



*Fred (center) and Judith (right) Mackenzie on a hike in Torres del Paine National Park, Peru, with their friend, Joe.*

### **About the Program**

The Department of Oceanography launched the undergraduate Global Environmental Science program in 1998 with the generous support of the Pauley Foundation. The vision and brainchild of Oceanography Emeritus Professor Dr. Fred Mackenzie, the GES program is known for its rigorous math and science foundation, integrated study of environmental- and sustainability-related issues, and faculty-mentored research thesis requirement. This research experience results in every GES graduate having completed a faculty-mentored research project, written a thesis, and presented their research results in a public forum. As a result of the challenging curriculum and research thesis requirements, GES graduates are well-prepared to enter the workforce in environmental science-related fields and industries or continue on to graduate studies in many different subjects in the sciences, social sciences, law, medicine, and engineering.

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# The University of Hawai'i at Mānoa Department of Oceanography presents SPRING 2021

## GLOBAL ENVIRONMENTAL SCIENCE



Friday, May 7, 2021  
10:00am - 12:00pm HST  
Via Zoom

## GES Symposium

GES students presenting at this symposium conducted basic research, analyzed their results, and compiled their findings into a thesis format. Many theses are converted into peer-reviewed journal publications; a feat usually accomplished by students once in graduate school. The GES Symposium is a celebration and culmination of undergraduate research efforts and experiences, so join us in supporting, engaging, and applauding today's presenters.

## Agenda

### 10:00 Welcome

**10:05 Glenn Arnade | Mark Glick (Hawai'i Natural Energy Institute)**  
Political and Economic Implications Associated with Climate Induced Migration from Central America

**10:25 Tina Huynh-Nguyen | Celia Smith (Botany)**  
Characterizing Nitrogen and  $\delta^{15}\text{N}$  Values in the Tissues of a Windward Population of *Avrainvillea lacerata*, an Invasive Green Alga

**10:45 Michaela "Mickey" Johnson | Amy Moran (Biology)**  
Thermal Tolerance of *Siphonaria normalis* Embryos on O'ahu, Hawai'i

**11:05 Eric Klingberg | Jeffrey Drazen (Oceanography)**  
Linking Ecological Conditions to Size-Distributions of Abyssal Scavengers

**11:25 Mariam Moreno | Margaret McManus (Oceanography)**  
Environmental Influences on Vertical Picoplankton Distribution in Māhala Bay, Oahu, Hawai'i

**11:45 Kayla White | Giuseppe Torri (Atmospheric Sciences)**  
Simulating the Effects of Climate Change on Cloud Formations Around Mountainous Islands

## Biographies



### **Glenn Arnade**

*Mentor: Mark Glick*

Growing up near the rainforests of Singapore and traveling across Southeast Asia, Glenn has always had a passion for the outdoors. Throughout his life, Glenn began to explore the mountains and oceans in pursuit of learning more about the world around him. As a foreign-born citizen, he was also interested in motivators of migration and what encouraged the pursuance of an alternative environment. Over time, he developed an understanding between the mutual relationships of nature and society, which sparked his interest in the Global Environmental Science program at University of Hawai'i at Mānoa. During his time as a student, Glenn took interest in how climate change affects large populations. With the help of his mentor Mark Glick, he developed a research project that combined the climatic and socioeconomic disparities present in Central America; a region near his home in Southern California. Looking towards the future, Glenn hopes to use his degree to bridge the gap between scientific and socioeconomic dilemmas to help distraught population groups. Glenn was born in Singapore and raised in Walnut, CA.



### **Tina Huynh-Nguyen**

*Mentor: Celia Smith*

Tina is the product of great mentors who nurtured the scientist in her: Celia M. Smith, Mackenzie Manning, Wendy Kuntz, Colleen Allen, Narrissa Brown, and Florybeth La Valle. Her academic journey started at Kapi'olani Community College, where she learned about intertidal monitoring from the Our Project In Hawai'i's Intertidal (OPIHI) program. During her time on the reef, she understood the imminent threat of non-native, invasive alga, *Avrainvillea lacerata*, on Hawai'i's native marine biodiversity. For the past three years, she has been pursuing this bio-invader in the hopes of helping Hawai'i reef managers gain better insight into environmental drivers that contributes to the expansion of *A. lacerata*. Her environmental studies were supported by scholarships and awards, such as the Global Environmental Science Endowed Scholarship, NSF S-STEM Scholarship, Undergraduate Research Opportunities Program Funding, and several Hawai'i Community Foundation Scholarships. Tina was born and raised in Honolulu, HI, and is the first in her family to receive a college degree.



## **Biographies (continued)**

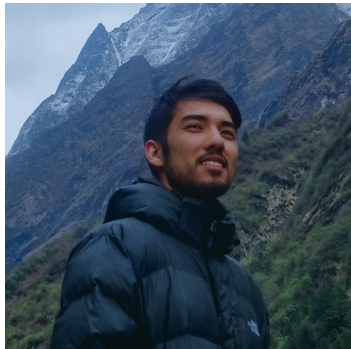


**Michaela “Mickey” Johnson**

*Mentor: Amy Moran*

Growing up in Hawai‘i, Mickey has fostered a love for the ocean and its wildlife. When she learned about the Global Environmental Science (GES) program, Mickey felt like she had finally found a degree that she could make her own. She has a special interest in elasmobranchs, which she is able to cultivate as a Shark Lab intern at the Hawai‘i Institute

of Marine Biology. After taking a Biology of the Invertebrates class at the University of Hawai‘i at Mānoa, she also discovered an interest in invertebrates, which she explored by conducting a thesis project on a local intertidal invertebrate with Dr. Amy Moran. By combining a GES BS degree with a Certificate in Marine Option Program, she hopes to follow her passion into marine wildlife conservation and research. Mickey was born and raised in Ha‘ikū, Maui, HI.



**Eric Klingberg**

*Mentor: Jeffrey Drazen*

From growing up in the desert heat of Tucson, Arizona, to studying the cold reaches of the deep sea, Eric came to Hawai‘i to better understand the problems facing the ocean, and the solutions that can lead to a more sustainable future. His interest in conservation and exploration led him to join the Deep Sea Fish Ecology Lab, as well as living at sea for a

month assisting in deep-sea coral research near the northwest Hawaiian Islands with the Schmidt Ocean Institute. While working through the academic rigor of the major, he has persevered with the help of the friends, family, teachers, and advisors that have supported him along the way. Following graduation, he plans on traveling and seeking federal work opportunities. Eric was born and raised in Tucson, AZ.



**Mariam Moreno**

*Mentor: Margaret McManus*

Mariam came to University of Hawai‘i at Mānoa with the intention of pursuing oceanography. Originally starting as an engineering student to pursue ocean engineering, Mariam realized she preferred working in the field and in the lab. Switching to Global Environmental Science (GES) opened up volunteer opportunities through the Hawaii

Ocean Time-series cruises and research assistant work in the McManus oceanography lab. It was in the McManus lab that Mariam took interest in the former Seawater Air Conditioning project which solidified her passion in physical oceanography. Working with Christina Comfort and Dr. Margaret McManus, her GES thesis is on the effects of environmental factors of Māmala Bay on vertical picoplankton distribution. She hopes to continue doing similar work with other universities in Southern California. Mariam was born and raised in Harbor City, CA.



**Kayla White**

*Mentor: Giuseppe Torri*

Kayla’s passion for the environment and natural beauty of Hawai‘i brought her to the University of Hawai‘i at Mānoa. After starting as a marine biology student, Kayla switched to the Global Environmental Science program and expanded her undergraduate focus to climate change’s effects on all Earth systems, beyond the ocean. To keep her ties to marine biology, Kayla pursued a Certificate in the

Marine Option Program (MOP) and serving as Editor for MOP’s monthly newsletter, Seawords. To expand her horizons, she went on an exchange program to the University of Technology Sydney in Sydney, Australia, in the Fall of 2019 and after her return, began working on her thesis exploring how climate change affects atmospheric convection above islands with her mentor, Dr. Giuseppe Torri. After her anticipated graduation in the Spring of 2021, Kayla will continue her education at the University of Texas at Austin pursuing her PhD in the Jackson School of Geosciences with a focus on climatology and the environment with Dr. Geeta Persad. Kayla was born and raised in Dallas, TX.





Photo courtesy of Eric Klingberg. Eric Klingberg processing deep-sea coral samples aboard the R/V *Falkor* as a Student Opportunities participant with the Schmidt Ocean Institute. Photo credit: Eric Klingberg.



Photo courtesy of Tehani Malterre. Tehani collecting images to add to her virtual tour of the NOAA Inouye Regional Center.



Photo courtesy of GES. Diana Lopera, Tina Huynh-Nguyen, Han Quach, and Kayli Ching volunteering at the GES exhibit during the 2019 SOEST Open House. Photo credit: Lentina Villa.



Photo courtesy of Shannon Murphy. Shannon prepping to count how many Hanauma Bay visitors enter her designated plot in a 30-minute period. Her task is monitoring their interactions with the reef, including stepping on, kicking, or grabbing the substrate. Photo Credit: Stefan Cranston.