Study on the resilience of Puerto Rico’s electrical grid towers underway this hurricane season [1]

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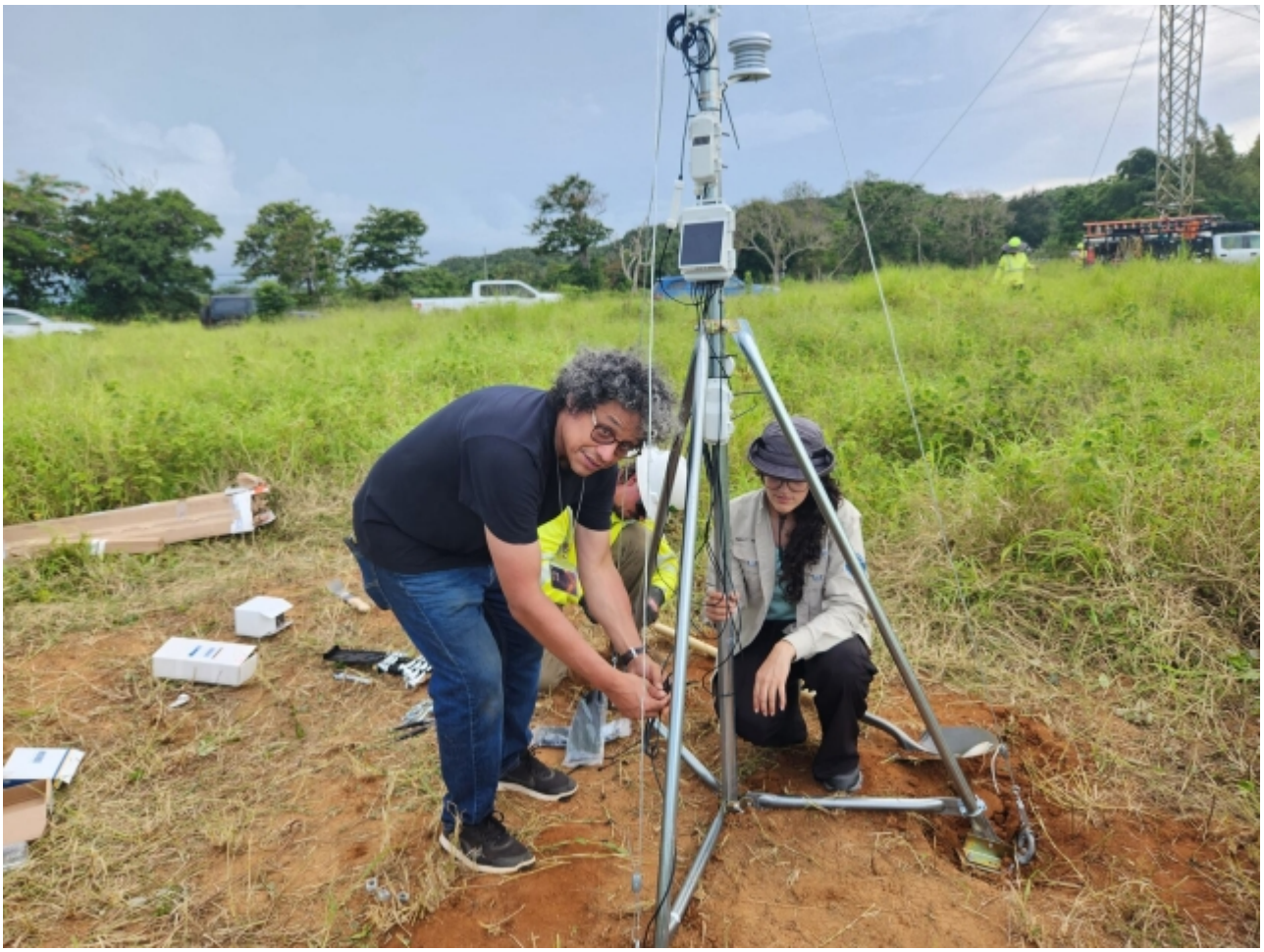

Professor Jorge González Cruz and University at Albany student Bianca Méndez installing a weather station in Arecibo. (Suministrada)

Washington D.C. - A **study** led by Puerto Rican professor **Jorge González Cruz**, of the University at Albany, seeks to determine the safety and resilience of **Puerto Rico's electrical system** in the face of extreme weather events, particularly on the coasts and in the mountains.

To this end, researchers began installing sensors on transmission towers to measure infrastructure resistance, weather conditions and develop damage prediction models.

In September, the installation of sensors in the northern, southern and mountainous regions of **Puerto Rico** will be completed. But, data collection will span three hurricane seasons.

"The ultimate goal is to predict whether components of the electrical system will fail or have been compromised," said González Cruz, a professor in the Atmospheric and Environmental Sciences Program at the University at Albany (New York), in a telephone interview with **El Nuevo Día.** [3]

Along with González Cruz, experts from the University of Puerto Rico, University of Puerto Rico Mayagüez Campus (RUM), and New York University, as well as students, are participating in the

research. González Cruz is a former professor of Mechanical Engineering at RUM.

The study, funded with more than $7 million from the U.S. Department of Commerce's National Institute of Standards and Technology and the National Science Foundation, follows up on research on the impact of the 2017 cyclones on the electrical system, which was collapsed by **Hurricane María**, which caused more than $90 billion in damage.

The first part of the study, which had the collaboration of the **Puerto Rico Electric Power Authority**, showed that "the impact of interruptions in water and electricity services during extreme weather events varies according to social vulnerability," said González Cruz.

Now, for the new study, they are receiving the collaboration of **LUMA Energy** to be able to use a 230 kilowatt high voltage central line, which runs 40 kilometers from Guayanilla to the area between Arecibo and Hatillo, crossing the central mountainous region.

There will be six sensor sites. Each site normally has three sensors on the towers. The sensors are magnets installed by LUMA workers themselves. In September, González Cruz expects the missing sensors on the electricity towers in the mountain to be installed.

In addition, they will have weather stations around each site measuring weather variables such as wind, precipitation and humidity, among other things. Later, they may use other measuring instruments.

"We have visualized and implemented the electric system based on assumptions that are no longer valid, because things have changed. We have stronger and more frequent hurricanes, so we must review the configuration of the electrical infrastructure," said González Cruz.

The professor pointed out that it is key to measure the weather conditions near the towers and try to predict, as an ultimate goal, in the short or long term, whether the system will fail in the face of an upcoming hurricane.

The intent is for utilities to be able to project the resiliency of the various components of the grid, whether it's because a hurricane with 80 mph or 120 mph winds is approaching.

"Hurricane María was preceded by **Irma**. We don't know how many of the towers were compromised before María. This new study is going to allow us that kind of anticipation and greater visibility of the grid elements... **The sensors allow us to collect the data that we will use to develop the prediction models,"** explained González Cruz.

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