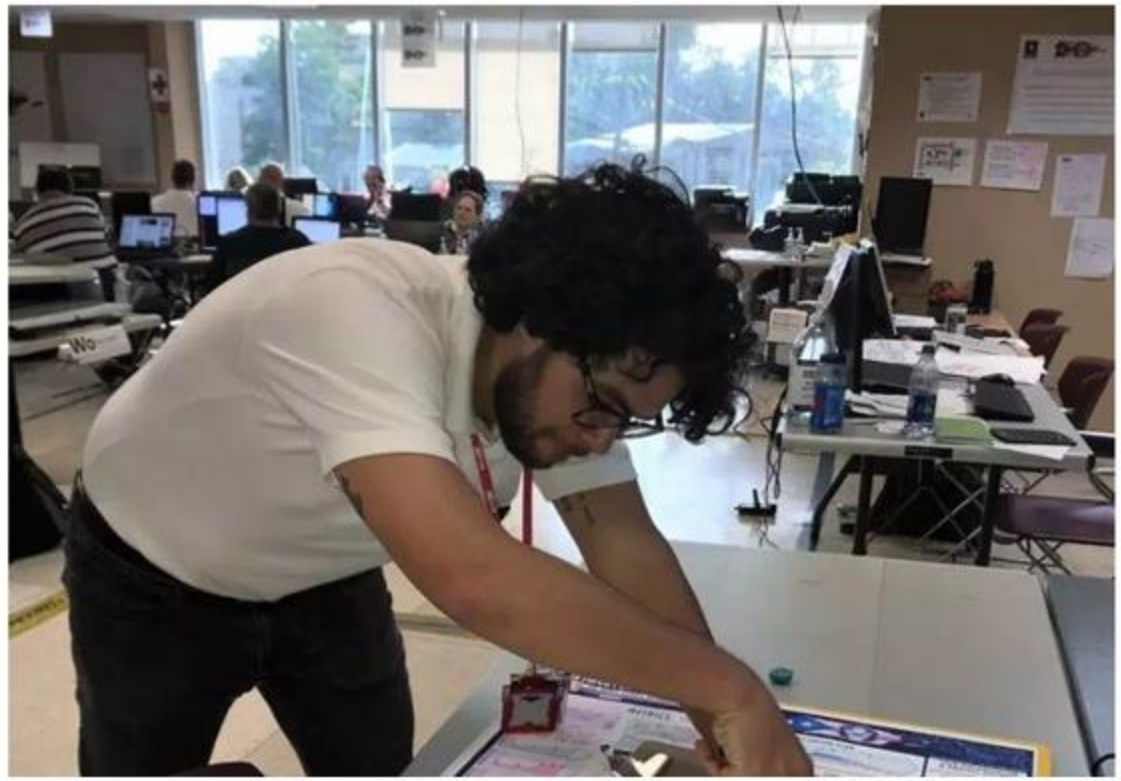
"Mission of power in Puerto Rico": A personal matter for the Army Corps

The experience of a Puerto Rican engineer who helped the recovery of the island after Hurricane Maria



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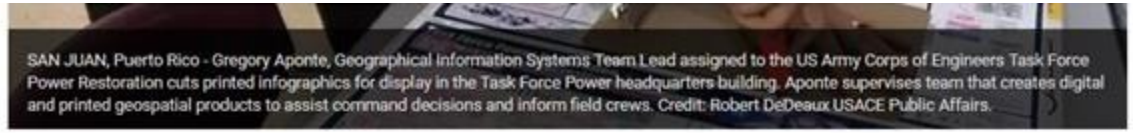

SAN JUAN, Puerto Rico - Gregory Aponte, Geographical Information Systems Team Lead assigned to the US Army Corps of Engineers Task Force Power Restoration cuts printed infographics for display in the Task Force Power headquarters building. Aponte supervises team that creates digital and printed geospatial products to assist command decisions and inform field crews. Credit: Robert DeDeaux USACE Public Affairs.

BY: JOANNE CASTAGNA, ED.D.

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Gregory Aponte, a New York Area Engineer from the US Army Corps of Engineers, surprised his parents by showing up unannounced at his home in Puerto Rico.
He had to do it because he had no way of contacting them. They ran out of electricity due to Hurricane Maria.

"After the storm touched down, I did not hear from him for three days. I started to feel a little worried, "said Aponte.

Aponte went there to make sure his parents were well. He was also there to improve the lives of millions of citizens of the American community who are dealing with the aftermath of the strongest hurricane that hit the island in almost a century.

Aponte was one of the approximately 2,000 members of the Army Corps and contractors who deployed in Puerto Rico for the Power Restoration mission of the Army Corps Task Force.

The mission was to make repairs to the damaged electrical power system to temporarily generate light.

Aponte's role was to use the Geographic Information System (GIS) and map the island's electricity grid to make repairs to the aging and fragile energy system of 80 years ago.

"My parents did not have electricity and water for three months," Aponte said.

After the start of the hurricane, the Federal Emergency Management Agency began its recovery mission that included the repair of the power system.

The Army Corps was called for assistance and worked under the direction of FEMA and in partnership with the Government of Puerto Rico, the Puerto Rico Electric Power Authority and the US Department of Energy.

To restore power, the Army Corps provided temporary emergency light and timely generation for critical facilities, such as hospitals and water treatment plants; guaranteed adequate generation in power plants; transmission lines reinstalled and repaired; and distribution lines restored and repaired.
In order to carry out this work efficiently, SIG was used.

According to Aponte, the beginning of the mission was chaotic because different organizations had their own information that had different levels of accuracy.

Aponte, who served as a GIS specialist team leader, created a system that synchronized and updated the information in one place.

His team created the Task Force Power Restoration web viewer, an interactive internal information database created using the ArcGIS Online platform of the Environmental Systems Research Institute (Esri).

The Viewer kept participants informed about the progress of the mission and helped leaders make critical decisions.

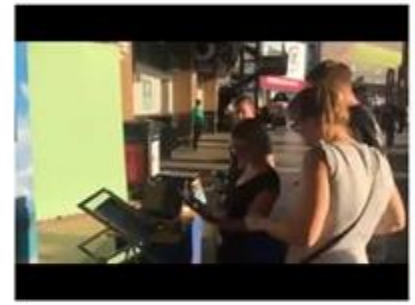
The system is an electronic map of the entire island of Puerto Rico, including some smaller islands that are part of the region, with a total of 5,320 square miles.
Within the map of the island, the feeding system and several components that cross the region are shown in different colors.

As repairs were made to these components, the Visualizer tracked the percentage of work that was completed.

In addition, the monitored system: the location and status of the temporary power mission, the leases of power generation units and microgrids; the power of critical infrastructures, including hospitals; where the contractors were located and the work they were doing; the locations of building materials; the location of the access cuts to the work site; environmental impacts that need mitigation; and the percentage of the region that receives energy or "energy".

To begin building the viewer, data were collected that included demographic information, geographic data, such as land interest areas, wetlands, fish and wildlife, pre- and post-storm images, the location of critical public facilities, and municipal and political boundaries.

The team also received data on the energy system, including the location of transmission centers, substations, micro-grids and transmission lines and the number of households that received power



The team also received data on the energy system, including the location of transmission centers, substations, micro-grids and transmission lines and the number of households that received power from them.

Aponte said: "Knowing where the transmission lines were located and the number of houses they attended was important because it told us how many people were being energized when we repaired a power line."

With an established base, Aponte and his team began to populate the system daily with information from the field offices.

The team also used the Viewer to create map books , information graphics and models to keep the leadership updated on the mission and help them make important decisions to save time and resources in the mission.

These decisions included: deciding whether to divert a repaired power line that is obstructed by fallen trees or a landslide; and decide which access routes are the safest and most efficient to travel and get to the transmissions that need repair.

The power mission was completed and in August 2018, 99 percent of the island's energy has been restored.

Even though the mission was completed, the Viewer remains of great value. "At this time, FEMA is using the data from the web viewer to look for ways to modernize the island's paralyzing energy system," Aponte said.

Moving to Puerto Rico was bitter for Aponte. He was there twice, first to help with the housing mission and later to help in the mission of power. Every time he witnessed the Puerto Ricans he went through difficult times.

He explained the work that the Army Corps was doing and how he would help them. Aponte said: "This mission was the reason why I studied engineering and joined the Army Corps. I supported several Corps and FEMA missions before, and when Maria arrived in Puerto Rico, where I was born and raised, it was not a piece of cake for me. There was no way I was not going to take part in this. "

(JoAnne Castagna, Ed.D., Public Affairs Specialist US Army Corps of Engineers)