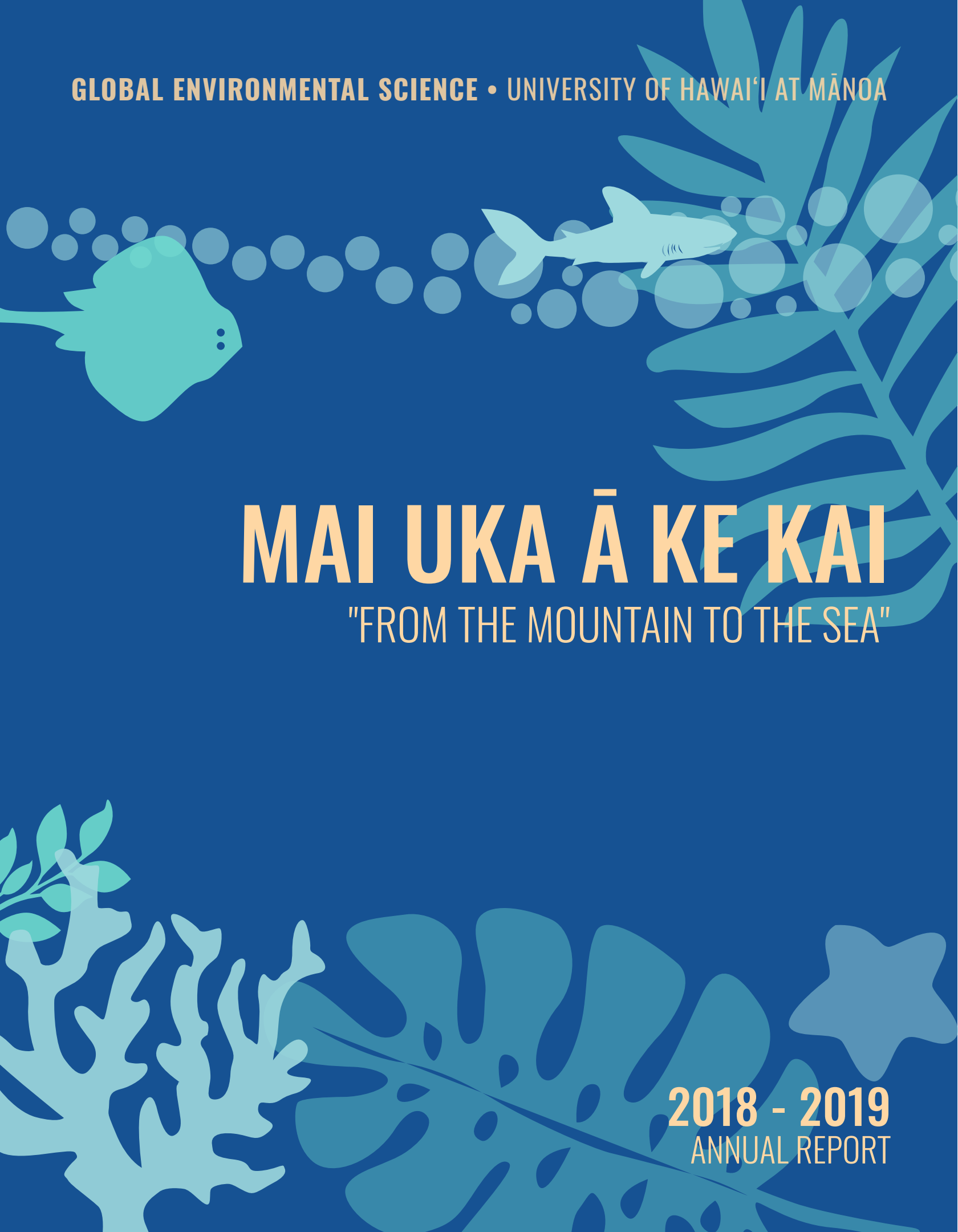
GLOBAL ENVIRONMENTAL SCIENCE • UNIVERSITY OF HAWAIʻI AT MĀNOA



MAI UKA Ā KE KAI

"FROM THE MOUNTAIN TO THE SEA"

2018 - 2019
ANNUAL REPORT

GLOBAL ENVIRONMENTAL SCIENCE
AT THE DEPARTMENT OF OCEANOGRAPHY

PREPARING STUDENTS **FOR THE FUTURE**

The Global Environmental Science (GES) program at the UH Mānoa School of Ocean and Earth Science and Technology (SOEST) trains high-quality students to be knowledgeable in Earth-system science and think creatively about solving present and future challenges facing communities and natural resources.

Each GES student performs faculty-mentored original research, writes a thesis and presents their findings to the public. Faculty mentors include SOEST faculty—global leaders in the fields of ocean, earth, atmospheric, climate, and space sciences— along with other UHM faculty experts in natural resource management, coral reefs, water quality, marine biology, environmental planning, public health, environmental anthropology, and sustainability. Throughout the GES degree program, students are engaged in fieldwork, laboratory work and field trips, and have access to deep ocean and coastal research vessels, SOEST's world-class Hawai'i Institute of Marine Biology and an active volcano.

The GES Program is designed to prepare students to achieve their goals. It is one of the most rigorous and involved undergraduate programs at the University of Hawai'i, requiring:

1. A UH faculty-mentored undergraduate research thesis experience;
2. Program specific one-on-one academic coursework and career advising;
3. Rigorous curriculum in science and math; and
4. Development of valuable and critical skills in computer programming, oral communication and presentation, technical writing, and independent research that are transferable to many fields and opportunities.

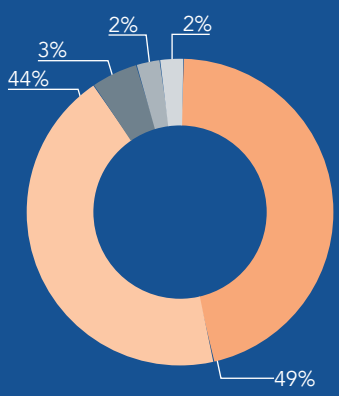
The GES program prepares students to excel in post-GES endeavors such as:

- Graduate studies in environmental, sustainability, science, and engineering-related fields;
- Professional degree programs in environmental law and policy, environmental and public planning, public health administration, travel industry management, sustainability, etc.;
- Environmental Science-related positions in private industry (environmental consulting, non-governmental agencies, etc.)
- Environmental Science-related positions in local, state, and federal government agencies;
- Entering or returning to teaching with knowledge of how the Earth system works; and
- Entering the work force in another field as an educated person with the knowledge required to enable us to become wise environmental stewards of the planet.

ALUMNI EMPLOYMENT STATISTICS

As of 2018, employment 0-12 months after graduation for alumni who graduated from 2013-2018.

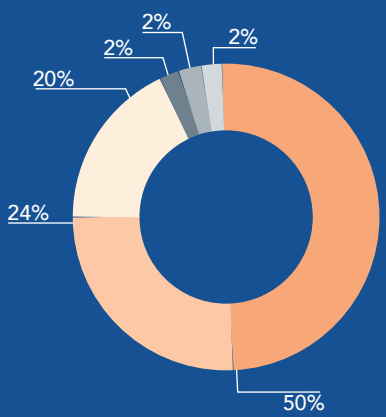
55 RESPONSES OUT OF 59 = 93% RESPONSE RATE



- Employed full time (27)
- Attending graduate or professional school, employed part-time or full-time (24)
- Working part time, looking for full-time work (2)
- Gap Year (1)
- Unemployed (1)

As of 2018, category of employment 0-12 months after graduation for alumni who graduated from 2013-2018.

55 RESPONSES OUT OF 59 = 93% RESPONSE RATE



- Education and Academia (28)
- Private Industry and Consulting (13)
- Government, and Public and Social Service (11)
- Other (1)
- Gap Year (1)
- Unemployed (1)

TABLE OF CONTENTS

MESSAGE FROM THE PROGRAM

ALOHA GES ‘OHANA

As we transition into the 2019-2020 academic year, we are excited to share with you the program’s third annual report!

The stories contained in this annual report share the experiences and adventures of current GES students, alumni, and program updates. We hope the stories in this report inspire you as much as they do us working daily with the students.

The program continues to evolve its curricular opportunities. There are now five tracks/concentrations (Environmental Anthropology, Environmental Health Sciences, Environmental Planning, Sustainability Science, and Sustainable Tourism). There also are two combined Bachelor’s-and-Master’s (BAM) pathways--one with the Master of Urban and Regional Planning and the other with the Master of Public Health, Epidemiology emphasis--and both of these pathways end in nationally-accredited MS degrees. These pathways allow GES students to get their BS and MS in a total of five years. In addition to finalizing several other tracks and BAM pathways, we are also talking about initiating a study abroad opportunity for GES students!

This past summer, the GES lounge underwent a significant renovation with a fresh coat of paint and new furniture, including a sectional sofa, study carrels, and tables and chairs, all of which were donated to the program (see below pictures). The project was coordinated by Lentina Villa, who joined the program in April 2018 and has since been providing support to the GES students and faculty. Could a sink be next?! Stay tuned! Finally, a big mahalo to the UH Sea Level Center and Director Dr. Phil Thompson for helping once again cover a portion of the annual report's production cost.

UNIVERSITY OF HAWAII
SEA LEVEL CENTER

PHOTO CREDIT: JESSICA MURRAY▲

KEALOHI SABATE PARTICIPATED IN A RESEARCH EXPERIENCE FOR UNDERGRADUATES THROUGH THE ORGANIZATION OF TROPICAL STUDIES DURING THE SUMMER OF 2019 IN COSTA RICA. HER RESEARCH FOCUSED ON LOOKING AT THE TEMPERATURE SENSITIVITIES OF CANOPY SOILS AND HOW THEY MAY INFLUENCE CARBON CYCLING ACROSS DIFFERENT CLIMATES.

STRIVING TO REPRESENT

KEALOHI SABATE

Growing up, I found there is this misconception that it takes a certain type of person to be in Science, Technology, Engineering and Math (STEM). Especially as a Native Hawaiian, I didn't see very many people like me, which made it harder for me to picture that being in STEM was possible. As a kid, my life revolved around the environment. Most of my days were spent surfing at the beach or hiking up the mountains and I think things really clicked for me once I noticed a lot of my favorite places had started to fade with development and erosion. At that point, I knew I wanted to do something to protect my island from modernization, but I just didn't know how I'd do that. I've always had an interest in the environment, but it was something that didn't seem right to pursue in my household because it wouldn't guarantee myself a good-paying job. Also as the first to pursue a STEM degree in my family, it just seemed like something that was too hard to achieve. I think once I was able to look past the difficulties of science, it made me really focus on the end goal of why I am here in the first place. As a Native Hawaiian, I want to be able to protect and serve my ʻāina as a kuleana of what my kupuna had done before me.

As a Global Environmental Science (GES) major, it has really given myself opportunities that I didn't think were possible. The knowledge and support this program has given me through the network of my fellow GES faculty and peers has really provided me with a strong foundation for success in STEM. In the past year alone, I was given the amazing opportunity to travel to Texas, Puerto Rico, and Costa Rica to present my research as well as participate in a summer internship. Without my network, I wouldn't have been able to travel to all these places, cost-free, as well as explore my interests with confidence knowing that I wouldn't be alone.

Research was something that I wasn't particularly interested in as an up-and-coming scientist, but over the years I have learned that in order to understand our changing planet, you have to immerse yourself in nature to do so. This past summer I participated in a Research Experience for Undergraduates under the Organization of Tropical Studies in Costa Rica. There I studied canopy soils and their sensitivity towards temperature fluxes. Not only was I able to climb 100ft trees this summer, but I also gained more technical skills with sensor work and coding in R. Being in STEM has given me so many opportunities, funded so much that I could never afford, and presented me with some of the most unforgettable life experiences. I know science isn't for everyone, but that doesn't mean it's impossible. This is what I've been doing this far in my career, and I hope to inspire more like me to join in protecting our precious environment.

HOPE FOR CONSERVATION IN THE LAST FRONTIER

ANDREW TOKUDA

PHOTO CREDIT: JACOB ARGUETA ▲

COLLECTING SALMON MEASUREMENTS FOR POPULATION ASSESSMENTS IN TUTKA BAY, KENAI PENINSULA, ALASKA.

During the Summer of 2019, I was given the privilege to intern at the Kachemak Bay National Estuarine Research Reserve (KBNERR) as part of the National Oceanographic and Atmospheric Administration Ernest F. Hollings Scholarship Program. The reserve is located in Homer, a small city situated in the southern region of the Kenai Peninsula, Alaska. Ever since being inspired by Dr. Jeffrey Drazen's insights on fisheries management, I always wanted to conduct fisheries-related research in Alaska. Also known as "The Last Frontier," Alaska has arguably one of the most productive wild salmon fisheries in the world and its untouched habitats serve as ideal locations to conduct conservation-related research. As a senior aspiring to join the U.S Army as an active-duty officer with the dream of improving the dialogue between the military and environmental sciences, I wanted an internship that would encompass both terrestrial and marine environments, and upon further research, I found that the KBNERR would be a perfect fit. Along with my mentors (Nina Garfield, Coowe Walker, and Chris Guo), I designed a project to characterize riparian prey availability for juvenile salmon in the Anchor River estuary. The Anchor River is a stream that runs approximately 30 miles and intersects a critical habitat area. It is also home to all five species of Pacific salmon—making it a popular destination for anglers. Since the consumption of riparian prey is unique to salmon which interact with estuaries, I decided to use riparian prey availability as a metric to determine ecosystem health. By building traps that collected terrestrial prey while simultaneously examining salmon stomach contents, we learned more about terrestrial prey composition and how different environmental parameters can potentially affect salmons' preference of going after terrestrial prey over aquatic prey and vise versa. My project created a baseline for terrestrial organism identification at the estuary and will feed into the ongoing research done at the reserve. By participating in other researchers' projects, I was personally surprised to discover how estuaries play such a critical role in the life-cycles of Alaskan fish, many of which are commercially valuable. Estuarine systems can also be quite vulnerable and damaging one can pose a myriad of complications in terms of ecosystem health, and this can affect local communities which heavily rely on it. Hawai'i is no exception; we also have estuaries which house numerous species of fish which are both ecologically and economically substantial. I am beyond grateful to have been able to work with a family of such passionate and knowledgeable researchers, as well as being able to socialize with the local community, and further realizing that both had a common mindset of taking care of the environment for future generations.

GROWING FROM DIVERSE SEEDS TO A BLOSSOMING FOREST

AMANDA WONG

PHOTO CREDIT: FRED ABBOTT ▲

AMANDA WONG LEARNING ABOUT ECOLOGY AT DELICATE ARCH IN ARCHES NATIONAL PARK, UTAH AS A PART OF HER ESA SEEDS FELLOWSHIP IN APRIL OF 2019.

From the cool and fishy Finger Lakes in New York to the bountiful biodiversity of the Sky Islands in Arizona to the rocks and ranches of Utah, I donned my ecology thinking cap as a Strategies for Ecology Education, Diversity, and Sustainability (SEEDS) fellow. SEEDS is the education program of the Ecological Society of America (ESA) that promotes the diversification of the ecology field. The SEEDS Partnerships for Undergraduate Research Fellowship is the "highest honor in the SEEDS program." As part of my SEEDS Fellowship, I had the opportunity to conduct a science research project at a SEEDS partner site over the summer of 2018 at Cornell University, participate in the SEEDS Leadership Meeting in Portal, Arizona, attend the SEEDS Spring National Field Trip to Utah on the Colorado Plateau, and present my research project at ESA's Annual Meeting in Louisville, Kentucky in August of 2019.

During my SEEDS summer internship in 2018, I worked under the mentorship of Dr. David Lodge, Dr. Jose Andres, and Dr. Paul Czechowski in the Ecology and Evolutionary Department at Cornell University. The goal of my project was to improve the feasibility of detecting the invasive aquatic weed, Hydrilla verticillata, in the field with faster and cheaper techniques. We utilized the non-destructive techniques of collecting water samples for Hydrilla eDNA coupled with Loop-Medicated Isothermal Amplification (LAMP) for DNA amplification to detect Hydrilla eDNA based on a color change. Theoretically, the degree of color change from pink to orange to yellow can inform us of the presence and abundance of Hydrilla in the water body. The ultimate goal of this project is to make these eDNA and LAMP techniques feasible for managers to detect Hydrilla early on at a rapid rate in the field by collecting a water sample to identify Hydrilla eDNA based on a change in color. At Cornell University, I also had the opportunity to collect Daphnia from Honeoye Lake with Dr. Nelson Hairston and seine for the invasive round goby in Cayuga Lake.

Along with my SEEDS summer internship, I had the opportunity to attend the SEEDS leadership meeting with SEEDS chapter representatives from campuses across the nation at the Southwestern Research Station in Portal, Arizona in September of 2018. During the leadership meeting, we discussed the implications of political borders on ecosystem management and policies and attended workshops on leadership, science communication, and public policy. I also witnessed my first skunk (from a distance), held my first snake, and temporarily noosed lizards for data collection! Through my SEEDS fellowship, I also had the opportunity to attend the SEEDS field trip to The Nature Conservancy's Canyonlands Research Center in Monticello, Utah in April of 2019. I learned about the multiple research projects at the center on the living biocrust of the semi-arid lands and the operations of the working ranch, while also exploring the spectacular canyons and rock formations of Canyonlands National Park and Arches National Park.

The Global Environmental Science (GES) Program has provided me with a strong foundation in STEM and the opportunity to follow my passion and interests through the thesis project, which has equipped me with the knowledge and skills that got me to where I am today. Amongst my achievements along my GES journey, I am most proud of receiving the SEEDS Fellowship as one of eight SEEDS fellows from across the US within my 2018-2019 cohort. If it weren't for the GES Program and my diverse and knowledgeable GES friends, I would not be a SEEDS fellow, equipped with the potential to become "outstanding leaders in the future of ESA" as fellows are encouraged to do so, and for that, I am forever grateful!

TACKLING THE PLASTIC PROBLEM: ONE FRAGMENT AT A TIME

KAYLA CHANTEL BRIGNAC

In 2016 I came to Hawai'i to start a new chapter in life through the GES program, not realizing that this was the beginning of a journey of a lifetime. Prior to entering the GES program, I worked for a non-profit called Environment California where we worked on many projects, but one in my particular interest was petitioning for a plastic bag ban in southern California. I had grown up in Oceanside, a surfing community along the southern California coast, and in my lifetime I have seen the beaches change as plastic pollution became more evident. At the time, the North Pacific Garbage Patch was all the rage, and although southern California had large debris pieces wash ashore, it was nothing in magnitude compared to the marine debris loads Hawai'i receives. I realized that if I really wanted to make change and do something about this growing problem, I needed to further my education. The GES program and its research thesis requirement provided an outlet for me to conduct and customize research that I was interested in with hopes to find solutions to this plastic pollution crisis.

I had a strong background in chemistry that developed while being a student at Palomar College in California. So, while pursuing my GES degree, I also received a minor in chemistry. The GES program was flexible enough to ultimately allow me to customize an environmental chemistry track within the degree, providing me with a specialized skill set that has served to be very useful for professional jobs. While completing my degree, I was supported by two National Institute of Standards and Technology (NIST) Summer Undergraduate Research Fellowships under the mentorship of Dr. Jennifer Lynch, co-authored three scientific publications, and attended seven conferences, symposiums, and/or workshops that all centered around plastic pollution. Funding for all these experiences was provided by NIST and the University of Hawai'i at Mānoa Undergraduate Research Opportunities Program, while facilities were provided by Hawai'i Pacific University (HPU). My research thesis titled "Marine Debris Polymers on Main Hawaiian Island Beaches, Sea Surface, and Seafloor", under the mentorship of Dr. Jennifer Lynch and Dr. James Potemra, fueled my career in plastic pollution as it provides a profile of plastic polymers in different environmental compartments across the state of Hawai'i. This work is currently in peer-review with the scientific journal Environmental Science and Technology and has been utilized as a foundation for many other studies.

My background in chemistry, flexibility of the GES program, funding opportunities, and amazing mentorship got me to where I am today, which is a research and technician position in the Center for Marine Debris Research at HPU. In the near future I will be going back to school to obtain a graduate degree in polymer science. Polymer science expertise is severely lacking in the marine debris field yet is critical for understanding how environmental parameters affect the physical and chemical properties of plastic polymers. Through all of this I just hope to educate and spread awareness about the complexity of plastic pollution, while promoting sustainability.

PHOTO CREDIT: KAYLA BRIGNAC/DR. JENNIFER LYNCH ▲

KAYLA USING RAMAN SPECTROSCOPY TO IDENTIFY THE POLYMER COMPOSITION OF HAWAIIAN BEACH DEBRIS.

THE AMAZON: WORKING TOWARDS SUSTAINABLE SOLUTIONS

EDUARDO GUIMARAES

The Amazon Forest is the largest rainforest in the world. Brazil, my home country, possesses 60% of the total area from this Natural World Heritage ecosystem. The Amazon provides essential ecosystem services for the planet such as carbon storage, albedo, rich flora and fauna. And it is also rich in several valuable minerals and other industrial and commercial commodities. For being such a rich and unique territory, the Amazon is constantly being threatened by illegal miners, cattle ranchers, or simply wildfires which are spread by the population, especially in the dry season. The Amazon is a central theme currently in the international environmental debate and I am fortunate to be playing a role in its future.

At 3pm, August 19th, 2019, São Paulo was enveloped by darkness. Some would believe the apocalypse had arrived in Brazil's largest city and economic center, and in some ways it actually did, as the darkness was caused by air particles from the large scale burning of the Amazon forest. Skeptics say the fires are part of the natural system as a way of bringing the nutrients from the trees back into the soil and renewing the forest. However, in the Amazon situation, there is a direct relationship between deforestation and forest fires, which are a result from illegal cattle ranchers opening land for pasture. These practices are very unsustainable, both environmentally and economically speaking. It is proven that Brazil already has enough cleared land to support its meat industry (which is already a significant polluter itself!) and so there is no need to burn and clear forest for more meat production. Secondly, one of our largest international meat customers, the European Union (EU), is in favor of sanctions against unsustainable practices that are tied to Brazilian products. We must find another way as a country.

In 2017-2018, I was an Environmental Affairs Intern for the United Nations Environment Programme in Geneva, where I assisted the Strategic Approach to International Chemicals Management team on the development of an international chemicals agenda. I was also the President of the United Nations Environment Programme Intern Board and fought for developing a better experience for UN Interns. Through the UN internship, I was amazed about the complexities and challenges of bringing several stakeholders together to make progress on an issue. For this reason, I decided to return to my country and make contributions to addressing complex environmental matters by bringing together multiple stakeholders. Today, I am an Innovation Trainee for the largest Environmental Engineering Company in Latin America working to find innovative, sustainable solutions to large problems such as the Amazon.

PHOTO CREDIT: PILAR GOMIS ▲

EDUARDO VISITING A GLACIER WHILE AT HIS UN ENVIRONMENT INTERNSHIP EXPERIENCE.

ALUMNI SPOTLIGHT

HANNAH SCHUCHMANN

PHOTO CREDIT: PETER MANNION ▲

HANNAH EXPLORED CAVES AND TIDE POOLS ON HER BIRTHDAY WITH DAUGHTER REMY LEIA AT NEARBY CAVES BEACH, A FEW HOURS NORTH OF SYDNEY, AUSTRALIA.

I transferred into the GES program in Fall 2013 from the Environmental Science program at Texas A&M University Corpus Christi. For my GES thesis research, I was fortunate to land a position (with mentor Dr. Nicole Lautze) assessing the geothermal energy potential of Hawaii using surface features. After graduating from the GES program in Spring 2015, I moved to Australia to be with my fiancé Pete, an Aussie, who I met in Hawaii. We got married, welcomed our daughter, Remy Leia, in 2016 and later that year I began working for the New South Wales (NSW) Environment Protection Authority (EPA), which is the primary environmental regulator for the state. Prior to being hired at the EPA, I had considered going to grad school, and had contacted the head of chemical engineering at the University of Newcastle who was doing some awesome projects involving renewable energy. In Australia, master/PhD are entirely research based (i.e. no coursework).

Shortly after I got hired at the EPA I was also accepted as a grad student in the chemical engineering department and offered a full tuition scholarship and living allowance stipend for a research proposal involving the functionalization of coal tailings (a waste product of the coal industry). For about 6 months I worked at the EPA part time while putting in full-time hours of post-grad work researching and writing my literature review for my thesis. Long story short, after some soul searching, I decided to put my post-grad research on hold and focus on my career with the EPA, a decision I have been very happy with.

My GES degree (especially Calculus courses, Biogeochemical Systems and the chemistry/renewable energy basis of my thesis) was vital in landing my post-grad research position as well as my current job with the EPA. I would not have been qualified for either opportunity without these my GES degree and accompanying thesis. My current job title is Operations Officer at the NSW EPA and my primary role is ensuring compliance with NSW environmental legislation and policies is achieved at premises that hold an Environment Protection Licence. The types of industries I've worked with range from coal mines, steel mills, chemical plants and quarries to sewage treatment plants, landfills, compost facilities, and poultry farms. Day to day activities include site inspections, investigations into non-compliances and public complaints, drafting letters or legal notices, reviewing reports and licence variation requests, determining emission limits and responding to pollution incidents. I absolutely love my job – it's challenging but not over the top high pressure, it's fun and interesting and very diverse and the culture is wonderful with lots of flexible work arrangements.

I had a great GES experience, the staff in the department are some of the best in their research areas from around the world and I met some amazing friends that I'm still in touch with today. It was challenging for sure, but nothing good in life comes easy. If I could go back to the start of my time in GES, I would probably try to master the art of the 5am wake up and definitely put more of a focus on fostering grade A time management/ task prioritisation and focus techniques (i.e. the Pomodoro Technique for productive bursts) so I would have had more free time to explore the islands - plus I needed those skills anyways for my job so I should have just started earlier and enjoyed more balance!

PHOTO CREDIT: NOAH HOWINS ▲

SPRING AND SUMMER 2019 GRADUATES AT THE 108TH ANNUAL COMMENCEMENT EXERCISE.

MESSAGES FROM THE ALUMNI

"Don't take "No" for an answer and follow your passion regardless of what everyone else says. Only you know what is best for you. If you want something bad enough you will make it happen and things will fall into place."

- KAYLA BRIGNAC, '18

"Take it slow, and don't procrastinate."

- WILLIAM ROBERT KELLY, '18

"Relax, you don't have to have everything figured out. The older you get you will realize that it is not about the destination, it's about the journey. P.S. listen to your mother!"

- TINEILL DUDOIT, '18

"Start writing your GES thesis way earlier than you think you need to!"

- NO'EAU MACHADO, '19

"Stand up for yourself. Freshman year is a new experience and a place to grow. Try out new things, remember to breathe, and don't forget to share your feelings."

- CUONG TRAN, '19

"Take yourself seriously! Just because you're starting out doesn't mean you aren't valuable in lab settings/for projects!"

- BRENNA CARROLL, '19

"When life happens, don't dwell on the negativity, but rather on the lessons that can be learned from it. It's okay. (: "

- ULISES DIAZ, '19

"Reach out to upperclassmen for advice! A considerable number have research experience and have taken the classes you will be taking. Hindsight is 20/20!"

- NOAH HOWINS, '19

"I would advise GES students that they are not alone in their journey through GES. Although the GES curriculum is rigorous, GES faculty, staff, and fellow students are here to support you on your journey. GES is a tight knit family to me, and I hope you can share the same experience as me by joining the GES 'ohana."

- AMANDA WONG, '19

AWARDS AND SCHOLARSHIPS

GES recognizes the following students for their academic achievement while in pursuit of their degree.

MĀNOA DEAN'S LIST

Glenn Arnade, Arisa Barcinas, Dylan Boeman, Honour Booth, Solomon Chen, Kayli Ching, Maegan Chow, Meghan Corson, Zoe Curley, Samantha Darin, A'ja-Faith Greene, Cherryle Heu, Tina Huynh-Nguyen, Seraphina King, Aiyana Kleefisch, Tabatha Knudson, Diana Lopera, Noeau Machado, Rayna McClintock, Shannon Murphy, Brylin Nelson, Kelsey Nichols, Kayla Palmer, Alyssa Renteria, Kealohi Sabate, Andrew Tokuda, Cuong Tran, Jakkob Wagenvoord, Henrik Weiberg, Amanda Wong, Shaun Wriston, Eleanor Yuan

MĀNOA HONORS PROGRAM

Solomon Chen, Noah Howins, Kelsey Nichols, Amanda Wong

MĀNOA HONORS SOCIETY

Phi Beta Kappa - Cuong Tran, Amanda Wong

108TH ANNUAL COMMENCEMENT EXERCISE SOEST STUDENT MARSHAL

Cuong Tran

44TH ANNUAL ALBERT L. TESTER MEMORIAL SYMPOSIUM

Best Undergraduate Poster Presentations - Brenna Carroll, Andrew Tokuda

MĀNOA UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM

Kealohi Sabate, Andrew Tokuda, Cuong Tran, Henrik Weiberg, Amanda Wong

UNIVERSITY OF HAWAI'I SCHOLARSHIPS

UH Stars of Oceania Scholarship - Diana Lopera
UH Athletic Scholarship (Beach Volleyball) - Anna Maidment
ASUH Scholarship - Solomon Chen, Henrik Weiberg
Chancellor Virginia S. Hinshaw Scholarship in Sustainability - Alyssa Renteria
Mānoa Achievement Scholarship SOEST - Solomon Chen, Amanda Wong
Mānoa Achievement Asia-Pacific Scholarship - Solomon Chen
Mānoa International Excellence Scholarship - Anna Maidment
Peter Rappa Sea Grant Fellowship - Honour Booth
Rose and Hao-Lin Tseng Family Scholarship - Solomon Chen
SOEST Dean's Undergraduate Scholarship - Alyssa Renteria
Sherwood Maynard Award - Ray Aivazian III

GLOBAL ENVIRONMENTAL SCIENCE SCHOLARSHIPS

Sarp M. Kayan Scholarship - Kealohi Sabate, Shaun Wriston
Frances K.C. Foo Sr. & Evelyn S. Foo Scholarship - Noah Howins

EXTERNAL AWARDS AND OPPORTUNITIES

Ecological Society of America SEEDS Fellowship - Amanda Wong
Global Sustainability Scholars Program - Vanessa Villanueva
MIT Summer Research Program Award - Solomon Chen
NOAA Ernest F. Hollings Undergraduate Scholarship - Diana Lopera, Andrew Tokuda, Cuong Tran
NSF Center of Sustainable Nanotechnology Summer Fellowship - Solomon Chen
NSF Geo-Future Program Award - Solomon Chen
NSF Graduate Research Fellow - Cuong Tran
NSF Research Experiences for Undergraduates - Kealohi Sabate
Oregon Sea Grant Summer Scholar Program - Honour Booth
Woods Hole Oceanographic Institution Summer Student Fellowship - Solomon Chen
Woods Hole Oceanographic Institution Academic Program Office Travel Award - Solomon Chen

NOAA Ernest F. Hollings Undergraduate Scholarship - Diana Lopera, Andrew Tokuda, Cuong Tran
NSF Center of Sustainable Nanotechnology Summer Fellowship - Solomon Chen
NSF Geo-Future Program Award - Solomon Chen
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Oregon Sea Grant Summer Scholar Program - Honour Booth
Woods Hole Oceanographic Institution Summer Student Fellowship - Solomon Chen
Woods Hole Oceanographic Institution Academic Program Office Travel Award - Solomon Chen

2018 - 2019 GRADUATES

FALL 2018

KAYLA BRIGNAC
Presented "Identification and Spatial Distribution of Plastic Marine Debris Polymers in the Hawaiian Islands: Beach, Sea Surface, and Seafloor" with Dr. James Potemra from Oceanography and Dr. Jennifer Lynch from National Institute of Standards and Technology.

TINEILL DUDOIT
Presented "The Use of Groundwater Geochemistry to Prospect for Blind Geothermal Resources in the State of Hawai'i" with Dr. Nicole Lautze from Hawai'i Institute of Geophysics and Planetology.

WILLIAM KELLY
Presented "Critical Assessment of Utilizing Constructed Wetlands to Sustainably Treat Petroleum Industry Wastewater" with Dr. Michael Cooney from Hawaii Natural Energy Institute.

SPRING 2019

HONOUR BOOTH
Presented "Assessing the Sunscreen Sheen: Determining the Presence and Persistence of Organic Ultraviolet Filters in the Waters of the Hanauma Bay Marine Life Conservation District" with Dr. Philip Williams from Chemistry.

BRENNA CARROLL
Presented "Effects of Future Ocean Conditions on the Microbiome of Crustose Coralline Algae with Implications for Coral Settlement and Growth" with Dr. Craig Nelson from Oceanography.

NO`EAU MACHADO
Presented "Nā wai momona `o Meheanu: Correlation of He'eia Fishpond Plankton Community Abundance and Distribution in Response to Environmental Conditions" with Dr. Rosie Alegado from Oceanography.

CUONG TRAN
Presented "Updating Historical Shoreline Change Rates of North Kā`anapali, Honokōwai, and Kahana, West Maui" with Dr. Charles "Chip" Fletcher from Earth Sciences.

SUMMER 2019

ULISES DIAZ
Presented the "Tracking Shoreline Morphology Using Drone Based Photogrammetry on Rockpiles Beach in Hawai`i" with Dr. Martin Guiles from Oceanography.

NOAH HOWINS
Tresented on "Impact of Physical Reef Characteristics on Calcification Rates of the Kāneo'he Bay Barrier Reef" with Dr. Eric De Carlo and Dr. Christopher Sabine from Oceanography.

AMANDA WONG
presented on "The Seedling Skirmish: The Effect of 'Ōhi'a and Strawberry Guava Plant Neighbors in Hawai'i" with Dr. Kasey Barton from Botany.

CONNECTING WITH ALUMNI SERIES

In our hopes to bridge the gap between current GES students and the expanding alumni base, we offer this opportunity for GES graduates to visit the University of Hawaii at Manoa campus and interact in an informal environment with a small group of GES students. Alumni will visit our current GES students to share their experiences in the program and now the workforce.

BRETT MARCHANT ▲

KIMBERLEY (MAYFIELD) BITTERWOLF ▲

HEIDI (NEEDHAM) KĀNE ▲

FALL 2018

BRETT MARCHANT is an Oceans Project Officer with the Government of Canada in Vancouver, BC. He helps identify and implement marine protected areas and other sensitive habitats in the Pacific from human-based disturbances. Brett graduated in 2008.

SPRING 2019

KIMBERLEY (MAYFIELD) BITTERWOLF is a PhD candidate at the University of California, Santa Cruz, in the Ocean Sciences department. Her current research revolves around the isotope geochemistry (Li, Mg, Ca, Sr, and Ba isotope systems) of the Fraser River, coastal groundwater discharge, and seawater of the Red Sea. Kimberley graduated in 2014.

[AS OF SPRING 2019] **HEIDI (NEEDHAM) KĀNE** was the STEM Diversity Coordinator for the University of Hawai'i's Office of STEM Education. Heidi previously held the position of program manager for the SOEST Maile Mentoring Bridge, a peer mentoring program which aims to inspire Native Hawaiians, kama'āina, and underrepresented ethnicities into geoscience professions at the School of Ocean and Earth Science and Technology. Heidi graduated in 2014.

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