

Veronica L. Gibson

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EDUCATION

Ph.D., Marine Botany, Ecology, Evolution, and Conservation Biology Specialization 2018-2022

College of Natural Sciences, University of Hawaiʻi at Mānoa, Honolulu, HI

Dissertation: Ecohydrology of macroalgae and submarine groundwater discharge on Hawaiian Reefs

M.S., Marine Botany, Ecology, Evolution, and Conservation Biology Specialization 2014-2018

College of Natural Sciences, University of Hawaiʻi at Mānoa, Honolulu, HI

B.S., Global Environmental Science, minor in Botany 2007-2012

School of Ocean Earth Science Technology, University of Hawaiʻi at Mānoa, Honolulu, HI

Thesis: Integrated responses to simulated submarine groundwater discharge; tissue water potential, photosynthesis, and growth comparisons for two intertidal algae species.

EXPERIENCE

Heʻeia National Estuarine Research Reserve Wetland Hydrogeology Postdoctoral Researcher

Hawaiʻi Institute of Marine Biology, University of Hawaiʻi at Mānoa

January 2023-Present

- Leads field and laboratory work for a National Science Collaborative project examining surface and groundwater flow and quality in the Heʻeia ahupuaʻa and watershed including water quality, nutrients, and geochemical tracers.
- Conducts data Quality Assurance/Quality Control (QA/QC) and metadata development on nutrient fluxes, recharge and discharge patterns.
- Compiles existing and new data into an accessible online application for stakeholder use.
- Prepares results for community-based collaborators, publications, and presentations at scientific conferences.
- Works with Heeia Education program to write up project-related activities into education curricula.
- Provides mentorship, direction, guidance, and training to students in experimental techniques.

Teaching Assistant :

Aug 2014-Dec 2018, Aug-Dec 2022

Oceanography and Botany departments, University of Hawaiʻi at Mānoa

- Courses taught: OCN201L, BOT 201L, BOT 480L, BOT 682L, BOT 101L
- Led undergraduate oceanography and undergraduate and graduate botany laboratory classes
- Lectured on oceanographic geology, chemistry, and biological oceanography and led students
- Lectured on botanical, mycological, and phycological diversity; taught microscope use; herbarium construction; graded lab reports, quizzes, essays, and presentations; led field trips for herbaria collections.
- In 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.
- As lead TA coordinated sample collection and laboratory lecture materials across 4 weekly laboratory sections. Addressed student and TA issues.

Graduate Research Assistant

May 2021-May 2022

Water Resource Research Center and Hawaiʻi Economic Research Organization (UHERO)

- Led a publication on biocultural values of groundwater dependent ecosystems in Kona, Hawaiʻi
- Created community and policy focused outreach materials on the cultural and ecological value of groundwater dependent ecosystems in Kona
- Assisted a multidisciplinary team with linking groundwater and marine ecological modeling, collaborative writing and presentations about links between land management and marine ecosystems

Graduate Research Assistant

September 2018-May 2021

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

- 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).
- 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 Mentor

Summer 2015-Fall 2022

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

- Mentored Native Hawaiian and Pacific Islander undergraduate students in STEM fields throughout the course of their undergraduate careers.
- Facilitated these students' transition from community college to the university degree program and setting.
- Provided guidance in STEM, academic planning, academic resources, and future goals.

Research Mentor

Summer 2018 and Summer 2021

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

- Mentored two incoming freshmen students of Native Hawaiian descent in designing and implementing scientifically rigorous summer research projects, and in communicating research results.

Graduate Assistant and Field Lead

Summer 2019

School of Ocean and Earth Sciences and Technology (SOEST) University of Hawai'i at Mānoa

- Acted as field team lead on multiple projects examining groundwater pollution linkages to nearshore ecosystems
- Hired and supervised two undergraduate research interns.
- conducted benthic community analyses, water and algal tissue sample collection and processing for Nitrogen concentration and isotopic $\delta^{15}N$ analyses.
- Led 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.
- Led my algal physiology dissertation work at Wailupe, on the South Shore of O'ahu, where interns assisted with water and algal sample collection and measurements for photosynthesis using a Junior PAM and tissue water potential using the Chardakov method.

Graduate Representative

2017-2019

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

- 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, scheduling and advertising of required course offerings.

Field and Lab Technician, Samoa

2015-Fall 2018

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

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."

- As field lead for one field season: 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
- For three 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.

Field and Laboratory Technician

Summer 2014

Aquatic Research Consultants, Honolulu, HI

- 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.

Environmental Scientist, RISE internship

May 2013-Fall 2014

Advanced Compliance Solutions, Inc., Waipahu, HI

- 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 permitting and development

Undergraduate Research Assistant (Plant Evolutionary Ecology)

April 2010-May 2012

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

- Assist with experiments examining plant physiology: evolutionary ecology, ontogeny and herbivore interactions
- Greenhouse, field data and plant collection; laboratory data collection and organization in Microsoft word and Excel; GPS data collection; Junior Pulse Aplitude Modulated Fluorometry measurements
- Metadata analysis-Web and library research for citations and scientific journal articles, organization of reference material databases using EndNote.

Lab/Field Assistant, Educational outreach

November 2011-December 2012

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

- 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.

Seafloor Video Analyst

May 2008-June 2010

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

- 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.

Note Taker

2012-2013

KOKUA Program, University of Hawai'i at Mānoa

- 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

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. "Effects of multiple drivers of environmental change on native and invasive macroalgae in nearshore groundwater dependent ecosystems." Manuscript in review with Water Resources Research.

Gibson, V.L., C.M. Smith, A. Dedloff, and L.J. Miller. Integrated responses by algal photosynthesis and tissue water potential to submarine groundwater discharge at Wai'alaie, O'ahu. Manuscript in review.

Gibson, V.L., A. Richards-Dona, and C.M. Smith. Measuring tissue water potential in macroalgae via an updated Chardakov method. Manuscript in review.

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*. 27(3):18. <https://doi.org/10.5751/ES-13432-270318>

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. and C.M. Smith. Benthic community composition and macroalgal assemblages across three gradients of submarine groundwater discharge within Maunalua Bay, O'ahu. 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.

SELECTED PRESENTATIONS

Invited Seminars

"Biocultural values of groundwater dependent ecosystems in Kona, Hawai'i." Invited speaker. 5th International Symposium on Anchialine Ecosystems. November 3, 2022. Kailua Kona, Hawai'i.

"Integrated physiological response by four red algae species and analysis of benthic community structure across an environmental gradient of tidally-driven submarine groundwater discharge conditions." Invited symposium speaker, From high islands to the ocean floor: pacific plants at the extreme. July 22, 2022. Botany 2022, annual conference of the Botanical Society of America. Dena'ina Center, Anchorage, Alaska.

"Biocultural values of groundwater dependent ecosystems and associated plants in Kona, Hawai'i." Invited colloquium speaker, Paths forward: Engaging Indigenous science and knowledge. July 22, 2022. Botany 2022, annual conference of the Botanical Society of America. Dena'ina Center, Anchorage,

Alaska.

- “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.
- “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.
- “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 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.

Conference Proceedings

- “Integrated physiological response by four species to submarine groundwater discharge conditions at Wailupe, O’ahu.” Selected participant, Fourth International Council for the Exploration of the Sea and North Pacific Marine Science Organization Early Career Scientist Conference. July 18, 2022. St. John’s, Newfoundland, Canada.
- “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.
- “Ecological, cultural, and social values of groundwater dependent ecosystems in Kona, Hawaii.” Hawaii Conservation Conference. September 1, 2020. Virtual, Honolulu. March 12, 2021.
- “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.
- “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.
- “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.

GRANTS & HONORS

- 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.

EDUCATION AND OUTREACH EXPERIENCE

Mentoring

- Maile Mentorship program for Native Hawaiian and Pacific Islander transfer students from community colleges to SOEST: acted as a mentor to three students from transfer through graduation.
- Through the Native Hawaiian Science and Engineering Mentorship Program: acted as a mentor to two incoming freshmen students, students successfully conducted scientifically rigorous project-based research study, I provided mentorship in study design, implementation, data analysis, and communication of results. One student project collaborated with a community partner to analyze community collected reef survey data.
- Acted as a mentor to 5 students who continued from Botany 480 laboratory courses to conduct thesis research with the limu lab. Mentored three of these students to successfully apply for and receive Undergraduate Research Opportunity Grants to fund their work, conduct marine research projects, and to satisfy thesis requirements for their degrees.
- Provided mentoring through field training, feedback on study design, implementation, and communication of research results for 24 total community college, undergraduate, and graduate students through UH Mānoa limu lab activities.

Teaching

- Teaching Assistant OCN201L (3 semesters), BOT 201L (3 semesters), BOT 480L (4 semesters, 1 as lead TA), BOT 682L (2 semesters), BOT 101L (1 semester)
- Guest lecturer, MSC 160: Natural Marine Resources, American Samoa Community College, 11/9/2021
- Guest lecturer, BOT 480: Algal Diversity and Evolution, UH Mānoa, 3/29/2019, 3/23/2018, 3/23/2017
- Guest lecturer, ZOO 200: Marine Biology, Kapi'olani Community College, 2/15/2018, 2/22/2016

Public Outreach and Volunteering

- 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-Summer 2022
- 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.
- Biocultural restoration: loko i'a, kalo agriculture, wetland restoration, including 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 He'eia Loko i'a, Kealohi wetland, Kāko'o 'Ōiwi, 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.