

HENRIETTA DULAI

Professor, University of Hawai'i at Manoa, Department of Earth Sciences

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UPDATED: AUGUST 2024

EDUCATION

Ph.D. in Chemical Oceanography **2005**
FLORIDA STATE UNIVERSITY, DEPARTMENT OF OCEANOGRAPHY **TALLAHASSEE, FLORIDA, USA**
Dissertation Thesis: Multiple Isotopic Tracers for Study of Coastal Hydrological Processes
M.S. in Nuclear Chemistry **1997**
CZECH TECHNICAL UNIVERSITY **PRAGUE, CZECH REPUBLIC**
SCHOOL OF NUCLEAR SCIENCES AND PHYSICAL ENGINEERING
Thesis: Determination of Uranium by Gamma-Spectrometry
Certificate in Education – Pedagogy of STEM Subjects **1997**
CZECH TECHNICAL UNIVERSITY **PRAGUE, CZECH REPUBLIC**
MASARYK INSTITUTE OF ADVANCED STUDIES

PROFESSIONAL EXPERIENCE

Professor **August 2021 - present**
Associate Professor **August 2014 - 2021**
Assistant Professor **January 2009 – August 2014**
UNIVERSITY OF HAWAI'I, DEP. OF EARTH SCIENCES/GEOLOGY AND GEOPHYSICS
Affiliate Faculty **January 2012 - present**
UNIVERSITY OF HAWAI'I, WATER RESOURCES RESEARCH CENTER
Chair, Earth and Planetary Sciences Graduate Program **August 2021 – July 2024**
UNIVERSITY OF HAWAI'I
Postdoctoral Scholar & Postdoctoral Investigator **November 2005 – November 2008**
WOODS HOLE OCEANOGRAPHIC INSTITUTION
DEPARTMENT OF MARINE CHEMISTRY AND GEOCHEMISTRY
Graduate Research Assistant **May 2000 – October 2005**
FLORIDA STATE UNIVERSITY, DEPARTMENT OF OCEANOGRAPHY
Research Specialist **September 1997 – May 2000**
CZECH NATIONAL RADIATION PROTECTION INSTITUTE
Graduate Research Assistant **September 1995 – July 1997**
CZECH TECHNICAL UNIVERSITY

TEACHING EXPERIENCE (LAST 5 YEARS)

Undergraduate Courses: GG106/SUST116 Humans and the Environment (F24, F23, F22, F21, F20), GG200 Geologic Inquiry (S23, F22, S22, S21)
Graduate Courses: GG640 Coastal Geochemistry (S24, S20), EARTH654 Groundwater Contamination (F20)

ACADEMIC ADVISING

Undergraduate student principal thesis advisor: Kathy Ho (BS 2024), Tehani Malterre (BS 2023), Brandon Delacruz (BS 2023), Eric Welch (BS 2018), Elizabeth Dionne (BS 2017), Hannah Azouz (BS 2016), Tristan McKenzie (BS 2016), Alana Kleven (BS 2015), Kim Mayfield (BS 2014)

Graduate student principal advisor and sponsor: Jobel Y. Villafañe-Pagán (MS current), Hailey Pantaleo (MS current), Yunxuan Zhong (MS 2024), Kelly Truax (MS 2020, PhD 2023), Casey McKenzie (MS 2023), Tristan McKenzie (MS 2018, PhD 2020), Eric Welch (MS 2019), Elizabeth Dionne (MGeo 2018), Catherine Hudson (MS 2018), Hannah Azouz (MS 2017), Christina Richardson (MS 2016), Camille Vautier (MS 2016), Samuel Wall (MS-), Christine Waters (MS 2014), Gabrielle Weiss (MS-), Kamila Stastna (MS-visiting)

Postdoctoral scholar advisor and sponsor: Jan Kamenik (now Czech Academy of Sciences), Olkeba Tolessa Leta (now St. Johns River Water Management District), Veronica Gibson (Heeia NERR)

PEER REVIEWED PUBLICATIONS 2020-PRESENT

*student advisee *postdoctoral advisee

Google scholar: <http://go.hawaii.edu/3bB>

1. Wilson, S.J., Moody, A., McKenzie, T., Cardenas, M.B., Luijendijk, E., et al. 2024. Global subterranean estuaries modify groundwater nutrient loading to the ocean. *Limnology & Oceanography Letters*, 9, 411-422. <https://doi.org/10.1002/lol2.10390>
2. Watling, L., J. R. Smith, S. C. France, A. Baco, H. Dulai, G. S. Carter, E. B. Roark, 2024. Finding boundaries in the sea: The Main and Small Gap of the Emperor Seamount Chain as a biogeographic boundary for bathyal benthic fauna, Deep Sea Research Part II: Topical Studies in Oceanography 216, <https://doi.org/10.1016/j.dsr2.2024.105394>.
3. Engels, J., B.C. Bruno, E. Suzuki, K. Suzuki, H. Dulai et al. 2024. Co-Production of Knowledge at Sumida Farm Trains a New Generation of Community-Engaged Scientists. *Oceanography* 37(1), 38. 10.5670/oceanog.2024.212
4. Truax^x, K, Dulai H, Misra A, Kuhne W, Smith C, Bongolan-Aquino C. 2024. Applications of LIF to Document Natural Variability of Chlorophyll Content and Cu Uptake in Moss. *Plants*. 13(15):2031. <https://doi.org/10.3390/plants13152031>
5. Watson, S.J., Arisdakessian, C., Petelo, M. et al. 2023. Geology and land use shape nitrogen and sulfur cycling groundwater microbial communities in Pacific Island aquifers. *ISME COMMUN.* 3, 58. <https://doi.org/10.1038/s43705-023-00261-5>
6. Haag, J., H. Dulai, W. Burt, 2023. The role of submarine groundwater discharge to the input of macronutrients within a macrotidal subpolar estuary. *Estuaries and Coasts*. 1-6. <https://doi.org/10.1007/s12237-023-01231-9>
7. Truax^x, K, H. Dulai, A. Misra, W. Kuhne, P. Fuleky, C. Smith, M. Garces, 2023. Laser Induced Fluorescence for Monitoring Environmental Contamination and Stress in the Moss *Thuidium plicatile*, *Plants*. 12(17), 3124; <https://doi.org/10.3390/plants12173124>.
8. Okuhata, B.K., J.M.S. Delevaux, A.R. Donna, C.M. Smith, V.L. Gibson, H. Dulai, A.I. El-Kadi, K. Stamoulis, K.M. Burnett, C.A. Wada, L.L. Bremer, 2023 Effects of multiple drivers of environmental change on native and invasive macroalgae in nearshore groundwater dependent ecosystems. *Water Resources Research*, 59, e2023WR034593, <https://doi.org/10.1029/2023WR034593>
9. Ghazal, K. A., O. T. Leta, H. Dulai, 2023. Spatiotemporal estimation of fresh submarine groundwater discharge across the coastal shorelines of Oahu Island, Hawaii. *Blue-Green Systems*, bgs2023010. doi: <https://doi.org/10.2166/bgs.2023.010>
10. McKenzie, T., H. Dulai, J. Lee, N. T. Dimova, I.R. Santos, B. Zhang, W.C. Burnett, 2023. Using Deep Learning to Model the Groundwater Tracer Radon in Coastal Waters, *Water Resources Research*, 2022WR033870RR accepted (1).
11. Adyasari, D., N. T. Dimova, H. Dulai, B. S. Gilfedder, I. Cartwright, T. McKenzie, P. Fuleky, 2023. Radon-222 as a groundwater discharge tracer to surface waters. *Earth-Science Reviews*, 104321 (1).
12. Truax^x, K, Dulai, H. Misra, A., Kuhne, W., Fuleky, P. 2022. Quantifying Moss Response to Metal Contaminant Exposure Using Laser-Induced Fluorescence. *Applied Sciences* 12,11580. <https://doi.org/10.3390/app122211580> (7)
13. Okuhata, B.K., D.M. Thomas, H. Dulai, B.N. Popp, J. Lee and A.I. El-Kadi, 2022. Inference of young groundwater ages and modern groundwater proportions using chlorofluorocarbon and tritium/helium-3 tracers from West Hawai'i Island. *Journal of Hydrology*, 609 <https://doi.org/10.1016/j.jhydrol.2022.127755> (3)
14. Okuhata, B.K., El-Kadi, A.I., Dulai, H., J. Lee, C.A. Wada, L.L. Bremer, K.M. Burnett, J.M.S. Delevaux, C. Shuler. 2022. A density-dependent multi-species model to assess groundwater flow and nutrient transport in the coastal Keauhou aquifer, Hawai'i, USA. *Journal of Hydrogeology*, 30, 231-250. <https://doi.org/10.1007/s10040-021-02407-y> (9)
15. Dulai, H., C. Smith, V. Gibson, L. Bremer, D. Amato, 2023. Risk to native marine macroalgae from land-use and climate change related modifications to groundwater discharge in Hawai'i. *Limnology and Oceanography Letters*, 2378-2242, [https://doi.org/10.1002/\(ISSN\)2378-2242](https://doi.org/10.1002/(ISSN)2378-2242) (9)

16. McKenzie^x, T.A., H. Dulai and P. Fuleky, 2021. Traditional and novel time-series approaches reveal submarine groundwater discharge dynamics under baseline and extreme event conditions, *Scientific Reports*, 11:22570, <https://doi.org/10.1038/s41598-021-01920-0> (16)
17. Wada, C., K. Burnett, B.K. Okuhata, J.M.S. Delevaux, H. Dulai, A.I. El-Kadi, V. Gibson, C. Smith, L. Bremer, 2021. Identifying wastewater management tradeoffs: costs, nearshore water quality, and implications for marine coastal ecosystems in Kona, Hawai'i, *PLoS ONE* PONE-D-21-17746R1 (11)
18. McKenzie^x, T.A., S. Habel., H. Dulai, 2021. Sea-level rise drives wastewater leakage to coastal waters and storm drains. *Limnology and Oceanography Letters*, 6: 154-163. <https://doi.org/10.1002/lol2.10186> (25)
19. Attias, E., S. Constable, D. Sherman, K. Ismail, C. Shuler, H. Dulai, 2021. Marine electromagnetic imaging and volumetric estimation of freshwater plumes offshore Hawai'i. *Geophysical Research Letters*, 48, e2020GL091249. <https://doi.org/10.1029/2020GL091249> (10)
20. Volta, C., Ho, D. T., Maher, D. T., Wanninkhof, R., Friederich, G., Del Castillo, C., & Dulai, H., 2020. Seasonal variations in dissolved carbon inventory and fluxes in a mangrove-dominated estuary. *Global Biogeochemical Cycles*, 34, e2019GB006515. <https://doi.org/10.1029/2019GB006515> (10)
21. Ghazal, K.A., O.T. Leta, A.I. El-Kadi, H. Dulai, 2020. Impact of coastal wetland restoration plan on the water balance components of Heeia watershed, Hawaii. *Hydrology*, 7(4), 86. (3)
22. McKenzie^x, T., C. Holloway, H. Dulai, J.P. Tucker, R. Sugimoto, T. Nakajima, K. Harada, I.R. Santos, 2020. Submarine groundwater discharge: A previously undocumented source of contaminants of emerging concern to the coastal ocean (Sydney, Australia), *Marine Pollution Bulletin*, 160, <https://doi.org/10.1016/j.marpolbul.2020.111519> (22)
23. Okuhata^x, B., H. Dulai, C. Shuler, J. Fackrell, A. El-Kadi, 2020. Metal mobilization as an effect of anthropogenic contamination in groundwater aquifers in Tutuila, American Samoa. *Water*. 12, 2118. (1)
24. Engels, J.L., S. Watson, H. Dulai, K.M. Burnett, C.A. Wada, A. Aga, N. DeMaagd, J. McHugh, B. Sumida, L.L. Bremer, 2020. Collaborative research to support urban agriculture in the face of change: The case of the Sumida watercress farm on O'ahu. *PLoS ONE* 15(7): e0235661. <https://doi.org/10.1371/journal.pone.0235661> (4)
25. Shuler, C., H. Dulai, O. T. Leta, J. Fackrell, E. Welch, A. El-Kadi, 2020. Understanding surface water-groundwater interaction, submarine groundwater discharge, and associated nutrient loading in a small tropical island watershed. *Journal of Hydrology*, 585. (11)
26. Dudley, B., F. Hughes, G. Asner, J. Baldwin, Y. Miyazawa, H. Dulai, C. Waters, J. Bishop, N. Vaughn, J. Yeh, S. Kettwich, R. MacKenzie, R. Ostertag, T. Giambelluca, 2020. Hydrological effects of tree invasion on a dry coastal Hawaiian ecosystem. *Forest Ecology and Management*, 458. (5)

PUBLICATIONS (NON-PEER REVIEWED) 2020-PRESENT

27. Dulai, H., I.R. Santos, Taniguchi, M., R. Sugimoto, A. Mukherjee, 2021. Editorial to special issue: Submarine Groundwater Discharge: Impacts on Coastal Ecosystem by Hidden Water and Dissolved Materials, *Frontiers in Environmental Sciences, Water and Wastewater Management* 8, 10.3389/fenvs.2020.629509.
28. Smith, J.R., L. Watling, L., N. Summers, E.B. Roark, N. Morgan, B. Lensing, S.C. France, H. Dulai, G.S. Carter, S. Bingo, and Amy Baco-Taylor, 2020. Exploring for a Biogeographic Boundary along the Emperor Seamount Chain: A Multidisciplinary Approach, in Raineault, N.A., and J. Flanders, eds. New Frontiers in Ocean Exploration: The E/V Nautilus, NOAA Ship Okeanos Explorer, and R/V Falkor 2019 field season. *Oceanography* 33(1), supplement, 122 pp., <https://doi.org/10.5670/oceanog.2020.supplement.01>.

GRANTS 2020-PRESENT

1. ONR through WRRP: Laying the groundwork for water security preparedness and resilience in Hawai'i and the USAPI through strong partnerships, robust scientific information, and increased analytical capacity, PI: T. Giambelluca, Science lead: Dulai, Funding Period: August 1, 2023-July 31, 2025.

2. NSF: Climate change impacts on the past and future coastal freshwater resources of oceanic islands. and REU supplement PI: C. Lipo, Binghamton U, UH subaward PI: H. Dulai. Funding period: September 1, 2022 - August 31, 2026.
3. NOAA NSC Collaborative Research: Wetland Water and 'Ike (WAI): Improving understanding of hydrology to inform management decisions, PI: S. Rii, Co-I and Technical Lead: H. Dulai, Funding period: October 1, 2022- September 30, 2024.
4. USGS WRRC: Characterizing network-wide, spatially explicit current and future stream temperature distribution. PI: H. Dulai. Co-PIs: Y-P. Tsang and K. Falinski, Funding period: September 1, 2022 - August 31, 2024.
5. NOAA CRCP: Investigating the role of groundwater in pollutant transport to Nu'uuli Pala Lagoon, American Samoa. PI: K. Knee AU, UH subaward PI: H. Dulai. Funding period: August 1, 2019- January 31, 2021.
6. DOE Consortium for Monitoring, Technology, and Verification. UH subaward PI: Milton Garces, co-PIs: H. Dulai & J. Learned. Funding period: August 1, 2019- July 31, 2024.
7. NSF EPIK: Project EPIK - Earth, Planets, Ike, and Kuleana - Preparing the next generation of diverse geoscientists in Hawai'i. PI: B. Smith-Konter, co-PIs: H. Dulai, J. Engels, J. Konter, S. Rowland. Funding period: August 1, 2019- July 31, 2024.
8. UH Sea Grant (NOAA): Tracking groundwater nutrients using novel tracers to inform coastal watershed management in South Kōhala, Hawai'i. PI: H. Dulai, co-PI: K. Falinski. Funding period: February 1, 2020-January 31, 2022.

PROFESSIONAL ACTIVITIES

INTERNATIONAL SERVICE:

Expert delegated by the International Atomic Energy Agency, 2017 Expert Mission: Applying Isotope Hydrology to the Study of Surface and Groundwater Mixing in the Unconsolidated Aquifer Along Lower Ping River, Thailand

EDITORSHIP:

Associate Editor: Limnology & Oceanography Letters

Associate Editor: Marine Chemistry

Special Issues Guest Editor:

Frontiers Environmental Science - Water and Wastewater Management: Submarine Groundwater

Discharge: Research progress during the last two decades.

Marine Chemistry: Radium and radon tracers in aquatic systems.

Journal of Environmental Radioactivity: Measurement and Application of Radium and Radon Isotopes in Environmental Sciences.

PROFESSIONAL AFFILIATIONS

American Geophysical Union

American Society of Limnology and Oceanography

GRADUATE STUDENT COMMITTEES

Brandon Bees EPS, MS 2024 (committee member)

Christina Comfort OCE, PhD current (committee member)

Nicolas Storie OCE, PhD current (committee member)

Ryo Sugimoto OCE, PhD current (committee member)

Reed Mershon EPS, PhD current (comprehensive exam committee)

Luis Dasilveira EPS, PhD current (comprehensive exam committee)

Samuel Kei Takazawa EPS, PhD 2024 (comprehensive exam committee)

Theodore Brennis EPS, PhD 2023 (comprehensive exam committee)

Elizabeth Benyishek EPS, PhD 2023 (comprehensive exam committee)

Natalia Gauer Pasqualon EPS, PhD current (comprehensive exam committee)

Maria MacNeill EPS, MS 2022 (committee member)
Brytne Okuhata EPS, PhD 2022 (committee member)
Diamond Tachera EPS, PhD 2022 (committee member, comprehensive exam committee)
Lucie Knorr OCE, PhD current (committee member)
Veronica Gibson Botany, PhD 2022 (committee member, comprehensive exam committee)
Kristina Remple OCA, PhD 2021 (committee member)
Tineill Dudoit EPS MS 2020 (committee member)
Jonathan Tobin EPS MS 2020 (committee member)
Jordan Mason GG, MS 2020 (committee member)
Haunani Kane GG, PhD 2019 (committee member)
Christopher Shuler GG, PhD 2019 (committee member, comprehensive exam committee)
Michael Mathioudakis GG, MS 2019 (committee member)
Kariem Ghazal NREM, PhD 2019 (committee member, comprehensive exam committee)
Florybeth LaValle, Marine Biology, PhD 2018 (committee member, comprehensive exam committee)
Joseph Kennedy GG, MS 2018 (committee member)
Kristen Fogaren Oceanography, PhD 2017 (committee member)
Joseph Fackrell GG, PhD 2016 (committee member)
Ken Lewis, GG MGeo 2016 (interim advisor)
James Bishop GG MS, 2016 (committee member)
Jacque Kelly GG, Ph.D. 2012 (committee member, comprehensive exam committee)
Kayla Holleman GG, M.S. 2011 (committee member)
Elaine Lampitoc GG, M.S. B 2010 (committee member)
Kristen A. McReynolds Chemistry, MS (committee member)

UNDERGRADUATE ADVISING (OTHER THAN BS THESIS ADVISOR)

Olivia Schmitt – NSF REU undergraduate research assistant 2022-24
Haley Currier – MTV project undergraduate research assistant 2022-24
Kathy Ho – UROP funded undergraduate research assistant 2022-24
Aston Benjamin Ramos – Earth Science on Volcanic Islands, Research Experience for Undergraduates, project advisor, project advisor, summer 2017
Sofia Suesue - Pacific Islands Climate Adaptation Science Center Summer Fellow, project advisor, summer 2017
Joe Kennedy, Global Environmental Studies, undergraduate co-advisor, B.S. 2011
Samuel Wall – Undergraduate Research and Mentoring in the Biological Sciences Fellow, project advisor, summer 2013
La Noa O Pono Keahinuanu –Internship Partnership Between Geology & Geophysics and Kokua Puni at the University of Hawaii at Manoa, spring 2013
Jennet Chang – Earth Science on Volcanic Islands, Research Experience for Undergraduates, project advisor, summer 2017
Funded undergraduate interns: Sierra Stammer, Raymond Moore, Vanessza Lopez, Haley Currier, U'ilani Jesse-Kealanahale, Kathy Ho, Montana Duggan

SERVICE SINCE 2020

UH Manoa Graduate Council – Course Committee & Grievance Committee 2022

SOEST service:

SOEST S-lab advisory board member 2020-current

SOEST Academic Council member 2022-24

Department service:

Earth Department Committee – chair 2019/20 and 2020/21

GG/Earth Associate Chair– 2021/22 and 2022/23

MEG Division Head 2018-2020, 2021/22

Earth and Planetary Sciences graduate program -Graduate Chair 2021/22, 2022/23, 2023/24