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Researchers in Puerto Rico struggle to adapt in the aftermath of Hurricane Fiona

With an islandwide power outage, scientists lose money and time trying to recover their research

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Rolando Oyola (left), professor of analytical chemistry at the University of Puerto Rico, Humacao, pours nitrogen into the magnet of the nuclear magnetic spectroscope while his colleague Jorge Castillo, professor of instrumental chemistry, shines a flashlight to help. MELVIN DE JESUS FLORES

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Three days after Hurricane Fiona tore its way through Puerto Rico, Ileana Rodríguez-Velez arrived at her laboratory, which had lost power, not knowing what to expect. A chemist at the University of Puerto Rico (UPR), Humacao, Rodríguez-Velez opened a refrigerator that stores the samples of rare plants her lab studies for their potential medical uses. The inside was warm, and most of the samples, which include fruits and leaves that must be stored at 4°C, were brown and withered—and now useless. “It’s frustrating to know that all of those hours my students and I spent on working to collect and process these plants are lost,” Rodríguez-Velez says. “So much effort is lost in the blink of an eye.”

Rodríguez-Velez is among the many scientists facing such losses across Puerto Rico’s hundreds of scientific laboratories and research sites in the wake of Hurricane Fiona. When it made landfall in Puerto Rico on 18 September, the entire island lost power and most of the island also lost running water. As of today, nearly half a million residents [are still without power](#).

Omar Pérez-Reyes, scientific director of the El Verde Field Station in the island’s storied El Yunque rainforest, says he lost dozens of living shrimp, from two species, that he and his students had collected from streams in the rainforest. Gathering the live specimens required arduous 2-day trips into the field, in addition to the time and resources dedicated to maintaining the animals in aquaria and prepping the animals for experiments. “This is an enormous investment of time and resources that goes to waste,” Pérez-Reyes says.

Pérez-Reyes and other researchers don’t yet know the full extent of their losses because access to the field station and other research sites is still limited thanks to landslides and rubble that hasn’t been cleared. It’s a familiar situation. Five years ago, researchers encountered similar problems after Hurricane María devastated the island. Many invested in generators to safeguard against future power losses. But consistent outages have been common since 2016 because of Puerto Rico’s failing electric grid, and now many overworked generators have failed, leaving labs vulnerable. Even scientists who have working generators often must wait in line for hours to procure costly fuel. Some “pay for fuel out of their own pocket,” Pérez-Reyes says.

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Researchers are making difficult decisions about what to save. Some are moving only their most crucial reagents and samples to places with more reliable power. Rodríguez-Velez, for instance, moved a few of her surviving plants into fridges in her home, as well as in her mother’s house, where power has been restored. Others, such as Pérez-Reyes, are limiting their workday to 5 hours to avoid using generators for too long.

Other researchers are simply working in the dark. At UPR, scientists who use a nuclear magnetic resonance spectrometer for their work have had to use flashlights as they pour the liquid nitrogen needed to maintain the instrument. They are also manually hauling cylinders of nitrogen up and down stairs because elevators aren’t working.

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Such problems have some scientists pondering how they might be able to insulate their laboratories from future disasters. Solar panels, for example, could keep the power on even when the island’s grid goes down. But there’s little funding available for such investments, says Rodríguez-Velez says, so “I have to take this preparation into my own hands to be able to save my science.”

Some academic researchers are worried about the storm’s long-term impacts on Puerto Rico’s scientific enterprise and the negative impact on students’ scientific training. They fear that students, for example, might be deterred from enrolling in science programs or launching research projects if the island doesn’t fully repair its battered infrastructure and improve disaster preparedness. “Students need continuity in their research and learning,” says Kevin Alicea-Torres, science education director for the Partnerships for Research and Education in Materials program at UPR. “But here in Puerto Rico, it is interrupted.”

In the meantime, some faculty members are simply trying to help their students get through the hurricane’s aftermath. Prior to the storm, for example, one of Rodríguez-Velez’s students was completing experiments on the antimicrobial activity of an indigenous plant and was scheduled to present the results at a national conference. But the student lost some of the plants and reagents needed to finish the work, and now it’s not clear what comes next. The uncertainty, Rodríguez-Velez says, “is not easy.”



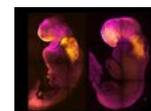
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