syracuse University. That same year, he also prepared and taught the first-ever contracting course on emergency management operations. North Atlantic and South Atlantic divisions asked Brigance to teach because of his reputation in emergency contracting procedures.

Brigance is also a mentor. He made a big difference to Joe Theobald, Chief of Contracting for Louisville District. Theobald was in a class Brigance taught in 1973.

"John's professionalism and caring demeanor impressed me," Theobald said. "He's been the standard that contracting officers in the Corps try to live up to. Where contracting is today is in a large part attributed to John Brigance. He truly has been a leader by example."

Rick Hedrick of Tulsa District says he thought of himself as an innovative contracting officer until he met Brigance. "In 16 years I've never found a new idea that he hadn't already thought of or tried. I'll call John and he'll say, 'Sure you can try it, but it didn't work too well back in 1963.' Then John usually finds a file that explains 'my' idea and how it worked."

Brigance's age and longevity with the Corps has lead to some humorous situations. Two years ago he went to buy a new car. Even though he could afford to pay cash, he wanted to take advantage of the dealership's low financing rates. During the loan application process, the auto salesman asked Brigance how long he had been employed at his present position. He replied, "Fifty-eight years." The dealer said, "No, I don't mean your age," and repeated the question.

SWD's Human Resources Office battles with Brigance's age every time they update the system. It automatically rejects him because he's beyond the usual retirement age.

Brigance's personal copy of his personnel file must be grasped with two hands and bulges with awards, commendations, and honors, including the Meritorious Civilian Service Medal. To help with this article, he flagged some highlights of his career. Five pages and 49 bullets later, this writer threw up her hands and said "Enough!"

Not all the accolades are on paper. Many are in the hearts of those Brigance has worked with. Col. Carla Coulson, former Deputy Division Commander, called Brigance's career "a lifetime of selfless service," commended his courage and commitment, and acclaimed him as "a dedicated professional with wisdom to spare."

Former co-worker Hector Vela, retired Division Counsel said, "I've never known John to lie about anything, even his golf game." Vela described Brigance as one who "never speaks bad about anybody" and added, "John made working for the Corps a pleasure."

Brigance has been called a "whirlwind" for fast action and for wearing multiple hats — contracting, small business advisor, and equal employment opportunity. At the age of 80, "Mr. Procurement" is still a whirlwind, cheerful and at the contracting helm, and that's where he plans to stay. He sees his future including a *few* more years of poring over contracts, and *many* more years of golfing, stamp-collecting, playing bridge, hunting, and ballroom dancing with the love of his life, Peg.