



Noelani Puniwai, PhD

## Focus on Researchers—Dr. Puniwai Investigates Seascapes Using Human Observation and Physical Science

by Sarah Nash

So often the focus of the Climate Science Centers (including the PI CSC) is on the exciting science being investigated. We also need to remember that the achievements of our supported fellows and researchers are events for celebration.

On that note, the PICSC would like to take this opportunity to congratulate **Noelani Puniwai**, a Mellon Hawaii Fellow, on achieving her PhD from the Department of Natural Resources and Environmental Management at University of Hawai'i at Mānoa. Dr. Puniwai defended her dissertation on 2 July 2015 entitled: 'Ike I Ke Au Nui, Me Ke Au Iki; Complex Social and Physical Seascapes of Hawai'i Island.

Unlike landscapes, seascapes provide very little long-term proof of their physical changes. The relationships between human activity and the environment create ecological, socioeconomic, and cultural patterns, and the mental maps created through these interactions can provide highly accurate insights. As Hawai'i's climate changes, the need to observe and document past and current states of the ocean becomes more relevant in order to predict and prepare for those changes. The spatial scale at which people interact with their environment is difficult to explain yet extremely pertinent when comparing observations with others, interacting with datasets, and visualizing in GIS. Dr. Puniwai's research has focused on discovering those interactions between people and their ocean environment by combining sensor data and human experience to infer future characteristics of the changing marine environment.

Dr. Puniwai spared some time to talk with me about some of her thoughts and reflections on the work she has been doing and future directions for integrating traditional and community knowledge with climate and ocean science.

---

*SN (S. Nash):* What led you to investigate cultural seascapes as opposed to other connections between people and places?

*NP (N. Puniwai):* I like looking at the connection people have with the environment and seeing how they connect to their environment gives you a real understanding of their perceptions and point of view of a place. I also looked at

how decisions made in management impact the environment based on managers' values and how that might change in the future. For me, particularly, I have a background in marine science, so oceans and seascapes were a perfect fit.

*SN:* You used two types of knowledge systems, one being experimental climate science

(quantitative) and one being community observer knowledge (qualitative). How would you describe the strengths of both?

*NP:* As a human, you observe what is important to you. So you intuitively cull the data and observe the impacts of the variables and understand the significant components. The bias is in what you observe, so it is known, whereas in science it is an unknown bias because you create the model, but you do not realize how all the variables interact. I am much more critical about the biases in science. Human knowledge systems also bring in engagement by the community because people observe what is important to them and generally want to know how those values are impacted by change. Science gives you a broader understanding of what is happening to a place, which is good for the larger scale changes and understanding the baselines of physical changes. Another positive in experimental science is that you collect variables over time so you can play with the data a little more and see patterns that human observers do not pick up.



Honoli'i is a popular surf spot along a river mouth in Hilo Bay, Hawaii. Photo: N. Puniwai

*SN:* Would you incorporate another area of study or knowledge base if you could do it again?

*NP:* I would add more historical records, maybe economics and anthropology. Some of the ocean current knowledge could be expanded, especially for the Honoli'i site. There are more people I would like to include as well.

*SN:* What has been the most interesting or compelling component of this work?

*NP:* I find it interesting that people change with the place so much that the perception is often that the place is not changing. But everything is constantly changing. There does not appear to be a threshold. People are adapting with their environment and naturally accept change occurring. A second interesting aspect of the research is that the relationships that observers have to their peers at the place are just as fundamental as the environmental conditions of that place. So the people that they surf with changes how they feel about the place (for example, everyone is younger or their long-term friends still surf), so the connection to the place is just as much social as it is physical. Because the importance of the social aspect is such a big factor, it is hard to model the future change of that relationship.

*SN:* Where do you go from here in the research?

*NP:* I plan to continue the work over the next year, to see if the perceptions that I tested hold true. I would like to incorporate the lifeguard data from the last 30 years to see how they have changed through time and forecast the conditions. I might expand to other culturally important sites like salt resources and freshwater springs, and look at how those

relationships persist and how will climate change affect those locations.

[Learn more about Dr. Puniwai's research](#)