

Students tour
District
project site
Page 6



Little River
Saltmarsh
Page 5



Commander's Column.....	3
Milford Beach.....	3
Windfarm EIS Update.....	7
From the Field.....	8
Merrimack River flow patterns....	9
Computer Assisted Design.....	10



**US Army Corps
of Engineers
New England District**

Volume 39, No. 3

Yankee Engineer

December 2002

Temple takes command of North Atlantic Division

Brig. Gen. Merdith W. "Bo" Temple assumed command of the U.S. Army Corps of Engineers' North Atlantic Division during a Change of Command ceremony presided over by Lt. Gen. Robert Flowers, the Chief of Engineers, Nov. 25, at Fort Hamilton, Brooklyn, N.Y.

The Change of Command is a time honored military tradition, the passing of the Flag, which marks the transfer of command. Brig. Gen. Temple assumed command from Brig. Gen. M. Stephen Rhoades, who retired.

Brig. Gen. Temple, a Virginia native, comes to the Division after a tour as Commander of the Corps' Transatlantic Programs Center in Winchester,



Brig. Gen. Merdith W. Temple

Va. He holds a bachelor's degree in civil engineering from the Virginia Military Institute, a masters degree in civil engineering from Texas A&M University, and is a graduate of the U.S. Army Command and General Staff College and the U.S. Army War College. Brig. Gen. Temple is a registered professional engineer in the Commonwealth of Virginia.

General Rhoades, who has commanded the Division since July 1999, retired from the Army with more than 29 years of distinguished service. During his three plus years as Commander, he maintained one of the Corps' largest and most challenging programs. (NAD Press Release)

Division Engineer's Command Philosophy

by **Brig. Gen. Merdith W. Temple
Division Engineer**

Since it will be a while before I get a chance to visit you personally, I have decided to share my thoughts with all Division team members via the written word.

During the past 27 years, most of my experience has been operational, having served at Fort Bragg and several overseas locations. I understand the Army's wartime mission. My experience with the Transatlan-

tic Programs Center has helped me to better understand military programs, but I will need to spend time learning about the Corps' budget processes and our civil works, environmental and O&M missions.

You are wondering what changes I may make and if I have a hidden agenda. I'll tell everyone right up front: There will be NO significant changes in the near term and I have no hidden agenda. I am a pretty easy read – what you see is what you get!

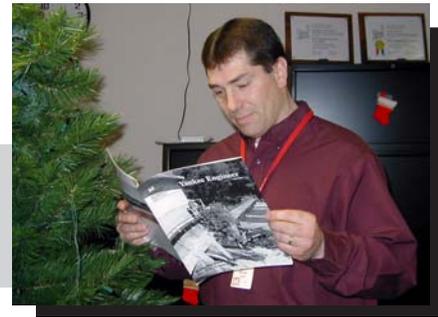
I firmly believe in teamwork. This

is the key to an organization's success and everyone needs to be a positive contributor to the team. Working together, and across functional lines, we can meet our customer's needs for quality planning, engineering, construction and project operation. Whether we are building a new training facility for the soldiers or working on improvement of a large port, you and I need to meet very high standards for executing the requirement. That is

Continued on page 4

Yankee Voices

Mike Tuttle
Programs/Project Management



Sympathy

...to **Paul Harper**, Mailroom, on the passing of his father, **Melvin Harper**, Nov. 30.

...to **Bob Henderson**, Resource Management, and his wife, **Zina Cassulo-Henderson**, Regulatory, on the passing of Bob's mother, **Mary Henderson**, Nov. 4.

Sympathy also goes out to the family for the passing of Zina's aunt, **Mary Cassulo**, Nov. 23 and the recent passing of Zina's niece, **Dana Rose Cassulo**.

...to the family of New England Division retiree **Vassil L. Psilekas**, who recently passed away.

Welcome

Engineering/Planning

Katarzyna Chelkowska
Rebecca Flynn
Sheila Holt
Marla Keene
Robert Leitch
Megan Minger
Barbara Newman
Saji Varghese

Regulatory

Charles Farris

President Bush's letter to the District

I would like to take the opportunity to congratulate you on receiving a 2002 Coastal America Partnership Award. This award recognizes your outstanding team efforts and contribution to the restoration and protection of our Nation's coastal resources.

The partnership you forged united federal, state, and local governments, nongovernmental organizations, and the private sector in a joint effort to restore tidal flushing to 170 acres of degraded salt marsh in North Hampton, New Hampshire.

Thank you for your commitment and leadership on the conservation of our Nation's natural resources.

President **George W. Bush**

Congratulations

...to **Matt Walsh**, Engineering/Planning Division, and his wife, **Ann**, on the birth of their daughter, **Erin Catherine**, Nov. 27. She joins her sister, **Caila**, in the family circle.

...to **Dave O'Connor**, Devens Resident Office, for being selected as the WE Committee's Employee of the Month for December. He received the honor for three very complex Superfund projects that Dave is working on: Charles George, Tyngsboro, Mass., Silresim, Lowell, Mass., and Eastland Woolen Mill, Corinna, Maine.

...to the New England District Field Force Engineering (FFE) Basecamp Development Team (BDT) for being selected as the WE Committee's Team of the Month. The Team members are **Farrell McMillan, Chris Lindsay, Ed Mills, Phil Durgin, Larry Oliver, Brian Waz, Don Wood, Ken Paton, Jerry Nunziato, Dave Schafer and Rachel Fisher**. They received the award for their efforts on a short-suspense from NAD to support NAU on an FFE mission in support of Operation Enduring Freedom.

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Chief, Public AffairsLarry Rosenberg



EditorAnn Marie R. Harvie
Media Relations Officer.....Timothy J. Dugan
Public Affairs Specialist.....Sally M. Rigione

Commander's Corner:

Project Management Business Process

by Col. Thomas L. Koning
District Engineer



Soon everyone in the District will be participating in the Project Management Business Process (PMBP) training. I cannot stress enough the importance of this training to the District and USACE at both the individual and team level. PMBP is the way we do business. It is how we deliver our

products and services to our customers.

PMBP training is designed to provide all an understanding of and the skills required for operating in the Corps project-focused environment. Some might say, "We already do this."

Yes, we have been evolving to a project-focused organization for many years. However, not every person and District is fully on-board. As the culture of the Corps becomes more corporate, everyone must be able to interact seamlessly. PMBP helps do that.

The training will be conducted via self-study using CDs and then small group discussions. We have trained numerous facilitators to lead the District through meaningful discussions. The initial three pilot Project Delivery Teams (PDTs) have completed the self-study and small group discussions of the disks. Feedback has been positive and constructive. One outcome already has been the decision to conduct two more

pilot groups. These pilot groups are helping to mold the facilitators to focus on the most important parts of the training to tailor it for our District.

Here is how the training will work. Every person will be assigned to a PDT. These PDTs will cut across all divisions and offices of the District to form multi-disciplinary teams. Everyone will receive an individual set of PMBP training disks. You will read, study and review two disks at a time, and then the PDT will form as a group for a facilitated discussion of the CDs. The goal is to share the knowledge across the District and therefore, bring better service to our customers.

The timeline for the training will be: 1) distribute the initial CDs by the end of December; 2) PDTs complete disks 1 & 2 and hold their small group discussions by the first week of February; 3) PDTs complete disks 3 & 4 and hold their small group discussions by the first week of April; 4) PDTs complete disks 5 & 6 and hold their small group discussions by the middle of June; and 5) PDTs complete disks 7 & 8 and hold their small group discussions by the first week of August.

Here are the course titles: Course 1 - Why PMBP?; Course 2 - Teams and Me; Course 3 - Public Service and Me; Course 4 - Organization, Teams and Me; Course 5 - Quality and the PDT; Course 6 - Working in the PDT; Course 7 - Success, the PDT and Me; Course 8 - Your call to Action.

If this has peaked your interest, learn more at www.hq.usace.army.mil/pmbp2, or jump into Disk 1 if you haven't already. Essayons!

Work at Point Beach in Milford progressing well

by Timothy Dugan
Public Affairs

The effort to elevate houses on the coastal shores of Connecticut to protect property from ocean flood waters is progressing well and is scheduled to be completed next year, according to U.S. Army Corps of Engineers officials.

The project is being completed under the Corps' Hurricane and Storm Damage Reduction Project authority (Section 103 of the River and Harbor Act of 1962, as amended).

The project is at Point Beach in Milford, Conn. Currently, about 22 homes

have been elevated on new foundations. The current contract calls for 34 homes to be elevated. Officials anticipate that number of homes to be elevated may be increased to about 40 homes. The original feasibility study on the project was completed in 1994. Initially, the Chief of Engineers approved a plan to raise 58 houses.

In March 2000, the Connecticut Department of Environmental Protection and the city of Milford indicated a willingness to rebid the project under new cost-sharing regulations allowing for a \$3 million federal funding limit. Plans and Specifications were reissued in Janu-

ary 2001.

The CT DEP signed the Project Cooperation Agreement with the Corps in January 1997. Bids were opened in February 1997; however, the bids were rejected because they significantly exceeded the government estimate.

DRL Corporation, of Oxford, Mass., was selected as the contractor and given a notice to proceed in May 2001. Actual construction began in July 2001. Construction activities are expected to continue into 2003 with completion scheduled for October 2003.

Division Engineer's Command Philosophy

Continued from page 1

what the American public expects of us.

I will assume, and trust, that everyone knows his or her job and is doing the right thing. If you did not want to be part of this great team, you would not still be working for the U.S. Army Corps of Engineers.

Some insight into the way I think and work: Please don't surprise me with bad news. It does not get better with age and I never "shoot the messenger." So if you have something "hot" please call or come see me. Putting it on email may not be good enough.

As I learn more about the North Atlantic Division and our functions, I will share what I learn. Many years ago, I found that sharing with others is key to an organization's success. Learning and change are central to the Corps' business processes. Our customers have choices. In many cases, they do not have to come to Corps of Engineers to meet their needs, so by learning, adapting, and improving we can remain an agent of choice for all our customers.

This morning I spent several minutes talking to the Division Headquarters management staff about our role. We will continue to facilitate our Districts' ability to produce for the customer. As the regional business center, the Division will help each District work through issues that cannot be resolved locally, while ensuring we have prepared for the future in order to facilitate the great work being performed daily by our Districts and our wonderful people in the field.

Expectations of Individuals

Everyone should come to work prepared to do your best – every day – by being ready mentally, physically and spiritually. It sets the tone for you and your team. Others will notice your extra effort toward preparedness and this type of attitude is contagious. Everyone needs to set an example and be

a positive role model for all team members.

Integrity is the bedrock of how we operate. Without integrity, we lose trust... and without trust there is no teamwork, leading ultimately to total mission failure.

I would like to encourage everyone to join appropriate professional organizations like SAME, AEA, AUSA, ASCE and support campaigns that build and support our human community like CFC, AER and other local or global associations.

Selfless service is the mark of a great organization. Place the needs of the organization before selfish needs.

'Integrity is the bedrock of how we operate. Without integrity, we lose trust... and without trust there is no teamwork, leading ultimately to total mission failure.'

- Brig. Gen. Merdith Temple

Never forget to have fun. Enjoy family, colleagues, and yourself. I take the mission and organization seriously, but I do not take myself too seriously. Learning and improving are fun and I'm certain to have plenty in the future.

Expectations of Managers

NAD will excel in meeting the Corps' Vision, with each and every one of us committed to success.

I am firmly committed to taking care of the Corps' greatest asset—our people. All of us must treat everyone with dignity and respect. Team leaders and managers must encourage all to share and learn from each other.

Anticipate requirements and think ahead for people, projects, dollars, and opportunities. Take the front and lead your team, or team of teams, with the contribution to the overall goals of the organization as your focus. Remember, no one individual can carry the

burden. Share and encourage others to share and learn from each other.

Whenever you learn something new, ask yourself three questions: What do I know? Who else needs to know? What actions, if any, are required of me? Then take action!

It is impossible to over-coordinate an action. We face many challenging and difficult tasks and in this fast-paced environment, multiple layers of coordination for each and every action are vital to success.

We have all received the Project Management Business Process compact discs. They are the process framework, but learning and doing are two different things. The only way we will be successful implementing PMBP by October 2003 is to start implementing it as we go. We need to start institutionalizing it now by working with our Districts to change and improve the way we do business. PMBP, enabled by P2, is the key. No new system is perfect and we will have a few roadblocks along the way, but working as a team, NAD will find solutions and make that system work. Communications is the glue that holds us all together. Every project has a customer, contractor/executor and the contract management agency (Corps of Engineers). Without good communications, we cannot work together successfully to deliver quality work.

Expectations of Everyone

Treat each other with dignity and respect. Tolerate nothing less from yourself or others. Be a good role model as we raise the next generation of leaders. Our hope is that they are better than we are. Through teamwork we can ensure that the total organization learns, not just its individuals.

Expectations of Me

The same!

Don't be surprised if I stop in to see you in the Division Headquarters, a district or a field office. It will be my chance to share knowledge and to learn from you. Essays!

Partnership celebrates restoration success

The Little River Saltmarsh in New Hampshire reaped the benefits of a unique partnership committed to restoring the environment.

In a Nov. 18 ceremony held in Manchester, N.H., the New England District and its Coastal America partners including the Corporate Wetlands Restoration Partnership, presented awards to agencies and individuals to honor those who participated in the restoration project that transformed an ailing saltmarsh into a thriving environmental paradise for wildlife.

Additionally, the event marked the initiation of the New Hampshire chapter of the Corporate Wetlands Restoration Partnership.

"This partnership of corporation and public funding programs owes its success to great leadership and vision from many agencies," said Col. Thomas L. Koning, District Engineer.

"CWRP holds the promise of much success in New Hampshire because of our business community's commitment to environmental quality," wrote New Hampshire Senator Bob Smith of the event.

During the awards portion of the ceremony, Col. Koning, who hosted the event, and Tim Keeney, Deputy Assistant Secretary for Oceans and

Atmosphere of NOAA, presented Coastal America plaques and letters from President George Bush to the Little River Salt Marsh project team.

The New England District was a recipient of one of the plaques, and Barbara Blumeris, Engineering/Planning, accepted a letter from the President on behalf of the District.

The towns of North Hampton, Hampton, and the state of New Hampshire, Office of State Planning- New Hampshire Coastal Program; requested the New England District to investigate flooding and salt marsh restoration issues at the Little River marsh.

The state and towns also approached the Natural Resources Conservation Service to help in this investigation. As a result, a cooperative effort was undertaken by all parties to conduct a study to determine optimum culvert and channel configurations which would allow large rainfall events to drain out of the marsh without flooding Route 1A and to improve saline tidal flow to restore the health of the marsh.

The New England District initiated the planning study for the \$1.2 million project in September 1997 and completed it in April 1999.

The findings of the study were used as the basis for restoration efforts

implemented by NRCS and many other federal, state and local partners.

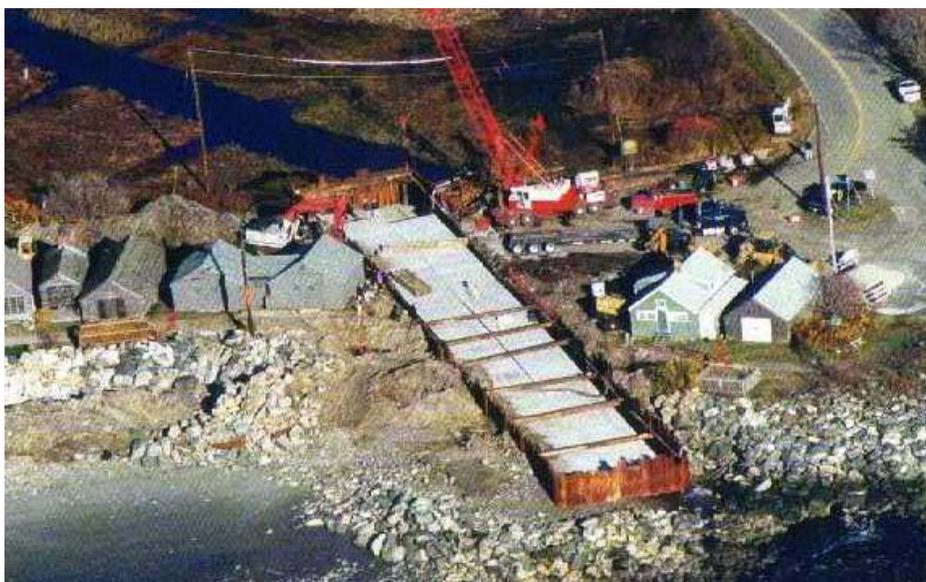
The saltmarsh is located west of Route 1A in North Hampton, New Hampshire. The 48-inch culvert at Route 1A restricted tidal flow into and out of the marsh. Invasive plant species, such as Phragmites took over the area.

The project restored the 170 remaining acres of degraded saltmarsh. Project work included installing twin 6-foot by 12-foot box culverts at the main outlet and under road crossings; dredging sediments out of the tidal creeks; employing a new protocol for pre-restoration monitoring; and improving water flow and quality, i.e., reduction in bacterial source contamination. Monitoring, land protection and public outreach will continue, mainly through the University of New Hampshire.

"I commend Coastal America and all of the public, corporate and non-profit organizations that have joined together to form this innovative partnership to restore coastal resources in New Hampshire," wrote New Hampshire Sen. Judd Gregg in a statement honoring the project.

In his remarks, Bill Hubbard, Chief of New England District Environmental Resources Section, commended the corporations and agencies for organizing to provide cost sharing funds to ecological restoration projects and congratulated the Little River Salt Marsh team for a project that, "is part of a larger regional effort to restore tides back to salt marshes and open rivers to anadromous fisheries migration."

Other speakers at the event included Congressman (Senator-elect) John Sununu; John MacDonald, PSNH; Bill Hubbard, New England District; Tim Keeney, Deputy Assistant Secretary for Oceans and Atmosphere; Linda Murphy, Environmental Protection Agency; George Olson, The Gillette Company; and Paul Ladd, Jacques Whitford Company.



Construction photo of the Little River Saltmarsh Restoration Project.

Local students get a practical exercise in science and engineering technology at landfill site

Junior high school science teacher Timothy “Mit” Wanzer wanted to give his students some practical experience on the subject of recycling and managing waste such as a community does with a landfill. He didn’t have to look far.

Less than two miles outside his window at the Francis W. Parker Charter Essential School in Ayer, Mass., work was nearing completion on the landfill cap portion of the Devens Consolidation Landfill Project.

Wanzer contacted the local engineers on the job and asked if there was any way he could tie his lesson into the local landfill project.

The engineers were happy to accommodate him and his students, and provided two presentations with slides at the school on Nov. 21 followed by tours of the landfill site for the approximately 75 junior high school students.

The \$25 million Devens Landfill project is part of the Base Realignment and Closure (BRAC) environmental restoration activities being performed by the U.S. Army. The U.S. Army Corps of Engineers executed the project with the construction contractor, Stone & Webster Construction, Inc. Oversight and input on the project was also provided by the U.S. Environmental Protection Agency, the Massachusetts Department of Environmental Protection and the Mass. Development Finance Authority.

As part of the presentation to the students, Resident Engineer James Morocco, of the U.S. Army Corps of Engineers North Central Resident Office at Devens, discussed the rapid rate of change in technology. “Computers today are 20 times more powerful than computers just five or six years ago,” he said.

Morocco encouraged students to consider science and engineering fields when making career choices. “Engineering is an interesting field. There is a lot of variety to it. And



District employees explain the landfill project to school children while they visited the site.

it’s always changing,” he said.

David Margolis, with the Corps’ Engineering/Planning Division, explained to students how the Devens Landfill was designed. “We built a consolidated landfill,” he said.

Nonhazardous material was taken from six landfill sites on the former base and consolidated at a newly constructed landfill. The project design included restoration of the excavation areas. Margolis explained to students how the landfill had an impermeable base layer of clay and then a layer of welded plastic material to prevent leachate from the waste from entering groundwater.

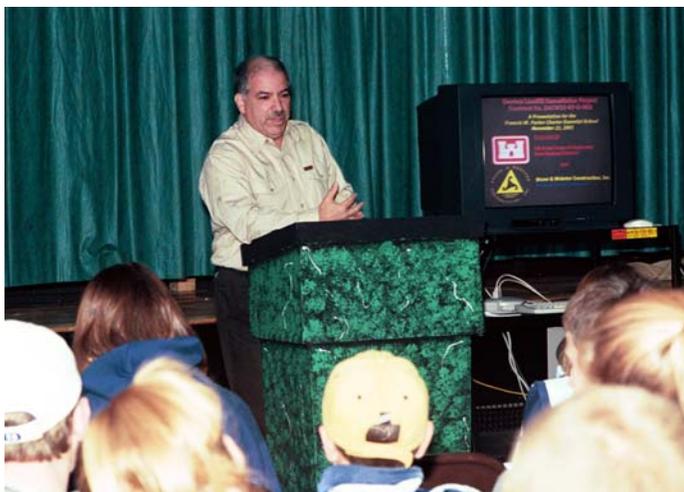
Leachate is collected and then pumped to a treatment plant. There is also an impermeable cap, which prevents precipitation from running through the waste. The runoff collects at a retention pond.

Construction Superintendent Jim Henebury of the construction contractor Stone & Webster Construction, A Shaw Group Company, of Boston, Mass., discussed the day-to-day construction of the project. He explained how the landfill was built like a swimming pool -- first dug to a certain depth to provide more room for the material.

Then material was placed in the hole and compacted and more material was placed on that until it ended up being a mound almost to the treetops. It has a protective material covering to prevent erosion and will be seeded.

“We trucked in the material from different parts of the base. We brought in about 380,000 cubic yards of material,” Henebury said.

Material was compacted to about 320,000 cubic yards. Another 100,000 cubic yards of material – wood, concrete, metal – was recycled. The 15-acre landfill project was



Photos by C.J. Allen

Jim Morocco discusses the landfill project that the children will visit at Devens, Mass.

started in September 2000 and is scheduled to be completed in April 2003. The landfill cap is scheduled to be completed in November 2002. Students were shown samples of materials used in the landfill to prevent water from leaching into the groundwater system and shown photos of the lined landfill construction and equipment used.

Wanzer reminded students to take their journals with them to the landfill site and use them to record information to help them complete the assignment to either design a landfill for their community or design a compost bin for home or school.

After the presentation, students boarded buses for a tour

of the landfill site and a first-hand look at what engineers discussed earlier. On site, students had a chance to see front-end loaders placing boulders as part of the drainage system. Engineers explained the operation and showed the students the sediment retention pond and the pumping station that prevents the water from leaching into the groundwater and sends it to be treated.

“The students had fun and it was educational,” Morocco said. “And, as engineers, we find it rewarding. We believe we are planting seeds to perhaps inspire some students to become future scientists and engineers.”

(Story by Timothy Dugan, Public Affairs.)

District holds meeting to update public on Wind Farm EIS

Hundreds of Cape Codders arrived at the Upper Cape Cod Regional Technical School cafeteria in Bourne, Mass., for a public information meeting to get an update on the status of the Wind Farm Environmental Assessment and state Environmental Impact Review.

The meeting, hosted by the New England District on Nov. 21, was open to all interested individuals, groups and agencies.

Approximately 200 people attended the four hour meeting. Various state and federal agencies and the applicant, Cape Wind, joined the District in hosting information tables and answering questions from the

public. A PowerPoint presentation discussing the Corps role in the permitting process played continuously during the meeting.

Cape Wind Associates is seeking a U.S. Army Corps of Engineers permit to install and maintain 170 offshore wind turbine generators for a wind farm power generation field in federal waters off the coast of Massachusetts in Horseshoe Shoals in Nantucket Sound, with the transmission lines going through Massachusetts state waters. These structures would be in Nantucket Sound but outside of the State of Massachusetts waters. The ocean waters at this location are approximately 13 feet deep.

The New England District made a determination on Aug. 19 to issue a five-year Section 10 permit to Cape Wind Associates to place a Scientific Measurement Devices Station and associated monitoring device on Horseshoe Shoals in Nantucket Sound off Cape Cod, Mass.

The permit is only for the installation of these

scientific measuring devices to gather technical data and has no effect on the environmental review and permitting process for the entire Wind Farm project.

Agencies that participated in the information meeting were the Environmental Protection Agency; U.S. Fish and Wildlife Ser-

vice, National Marine Fisheries Service; Department of Energy; Federal Aviation Administration; Massachusetts Coastal Zone Management Office, Massachusetts Environmental Policy Act Office, and Massachusetts Technology Collaborative. The organized opposition to the project, Alliance to Protect Nantucket Sound, also had an information table and participated in the process.

The New England District has created an information web page for the Cape Wind Permit Application. For more information on the project, please go to <http://www.nae.usace.army.mil/projects/ma/ccwf/windfarm.htm>.



Photo by Mark McInerney

Permit manager Karen Adams listens as a citizen asks questions during the meeting on the Cape Wind EIS.

From the field: District Engineer Recognizes Corps Volunteer

by Park Ranger Merl Bassett
East Brimfield Lake

When the District Engineer visits any field site during his or her three-year assignment, the visit becomes an event for that facility. An introduction of the staff and tour of the facility is customary. It is also an opportunity for the facility to show off their accomplishments and to be recognized for them.

Col. Thomas Koning, District Engineer, recognized Corps volunteer David Rose for his dedicated service to the New England District during a small ceremony held at East Brimfield Lake, Dec. 6.

The Park Manager of East Brimfield Lake Keith Beecher and Park Rangers Tom Chamberland and Merl Bassett hosted the occasion. The Park Manager of Buffumville Lake, Dave Stiddem, also attended.

Dave Stidham nominated David Rose for the letter of appreciation. The letter of appreciation and the District coin were presented to David at the ceremony.

David has been volunteering his time at both the East Brimfield Lake and Buffumville Lake projects since he retired five years ago. "We would be hard pressed to find a more dedicated and honest man to join our team at East Brimfield Lake," said Keith. "David has been a great friend, too."

According to David, he was very moved and appreciative of being recognized. So moved that he had the letter and coin encased in a framed setting. It now occupies the space in his den that was once reserved for his NRA Benefactor Recognition Plaque.

David's volunteer service with the Corps began as someone willing to maintain and install bluebird-nesting boxes located throughout the project of

Buffumville Lake and Hodges Village Dam. In the past, David had installed

plans are in the works to install wood duck nesting boxes in several small ponds at Conant Brook Dam.

David's talent and the willingness to help do not end with wildlife management. With a career in the construction trade as a union mason and foreman, it did not take long for David to take on other tasks. Last year, he logged over four weeks on a Corps tractor mowing fields and access roads.

Other examples of his dedication to the Corps and to the environment

include his assistance in rebuilding a stone bridge abutment for a pedestrian bridge as well as inspecting and maintaining the snow courses when staffing was tight.

David is no stranger to the Corps of Engineers. He served in the 101st Combat Engineers Battalion in the U.S. Army National Guard during the Cold War in 1962 and 1963. According to David, his old uniform still proudly displays the castle insignia that he continues to serve.

On hand for the occasion was David's wife Virginia, Col. Koning, Farrell McMillan, Deputy Assistant, ConOps, Robert Hanacek, Operation Manager for the Thames River Basin, and David Stidham, Project Manager, Buffumville Lake.



Photo by C.J. Allen

David Rose (front of boat) participates in this year's National Public Lands Day. Mr. Rose has become a valuable member of the New England District team.

and maintained hundreds of nesting boxes at Quabbin Reservoir Area, establishing his ability to do the job. Today, David continues his wildlife nesting box assistance at Buffumville Lake, as well as East Brimfield Lake.

At East Brimfield Lake, he has given real meaning to the word "volunteer" by assisting the staff in wildlife management. Creating or improving habitat at the project has been David's biggest contribution.

Because of his efforts in the past three years, abandoned fields on Corps land have been reclaimed for migratory songbirds and native field birds. He has also installed nesting boxes for songbirds -- especially bluebirds -- throughout the project and at all reclaimed areas. This winter, with David's help,

District, five area cities to study Merrimack River flow patterns using dye tracers

by Timothy Dugan
Public Affairs

The U.S. Army Corps of Engineers in partnership with five communities along the Merrimack River are conducting a comprehensive watershed study of the Merrimack River.

The community coalition includes the cities of Manchester, N.H., Nashua, N.H., Lowell, Mass., Haverhill, Mass., and the Greater Lawrence Sanitary District, Mass. The Merrimack River Watershed Council has joined the effort to provide outreach support. The study is being undertaken in consultation with regional, state and federal agencies, and interested citizen groups.

Phase I of the comprehensive study has three primary objectives: characterize the relative contributions of pollutants into the river from urban and non-urban sources; quantify the impact of these pollutants in the river with respect to water supply, recreation, aquatic habitat, and hydropower production; identify a management plan for the watershed aimed at attaining and improving all of the designated uses.

“The study will focus primarily on bacteria in the water, nutrients that can cause undesirable biological growth that

depletes the water of its oxygen supply, and metals that can enter the food chain,” said Study Manager Barbara Blumeris, of the U.S. Army Corps of Engineers, New England District. In addition to measuring the pollutant loads into the river, one of the most important aspects of the study is the measurement of transport times of pollutants in the river.

“Once pollution enters the river, it is important to understand how far its impairing effects will reach downstream before the pollutant decays naturally, is adequately dispersed or assimilated, or settles into the sediment,” Blumeris said. “Since these phenomena are time-dependent, it is useful to know how long it takes water to flow from upstream locations to downstream locations.”

To understand and be able to predict how far certain pollutants will travel downstream, two Time-of-Travel studies will be performed. The two studies will include scientific measurements of the time it takes for water to flow from an upstream location to a designated downstream location at a selected flow.

“The method used most often for this type of study involves the introduction of non-toxic dye tracers into the river at the upstream location, and the measurements of subsequent dye concentrations downstream,” Blumeris said. An addi-

tional benefit of this method is that the dispersive characteristics of the river will become apparent, since the downstream measurements will identify how widely dispersed the dye has become over the distance of the study area.

The first of the two study areas will be from the Massachusetts – New Hampshire State Line to Tewksbury (about 13 miles). The second study area will be from Lowell to Lawrence (about 9 miles). These areas correspond with areas selected for study by the United States Geological Survey (USGS), which is planning to repeat at least one of the two tests in 2003 at a different flow rate to help expand the database of information on the Merrimack River. The dye concentrations used for these tests are very low and harmless and at these very low concentrations the dye (Rhodamine WT dye) cannot be seen with the naked eye downstream of the discharge point. The time of travel studies with the dye tracer are planned for the week of Nov. 10, 2002.

The Corps has hired CDM, a Cambridge-based environmental consulting firm, as its prime contractor for the Merrimack Study. Normandeau Associates, a subconsultant based in Bedford, N.H., will be conducting the tests with cooperative assistance from the USGS and several of the communities within the study areas.

The study is being conducted under the authority of the General Investigations Program, Section 729 of the Water Resources and Development Act (WRDA) of 1986 “Study of Water Resources Needs of River Basins and Regions” (and as amended by WRDA 2000). It authorizes, among other things, the investigation of the problems, needs and opportunities of a watershed to include flood damage reduction, environmental restoration, water quality, water supply, drought preparedness, recreation and navigation.



Photo courtesy of USGS

Normandeau Associates perform a line injection across the middle of the river under the Hunt Bridge (below the Concord River) in Lowell, Mass.

Computer Aided Design and the New England District

by Scott Flanagan
Engineering/Planning

The origins of Computer Aided Design (CAD) can be traced back to the early 1950s, not long after the first computers were introduced. Early attempts to automate the engineering design and drafting process were conducted at several large companies, universities, and government agencies.

Organizations such as the U.S. Air Force, McDonnell Douglas, General Motors, and the Massachusetts Institute of Technology were some of the first to develop automated graphic design systems.

The earliest CAD programs used simple algorithms. It was not until circa the mid 1960s that commercial CAD programs were made available. The cost for one particular CAD system was \$500,000.

CAD and the computer continued to develop throughout the 1970s and into the early 1980s. During this time the ability to represent graphics in 3D was introduced. A major development in the CAD world occurred in 1982 when Autodesk was founded. In early 1983, Autodesk released AutoCAD version 1.2. Up until this time CAD was limited by large computers and complicated program languages. In the early 1980s, mini computers that were less expensive and more powerful than their predecessors began to appear. As a result, CAD became more widespread. Other commercial CAD programs were soon developed including MicroStation by Bentley Systems in 1985.

As computers and processors were further developed and became less expensive, CAD became more commonplace in the Architect-Engineering-Construction (AEC) industry. By early 1986, Autodesk had sold 50,000 copies of AutoCAD. Application add-ons to CAD programs became available, making CAD even



Chiway Hsiung uses MicroStation to edit a floor plan.

Photo by Scott Flanagan

more powerful. The introduction of the personal computer (PC) made CAD more accessible in the workplace. By 1990, CAD, to one degree or another, was in use practically everywhere in the AEC world.

The look and feel, or the interface, of the CAD programs of today might be unrecognizable to some of the earliest developers and programmers.

Today, CAD is used to design everything from the smallest part found in a wristwatch to the tallest building in the world. What began as an expensive, computerized 2D-drafting tool has become a cost-effective, intelligent 3D-design tool.

CAD not only creates drawings (plans, sections, elevations), it also creates and generates reports, calculations, renderings, animations, and so on. Several different and powerful CAD programs are now available along with thousands of add-on programs.

And instead of becoming more difficult to understand and use, CAD actually has become more "user friendly." CAD is now an integral part of the AEC process and is interoperable with other programs including database applications, GIS solutions, and document management systems.

CAD in New England

It didn't take long for the Corps in

New England to recognize the potential of CAD. The first CAD system (AutoCAD Version 1.8) was acquired by the Engineering Design Branch in 1985. Chiway Hsiung of Design Branch was one of the first users, completing plan drawings for the Computer Room design at the IRS building in Brook Haven, Long Island, NY with AutoCAD.

The Design Branch used AutoCAD until 1990, though most drawings were still produced by hand with pencil and ink by the Civil Engineering Section.

In 1990, the District followed the lead of other Corps organizations and government agencies and moved from AutoCAD to MicroStation.

MicroStation, then owned in part by Intergraph Corporation, was considered to be a more powerful CAD program that provided engineering add-ons that better fit the needs of the Corps.

The New England District was on the cutting edge of design technology. The workstations were impressive, some having 27" monitor displays and digitizing tablets. Each workstation was equipped with MicroStation, plotting software, and some also had engineering add-ons for architectural, civil, and structural design. The worksta-

tions served the Division, and later the District well, but eventually became obsolete as the PC became a less expensive and more powerful platform.

The New England District Engineering/Planning Design Branch currently maintains 25 seats or licenses of MicroStation, which are shared over the network via the CAD server. MicroStation is available to anyone within the district.

The Design Branch also maintains licenses of other Bentley engineering solutions such as InRoads for civil design and TriForma for architectural and structural design. These applications/solutions are also available to anyone. The Design Branch Survey Section recently acquired InRoads Survey and now produces and delivers a digital terrain model (DTM) of each topographic survey.

The CAD solutions available to the district are capable of producing 2D or 3D engineering documents for all disciplines. MicroStation alone can be used to do everything from 2D drafting to generating photo realistic 3D images of a project design. MicroStation, in conjunction with InRoads, allows for the ability to merge proposed designs onto existing surface models (DTM's), calculate cut/fill volumes, create geometry, generate cross-sections, etc.

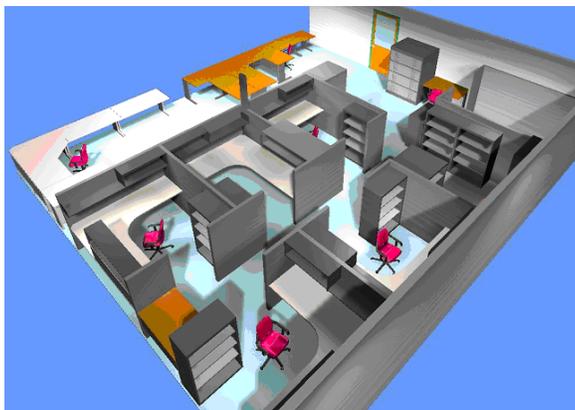
Intelligent 3D building or structural models can be created with MicroStation TriForma. Plans, sections, elevations, 3D walkthroughs, reports, etc. can be extracted from a TriForma model. The latest version of MicroStation (MicroStation V8) allows CAD users to work with both AutoCADDWG files and MicroStation DGN files.

This latest version will enable us to collaborate better with our AutoCAD customers. MicroStation V8 is considered to be a hybrid of previous versions of MicroStation and AutoCAD 2002, thus having the functionality and capa-

bility of both products.

The Future of CAD

CAD continues to develop and improve at a rate that is difficult to keep pace with. Recently, CAD has become more "intelligent" than ever. Graphics are now created as objects or features. A CAD object or feature can be thought of as one or more graphic elements that represent a particular part or item in 2D, 3D, or both. An object or feature also contains information about the part or item it represents (e.g. an object representing a particular door would know its dimensions, manufacturer, cost, etc.). In addition, an



Captured images from 3D Model of the New England District CAD Room – created with MicroStation TriForma.

object or feature may also know how it relates to other objects (e.g. a door fits in a wall). A 3D virtual model of a project design is created from objects or features. Objects help the design process by not allowing a designer to place, for example, a door or window that will not fit in a certain wall. Rules can also be applied to objects thus preventing an architect from designing a stairway that does not meet the required building code.

Structural designers would be unable to place a beam or truss incapable of supporting the roof, and so on. In addition, virtual models can be queried for information so that a designer can determine the number of a particular window or door that are in the model. Drawings, photo realistic renderings, bill of materials, etc. can all be extracted from a model. All extracted

documents are linked to the model, therefore when any single document is changed, the others are automatically updated.

Such enhanced capability has taken CAD beyond design and into other applications, such as Facility Management and Threat Assessment. As a result of this, customers are now requesting that a 3D virtual model be delivered with the project design.

Intelligent CAD has already changed the design process and will continue to do so. Terms like objects, models, and features are here to stay. This technology has widespread application. Anything from a ballpoint pen to a guardrail to an entire city can be represented as a CAD object. It's easy to become overwhelmed by the technology available today, never mind looking into the future. However, those with the insight and vision to embrace such technology and find ways to apply it will be better prepared for what's next.

Things to Know

Some time ago the Corps started two CAD support groups, the Senior Advisory CADD (SAC) and the Field Advisory CADD (FAC). Volunteers from various Corps districts, including the District, participate as members of these groups and provide valuable input and support to the CADD/GIS Center regarding CAD standards and use. For more information visit the Corps CADD Knowledge Base at <http://ckb.wes.army.mil/>.

Information including Release 2.0 of the A/E/C CAD Standard is available from the CADD/GIS Technology Center at <http://tsc.wes.army.mil/>.

Rowse Company, an engineering support and management company, provides free information and tips to MicroStation users online at <http://www.rowseco.com>.

Questions regarding CAD at the District can be answered in the Design Branch CADD Room by either Fred Hardy or myself.

Dredging up the past . . .



The New England District constructs a hangar at Westover Air Reserve Base in Chicopee, Mass., in this February 1989 photo.

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