

José Hernández Ayala: A Research Leader in Geographic Climatology [1]

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Dr. Hernández Ayala is a professor of geographic climatology at Sonoma State University

Climatology, the study of weather changes over time, is a prominent scientific field often cited in the media. Sonoma State University, in California, is one of several institutions that has a Climate Research Center (CRC-Sonoma), in which scientists from different disciplines collaborate to better understand the relationships between short-term atmospheric phenomena, the climate,

physical geography and human geography. Notably, CRC-Sonoma is directed by a young Arecibeño scientist!

In a recent interview for Ciencia Puerto Rico, **Dr. José Hernández Ayala** [4] shared his scientific journey and some tips so that young people interested in science can become professional scientists. He also discussed the effects climate change will have on Puerto Rico.

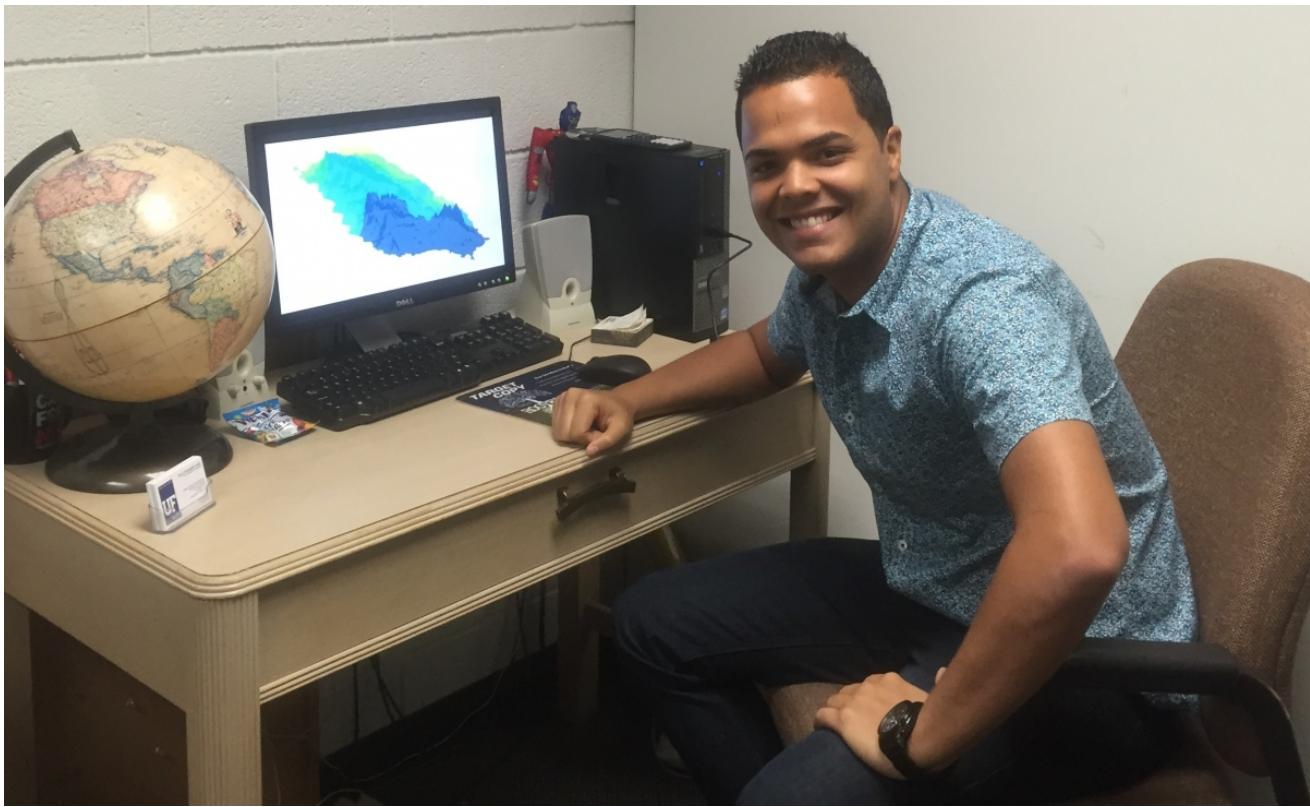
Dr. José Hernández Ayala was born in Arecibo and raised in the Candelaria sector, Sabana Hoyos neighborhood. He studied at the Hogar La Milagrosa School until the eighth grade, moved to Ramón Luis Rivera Intermediate School for one year and finished his high school education at Dra. María Cadilla de Martínez High School. Before high school, science was never his favorite subject.

"At La Milagrosa, I was fascinated by social studies, economics and history. As time passed, I became more interested in the relationship between humans and their environment; That's when I started to learn about geography. I remember loving to draw maps of Puerto Rico and its municipalities. "

For José, his parents' support was the most important factor in his development as a scientist, especially from his mother, Ms. Sandra Ayala. "After I got home from work every afternoon, she would sit and study with me—we would even do practice tests together. She always encouraged me to study geography and used to give me map books to play with. "

During his years at the Dra. María Cadilla de Martínez High School, Jose maintained his interest in geography and history while his scientific curiosity grew. He described the important influence two excellent teachers had on him during this time:

"One of the teachers who supported me most was Ms. Luz Juarbe, my eleventh grade chemistry teacher. I was captivated by her excellent teaching and her passion for science; I hoped to one day have the same love and passion for my profession. I also had a great history teacher who I still keep in touch with, Mr. Moisés Reyes. Thanks to his classes, I became even more interested in the geography and history of Puerto Rico. He was the first teacher that made me question many things that I never thought could be questioned. "



Dr. Hernández Ayala working with Geographic Information Systems (GIS).

Like many other young people who graduate from high school, José was not sure what he wanted to study in college. "I thought about studying psychology or physics and even seriously considered studying law and planning. In the end, I chose geography, a discipline that combined my interests in the social and natural sciences."

José began his studies Arecibo Campus of the University of Puerto Rico (UPRA) and then transferred to Río Piedras (UPRRP). He noted that he did not enroll directly in the UPRRP for financial reasons and because of the high quality of UPRA courses.

"I decided to start in Arecibo in order to save on housing costs for my parents. My experience at UPRA was very rewarding. My first course, Introduction to Social Sciences with Professor Juan Puig, reaffirmed my passion for geography. As part of the course, we visited Casa Pueblo in Adjuntas which made me even more interested in the complex relationships between human beings and their environment. I would not trade my two life-changing years at UPR for anything; The education I received was of equal or even better quality than the one I received at the UPRRP."

"Transferring to Río Piedras played a central role in my development as a scientist. At UPRRP, I took countless interesting courses that expanded my mind and helped me develop a strong base for graduate school. One of my mentors at that time was Prof. José M. Longo; He is a great geography educator whose passion inspired me to be the university professor that I am today. Other professors that inspired me there were Rafael Méndez-Tejeda, Ángel D. Cruz Báez,

Maritza Barreto and Carlos Guilbe."

José emphasized that the most important factor of his undergraduate education was the fact that he received an excellent education at an affordable cost for his working class family. High quality and low cost higher education, like that of UPR, is something that millions of students in the United States do not have access to.

Hernández Ayala obtained a Master of Science in Geographic Information Sciences at the University of Akron in Ohio, where he researched changes in Puerto Rican rain patterns using geographic information systems (GIS) and statistical techniques. He completed his PhD at the University of Florida, where he specialized in Puerto Rico's tropical climatology, particularly the rain processes associated with tropical cyclones and hurricanes. José commented on how his academic horizons have expanded and on his most important mentor.



Dr. Hernández Ayala at the conference of the Association of American Geographers.

"In my transition from high school to graduate school, I realized that science was actually a creative discipline; one can explore multiple solutions to different problems. My mentor in Florida was Prof. Peter Waylen, an excellent academic advisor and a great human being who taught me a lot about hydrology and climatology. Prof. Waylen and I had long conversations about life as an

academic, and he helped me apply for professorship jobs."

Although José completed his graduate studies successfully, not everything was easy. A teacher once accused him of plagiarism. She assumed that since English was not his first language, he could not have written a proper essay in English.

"In Akron, a teacher asked me if I alone had written my paper. She told me that my proposal seemed too well written for someone like me. In other words, she could not believe that a Puerto Rican could have done such a good job. She told me that she had searched online to see if she could find evidence that I plagiarized, but found nothing and asked me to be honest. I could not believe that I was being accused, especially without proof. I stood firm and showed her all the resources I used to write the proposal. She had to accept that I had done nothing wrong. "

In response to questions from Ciencia Puerto Rico, José told us what climatology is, the effects climate change will have on Puerto Rico and what we can do to minimize its impact on the Island:

"Climatology is the branch of geography that best incorporates both my passions for the social and natural sciences. It studies the climate system's biophysical complexity and its close relationship to socioeconomic factors. Climatology has generated scientific knowledge to support the argument that we must modify our economic systems and move towards a more sustainable and just global economy. "

"Puerto Rico will definitely suffer from the impacts associated with climate change. In general, we will see more powerful hurricanes, periods of extreme droughts, sea level increases, and more days with extreme temperatures. These changes will impact our coastal communities and will cause other ecological and economic impacts. We have to prepare for these effects now. "

"I am concerned about the impact that these extreme events will have on most Puerto Rican homes, which do not yet have the resources to successfully face these challenges. I worry that the state almost completely ignores the impacts climate change will have on Puerto Rican society, especially on poor people. I am concerned that the state sees taking action to prepare for climate change as an undue burden, instead of as an investment in the future stability of Puerto Rican society."



Dr. Hernández Ayala with his students from Sonoma State University at the inauguration of the Climate Research Center

José listed some suggestions for dealing with climate change in Puerto Rico. These include transitioning to a new renewable energy system resistant to the extreme events that lie ahead; developing a new economic system based on local production of food and consumer products; and investing in new housing and transportation infrastructure that is resistant to sea level rise and storm surge events.

Finally, José offered several tips for the new generation of university students and young scientists.

"I would tell young people to fight for their dreams, for better public education, for University of Puerto Rico (UPR), and for the creation of a more just society. Many who have graduated from our university are scientists and professionals who, like me, have been able to contribute something to address the most important problems of our generation."

"I would also tell them not to fear the unknown, to constantly question their positions on things that society simply does not question, to get carried away by their passions and curiosities, and to do something that makes them get up every day with a smile. I would say that the path to achieving one's goals is not always easy, but there's a lot to learn from both good and bad experiences. Dare to be the best you can be and do not fear anything or anyone when it comes to trying to reach your goals."

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