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After Hurricane Sandy

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The National Response to Sandy

A US Army Corps of Engineers perspective

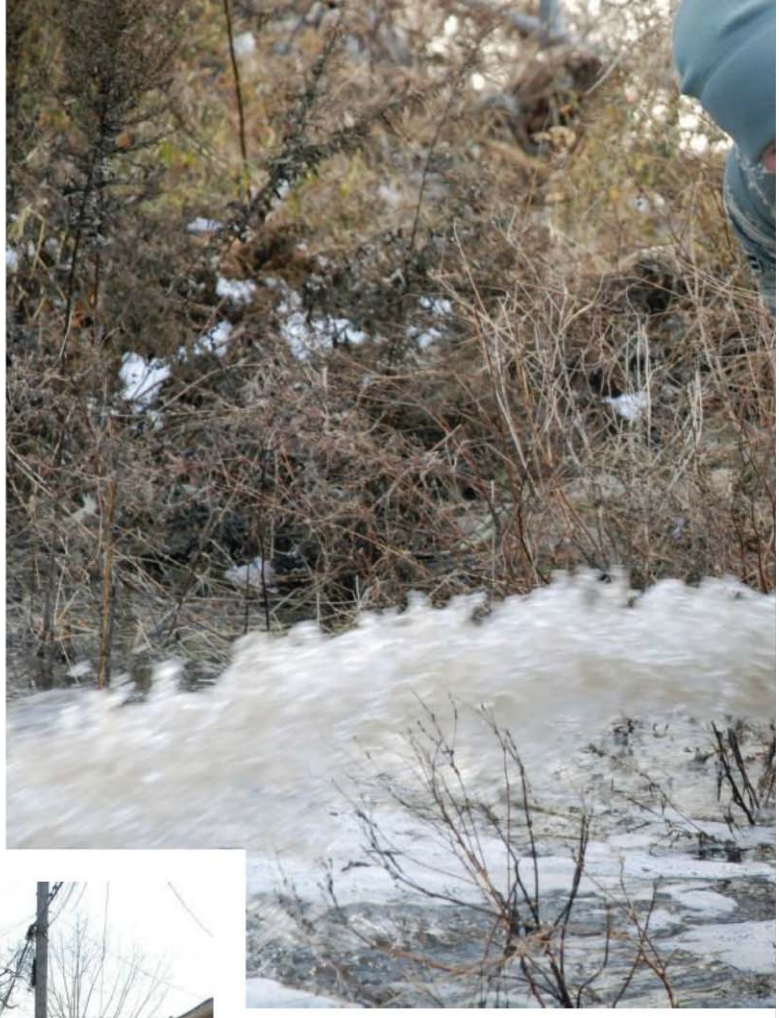
BY JOANNE CASTAGNA

"She was wandering around mounds of debris along the waterfront at Breezy Point, New York, and the shock on her face was pretty powerful for me," says Jim Balocki, chief, Interagency and International Services, Headquarters, US Army Corps of Engineers.

"Her name was Kathleen and she told me she had lost everything to Hurricane Sandy and that she was grateful for everything we were doing to help her community, and I was glad to be there to speak with her," says Balocki, who deployed to New York City as part of the Army Corps' Hurricane Sandy Recovery Mission.

Kathleen represents many of Sandy's victims and Balocki many of the hundreds of Army Corps personnel who deployed from around the nation to the New York–New Jersey metro area to take part in recovery missions assigned by the Federal Emergency Management Agency (FEMA).

The Army Corps has teamed with federal, state, city, and regional agencies to unwater flooded areas, provide temporary power, remove debris, and—just as important—provide an ear, a hand, or a hug.



Mary Markos, St. Louis District public affairs

Above and left: Service members, supporting the Army Corps FEMA mission to allow access to flooded homes in Breezy Point, NY, pumped an average of 750,000 to 1 million gallons of water a day in the week following Hurricane Sandy. The team, under the direction of the US Army's 19th Engineer Battalion, consisted of more than 600 service members from the US Army, Navy, Air Force, and Marines. It worked in coordination with the local emergency responders and officials to allow access and speed recovery efforts in New York.

Hurricane Sandy was the largest Atlantic hurricane on record, causing severe damage across 24 states, hitting New York and New Jersey especially hard.

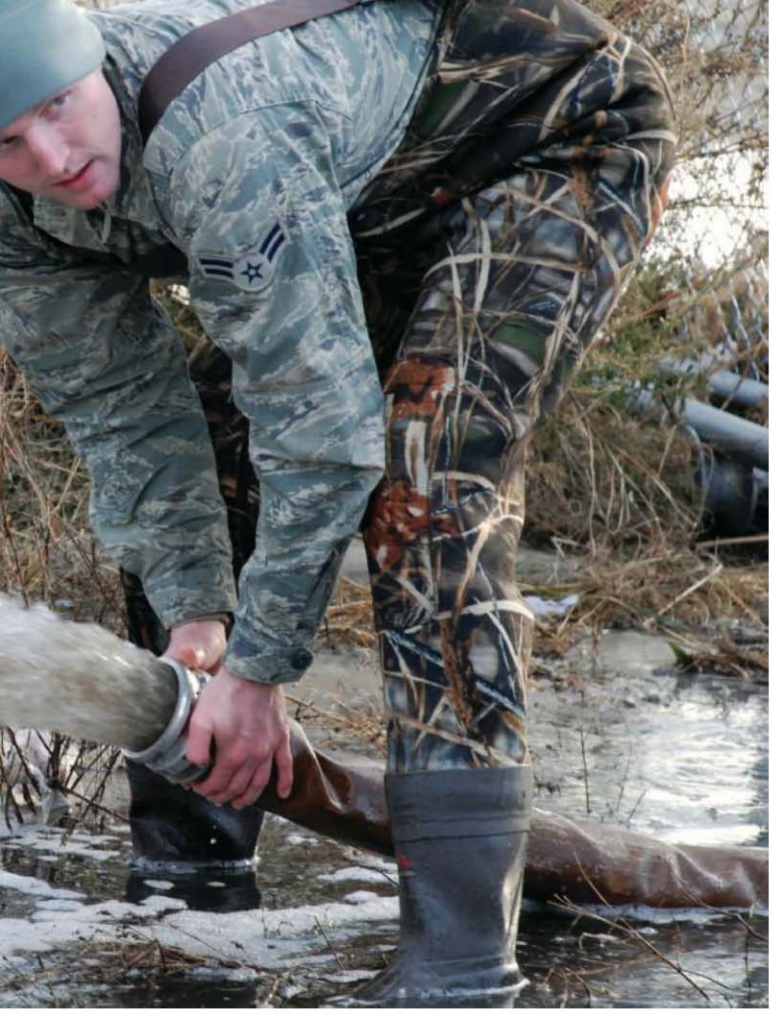
The super storm's 95-mile-per-hour winds and record-breaking storm surge flooded streets, subways, and vehicular tunnels with saltwater, wreaking havoc on communities throughout the region, especially those in coastal areas. The storm created major debris issues and knocked out power to millions of residents.

The Army Corps plays a major role in disaster response, with more than 40 specially trained response teams capable of providing a wide variety of public works- and engineering-related support.

After the hurricane, the Army Corps immediately had teams on the ground working around the clock to get things back to normal, families safely back in their homes, and people back to work.

"Twenty employees from our district jump-started the initial operations," says Col. Paul Owen, commander, New York District. "Even though our district was severely impacted, we maintained the ability to perform emergency operations and quickly established recovery field offices throughout the region. I was proud to see my employees so energized and dedicated to work on the mission, even though their own families had damaged homes and no power."

On top of supporting FEMA-assigned missions through-



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out the region, the Corps' New York and Philadelphia districts also carried out their own regular missions following the storm. These included helping the critical port of New York and New Jersey reopen, closing barrier island breaches in Long Island, and assessing damages to federally authorized and constructed shoreline projects while developing short-, mid-, and long-term alternatives for coastal storm damage risk management.

One of the first FEMA response missions the Army Corps received was to unwater critical public infrastructure in the New York City metro area. "Before we could get transportation systems and critical infrastructure back online, the flood waters had to be drawn down," says Thomas Heinold, deputy chief, Operations Division, Rock Island District, who was part of the Army Corps' Unwatering Task Force. This team also played a major role unwatering the flooded streets of New Orleans in the aftermath of Hurricane Katrina. "This is critical, because flooding creates dangerous situations, such as drowning and public health hazards."

One of the major challenges in the aftermath of the storm was removing almost 500 million gallons of seawater that washed into New York City's mass transit system. According to a story by New York University, almost 70% of the 1.6 million commuters who work in Manhattan use the subway system, be it MTA (Metropolitan Transit Authority) or PATH (Port Authority Trans-Hudson), on a daily basis.

"The mass transit system was basically shut down in the whole area. Having the system flooded like this has a tremendous negative effect on normal business activities and ultimately the economy," says Roger Less, chief, Design Branch, Rock Island District, who served as senior project manager on the Unwatering Task Force. "I saw some of the worst flooded areas of the city. There were subway stations that had water that came so high it was on the subway platforms."

The team immediately had pumps of various types and sizes sent to points around the transit system and began pumping. The task force provided technical assistance and unwatering for the Brooklyn Battery Tunnel (est. 86 million gallons), World Trade Center/PATH Train (est. 20 million gallons), South Ferry Subway Station (est. 20 million gallons), 14th Street Tunnel-Canarsie (est. 3.5 million gallons), the Battery Park Exchange (est. 57 million gallons), the Montague Street Tunnel (est. 60 million gallons), the Amtrak Substation Kearny (est. 40 million gallons), and the Passaic Valley Wastewater Treatment Plant (est. 200 million gallons). The Corps also provided technical assistance for other similar infrastructure unwatering efforts throughout the region.

Brooks Hubbard IV

In Rockaway, Queens, NY, Staff Sgt. Henry Howell and Sgt. Nathaniel Boecker of Headquarters and Headquarters Company, 249th Eng. Battalion (Prime Power), inspect generators at the Ocean Bay Public Housing complex. The 249th has installed 22 generators powering 24 family building structures in the Rockaways.

The pumps efficiently removed about 116,000 gallons of saltwater per minute, and in just nine days 475 million gallons of saltwater had been drained from the city's subways and tunnels. This is equivalent to nearly 719 Olympic-sized swimming pools.

Even though the water was pumped out rather quickly, it had to be done carefully. "If you draw the water down too fast and the water on the other side of tunnel walls and structures doesn't have time to gravity-drain at the same rate, this can collapse a wall and create further damages," says Heinold.

Roger Perk, assistant chief, Project Management Division, Rock Island District, who was on the Unwatering Task Force team, says, "The public has been asking why

the pumps already installed in these tunnels to routinely pump out rainwater and snowmelt did not remove the water. What many may not understand is that if you have an extremely large flow of saltwater filling the tunnels, it makes these pumps useless. The water makes the electrical system go down, so the pumps lose their power and can't function. In these situations, you need an agency like the Army Corps to come in and use pumps that have their own power source. Once the tunnels are pumped, maintenance crews can then come in to clean dirt and debris and get the tunnels' regular pumps powered up again."

The Corps' unwatering efforts augmented the existing capacities and efforts of local and state authorities like the MTA and the Port Authority that went straight to work to drain their subway lines, tunnels, and other infrastructure sites. The destruction caused by the storm was the worst disaster in the 108-year history of the city's subway system.

In other locations in the metro area, another unwatering team led by the US Army's 19th Engineer Battalion, based out of Fort Knox, KY, worked with members of the Army's 86th Engineer Dive Detachment, the Army's 76th Engineer Company, the Marine's 8th Engineer Support Battalion, and others to remove trash and debris, conduct engineering and structural assessments on piers and public property, and pump out large municipal buildings such as public housing complexes operated by the Housing Authority of New York and wastewater treatment plants.

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Debris is collected and then loaded onto trucks at Jacob Riis Park in Far Rockaway in Queens, NY, for shipping to landfills.

The Corps also played a vital role in providing temporary emergency power to critical public facilities, including water and wastewater treatment plants, hospitals, nursing homes, public housing developments, fire stations, and police stations. The temporary emergency power allowed these sites some level of operability while the commercial grid was restored by local power authorities.

"Power is what people need immediately after a disaster because it means life," says Balocki, who served as the Army Corps' leader for Task Force Power. "It's important to get power to such places as hospitals because people lives are on the line. People there are receiving critical care for illnesses and injuries and need the power to stay alive. Hospitals were also experiencing a surge of new people coming in because they were harmed during Sandy. We also provided power to facilities that are life sustaining so we can provide people the ability to shelter and care for their families and loved ones so they don't require additional support from the state and federal government."

Task Force Power, which included hundreds of soldiers from the 249th Engineer Battalion (Prime Power) and Corps civilians from Temporary Power Planning and Response Teams, ultimately installed 202 temporary FEMA generators throughout the metro area. The generators had the capacity to provide 54 MW of power and directly supported more than 25,000 residents, with thousands more benefitting indirectly. In addition to the above-mentioned municipal facilities like police and fire stations, the Corps worked to provide temporary emergency power to a wide range of critical infrastructure, including mass transit like the Hudson ferry, New Jersey's PATH trains, and the Long Island railroad, as well as petroleum terminals that were critical to returning normalcy to fuel availability in the region after the storm.

The generators were specific to the various power situations they encountered. "This is not a one-size-fits-all situation where we rolled up with 75 generators in the back of a van and started dropping them off and hooking them up," says Balocki. "Every one of the generators had to be specially matched and connected to safely provide temporary power. Because it's custom made, it takes a bit longer than what people expect and want, but it's for the safety of the people living and working in the facility."

The generators were used until the grid power from the area's service provider was available. One of the places the team installed generators was in a public housing development in Rockaway Beach, which houses 1,200 residents who didn't have power for several days.

"Two ladies from the development were there watching us do our work, and I explained everything we were doing so they would understand the situation," says Balocki. "Although they were not pleased with having to wait for electricity, they were grateful to have the Army Corps there and that we took the time to explain things to them. They gave me a hug."

Picking up the pieces after a hurricane like Sandy is the hardest thing for residents to do, and it's also the Army Corps' most intensive and largest mission that will continue into 2013.

"It's important to clear the debris from streets so that people can get to their homes and begin to rebuild their lives and eventually get back to normal," says Col. John Pilot, the debris team chief, who deployed from the Corps' South Atlantic Division. "Once the streets are clear, then residents are able to bring the debris from their property to their curbs for pickup. This allows them to clean up their homes and begin their recovery process, file insurance claims, rebuild, or in some cases demolish their homes."

FEMA, the Corps' Debris Task Force, and EPA, in cooperation with state and local agencies, continue to clean up an estimated 3.6 million cubic yards of debris left behind from Hurricane Sandy in the metropolitan area—enough to fill about seven Yankee Stadiums. The debris is being sent to temporary storage areas in the region, where it's being handled, sorted, and recycled and then transported to landfills—often via barges.

The Army Corps also assisted those trying to gather their belongings among the mounds of debris.

"I saw an older couple with some friends having some difficulty trying to carry a piano out of a house to the curb to be taken away. I ran up to them to give them a hand and they were very appreciative," says Col. Trey Jordan, commander, Baltimore District, who took part in the debris removal effort as commander for the New York Recovery Field Office. "We talked for a while and one of them told me he had worked for the Army Reserves for 20 years. It was a nice chance to bond with the people we were trying to help out. It's a personal way for the Army Corps to help besides what we are accomplishing through our assigned missions."

Although the Army Corps did not receive a direct federal assistance assignment for debris removal in New Jersey, the Corps did receive an $800,000 technical assistance mission to provide guidance and best management practices to New Jersey to ensure state landfills were not overburdened. The team initially provided assistance for eight New Jersey counties and will continue to provide support and coordination as the debris removal mission moves into waterway debris removal and property debris removal.

More than 15,000 trees were downed in the NYC metro area during the storm. The trees and broken limbs, currently estimated at 100,000 cubic yards, are being collected at Floyd Bennett Field. The city anticipates an

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New York District drift collection vessels work long hours to clear tons of drift and debris from the New York and New Jersey Harbor after Hurricane Sandy.

additional 100,000 cubic yards to be collected as cleanup continues. In partnership with New York City, the Corps will convert tree debris into reusable materials, including biofuel, mulch, and landfill cover.

The Corps also assisted FEMA in providing commodities during its response mission in the form of bottled water, beginning the first week of November through Thanksgiving. During the three-week time period, the Corps delivered 8.9 million liters of water, or enough water for 2.5 million people, to FEMA's Incident Support Bases along the East Coast for staging. FEMA then worked with the states, including West Virginia, New York, New Jersey, and Massachusetts, to set up points of distribution and determine the amount of truckloads necessary.

This show of support isn't occurring only between the task force teams and citizens, but also between the various agencies that are teaming together on this mission. All of the teams agree they are being welcomed by other agencies and find working with them to be very gratifying.

"It doesn't matter where they came from. They quickly plugged in and established working relationships with people from around the country, and they were focused on getting these missions done. They brought an energy into the situation because they were coming to help fellow citizens. It's always rewarding to help the public," says Jordan.

This interagency teamwork is continuing, as there is still work to be done. Although the unwatering mission is complete, pump teams have redeployed back to their home stations, and temporary emergency power generators are being unplugged, the debris removal mission will continue into 2013.

"I continue to be impressed with how the Army Corps can react to these types of disasters on relatively no notice and bring a very wide range of groups together and have a very positive impact," says Perk. "I hope we can continue to provide emergency operations for the nation in the future."

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Just days after Sandy hit, some of an approximate total of 57 million gallons of water is pumped out of the Battery Park Underpass as part of USACE's unwatering mission. The Battery Park Underpass is the roadway underneath Battery Park that connects West Street to FDR Drive.

Photos: Chris Gardner, New York District public affairs