

**Maj. Michelle Dittloff**, left, commander of the U.S. Army Corps of Engineers Europe District's Forward Engineer Support Team-Advanced (FEST-A), visited the Monrovia Medical Unit in Liberia for medical workers fighting Ebola in November. She is pictured with two U.S. Public Health Service members. Jenn McCarthy, below, a USACE New England District environmental scientist, conducted reconnaissance in November of the Sanniquellie Army Field Temporary Lab. Her team helped ensure the U.S. didn't harm Liberia's environment while working to stop the spread of Ebola.



# ENGINEERING RELIEF

By Matt Alderton

**WHEN MAJ. MICHELLE DITTOFF** arrived in Monrovia on Oct. 22, 2014, Liberia's capital city resembled a West African Chernobyl. Storefronts were closed. Schools were abandoned. Homes were still. And streets were hauntingly empty.

As it turns out, fever, diarrhea and internal bleeding weren't the only symptoms of the Ebola virus. Social stagnation and civic paralysis were also rampant.

"It was almost like a ghost town," said Dittloff, commander of the U.S. Army Corps of Engineers Europe District's Forward Engineer Support Team-Advanced (FEST-A). "People were not moving around; they were locked

down in their homes."

Her team of 13 engineers deployed to Liberia to support the mission of the U.S. Army's 101st Airborne Division to contain the Ebola outbreak in West Africa. When the team exited Liberia six months later, on April 8, the city was a different place.

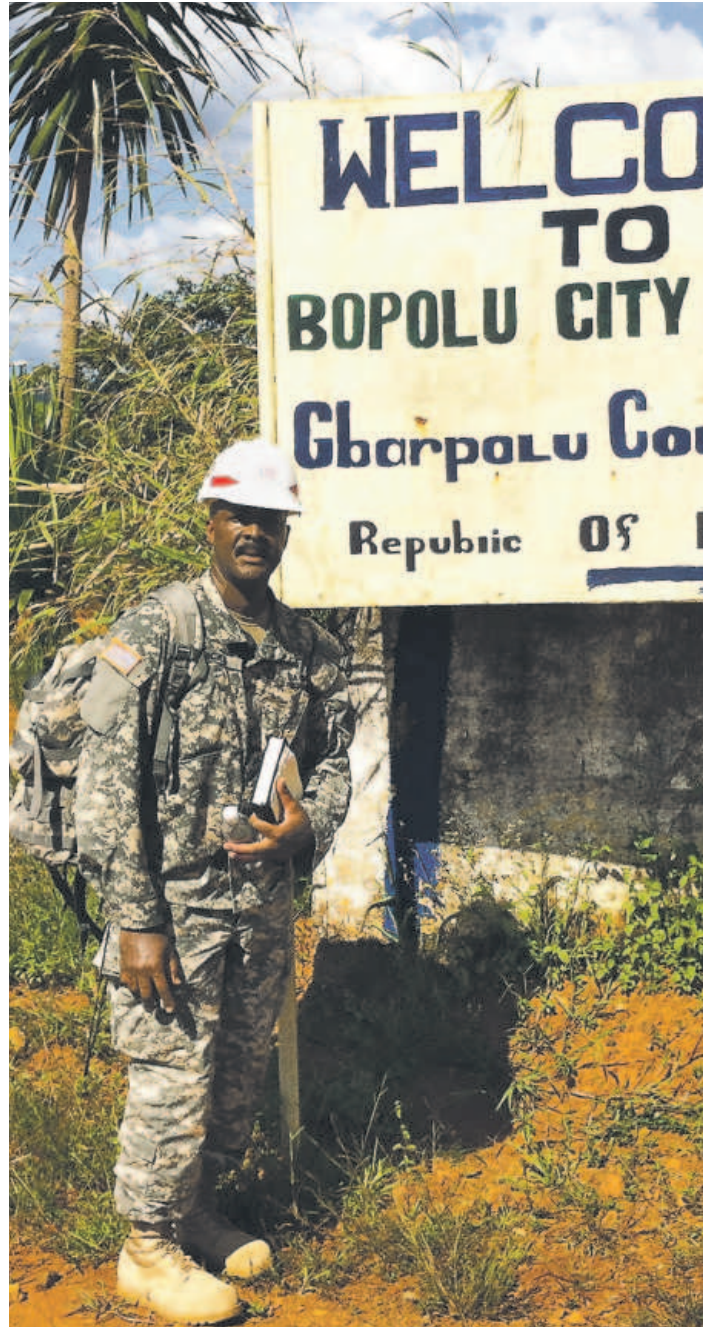
"It was a chaotic urban city when we left," said Dittloff. The number of new Ebola cases in Liberia had dropped from 300 per week in August to the declaration of the country being "Ebola-free" in May — and the city was functioning more normally again. "It was such a difference," she said.

The improvement was owed not only to the medical professionals who screened and treated Ebola patients, but also to the facilities and infrastructure that supported their work.

That infrastructure was made possible by the four soldiers and nine Army civilian volunteers — including civil, electrical, mechanical and environmental engineers — who constituted Dittloff's team. Along with past and present FEST teams, these engineers represent an important and lesser-known mission of the Corps: leveraging expertise in support of humanitarian response and disaster planning in foreign countries.

Hurricanes, floods, typhoons, wildfires, tornadoes, landslides and earthquakes — the most recent ones in Nepal, where a pair of deadly temblors struck within 17 days, killing more than 8,500 — have all been mitigated with USACE engagement.

"Severe disasters are occurring in different places around the world with great frequency;



**FEST-A members Stephen Lahti, center, and Jason Riharb are greeted by local children last November in Liberia as part of Operation United Assistance. Milton Ricks, a USACE New York District civil engineer, right, was deployed to a site assessment for construction of an Ebola treatment unit in Gbarpolu County, north of Monrovia, Liberia.**

## USACE helps mitigate humanitarian crises and natural disasters around the world.

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we have the ability to reduce the impact of these disasters by helping others prepare for them and respond to them," said Lloyd Caldwell, USACE director of military programs.

Back in West Africa, the disaster was an epidemic. And while most of us would have opted to stay far away from the outbreak, Dittloff's team volunteered to work in the center of the action.

"As a military officer, it was such a privilege to work with a volunteer team," said Dittloff, who on April 29 completed 21 days of mandatory medical monitoring after returning from Africa. "There was a lot of hysteria about this disease, so it's remarkable that these people all jumped in and said, 'I want to help.'"

FEST-A electrical engineer Anton Klein was one of the volunteers. He was apprehensive but

also resolute about the need to help.

"No one knew what was going to happen with Ebola. It was very scary," Klein said. "But I knew we could help because the FEST team is such a unique asset that the Army has. Most of us are professional engineers or land surveyors, so we bring a lot to the table in terms of the problems we have experience solving."

And there were plenty of problems to overcome, from Liberia's lack of potable water to its substandard power grid and tropical climate.

During the six-month mission, the 101st constructed 10 temporary Ebola treatment units (ETUs) in Liberia, not to mention temporary accommodations for 2,698 troops. Both efforts required FEST-A support, which included site surveys, environmental studies, well drilling,

power generation and distribution and field engineering.

"One of the major things we worked on was the runway at Roberts International Airport. There is only one runway for international flights in all of Liberia, so even in the best of times it can be a logistical quandary," Dittloff said.

"When we originally got to Liberia, they had shut down the seaport, so we were receiving all our supplies by aircraft, which meant we had to continuously evaluate the runway to make sure we weren't causing damage that would negatively impact Liberia's ability to support its own trade."

Being good stewards of their infrastructure and environment further ingratiated the Corps

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A pair of deadly earthquakes in Nepal in April and May left more than 8,500 people dead and more than twice as many injured. USACE last year completed work on Kathmandu's first blood bank, above, which went into immediate operation. The "Tibetan for Nepal" volunteers, top left, donated blood after the second quake May 12 at the facility at Tribhuvan University Teaching Hospital, a seismically sound facility designed to supply blood to patients at 75 percent of the medical facilities and hospitals in Kathmandu Valley in the event of a major quake. The facility showed no signs of buckling after either temblor and the blood bank filled its stock with donations.



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with Liberians, who welcomed U.S. troops wholeheartedly, according to Klein. "They told me that just seeing U.S. soldiers and military personnel gave them hope," he said. "When things were at their darkest, knowing the U.S. was there to help gave them confidence that things were going to get better."

### PREPPING FOR DISASTER

Engineering expertise makes FEST-A teams critical to U.S. operations.

"When you get into Army units, there's limited technical engineering capability," said Maj. Chris Kolditz, a military and training planner for USACE's operations section. "The Army came to USACE and said, 'We want you to fill this gap.' That's how the USACE Field Force Engineering program (of which FEST-A teams are a part) came about. We provide technical engineering and contract construction in

support of combatant commands and Army components during contingencies, exercises and peace-time engagements."

Engineering expertise is as critical before crises as it is after. The Corps supports the Army's humanitarian mission through its Civil Military Emergency Preparedness (CMEP) program, which holds emergency preparedness training events to help partner nations build their capacity to manage crises.

"The best way to respond to natural disasters is to put together pre-designated teams of engineers and train them so they are true experts in things like temporary housing, assessment of damaged infrastructure, debris removal and temporary power," said Karen Durham-Aguilera, USACE director of contingency operations and office of homeland security. Through the CMEP program, she said, USACE provides technical assistance to help

other nations assemble and train their own teams the way it has done at home.

In Nepal, where a magnitude-7.8 earthquake struck April 25, followed by another 17 days later, the death toll likely would have been much larger if not for the Corps, which a year prior completed work on Kathmandu's first blood bank. Located at the Tribhuvan University Teaching Hospital, the seismically sound facility withstood the quakes and was able to supply blood to patients at 75 percent of the medical facilities and hospitals in Kathmandu Valley.

"A lot of risks in Nepal relate to a major earthquake in Kathmandu," Stan Wharry, chief of the Alaska District's Asia Office, said before the quake occurred. "U.S. Pacific Command (which sponsored the blood bank) really

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An aerial view of the Ebola treatment unit in Zorzor, Liberia, on Jan. 10.

wants us to focus on building and providing infrastructure that can stand up to earthquakes within that region.”

After the first quake, Wharry reported from Nepal that the blood bank was in good condition and being used as expected. Additionally, six of seven deep-tube water wells built by the Corps were functioning.

## TRAINING RESPONDERS

Since 1998, the Corps has conducted more than 350 CMEP events in 41 countries. The events touch on subjects such as disaster preparedness surveying, national response plan development, GIS mapping, critical infrastructure protection, crisis communications and military/civil cooperation.

In 2014, USACE facilitated 14 such events in 10 countries. The work included conducting a disaster response exercise in the nation of Georgia, where the Corps helped the country test its newly formed National Security Crisis Management Council. In a disaster preparedness seminar in Turkmenistan, experts shared lessons learned during U.S. disasters

such as the Deepwater Horizon oil spill. And in Uzbekistan, USACE held a workshop on technology for forecasting, monitoring and tracking national emergencies.

“This year we’ll be doing about 18 events, including our first-ever event in Pakistan, which is probably our highlight of the year,” said CMEP program manager Diane Acurio. Those sessions will deal with flood, debris and emergency management, and media communications during disasters.

In places like Pakistan and North Africa, where USACE currently is courting new CMEP participants, knowledge transfer lessens the humanitarian impact of natural disasters, as well as the political and military impact. “When we can use our capability to build goodwill, and to strengthen our relationship with nations,

it has a tendency to open access in other areas,” Caldwell said.

“It gives us good insight into what’s going on in different nations and what their challenges are, which helps us understand what may be in U.S. interests there.” ●

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— Anton Klein  
FESTA-A electrical engineer

## PLANNING AHEAD

### IN ASIA, SAFETY BREEDS SECURITY

The U.S. military is in the midst of a strategic rebalance of resources toward Asia. So is the USACE, which is engaged in numerous and diverse disaster-planning activities designed to increase security across the Asia-Pacific region.

“Our customers, U.S. Pacific Command (PACOM) and the U.S. Agency for International Development (USAID), are really interested in stability within the region, and when disasters strike nations it creates major instability,” explained Stan Wharry, chief of the Alaska District’s Asia Office. “If we can support host nations in disaster planning, countries will be better off and more stable when they’re hit by a natural disaster.”

USACE currently manages some 200 humanitarian projects that receive more than \$80 million in funding across Vietnam, Bangladesh, Sri Lanka, Cambodia and Laos, besides Nepal and the recent earthquakes, Wharry said.

Cyclones and typhoons are one regional risk. In Bangladesh, the Corps has designed and built 23 coastal crisis management centers that double as schools and coast guard stations during normal times, and 17 cyclone shelters that double as schools. Ultimately, the Corps will build 100 of these shelters.

“In remote areas of Bangladesh, villages don’t have concrete structures; they have small wooden shacks,” Wharry said. “During a cyclone or typhoon, these villages and their infrastructure would be annihilated. The facilities we’re constructing for both USAID and PACOM in Bangladesh are elevated concrete structures that can be used as shelter during a storm, which is much safer than dangerous wooden shacks.”

Another area of major concern across the Asia-Pacific region is water resource management, which is a priority for USACE efforts there, according to James Ligh, chief of business management at the Pacific Ocean Division.

“Asia-Pacific has 35 percent of the global population, but only 15 percent of the world’s water,” Ligh said. “And if you look at it in terms of disaster planning, disaster management is very linked to how you manage and preserve water — whether you have too much of it or too little.”

The Mekong River Basin in Southeast Asia — spanning China, Myanmar, Laos, Thailand, Cambodia and Vietnam — is an area of particular concern. There, the Corps is engaged in 29 capacity-building activities.



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Participants in a basic sediment analysis workshop visit the site for the Nam Khan 3 hydroelectric dam in Luang Prabang in Laos in March.

purposes — ecological, fish, water, flood control — and those are lessons learned that we can share.”

Whether it’s consulting on dam construction in Thailand or building cyclone shelters in Bangladesh, the Corps’ activities aren’t just humanitarian in nature; they’re also diplomatic.

“There is a huge benefit to the United States from an international relations perspective,” said Drew Benziger, chief of readiness and contingency operations for the Pacific Ocean Division. “A disaster hitting a country opens them up for potential disruption in government ... Helping them build resilience ... helps them maintain continuity of government — and we benefit from that.”

— Matt Alderton