

# THE STATE OF THE ACADEMIA IN PUERTO RICO AFTER HURRICANE MARÍA

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ABSTRACT. On September 20, 2017, hurricane María hit Puerto Rico as a powerful high-end Category 4. In this short note, we describe the state of the academia and mathematics after the storm.

## 1. INTRODUCTION

SAN JUAN, P.R. – September 20, 2017 is a day that marked the life of every resident of Puerto Rico. Around 6:15 a.m. local time, hurricane María made landfall in Yabucoa – a small town located on the southeastern region of the main island. María was a powerful high-end Category 4 hurricane packing sustained winds of 155 mph (2 mph shy of a Category 5 storm) [2]. It is the strongest hurricane to hit Puerto Rico since hurricane San Felipe II hit the archipelago with sustained winds of 160 mph on September 13, 1928. The low pressure of María at landfall was recorded at 917 mbar [2], which is the lowest pressure on the island in recorded history and the lowest at landfall anywhere in the United States and its territories since hurricane Camille in 1969.

The catastrophic storm caused a humanitarian crisis that Puerto Rico is still recovering from months later. No town or city was spared. In fact, the immediate aftermath was, by any measure, a brutal one. The storm destroyed many houses, dismantled telecommunication towers and obliterated the electrical grid; the whole archipelago lost power during the event. Potable water quickly became non-existent. Many people lost their lives in hospitals and care centers because no power meant no dialysis, no oxygen, and worse. Most hospitals and care centers had power generators, but they needed diesel fuel, which became a commodity hard to find after the storm. The governor's office estimates the cost of the storm to be \$94.4 billion in 2017 US dollars [3]. There is no denying that the recovery has been slow and that there is still too much work that needs to be done. The sense of isolation and crisis was exacerbated by the feeling shared by most Puerto Ricans that the US government's emergency response was slow and inadequate [1].

As expected, the crisis also affected academia. The infrastructure of every university in Puerto Rico suffered. Some science laboratories, classrooms and other facilities were destroyed. A preliminary assessment estimates the losses in infrastructure to the public university at \$118 million dollars [4].

The fall semester was halted for every university on the island. In fact, every campus of the public university was closed for more than a month after the storm and the last one to open did so on November 5, 2017. When the semester resumed, many students were displaced, no power was available, some classes were offered

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in tents, and every academic activity needed to end at 5 pm when daylight turned to dusk. The storm also had an impact on the academic year. At the University of Puerto Rico, Río Piedras Campus, which is the largest of the public institution, the fall semester officially ended on March 2, 2018 and the spring semester, which started on March 12, 2018, is running as a trimester. Many US universities recognized that for some students this was a difficult proposition to bear and offered tuition-free registration for Puerto Ricans affected by the storm. We in Puerto Rico are very grateful for that gesture.

The aftermath brought great challenges to students and professors. For example, some students were attending university courses, but had limited time to study the material (no electrical power at home together with the fact that the university was closing at 5 pm). The professors, on the other hand, needed to think outside the box and construct examinations of coursework that took into account the fact that students were under great stress and that for some of them it was difficult to study because of the lack of power at home. However, we all welcomed the re-opening of the university and were determined to make it work. In fact, when the re-opening was suggested, many students, professors and employees volunteered for the removing of debris and the cleaning of the campuses. The re-opening represented to us some sense of normality, the continuation of the exchange of ideas, the acquisition of knowledge, and a platform from where we could help the country. It also gave us the chance to think and work on things that we enjoy and to forget, for brief moments, everything about María.

The storm also had a psychological toll on every researcher on the island. Most mathematical research coming from Puerto Rico was put on hold right after María. Part of the problem can be traced back to the lack of Internet connection, which took its toll on research collaboration. However, the bulk of the problem is attributed to the fact that it was extremely hard to concentrate on mathematical research under the living conditions of the storm's aftermath. Planning for the next hot meal, finding a store with ice available to keep medicine cold, and standing in line for hours to get gasoline or cash was the main priority for most residents of Puerto Rico. That situation lasted for a month or so for the majority of the metropolitan area of San Juan, other places on the island are still struggling.

The university made an effort to mitigate the situation and by mid October it offered a place where researchers can come and submit their research proposals. The researchers also went the extra mile. Their determination made them drive to whatever place they needed to go to find Internet and connect to the web. They also found places where they were able to recharge their laptops and during nights used solar powered light bulbs to continue their work. Yes, it was hard. In fact, for most of us, it took until January of 2018 to be able to be in top form again. Others living outside the San Juan metropolitan are still in the process of getting back to work on their research projects. However, the determination is there and a new normalcy is in the horizon.

We still have problems more than six months after María's wrath. Some of these problems can be attributed to the instability of the electrical grid and to the slow pace of recovery. Others lie deeper and are consequences of the proposed solutions to deal with the economic calamity brought by María to what already was an anemic economy. Internet is not as reliable as it used to be. Printing exams can be an odyssey. Deadlines for grant proposals needs to be treated with

extra care. But we learned to plan things well in advance to make sure that our work is not compromised by a sudden power or Internet failure. Our university is in operation once again. Our students are coming, we are exchanging ideas, solidifying knowledge, and working on our research projects. We are a little bit behind on getting our university back in optimal condition, especially when it comes to infrastructure, however, we have the determination and strength to continue doing our job and to continue the mission of our beloved university. We can be proud that we are on the brink of beating María's challenge.

We are now preparing ourselves for yet another challenge. This new challenge has the potential of being more dangerous than María's with long-lived consequences for our public institution. Part of this new challenge is the speed of outmigration of young Puerto Ricans, which is the main demographic group that our university serves. However, the real danger are proposals from The Financial Oversight and Management Board for Puerto Rico and the local government. These proposals include, among other things, severe cuts to our public institution and an increase of teaching load across all of its campuses and units. These proposals have the potential to alter the university's mission and to put all research in peril. We do not know how much different the university is going to be in the coming years, but we are determined to continue doing our work.

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