

USF doctoral students combining engineering and anthropology to inform Florida's Coral Reef restoration and monitoring

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RESEARCH AND INNOVATION

More than 300 miles of coral reefs stretch across Florida's Atlantic coast. While this marine habitat is home to hundreds of aquatic species and plays an important role in the state's economy, it is also in danger of disappearing. But a new project from a team of University of South Florida doctoral students is taking an interdisciplinary approach to protect and restore these vital habitats.

Michelle Platz and Kris-An Hinds are working toward doctoral degrees at USF, Hinds in applied anthropology and Platz in environmental engineering. In the classroom, the two researchers don't have much overlap. But thanks to USF's Systems Training for Research on Geography-based Coasts (**Strong Coasts program (<http://www.strongcoasts.org>)**), the two have been able to focus their expertise on a common goal.

"Coral reef restoration and monitoring is a social-ecological system, which requires both social and ecological considerations to be integrated when generating solutions. So, you cannot understand one aspect of the system without the other," Hinds said. "You really need to have that anthropological, societal understanding of what's happening on the policy level, how people are perceiving what's happening in the reef, and how that's impacting the actual environmental changes to address issues that the reef is facing."

"My research has focused primarily on the technology aspect, trying to develop new monitoring methods that can improve gaps in the field," said Platz. "Through my involvement in the Strong Coasts program, it became clear that technology alone cannot solve this problem. The solution has to be rooted in both the societal and ecological components."



USF doctoral students Kris-An Hinds (left) and Michelle Platz (right)

The pair's project has focused on strengthening the relationship between ocean-based and land-based reef restoration efforts and the impact to stakeholders from coral reef decline from Stony Coral Tissue Loss Disease, which spreads rapidly and impacts large areas of the Florida Reef Tract. By some estimates, as much as 95% of Florida's reef system has been damaged or destroyed by disease, climate change and pollution. Through their combined research efforts, Hinds and Platz hope to identify leverage points through which the coral reef restoration system can be improved.

From an anthropological standpoint, Hinds undertook an ethnographic study of coral reef restoration. Through virtual interviews with scientists, resource managers, policy makers and more, the team has been able to develop a broader, more holistic view of the issues facing the reef and how best to approach solving those problems. Initially, this portion of the project also included interviews and outreach with community members as well as those who live and interact with the reef regularly. However, due to the COVID-19 pandemic, researchers were forced to adjust their interview schedule. Hinds hopes to be able to incorporate local knowledge of the reefs from community members, including a public outreach component, once it is safe to do so.



USF researcher maintaining coral reef monitoring equipment.

On the engineering side, Platz has led the implementation of new reef restoration monitoring tools. Through this project, these new instruments have collected one of the longest continuous metabolic data sets recorded to date in the Florida Reef Tract. This metabolic data provides detailed insight into the reef ecosystem's health and progression in response to newly restored coral along the reef. For Platz, the use of this technology is exciting, but gaining a better understanding of the entire system, thanks to this interdisciplinary project, has really helped broaden her work's impact.

"This project has really helped me shift my perspective on how we assemble and communicate technological solutions," Platz said. "It's not always enough to engineer solutions, we have to take a holistic approach that finds the best fit for both the societal aspects, as well as the environmental components."

The pair are currently working to analyze their findings. They expect to publish several research papers through this project. And while the impact of their work will help shape ongoing restoration and mitigation efforts in the reef, they also hope other researchers will see the success this kind of interdisciplinary work can have and adopt these techniques in the future.

Platz and Hinds were first introduced through USF's Strong Coasts program, an initiative funded through a National Science Foundation National Research Trainee grant. Strong Coasts brings together graduate students from a variety of disciplines to explore complex and interconnected food, energy and water systems in coastal locations. The program, which is co-funded by the Louis Stokes Alliances for Minority Participation, is led by faculty at USF and the University of the Virgin Islands. To learn more about the work Strong Coasts is doing, [click here \(http://www.strongcoasts.org\)](http://www.strongcoasts.org).