

Trista McKenzie

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EDUCATION

Doctor of Philosophy (Ph.D.), Geology and Geophysics

Aug. 2018 – Dec. 2020

University of Hawai‘i at Mānoa

Honolulu, Hawai‘i

Dissertation: Multi-tracer Approaches for Groundwater Discharge and Anthropogenic Pollution in the Pacific

Master of Science (M.S.), Geology and Geophysics

Aug. 2016 - July 2018

University of Hawai‘i at Mānoa

Honolulu, Hawai‘i

Report: Kāne‘ohe Bay and Watershed: A Review of its Hydrogeology, Historical and Current Sources of Pollution and Methods to Quantify Pollutant Fluxes and Sources

Bachelor of Science (B.S.), Geology and Geophysics

May 2014 - May 2016

University of Hawai‘i at Mānoa

Honolulu, Hawai‘i

Thesis: Quantifying Atmospheric Fallout of Fukushima-derived Radionuclides in the Hawaiian Islands

RESEARCH EXPERIENCE

Postdoctoral Research Fellow (Supervisor: Isaac Santos)

Sept. 2021 – present

University of Gothenburg

Gothenburg, Sweden

Marie Skłodowska-Curie Individual Fellowship

- *Planning and execution of field research aboard the R/V Alice aiming to understand benthic fluxes of pharmaceuticals and greenhouse gases in hypoxic and anoxic basins in Sweden*
- *Investigation into relationships between coastal aquifer biogeochemistry and pharmaceutical attenuation in groundwater*

Postdoctoral Research Fellow (Supervisor: Henrietta Dulai)

Jan. – May 2021

University of Hawai‘i at Mānoa

Honolulu, Hawai‘i

Hawai‘i EPSCoR ‘Ike Wai Postdoctoral Research Fellow

- *Application of deep learning and time-series analysis to geochemical time-series*
- *Supervision of streamflow deep learning undergraduate research project*

Graduate Research Assistant (Supervisor: Henrietta Dulai)

Aug. 2019 – Dec. 2020

University of Hawai‘i at Mānoa

Honolulu, Hawai‘i

Hawai‘i EPSCoR ‘Ike Wai Graduate Fellow

- *Sensor development and deployment*
- *Application of machine learning to long-term time-series*

Visiting Ph.D. Student (Supervisor: Isaac Santos)

June – July 2019

National Marine Science Centre (Southern Cross University)

Coffs Harbour, Australia

Limnology and Oceanographic Exchange Research (LOREX) Fellowship

- *Field and lab analyses of radium, nutrients, and pharmaceuticals in Sydney Harbour*

Graduate Research Assistant (Supervisor: Mahdi Belcaid)

June 2018 – May 2019

University of Hawai‘i at Mānoa

Honolulu, Hawai‘i

Hawai‘i Data Science Institute Graduate Fellow

- *Development of courses on probabilistic programming and time series analysis*
- *Data analysis and management for the Hawai‘i EPSCoR ‘Ike Wai project*

Graduate Research Assistant (Supervisor: Henrietta Dulai)
University of Hawai'i at Mānoa
Sea Grant Graduate Trainee

Aug. 2016 – May 2018
Honolulu, Hawai'i

- *Collection and analysis of contaminants of emerging concern (CECs), radon, nutrients, and trace metals to study groundwater contamination*
- *Analysis of $\delta^{15}\text{N}-\text{NO}_3^-$ and $\delta^{18}\text{O}-\text{NO}_3^-$ in water*

Laboratory Assistant
University of Hawai'i at Mānoa

Jan. 2015 – May 2016
Honolulu, Hawai'i

- *Radiochemical preparation and analysis of soils, mushrooms, and seawater.*
- *Submarine groundwater discharge field and lab methods including radon and radium techniques, nutrient sampling, and carbon chemistry analysis, analytical chemistry laboratory techniques.*

PUBLICATIONS (PEER-REVIEWED)

1. **McKenzie, T.,** Dulai, H., Fuleky, P., (2021). Traditional and Novel Time-Series Approaches Reveal Submarine Groundwater Discharge Dynamics Under Baseline and Extreme Event Conditions. *Scientific Reports*, 11, 22570. doi: 10.1038/s41598-021-01920-0
2. **McKenzie, T.,** Habel, S., Dulai, H., (2021). Sea-level rise drives wastewater leakage to coastal waters and storm drains. *Limnology and Oceanography Letters*. doi: 10.1002/lol2.10186.
3. **McKenzie, T.,** Holloway, C., Dulai, H., Tucker, J., Sugimoto, R., Nakajima, T., Harada, K., Santos, I.R. (2020). Submarine groundwater discharge and flushing times drive contaminants of emerging concern in the coastal ocean (Sydney, Australia). *Marine Pollution Bulletin*, 160: 111519. doi: 10.1016/j.marpolbul.2020.111519.
4. **McKenzie, T.,** Dulai, H., Chang, J. (2019). Parallels between stream and coastal water quality associated with groundwater discharge. *PLoS ONE*, 14(10): e0224513. doi: 10.1371/journal.pone.0224513.
5. **McKenzie, T., & Dulai, H.** (2017). Quantifying Atmospheric Fallout of Fukushima-Derived Radiocesium in the Hawaiian Islands. *Journal of Environmental Radioactivity*, 180, 106-113. doi: 10.1016/j.jenvrad.2017.10.003.
6. **McKenzie, T.** (2016). Quantifying Atmospheric Fallout of Fukushima-Derived Radioactive Isotopes in Mushrooms in the Hawaiian Islands. *Mānoa Horizons*, 1, 28-33.

PUBLICATIONS (NOT PEER-REVIEWED)

7. Chua, E.J., Beck, H.N., Cohen, A.B., Hintz, C.L., Knotts, E.R., Lauck, M., **McKenzie, T.,** Marín, A.R., Wilkins, K.W., Woodstock, M.S. (2020). *Handbook for International Research Collaborations*. Association for the Sciences of Limnology and Oceanography. [Online] Available: www.aslo.org/wp-content/uploads/Living-Handbook-International-Collaborations.pdf
8. Beck, H.N., Cohen, A., **McKenzie, T.,** Weisend, R., Wilkins K.W., Woodstock, M.S. (2019). Broadening Horizons: Graduate Students Participating in International Collaborations Through the Limnology and Oceanography Research Exchange (LOREX) Program. *Limnology and Oceanography Bulletin*, 28(3) 85-89. doi: 10.1002/lob.10339.

FUNDING

- 2021** **Marie Skłodowska-Curie Individual Fellowship (€203,852)**
European Commission, European Union Horizon 2020
Horizon 2020 Project "STE CECS"
- 2019** **Fred M. Bullard Fellowship (\$3,000)**
Earth Sciences Department, University of Hawai'i at Mānoa

- 2019** **GSA On to the Future (OTF) Grant**
Geological Society of America (GSA)
- 2019** **Graduate Student Research Grant with Outstanding Mention (\$2,500)**
Geological Society of America (GSA)
One of the top 10 proposals submitted out of 748 in 2019
- 2018** **ASLO Limnology and Oceanography Research Exchange (LOREX) Fellowship**
Association for the Sciences of Limnology and Oceanography (ASLO)
- 2018** **William T. Coulbourn Fellowship (\$2,500)**
Dept. Geology & Geophysics, University of Hawai‘i at Mānoa
- 2018** **Hawai‘i Data Science Institute Fellowship (\$30,000)**
Hawai‘i Data Science Institute, University of Hawai‘i at Mānoa
- 2018** **GSO Travel Grant**
Graduate Student Organization (GSO), University of Hawai‘i at Mānoa
- 2017** **Fred M. Bullard Fellowship (\$3,000)**
Dept. Geology & Geophysics, University of Hawai‘i at Mānoa

HONORS AND AWARDS

- 2020** **L&O Letters Early Career Publication Award**
ASLO Limnology & Oceanography (L&O) Letters
- 2020** **Toby Lee ARCS Award in Earth Sciences (\$5,000)**
ARCS Foundation Honolulu Chapter
- 2019** **GSO Merit Award for PhD Research (\$5,000)**
Graduate Student Organization (GSO), University of Hawai‘i at Mānoa
- 2018** **GG-OGE Achievement Scholarship (\$1,500)**
Office of Graduate Education, University of Hawai‘i at Mānoa
- 2018** **Tester Symposium: Best Rapid-Fire Presentation**
43rd Annual Albert L. Tester Symposium, University of Hawai‘i at Mānoa
- 2016** **AGU Virtual Poster Showcase Spring 2016 Winner**
American Geophysical Union (AGU) Multi-Society Showcase

CONFERENCE PRESENTATIONS

(* invited, § oral presentation, ° poster, % student advisee, # presented by co-author)

- 2021** # Janiszewski, H.A., Caplan, C., Chertok, M., Coats, S., **McKenzie, T.**, Okuhata, B.K., Pietruszka, A.J., Ravanis, E., Shea, T., Tachera, D., Zhu, F. Huliāmahi: Overflowing of JEDI Efforts in the Earth Sciences at University of Hawai‘i at Mānoa. To be presented at the *American Geophysical Union Fall Meeting*. New Orleans, Louisiana. December 2021.
- 2021** *§ **McKenzie, T.**, The importance of coastal groundwater discharge. To be presented at the *Swedish Society for Marine Sciences Marine Research Days Conference*. Gothenburg, Sweden. 23-24 November 2021.
- 2021** § **McKenzie, T.**, Smith, T.P., Tachera, D., Okuhata, B., Barde-Cabusson, S., Gibson, V., Eason, D. Utilizing Hawaiian language newspapers to identify key water resources in Hawai‘i. *Geological Society of America Cordilleran Section Meeting*. Virtual. 12-14 May 2021.

- 2021** § **McKenzie, T.**, Habel, S., Dulai, H. Sea-Level Rise and Groundwater Inundation Drive Wastewater Pollution to Coastal Waters and Storm Drains. *International Tropical Islands Water Conference*. Virtual. 12-15 April 2021.
- 2021** § **McKenzie, T.**, Dulai, H., Lee, J., Fuleky, P. Assessing the Drivers, Dynamics, and Temporal Variability of Submarine Groundwater Discharge using Traditional and Novel Time-Series Approaches. *International Tropical Islands Water Conference*. Virtual. 12-15 April 2021.
- 2021** % Uehara, B., **McKenzie, T.**, Dulai, H. Streamflow Forecasting Using Recurrent Neural Networks and Transfer Learning. *International Tropical Islands Water Conference*. Virtual. 12-15 April 2021.
- 2021** # Dulai, H., Hudson, C., **McKenzie, T.**, Okuhata, B., Tachera, D., El-Kadi, E. Geochemical signatures of coastal groundwater reflect groundwater flow lines and land-uses in West Hawaii. *International Tropical Islands Water Conference*. Virtual. 12-15 April 2021.
- 2020** **McKenzie, T.**, Dulai, H., Lee, J., Fuleky, P. Upscaling submarine groundwater discharge using local long-term high-resolution radon measurements and deep learning. *American Geophysical Union Fall Meeting*. Virtual. 1-17 December 2020.
- 2020** § **McKenzie, T.**, Dulai, H., Fuleky, P., Lee, J. Assessing submarine groundwater discharge dynamics using long-term high-resolution radon measurements and machine learning. *Goldschmidt Conference*. Virtual. 21-27 June 2020.
- 2020** § **McKenzie, T.**, Holloway, C., Tucker, J., Sugimoto, R., Nakajima, T., Harada, K., Dulai, H., Santos, I.R. Submarine Groundwater Discharge is a Source of Contaminants of Emerging Concern to the Coastal Ocean (Sydney, Australia). *Association for the Sciences of Limnology and Oceanography Ocean Sciences Meeting*. San Diego, California. 16-21 February 2020.
- 2020** § **McKenzie, T.** Adventures in International Collaboration in Australia Through the LOREX Program. *Association for the Sciences of Limnology and Oceanography Ocean Sciences Meeting*. San Diego, California. 16-21 February 2020.
- 2019** *§ **McKenzie, T.**, Habel, S., Dulai, H. Increased coastal pollution expected under future sea level stands: chemical evidence for tidal groundwater inundation of coastal wastewater infrastructure. *Geological Society of America Annual Meeting*. Phoenix, Arizona. 22-25 September 2019.
- 2019** § **McKenzie, T.**, Dulai, H., Chang, J. Linking baseflow and submarine groundwater discharge: impacts on water quality along the stream-coastal continuum in Kāneʻohe Bay and Watershed, Hawaiʻi. *Association of Limnology and Oceanography Aquatic Sciences Meeting*. San Juan, Puerto Rico. 24 February – 1 March 2019.
- 2018** § **McKenzie, T.**, Dulai, H., Popp, B., Whittier, R. Tracing surface-groundwater pathways of anthropogenic contaminants in Kāneʻohe Bay Watershed, Oʻahu, Hawaiʻi. 7th *International Conference on Environmental Future*. Honolulu, Hawaiʻi. 16-20 April 2018.
- 2018** § **McKenzie, T.** & Dulai, H. Fukushima-derived radiocesium fallout map of Hawaiʻi. *Methods and Applications of Radioanalytical Chemistry Conference*. Kona, Hawaiʻi. 8-13 April 2018.
- 2017** ° **McKenzie, T.**, Dulai, H., Popp, B., Whittier, R. Locating Groundwater Pathways of Anthropogenic Contaminants Using a Novel Approach in Kāneʻohe Watershed, Oʻahu, Hawaiʻi. *American Geophysical Union Fall Meeting*. New Orleans, Louisiana. 11-15 December 2017.

- 2017** ° **McKenzie, T.** & Dulai, H. Seasonality of groundwater inputs and associated anthropogenic fluxes in the Kahalu‘u Stream Complex, O‘ahu. *Geological Society of America Cordilleran Section Meeting*. Honolulu, Hawai‘i. 23-25 May 2017.
- 2017** ° **McKenzie, T.** & Dulai, H. Groundwater inputs and their effect on water quality in the Kahalu‘u Stream. *Association of Limnology and Oceanography Aquatic Sciences Meeting*. Honolulu, Hawai‘i. 26 February – 3 March 2017.
- 2017** § **McKenzie, T.** & Dulai, H. Quantifying Atmospheric Fallout of Fukushima-derived Radiocesium in the Hawaiian Islands. *Radiobioassay and Radiochemical Measurements Conference*. Honolulu, Hawai‘i. 6-10 February 2017.
- 2016** ° **McKenzie, T.** & Dulai, H. Quantifying Atmospheric Fallout of Radioactive Isotopes in the Hawaiian Islands (EGU2016-10453). *European Geosciences Union: General Assembly*. Vienna, Austria. 18-22 April 2016.
- 2016** ° **McKenzie, T.** & Dulai, H. Quantifying Atmospheric Fallout of Radioactive Isotopes in the Hawaiian Islands. *AGU Virtual Poster Showcase, Multi-Society Showcase*, Washington DC. Poster. May 2016

INVITED TALKS

- 2021** Submarine Groundwater Discharge Virtual Seminar
Invited seminar speaker to over 40 attendees
- 2021** Hawai‘i Water Resources Research Center (WRRC) and ‘Ike Wai Seminar
Invited seminar speaker with over 100 attendees
- 2020** Cesspool Researchers, Advisors, and Planners (CRAP) Pau Hana Talk
Invited to give a scientific research presentation to members of the CRAP group
- 2019** Hawai‘i Department of Transportation Harbor Tenant training talks
Invited to give a scientific talk to 40-50 (per session) harbor’s tenants taking storm water awareness training (two sessions)
- 2019** Invited talk at Southern Cross University, Coffs Harbour, Australia
Invited to give scientific talk to about 20 staff and students at the National Marine Science Centre
- 2017** AGU Bright Stars Luncheon Invited Speaker
Invited speaker for AGU Bright Stars program (K-12) during the AGU Fall Meeting in New Orleans, Louisiana

OTHER TALKS

- 2021** Marine Science Department Seminar Talk (University of Gothenburg)
Scientific talk at departmental seminar entitled “Sea-Level Rise Negatively Impacts Coastal Water Quality: A Field-Based Geochemical Study”
- 2021** Earth Sci Departmental Lightning Talk (University of Hawai‘i)
Scientific lightning talk at departmental seminar entitled “Submarine groundwater discharge in Kona”
- 2020** Earth Sci Departmental Lightning Talk (University of Hawai‘i)
Scientific lightning talk at departmental seminar entitled “Upscaling submarine groundwater discharge using radon data and machine learning”
- 2018** Earth Sci. Departmental Colloquium Talk (University of Hawai‘i)
Scientific talk at departmental seminar entitled “Mauka to Makai: Ground and surface water contamination to Kāne‘ohe Bay”

- 2018** Tester Symposium: 5-minute rapid fire talk (University of Hawai‘i)
Scientific talk at Tester Symposium entitled “Tracing groundwater pathways of wastewater using a novel approach in Kāne‘ohe, O‘ahu” to about 200 attendees
- 2018** Geology & Geophysics Departmental Colloquium Talk (Bullard)
Scientific talk at departmental seminar entitled “A novel approach for tracing diffuse pollution pathways”
- 2017** UH Sea Grant Hanauma Bay Education Program outreach talk
Outreach talk entitled “Identifying pollutant pathways: tracing pharmaceuticals into Kāne‘ohe Bay” for about 30 attendees
- 2017** Interagency Workshop on Ecological Risk Research talk
Scientific talk for workshop influencing policy for Ecological Research Assessment in Hawai‘i
- 2017** Sea Grant Research Symposium
Gave scientific talk to Sea Grant researchers
- 2017** Honolulu Nerd Nite Honolulu Outreach Talk
Outreach talk entitled “Urban streams on tropical islands – not the paradise you expect” for about 40 attendees
- 2016** UH Sea Grant Hanauma Bay Education Program outreach talk
Outreach talk entitled “The influence of surface and groundwater inputs on water quality in Kāne‘ohe Bay” for about 30 attendees

MENTORING & TEACHING EXPERIENCE

- 2021** Instructor
Instructor for marine chemistry portion of lower division course entitled “Ocean models and databases” at the University of Gothenburg
- 2020** Guest lecturer
Coastal Geochemistry graduate course, (nitrogen stable isotopes and water quality research in Hawai‘i, 2 lectures)
- 2019** Python workshop for Earth Scientists
Designed and taught a one-hour workshop on introductory Python programming with a focus on Pandas at the University of Hawai‘i.
- 2019** Guest lecturer
Geological Inquiry (geological cross-sections, 2 lectures)
- 2018** Guest lecturer
Humans and the Environment (water quality, 2 lectures)
- 2018- 2019** Course development
Development of two online 1-credit modules to be offered at the University of Hawai‘i:
- *Probabilistic programming with PyMC3*
 - *Time-series analysis in Python*
- 2018** Graduate REU Assistant
Assisted with the NSF Research Experiences for Undergraduates (REU) program by facilitating twice a week meetings and workshops with the REU students. (Summer 2018)

2016-present Students mentored:

Brody Uehara (BS Computer Science): 2020-2021
Michael Dodge II (BS Computer Science): 2019-2020
Sierra Stammer (BS Earth Sciences): 2019-2020
Jennet Chang (NSF REU Student): 2017
Eric Welch (BS Global Environmental Science): 2016-2018

WORKSHOPS

2018 Intelligent Systems for Geosciences (IS-GEO) Workshop - Hilo, Hawai'i
Hackathon sensor development and deployment capturing the outskirts of Hurricane Hector

SERVICE

Review Editor for *Frontiers in Water and Wastewater Management* (**2021 – present**)

Earth Sciences Dept. Diversity, Equity, and Inclusion (DEI) Group (**2020-2021**)

Earth Sciences Dept. Graduate Student Representative to the Graduate Studies Committee (**2019-2020**)

Society of Exploration Geophysicists UH Student Chapter (**2016-2020**)

Officer: Vice President (2019-2020), Secretary (2016-2018)

Manuscript reviewer for:

Journal of Radioanalytical and Nuclear Chemistry

Journal of Hydrology

Limnology & Oceanography

Limnology & Oceanography Methods

Applied Radiation and Isotopes

Journal of Geophysical Research – Oceans

Frontiers in Water and Wastewater Management

Frontiers in Environmental Science

PROFESSIONAL MEMBERSHIPS

2018 – present Geological Society of America

2017 – present Association for the Sciences of Limnology and Oceanography

2016 – present American Geophysical Union

MEDIA APPEARANCES AND INTERVIEWS

2021 Interview with Hawai'i News Now: This is Now (*Mar. 2021*)

2020 ARCS Meet the Scholar Interview

[*Interview*](#) with ARCS Honolulu Chapter (*Sep. 2020*)

2020 GSA My OTF Experience Interview

[*Interview*](#) with GSA (*Jan. 2020*)

2019 AGU Paths through Science Interview

[*Interview*](#) with AGU Narratives (*Apr. 2019*)

2017 Sea Grant Educational Podcast

*Outreach [*podcast*](#)* (*May 2017*)

2017 Voice of the Sea TV Program

*Episodes [*4-1*](#) and [*4-2*](#)* (*Feb. 2017*)

OUTREACH ACTIVITIES

- 2021** Better Poster Workshop Coach
Coached students on how to create a better scientific poster (Feb. 2021)
- 2020** Radford High School Outreach (EP'IK Program)
Taught hydrology and water quality to high schoolers (Oct. 2020)
- 2019** Kahala Elementary Science Showcase
Outreach activity for 75 4th graders (Dec. 2019)
- 2019** SOEST Semi-Annual Open House
Outreach event for over 6,000 K-12 attendees (Oct. 2019)
- 2019** ASLO Instagram Takeover
Posted content to ASLO's Instagram for 1 day (July 2019)
- 2019** AGU Instagram Takeover
Posted content to AGU's Instagram for 3 days (July 2019)
- 2019** ASLO LOREX Blog
Wrote 5 [blogs](#) about experiences with international collaboration (Summer 2019)
- 2018** Hawai'i Sea Grant Poster Symposium
Scientific poster presentation for Sea Grant representatives (Dec. 2018)
- 2018** Windward District Science Fair Judge
Judge of middle school science fair projects (Feb. 2018)
- 2017** AGU Near-Peer Undergraduate Mentoring Session
Participated as a mentor for undergraduate students during the AGU Fall Meeting in New Orleans, Louisiana (Dec. 2017)
- 2017** SOEST Semi-Annual Open House
Outreach event for over 6,000 K-12 attendees (Oct. 2017)
- 2017** Roosevelt High School Science Outreach
Outreach event for high school students (Apr. 2017)
- 2017** Bishop Museum Fall in Love with Science Outreach
Outreach event for children and their families (Feb. 2017)
- 2017** UH Sea Grant Hanauma Bay Volunteer Education Event
Outreach event for about 40 Hanauma Bay volunteers (Jan. 2017)