

Veronica Gibson

ABD-PhD

Department of Botany, School of Life Sciences
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RESEARCH INTERESTS

My research focuses on macroalgal physiology and ecology, and the ecohydrology of submarine groundwater discharge influenced reefs. My work also spans the social ecological systems and biocultural values of groundwater dependent ecosystems and nearshore reefs, and the co-revitalization of Indigenous knowledge and ecology. I strive for excellence in developing reciprocal knowledge sharing relationships with community stakeholders, and in teaching and learning about natural sciences and social ecological systems at all levels. Through my dedication to marine science I work to facilitate spaces for and mentor diverse students, especially Indigenous, underrepresented and neurodiverse students, to build confidence, scientific skill sets and effective communication. I am dedicated to contributing to marine science, mentorship of a diverse and ethical next generation of marine scientists, and creating knowledge sharing networks for better stewardship and conservation of not only coastal marine systems, but the interconnected whole-island and Pacific biomes throughout Oceania.

EDUCATION

Master of Science, Marine Botany, Ecology, Evolution, and Conservation Biology Specialization, May 2018
College of Natural Sciences, University of Hawai'i at Mānoa, Honolulu, HI GPA 3.76

Bachelor of Science, Global Environmental Science, Oceanography, Botany minor December 2012
School of Ocean Earth Science Technology, University of Hawai'i at Mānoa, Honolulu, HI GPA 3.71

APPOINTMENTS

Oceanography Department, School of Ocean Earth Science and Technology, University of Hawai'i at Mānoa
Teaching Assistant : Science of the Sea (OCN 201) Fall 2017, Fall 2018, current

Position description: Led undergraduate oceanography laboratory classes where I lectured on oceanographic geology, chemistry, and biological oceanography and led students through experiments, use of oceanic computer databases, and field trips.

Botany Department, Natural Sciences, University of Hawai'i at Mānoa

Teaching Assistant : Plant Evolutionary Diversity (BOT 201, 2 semesters), Algal Diversity and Evolution (BOT 480, lead TA for one semester, 4 semesters total), Adaptations of Plants to Marine Environments (BOT 682), Advanced Botanical Problems (BOT 612), and Introduction to Botany (BOT 101) August 2014-May 2018 (except Fall 2017)

Position description: Led botany laboratory courses; lectured on botanical, mycological, and phycological diversity; taught proper microscope use; assisted students in laboratory exercises and herbarium construction; graded lab reports, quizzes, essays, and presentations; led field trips for herbaria collections. For writing intensive courses: provided rigorous feedback on weekly essays and presentations to prepare students for scientific writing and speaking. Guided both graduate and undergraduate students through experimental design, analysis, and communication of results. Delivered lectures in the lecture section for the algal evolutionary diversity lecture section each semester. Taught at the undergraduate introductory through senior and graduate levels.

Sea Grant Fellow: Water Resource Research Center and Hawai'i Economic Research Organization (UHRO)
Graduate Assistant, PI: Dr. Leah Bremer May 2021-May 2022

Position description: As part of a cross-disciplinary team of economists, social scientists, hydrologists, and marine biologists: identified socio-cultural and economic values associated with Kona's groundwater dependent ecosystems (GDEs). Conducted an in-depth case study linking submarine groundwater discharge (SGD) quality and quantity to nearshore reef systems and algal blooms, and evaluated the potential impacts of groundwater pumping, nutrient inputs, and/or climate change on this linked resource. Acted as field lead for algal community diversity surveys along the Kona coast, which were used as a baseline for a model depicting current and future algal biomass based on various land use and climate change scenarios. Evaluated links between cesspool and septic pollution and restoration and GDEs and their values in order to examine spatially targeted investments in watershed conservation and restoration. Disseminated results to community stakeholders through an iterative process. Through this position I am acting as co-author on three upcoming publications.

'Ike Wai EPSCOR and Hawaii Economic Research Organization (UHRO), College of Social Sciences, Social Science Research Institute in collaboration with the Water Resources Research Center, University of Hawai'i at Mānoa

Graduate Assistant, PI: Dr. Leah Bremer

September 2018-May 2021

Project description: "To ensure Hawai'i's future water security through an integrated program of research, education, community engagement, and decision support. Its vision is to promote water resource management in Hawai'i that is sustainable, responsible, and data driven. Scientific, cultural, and social dimensions to the problem of water security are integrated in a transparent, stakeholder-driven, and rigorous water research enterprise.

Position description: Conducted an interview series with lineal descendents of Kailua Kona and resource managers focused on the biocultural values and care of groundwater dependent ecosystems (nearshore reefs, loko i'a aquaculture systems, and anchialine pools) on the Kona coast. Results of this study were analyzed using a Hawai'i based ecosystem services framework developed by Pascua (2015). Results and publications underwent an iterative review process with interviewees and community partners. Acted as first author for an academic publication of these results, and for a book written for broader community audiences. Acted as a member of a cross-disciplinary team investigating multiple aspects of the Hualālai and Pu'uloa aquifers and acted as co-author on three additional publications.

Maile Mentoring Program, School of Ocean Earth Science and Technology (SOEST), University of Hawai'i at Mānoa

Maile Mentor

Summer 2015-Present

Position description: Meet with and mentor Native Hawaiian and Pacific Islander undergraduate students in STEM fields throughout the course of their undergraduate careers. Facilitate these student's transition from community college to the university degree program and setting. Provide guidance in STEM, academic planning, academic resources, and future goals.

Mentees: Candice Matsuda, 2016-2018 Global Environmental Science Graduate; Amanda Wong 2018-2019 Global Environmental Science Graduate; Troy Terazono 2021-current, Windward Community College Student with intent to transfer to SOEST

Native Hawaiian Science and Engineering Mentorship Program (NHSEMP) Freshman Bridge, University of Hawai'i at Mānoa

Research Mentor

Summer 2018 and Summer 2021

Position description: Mentored two Native Hawaiian undergraduate students in designing and implementing scientifically rigorous summer research projects, and in communicating research results. For the first project the student designed and implemented coastal benthic community surveys at Wailupe, O'ahu. For the second project I facilitated a collaboration between my mentee and a community partner, Queen Lili'oukalanani Trust. The student led non-metric multidimensional scaling analyses of the community partner's marine intertidal monitoring data based on Our Project in Hawai'i's Intertidal (OPIHI) monitoring protocols. This

mutually beneficial partnership allowed the community partner to get analyses of their monitoring data and support their mission of serving Native Hawaiian youth, while the student made valuable connections and gained experience working with community partners in addition to learning programming in R and statistical methods. In both summers the NHSEMP interns were also paid to work 20 hours per week alongside me on my Wailupe dissertation work and were trained in marine biology field ecology techniques including: water sample collection for Nitrogen tracking; algal collection for physiology measurements and isotopic $\delta^{15}N$ analyses; collection and processing of photo quadrat surveys for algal percent cover and community diversity analyses across environmental gradients.

Mentees: Kelsi Julian-Araki, UH Mānoa-Summer 2018, Keahe Silva, Hawai'i Community College-Summer 2021

School of Ocean and Earth Sciences and Technology (SOEST) University of Hawai'i at Mānoa
Graduate Assistant and Field Lead, PI: Dr. Craig Glenn Summer 2019

Position description: Acted as field team lead on multiple projects examining groundwater pollution linkages to nearshore ecosystems. I put out a call for volunteers, and identified and applied for SOEST funding to hire two paid student field interns. I interviewed and hired two interns who were trained in field methods for benthic community analyses, water and algal tissue sample collection and processing for Nitrogen concentration and isotopic $\delta^{15}N$ analyses. I led our field team in collecting algal samples for isotopic $\delta^{15}N$ analyses and algal community data for collaboration with the lab of Dr. Craig Glenn examining Geochemical and stable isotope source tracking of terrestrial nutrient pollution to the coastal waters of Waialua Bay, North Shore, O'ahu. During this summer I also trained this team of interns to assist with my algal physiology dissertation work at Wailupe, on the South Shore of O'ahu, where they assisted with water and algal sample collection and measurements for photosynthesis using a Junior PAM and tissue water potential using the Chardakov method. One of my hired interns has remained involved in a voluntary capacity and will be included as a co-author on the publication.

Student employees: Angelene Dedloff and Ashley Ostendorf

Limu Lab, University of Hawai'i at Mānoa

Student and Research Mentor

2015-present

Position description: Through the UHM Limu Lab in the UHM Botany department; mentored community college, undergraduate, and graduate students in education, research, science communication, and science career planning. A number of undergraduate and community college students have volunteered with dissertation field work where they were trained on field marine biology methods including algal and water sample collecting and processing. Additionally, mentored 5 undergraduate students in undergraduate thesis projects from asking research questions to successfully applying for undergraduate research funding, field study design and implementation, data analysis, and communication of research results. Our lab also hosted 4 summer Pacific Islander internship students, whom I assisted in mentoring in laboratory work and communication of research results. Additionally, provided mentorship support to visiting summer REU students and entering graduate students.

Mentees: Debbi Yoshimoto, Sarah Albright, Tina Huynh-Nguyen, Kevin Ravago, Kelsey Cushway, Lexi Heaton, Lauren Block, Mackenzie Jahnke, Brianna Ornelas, Scott Van De Verg, Aleca Borsuk, Nozomi Shimizu, Broderick Menke, Cody Takabuki, Katherine Cockerille, Ashley Nalani Olguin, Emmett Henley, Samantha Flounders, Milie Rechirei, and Anita Tsang

Graduate Representative, Ecology, Evolution, and Conservation Biology (EECB) Graduate Program. University of Hawai'i at Mānoa
2017-2019

Position description: Acted as the liaison between faculty and students within the EECB program; attended faculty meetings as a student representative; facilitated student meetings; took student votes on programming decisions; led student outings; organized and facilitated the EECB weekly seminar series by inviting and introducing speakers and organizing workshops; managed program grant opportunity advertisements and worked with faculty to ensure that the courses were offered to satisfy requirements needed for comple-

tion of the program specialization.

Water Resources Research Center, University of Hawai'i at Mānoa

Field and Lab Technician, Samoa, PI: Dr. Rosie Alegado

2015-Fall 2018

Project description: "Identifying future hotspots for algal blooms: A multi-dimensional analysis evaluating impacts of potential land-based sources of pollution on the health of American Samoa's coasts."

Position description: Acted as a field technician for two field seasons, and moved into field lead in the third field season. As field lead: organized a team of microbiologists, hydrologists, and biologists; planned and implement field surveys abroad; made contact with local governance agencies and community groups to facilitate our work. During field seasons: collected and processed algal samples for nitrogen isotope analyses and species identification; collected and processed biofilms for microbial DNA analyses; and collected and processed water samples for nutrient and salinity characterization; assisted with radon surveys to identify sources of submarine groundwater discharge seeps; collaborated with the Nelson Lab in UHM SOEST to collect coral samples along the same gradients of SGD influence where chronic nutrient impacts were seen, these samples were used to examine coral physiology and symbiont assemblages in regions of chronic nutrient impacts.

Aquatic Research Consultants, Honolulu, HI

Field and Laboratory Technician

PI: Dr. Heather Spalding

Summer 2014

Position description: Dissected tilapia and identify gut contents in order to determine food sources and percent composition of tilapia diet in a man made lagoon, as a portion of a larger ecological and environmental impact study of the lagoon.

Advanced Compliance Solutions, Inc., Waipahu, HI

Environmental Scientist, RISE internship

May 2013-Fall 2014

Position description: environmental management system development and implementation; groundwater and injection well monitoring sampling, and permitting; pesticide polluted soil remediation; hazardous waste and oil management; lead based paint maintenance and monitoring; bioenergy plant development.

Barton Plant Physiology Lab, Botany Department, University of Hawai'i at Mānoa

Undergraduate Research Assistant (Plant Evolutionary Ecology), PI: Dr. Kasey Barton

April 2010-May

2012

Project description: Experiments examining Plant Physiology: Evolutionary Ecology, Ontogeny and Herbivore Interactions Position description: Greenhouse, field data and plant collection; laboratory data collection and organization in Microsoft word and Excel; GPS data collection; Junior Pulse Amplitude Modulated Fluorometry measurements; Metadata analysis-Extensive web and library research for citations and scientific journal articles, organization of reference material databases using EndNote.

Smith Phycology Lab, Botany Department, University of Hawai'i at Mānoa

Lab/Field Assistant, Educational outreach, PI: Dr. Celia Smith

November 2011-December 2012

Position description: Assisted in field work examining the ecology of marine plants, marine ecosystem restoration, and educational outreach. Assisted with planning and implementation of invasive algae cleanups in coordination with the Waikīkī Aquarium.

Pacific Island Benthic Habitat Mapping Center, NOAA Coral Reef Conservation Program, School of Ocean Earth Science and Technology, University of Hawai'i at Mānoa

Seafloor Video Analyst, PI: Dr. John Rooney

May 2008-June 2010

Position description: analyzed seafloor video from throughout the Main Hawaiian Islands, Papahānaumokuākea Marine National Monument, U.S. Pacific islands and remote U.S. affiliated islands, and the Indo-Pacific; produced datasets of coral cover and other benthic flora and mobile fauna for ArcGIS Mapping of coral reef

ecosystems which are used for management; became fluent in identification of Hawaiian and Indo-Pacific species of coral, invertebrates, fish, and macroalgae for benthic classification; used Microsoft Excel and Microsoft Access to manage databases; contributed to work describing Mesophotic ecosystems in the northwest Hawaiian Islands, the Au'au Channel, Tutuila, American Samoa, and the Mariana Archipelago, and to Navy contracted analyses of coral assemblages in the Philippines for harbor planning; also contributed to: establishing and evaluating marine protected areas; developing robust sampling designs for monitoring, assessing damage to natural and cultural resources; planning coastal development and mitigation activities; prioritization of conservation efforts; conducting change analyses to detect ecosystem shifts; and developing technologies to more efficiently map coral habitats. Nominated for University of Hawai'i at Mānoa student employee of the year for JIMAR.

KOKUA Program, University of Hawai'i at Mānoa

2012-2013

Here I attended classes and took detailed notes, which were then shared with students in the KOKUA program to ensure equal access to course materials for students with disabilities.

PEER REVIEWED PUBLICATIONS

Gibson, V.L., L.L. Bremer, K. Burnett, N.K. Lui, C.M. Smith. Biocultural values of groundwater dependent ecosystems: a case study from Kona, Hawaii. *Ecology and Society*. In press.

Dulai, H., C.M. Smith, D.W. Amato, **V.L. Gibson** and L.L. Bremer. 2021. Risk to native marine macroalgae from land-use and climate change-related modifications to groundwater discharge in Hawaii. *Limnology and Oceanography*. <https://doi-org.eres.library.manoa.hawaii.edu/10.1002/lol2.10232>

Wada C.A., K.M. Burnett, B.K. Okuhata, J.M.S. Delevaux, H. Dulai, A.I. El-Kadi, **V.L. Gibson**, C.M. Smith, and L.L. Bremer. 2021. Identifying wastewater management tradeoffs: Costs, nearshore water quality, and implications for marine coastal ecosystems in Kona, Hawaii. *PLOS ONE*. 16(9): e0257125. Online: <https://doi.org/10.1371/journal.pone.0257125>

Shuler, C. K., D. W. Amato, **V. L. Gibson**, L. Baker, A. N. Olguin, H. Dulai, C. M. Smith, and R. A. Alegado. 2019. Assessment of Terrigenous Nutrient Loading to Coastal Ecosystems Along a Human Land-Use Gradient, Tutuila, American Samoa. *Hydrology*. 6(1), 18; <https://doi.org/10.3390/hydrology6010018>

Gibson, V.L., C.M. Smith, A. Dedloff, and L.J. Miller. Integrated physiological response to submarine groundwater discharge by four marine plant species at Wailupe, Oahu. Manuscript in preparation.

Gibson, V.L. and C.M. Smith. Benthic community composition of submarine groundwater discharge influenced reefs within Maunalua Bay on the south shore of Oahu. Manuscript in preparation.

Gibson, V.L. and C.M. Smith. The Chardakov Method for measuring tissue solute potential in marine plants. Manuscript in preparation.

Okuhata, B.K., L. L. Bremer, J.M.S. Delevaux, A.R. Don, C. Smith, **V.L. Gibson**, H. Dulai, A. I. El-Kadi, K. M. Burnett, C. A. Wada. "Climate, forest, and wastewater management influences on native and invasive limu in Kona, Hawai'i." Manuscript in preparation.

OTHER PUBLICATIONS

Gibson, V.L. Groundwater Dependent Ecosystems in Kona, Hawaii. Book in preparation.

Gibson, V.L. "Using, valuing, and caring for groundwater dependent ecosystems in Kona, Hawai'i." Hawai'i Sea Grant Blog. Sea Grant, University of Hawaii. May 4, 2022.

PUBLIC TALKS and LECTURES

"Integrated physiological response by four species to submarine groundwater discharge conditions at Wailupe,

O'ahu." Springs: unique habitats in steady decline, Joint Aquatic Sciences Meeting. Consortium of Aquatic Science Societies. May 17, 2022. Devos Place Convention Center, Grand Rapids, MI.

"Biocultural values of groundwater dependent ecosystems in Kona, Hawai'i." Workshop on Energy and Environmental Research. University of Hawai'i Economic Research Organization. Virtual, Honolulu. March 7, 2022.

"Biocultural values of groundwater dependent ecosystems in Kona, Hawai'i." Ocean Sciences Meeting. Virtual, Honolulu. February 28, 2022.

"Integrated response in photosynthesis and tissue water potential by four macroalgal species, *Gracilaria salicornia*, *Hydropuntia perplexa*, *Acanthophora spicifera*, and *Laurencia majuscula* to conditions of submarine groundwater discharge at Wailupe, O'ahu." Ecology, evolution and conservation biology seminar. Virtual, Honolulu. November 12, 2021.

"Coastal macroalgal and wastewater contamination field methods and research in American Samoa and Hawai'i." MSC 160: Natural Marine Resources. Instructor: Megan Curtis. American Samoa Community College. Virtual. November 9, 2021.

"Linked Ecological, Cultural, and Social Values of Groundwater Dependent Ecosystems in Kona, Hawaii." Tropical Island Water Futures: Water for People and Ecosystems in the Face of Change Conference, Water Resource Research Center. Virtual, Honolulu. April 14, 2021.

"Ecological, cultural, and social values of groundwater dependent ecosystems in Kona, Hawaii." Hawaii Conservation Conference. September 1, 2020. Also presented at: Ecology, evolution, and conservation biology seminar. Virtual, Honolulu. March 12, 2021.

"Kona: where groundwater links biology, culture, and practice." Hanauma Talks. Hanauma Bay Education Program. November 19, 2020. Virtual, Honolulu.

"Tissue water potential regulation and photosynthesis by *Gracilaria salicornia* in a submarine groundwater discharge influenced system." Phycological Society of America Annual Meeting. Fort Lauderdale, FL. June 24, 2019.

"Nearshore groundwater dependent ecosystems and their ecological, cultural, and socio-economic values in Kona, Hawai'i." Phycological Society of America Annual Meeting. Fort Lauderdale, FL. June 23, 2019.

"Red Algal Ecology and Submarine Groundwater Discharge." Botany 480: Algal Diversity and Evolution, guest lecture. Instructor: Dr. Celia Smith. University of Hawai'i at Mānoa, St John Plant Sciences Building Rm 11. March 28, 2019.

"Tidal influence on nearshore groundwater dependent ecosystems." Invited panelist. Adaptive Management Symposium on Groundwater Dependent Ecosystems at Kaloko-Honokōhau National Historical Park. State of Hawaii Commission on Water Resource Management. November 8, 2018.

"Assessment of Terrigenous Nutrient Loading to Coastal Ecosystems Along a Human Land-Use Gradient, Tutuila, American Samoa." Water Resource Research Center Advisory Board Meeting. Tauese P.F. Sunia Ocean Center. Pago pago, American Samoa. October 16, 2018.

"Red Algal Ecology and Submarine Groundwater Discharge." Botany 480: Algal Diversity and Evolution, guest lecture. Instructor: Dr. Celia Smith. University of Hawai'i at Mānoa, St John Plant Sciences Building Rm 11. March 23, 2018.

"Macroalgal physiological and ecological response to submarine groundwater discharge." Zoology 200: Ma-

rine Biology, guest lecture. Instructor: Mackenzie Manning. February 15, 2018.

“Macroalgal Physiological and Ecological Response to Submarine Groundwater Discharge.” Evoluncheon, Ecology Evolution and Conservation Biology Seminar. Gilmore 306, University of Hawai‘i at Mānoa, Honolulu, Hawai‘i. 11:30 a.m. November 17, 2017.

“Macroalgal physiological and ecological response to submarine groundwater discharge in tropical island ecosystems.” Poster presentation. Phycological Society of America Annual Meeting. Lewin Award Contestant. Embassy Suites by Hilton Monterey Bay Seaside, 1441 Canyon Del Rey Boulevard Seaside, CA. 5:00pm. June 5, 2017.

“Does groundwater influence algal communities?” Poster presentation. 42nd annual Albert L. Tester Memorial Symposium, Keoni Auditorium, East-West Center, University of Hawai‘i at Mānoa. April 26, 2017.

“Red Algal Ecology and Submarine Groundwater Discharge.” Botany 480: Algal Diversity and Evolution, guest lecture. Instructor: Dr. Celia Smith. University of Hawai‘i at Mānoa, St John Plant Sciences Building Rm 11. March 23, 2017.

“Assessment of land based sources of pollution to reefs of Tutuila, American Samoa.” Evoluncheon, Ecology Evolution and Conservation Biology Seminar. Gilmore 306, University of Hawai‘i at Mānoa, Honolulu, Hawai‘i. 11:30 a.m. October 21, 2016.

“Assessment of land based sources of pollution on coral reefs of Tutuila, American Samoa.” Presentation given to the American Samoa Environmental Protection Agency, Pago Pago, Tutuila, American Samoa, August 22nd, 2016.

“Life at the Coastline: Ocean Interface.” Zoology 200: Marine Biology, guest lecture. Instructor: Mackenzie Manning. February 22, 2016. “Life at the Coastline: Ocean Interface.” Botany Graduate Proposal Symposium. St John Room 11. May 8, 2015.

AWARDS and RESEARCH GRANTS

- Selected participant: International Council for the Exploration of the Sea and North Pacific Marine Science Organization Early Career Scientist Conference. Fully funded conference attendance and travel support. Newfoundland, CA. 2022.
- Symposium Invited speaker: “From High Islands to the Ocean Floor: Pacific Island Plants at the Extreme.” Botany 2022. Botany Society of America. Anchorage, 2022.
- Botany Society of America Ecological Section student travel award, 2022.
- Botany Society of America Physiological Section student travel award, 2022.
- Selected alternate delegate: 2020 Young Pacific Leadership Conference, Cultural Vistas, Port Moresby, Papua New Guinea.
- Phycological Society of America, Grants in aid of research award, 2022
- Graduate Student Organization Research Grant award-Spring 2021, Spring 2019, Spring 2017
- WRRRC grant for research in American Samoa-2016-2018
- Hoshaw Travel Grant, Phycological Society of America-Summer 2017, Summer 2019
- Ecology, Evolution, and Conservation Biology Watson T. Yoshimoto Fellowship- Spring 2017
- Rewarding Internships for Sustainable Employment Intern, KUPU Hawaii-May 2013
- Undergraduate Research Opportunities Program Grant for Thesis Research- Spring 2012
- School of Ocean and Earth Science Technology Departmental Scholarship for Academic Achievement-Fall 2011

- Federal Smart Grant: Fall 2009-Spring 2010 and Fall 2010-Spring 2011
- Student Ambassador, School of Ocean Earth Science and Technology- Spring 2011
- Alan Church Award for Environmental Stewardship- Fall 2010
- Francis K.C. Foo Sr. and Evelyn S. Foo Endowed scholarship for Global Environmental Science-Fall 2010
- University of Hawai'i at Mānoa Botany Departmental Merit Scholarship-Spring 2010
- Student Employee of the Year- Joint Institute for Marine and Atmospheric Research Nominee, University of Hawai'i at Mānoa, for my work with the Benthic Habitat Mapping Center, NOAA-2009

MARINE SCIENCE CONSULTING

- Hui Kaloko-Honōkohau, Kaloko Honōkohau National Historical Park: I provide scientific consulting and field science training for Native Hawaiian-led community restoration and management of Kaloko Loko i'a in Kailua Kona in development of community based limu (macroalgae) monitoring. In collaboration with loko i'a practitioner and steward Loke Aloua we are working to train community resource managers in benthic quadrat surveys, macroalgal identification, and algal tissue collection for Nitrogen source tracking.
- Huliāmahi Institutional Learning Outcome Project, Kapi'olani Community College Information and Computer Science Program: Provided advising in the development of a loko i'a based curriculum for teaching heritability in object classes for computer science with Asst. Professor Lisa Miller. This addresses the Huliāmahi directive to improve the college's place-based learning outcomes.

COMMUNITY SERVICE

- Surfrider Spirit Session Mentor: provide holistic and ocean based experiential education for at-risk and adjudicated youth through mentorship and teaching of ocean awareness, environmental science, and Hawaiian culture-August 2019-present
- Waikīkī aquarium invasive algae cleanups and Jefferson Elementary School algae education: Aid in the organization of algae cleanup materials, volunteers, and composting of invasive algal biomass in coordination with the Mānoa Limu Lab and community stakeholders. Provide community and volunteer education and invasive algal removal training. 2010-2020.
- Loko i'a fishpond restorations: removal of sediment and invasive plant and algal biomass, outplanting of native macroalgae, and rebuilding of fish pond walls. I have participated in numerous restoration projects including Hui Kaloko Honōkohau, Hui Aloha Kīholo loko i'a fishpond restoration, Waimanalo Limu Hui Pāhonu loko i'a fishpond restoration, and Huihua fishpond restoration at Hulihe'e palace-continuous
- Daughters of Hawai'i: assist to perpetuate the memory and spirit of old Hawai'i, Hawaiian history and historic sites, and to preserve nomenclature and correct pronunciation of the Hawaiian language. I have participated as a volunteer in Hulihe'e palace events, the King Kamehameha III birthday celebration at Keauhou bay, and Pu'uhonua o Hōnaunau National Historical Park Makahiki traditions and annual Hukilau. Youth hula 1994-1996, volunteer 2012-2014, calabash cousin 2019-present.
- Honolulu Elks Club: participate in lodge meetings and charity events, contributions to charitable donations and student scholarships. 2017-present.
- Buddhi Yoga Mānoa, student Registered Independent Organization: founder and president. Organized founding documents and board members, reserved space, organized guest teachers, and taught weekly yoga and meditation classes for the physical, mental, and emotional health of University of Hawai'i at Mānoa students and community members. 2017-2020.