

Ocean and Earth EM Laboratory
Institute for Geophysics
Jackson School of Geosciences
The University of Texas at Austin

ACADEMIC POSITIONS

2022 – Present	Research Assistant Professor , Head of the Ocean and Earth Electromagnetic Laboratory, Institute for Geophysics, Jackson School of Geosciences, The University of Texas at Austin
2023 – 2024	Guest Investigator , Geology & Geophysics, Woods Hole Oceanographic Institution
2022 – 2023	Research Associate III , Geology & Geophysics, Woods Hole Oceanographic Institution
2020 – 2022	Research Affiliate Faculty , School of Ocean and Earth Science and Technology, Institute of Geophysics and Planetology, Department of Earth Sciences, University of Hawai'i
2021	Visiting Scientist , Earth and Planetary Sciences, Weizmann Institute of Science
2018 – 2020	Postdoctoral Research Fellow , School of Ocean and Earth Science and Technology, Department of Earth Sciences, University of Hawai'i

EDUCATION

2013 – 2017	Ph.D., Geophysics, University of Southampton, National Oceanography Centre, UK
2012 – 2013	MRes., Geology & Geophysics, University of Southampton, UK
2000 – 2003	B.Sc., Oceanography (Magna Cum Laude), Ruppig College, IL

RESEARCH SUMMARY & THEMES

My research focuses on dynamic oceanic Earth processes, emphasizing *geohazards* and *renewable resources* originating from the upper mantle to the ultra-shallow crust. I am particularly interested in studying lithosphere-biosphere feedback interactions using advanced marine electromagnetic (EM) imaging augmented by seismic and potential field methods integrated with rock physics modeling and oceanographic/biogeochemical data. My lab ([OCEEMlab](#)) pioneers next-generation marine EM technologies to rigorously characterize hydrothermal mineralization and geo-hydrogen processes at spreading ridges and subduction zones, monitor subsea CCS, and map renewable submarine freshwater systems. OCEEMlab is dedicated to supporting the global energy transition and advancing the burgeoning [New Blue Economy](#).

- Dynamics of melting ice sheets, isostatic rebound, and methane contributions to the ocean carbon cycle
- Role of subduction zone-driven slab rollback and toroidal/poloidal mantle flows in continental breakup
- Geological hydrogen generation and storage beneath ultraslow-spreading and subduction zones
- Convection dynamics of upwelling hot plumes and cold downwelling mantle curtains
- Interplay between volcanic plumes, groundwater flux, and marine biodiversity
- Quasi-periodic earthquake cycles of oceanic transform faults
- Onshore-offshore hydraulic functioning of submarine freshwater
- Hydrothermal circulation and seafloor mineralization
- Time-lapse monitoring of subsea CO₂ storage sites

RESEARCH GRANTS

2018 – 2021 NSF (EPSCoR) #1557349: **IKEWAI** Submarine freshwater mapping offshore Hawai'i. Past grant: \$240,000

PUBLICATIONS

* *h-index*: 10, of peer-reviewed publications: 13, # of citations: 649 (Google Scholar, 04.18.2025)

In Prep.

Zhang, M., **E. Attias.**, C. G. Farquharson., T. Lin., (In Prep). Application of quasi-2D electromagnetic field gradient-constrained inversion for Detecting the Hongqiling Copper-Nickel Sulfide Deposit. fault.

Zhang, M., C. G. Farquharson., **E. Attias.**, T. Lin., (In Prep). Three-dimensional electromagnetic inversion method with enhanced boundary resolution using field gradients as constraints. fault.

Yilo, K. N., **E. Attias.**, T. A. Minshull., K. Weitemeyer., (In Prep). Seismically-constrained CSEM imaging of the submarine Sleipner CCS site.

2025

Chesley, C., R. L. Evans., J. Warren., A. Gase., J. Perez., C. Armerding., P. Koenig., **E. Attias.**, B. Fluegel., N. Hummel., J. D. Kim., K. Enright, E. Topp-Johnson., H. Brewer., M. Boettcher, (2025). Evidence for crustal brines and deep fluid infiltration in an oceanic transform, *Sci. Adv.*, 11, 15, eadu3661. fault.

2024

Yilo, K. N., K. Weitemeyer., T. A. Minshull., **E. Attias.**, H. M-Moreno., I. F-Suarez., R. Gehrman., J. Bull, (2024). Marine CSEM synthetic study to assess the detection of CO₂ escape and saturation changes within a submarine chimney connected to a CO₂ storage site. *Geophys. J. Int.*, 236(1), 183–206.

2023

Haroon, A., H. Paasche., S. Graber., S. Petersen., **E. Attias.**, M. Jegen., R. Gehrman., S. Hölz., M. Klischies, (2023). Automated seafloor massive sulfide detection through integrated image segmentation and geophysical data analysis: Revisiting the TAG hydrothermal field. *Geochem. Geophys. Geosyst.*, 24(12), e2023GC011250.

2021

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. *Geophys. Res. Lett.*, 48(7), e2020GL091249.

2020

Attias, E., D. Thomas., D. Sherman., K. Ismail., S. Constable, (2020). Marine electrical imaging reveals novel freshwater transport mechanism in Hawai'i, *Sci. Adv.*, 6, 48, eabd4866.

Attias, E., K. Amalokwu, M. Watts, I. Falcon-Suarez, L. North, H. Gaowei, A. I. Best, K. Weitemeyer., T. A. Minshull, (2020). Gas hydrate quantification at a pockmark offshore Norway from joint effective medium modeling of resistivity and seismic velocity. *Mar. Petrol. Geol.*, 113, 104–151.

2018

Attias, E., K. Weitemeyer, S. Hölz, Samer Naif, T. A. Minshull, A. I. Best, M. Jegen-Kulcsar., C. Berndt, (2018). High-resolution resistivity imaging of marine hydrate structures by combined inversion of CSEM towed and ocean-bottom receiver data. *Geophys. J. Int.*, 214(3), 1071–1714.

Haroon, A., S. Hölz, M. Watts, R. Gehrman, **E. Attias**, M. Jegen-Kulcsar, T. A. Minshull., B. Murton, (2018). Marine dipole–dipole controlled-source electromagnetic and coincident-loop transient electromagnetic experiments to detect seafloor massive sulphides: effects of three-dimensional bathymetry. *Geophys. J. Int.*, 215(3), 2156–2171.

2017

Attias, E., R. L. Evans., J. Elsenbeck., S. Naif., K. Key, (2017). Conductivity structure of the lithosphere-asthenosphere boundary beneath the eastern North American margin. *Geochem. Geophys. Geosyst.*, 18(2), 676–696.

2016

Attias, E., K. Weitemeyer, T. A. Minshull, A. I. Best, M. Sinha, M. Jegen-Kulcsar, S. Hölz., C. Berndt, (2016). Controlled-source electromagnetic and seismic delineation of sub-seafloor fluid flow structures in a gas hydrate province, offshore Norway. *Geophys. J. Int.*, 216(2), 1093–1110.

* Peer-reviewed publications in *Molecular Genetics* research:

2009

Amir O., Amir R, Paz H, **E. Attias.**, Sagiv M., Lewis B, (2009). Relation between AT1R gene polymorphism and long-term outcome in patients with heart failure. *Cardiology.*, 112(2), 151–157.

2007

Yamin C., Amir O., Sagiv M., **E. Attias**, Meckel Y., Eynon N., Amir R., (2007). ACE ID genotype affects blood creatine kinase response to eccentric exercise. *J. Appl. Physiol.*, 103(6), 2057–2061.

Amir O., Amir R., Yamin C., **E. Attias**, Eynon N., Sagiv M., Meckel Y., (2007). The ACE deletion allele is associated with Israeli elite endurance athletes. *Exp. Physiol.*, 92(5), 881–886.

CONFERENCES

○ *Pending publication abstracts:*

2025

B. Boddupalli., B. Arntsen., T. Minshull., K. Hokstad., **E. Attias.**, S. Leroy., S. Johansen., L. Watremez., A. Corbalan., and L. Sørnum (2025). Artificial Smoker: Geophysical characterization of an ultraslow ridge system for sustainable resource management. *EGU General Assembly*, Vienna, Austria.

2024

E. Parker., **E. Attias.**, F. Roth., D. H-Hansen., S. Han., and S. Naif, (2024). New Insights into the Resistivity Structure of the Northern Hikurangi Margin. *AGU Fall Meeting.*, Washington DC, USA.

B. Fluegel., **E. Attias.**, D. Sherman., C. Chesley., N. Hummel., J. D. Kim., A. Gase., P. Koenig, J. Perez., C. Armerding., K. P. Enright., E. T-Johnson., and R. L. Evans, (2024). A Vulcan Mapping of the Gofar Transform Fault: Understanding the Effect of Porosity Structure on Seismicity Segmentation Using Active Source Marine Electromagnetic Data. *AGU Fall Meeting.*, Washington DC, USA.

SEAGOING & LAB EXPERIENCE

- 2024 **Team leader**, USA, cruise AT50-19, *R/V Atlantis*. UNOLS instrument training and calibration.
- 2022 **Senior geophysicist**, Japan. Seafloor minerals mapping using an AUV PlumeHunter sensor suite, *Ocean Floor Geophysics*.
- 2022 **Scientific collaborator**, cruise TN-399, *R/V Thompson*. Properties of the Gofar Transform fault zone: Using electromagnetics to map variability in structure concerning the earthquake deformation cycle. NSF-funded project. PI: *Rob L. Evans*.
- 2021 **Senior geophysicist**, Norway, *R/V Olympic Delta*. Seabed mineral exploration at mid-ocean ridge using an AUV-Self-Potential system, *Ocean Floor Geophysics*.
- 2019 **Staff scientist**, cruise SKQ201914S, *R/V Sikuliaq*. Marine EM survey of fluids in the Alaskan Megathrust. NSF-OCE 1654652. PI: *Kerry Key*.
- 2019 **Staff scientist**, cruise RR1817, *R/V Roger Revelle*. Marine EM imaging of the Hikurangi subduction zone, New Zealand. NSF-OCE 1737328. PI: *Samer Naif*.
- 2019 **Senior geophysicist**, Japan. Seafloor massive sulphide exploration using an AUV-Self-Potential system, *Ocean Floor Geophysics*.
- 2018 **Chief scientist**, cruise HP2018IW, *R/V Huki Pono*. Marine CSEM mapping of submarine freshwater offshore Hawai'i. NSF-EPSCoR 1557349.
- 2017 **Scientific consultant**, Japan. Gas hydrate 3-D marine CSEM experiment, *Ocean Floor Geophysics* in collaboration with *Scripps Institution of Oceanography*.
- 2016 **Staff scientist**, cruise JC138, *RRS James Cook*. Mineral exploration using marine CSEM at the TAG hydrothermal field, 26°N mid-Atlantic ridge. European Commission grant 604500. PI: *Bramley Murton*.
- 2016 **Field geophysicist**, cruise MGL02-16, *R/V Marcus G. Langseth*. Passive imaging of the LAB at the equatorial mid-Atlantic ridge. Natural Environment Research Council grants NE/M003507/1 and NE/K010654/1. PIs: *Catherine Rychert and Steve Constable*.
- 2015 **Field geophysicist**, Japan. Marine CSEM gas hydrate survey, *Ocean Floor Geophysics* in collaboration with *Scripps Institution of Oceanography*.
- 2011 – 2012 **ROV Pilot/Tech**, West Africa, Mediterranean Sea. Company: *Oceaneering*.
- 2008 – 2010 **Senior hydrographer**, Tanzania. Hydrographic survey at Dar Es Salaam port. Company: *EDT*.
- 2006 – 2008 **Research associate**, Israel. Wingate Institute Molecular Genetic Laboratory (see publications above).

SUPERVISION

Graduate Students

Yanyi Wang, Central South University, 2024 – Present

Elora De Gal, ESPCI Paris - PSL, 2025

Naima K. Yilo, University of Southampton (informal advisor), 2018 – 2025

Postdoctoral Fellows

Tanner Acquisto, Institute for Geophysics, UT Austin, 2024 – present

Research Scientists

Ming Zhang, Jilin University, 2024 – present

Marine Techs

P. Eng. *Tony Wass*, Senior Subsea Engineer, 2023 – present

Subsea Instrument Development Affiliates

P. Eng. *Nathan Ehrenholz*, NOW Subsea, 2023 – present

Res. Eng. *Max Woolsey*, University of Southern Mississippi, 2023 – present

Former Students & Postdocs

Emma L. Parker, Jackson School of Geosciences, The University of Texas at Austin, 2023 – 2024

Bailey L. Fluegel, MIT-WHOI Joint Program & UTIG's OCEEMlab, 2022 – 2024

Dallas Sherman, Institute for Geophysics, UT Austin, 2023 – 2024

TEACHING

2023: Electromagnetic methods in the Potential Field in Geophysics course GEO 365P/383P. Jackson School of Geosciences, UT Austin.

2018–2021: Marine electromagnetic exploration methods. Institute of Geophysics and Planetology, Department of Earth Sciences, University of Hawai'i.

2015–2017: Applied and marine geophysics, introduction to marine geology, geophysical field methods, basin analysis, seafloor exploration and surveying, bathymetric survey (field course): data acquisition, analysis, and interpretation. University of Southampton, National Oceanography Centre.

INVITED TALKS

2025	Université libre de Bruxelles (ULB)
2025	Instituto de Ciencias del Mar (ICM) – CSIC
2025	Weizmann Institute of Science, Department of Earth and Planetary Sciences
2023	University of Washington, College of the Environment, School of Oceanography
2022	University of Texas at Austin, UTIG's 50 th Anniversary Symposium
2022	International Workshop on Offshore Freshened Groundwater Research
2022	University of Texas at Austin, Institute for Geophysics
2021	University of Bremen, Department of Geoscience, Winter Colloquium
2021	COOPERATE EM Meeting
2021	Marine Seismology Symposium
2021	Weizmann Institute of Science, Department of Earth and Planetary Sciences
2020	University of Hawai'i, School of Ocean and Earth Science and Technology
2019	University of Southampton, National Oceanography Centre
2018	Scripps Institution of Oceanography, Marine EM laboratory consortium
2016	University of Texas at Austin, Jackson School of Geosciences

SELECTED MEDIA COVERAGE

Eos – Science News by AGU (2021): “*Deep Submarine Fresh water: A New Resource For Volcanic Islands?*”

Tribune Herald (2021): “*Scientific breakthrough: First images of freshwater plumes at sea taken off West Hawai'i*”

- Honolulu Star-Advertiser** (2021): “University of Hawaii researchers are the first to track freshwater plumes rising from the ocean floor”
- Hawai'i News Now** (2020): “UH freshwater discovery raises hopes for islands worldwide”
- New York Times** (2020): “Hawai'i's Fresh Water Leaks to the Ocean Through Underground Rivers”
- Smithsonian Magazine** (2020): “Newly Discovered Underground Rivers Could Be Potential Solution for Hawai'i's Drought”
- New Scientist** (2020): “Huge reservoir of fresh water found beneath the sea off Hawai'i”
- Inverse** (2020): “Scientists Uncover Billions of Gallons of Hidden Fresh water off Hawai'i”
- Earth.com** (2020): “New discovery could provide sustainable freshwater to volcanic islands”
- International Business Times** (2020): “Scientists Discover Billions of Gallons of Hidden Freshwater off Hawai'i Coast”
- Science Alert** (2020): “Huge Underground Reservoir of Freshwater Discovered Off The Coast of Hawai'i”
- Science Node** (2020): “Under the ocean”
- University of Hawai'i News** (2019): “Record-breaking survey investigates Alaskan ocean trench”
- University of Hawai'i News** (2019): “Ocean sensors help UH researchers understand Hawai'i Island aquifers”
- AGU GeoSpace** (2014): “Electromagnetic imaging helps scientists locate underwater methane”

SYNERGISTIC ACTIVITIES

Conference Meetings

- 2020 Primary-convener, *Imaging Earth Structures from the Surface down to the Upper Mantle with Multiple Geophysical and Geochemical Data I and II*, AGU Annual Fall Meeting.
- 2018 Co-convener, *Electromagnetic Methods Applied to Studies of Crustal and Mantle Dynamics*, 15th Annual Meeting of Asia Oceania Geosciences Society.

Review Activities

Manuscript reviewer for *Nat. Rev. Earth Environ.*; *Geophys. Res. Lett.*; *J. Geophys. Res.*; *Geochem. Geophys. Geosyst.*; *Geophys. J. Int.*; *Geophys. Prospect.*; *Geophysics*, and abstracts for AGU and SEG Annual Meetings.

Service: Academia & Industry

- 2024 – present: [Quantum Marine Minerals Inc., Norway](#) – Advisory board member.
- 2023 – present: [UT Austin, Jackson School of Geosciences](#) Scientific Equipment Funding Committee – Member.
- 2023: [OCEEMlab–GeoFORCE](#) BootCamp. A one-week geophysical fieldwork-driven course in partnership with the [GeoFORCE](#) Texas outreach program at UT Austin, Jackson School of Geosciences. GeoFORCE introduces high school students from underserved school districts to careers in geosciences and STEM.
- 2023 – present: [OCEEMlab–ATX](#) initiative. Serve as an academic adviser to the [ATX Science Olympiad](#) student organization at UT Jackson School of Geosciences.
- 2021: Leading the *Geophysics & Tectonics* division journal club, Department of Earth Sciences, University of Hawai'i.
- 2018 – 2021: Mentor, undergraduate, and master students from the School of Ocean and Earth Science and Technology, University of Hawai'i.
- 2018: Advisor, British Geophysical Association, *Postgraduate Research Meetings*, University of Southampton, UK.
- 2015 – 2017: Member, Graduate School Committee, University of Southampton, UK.

2014 – 2017: Member, Environmental Committee, National Oceanography Centre, Southampton, UK.

Service: Community

2018 – 2020: Bimonthly meetings with Hawai‘ian communities to provide updates on *Ike Wai*.

2019: Mentor, Kān‘eohe Community College, Hawai‘i. The TRiO STEMulate program is an educational program to prepare low-income first-generation high school students for college.

2017: Facilitator, FutureLearn *Exploring Our Oceans*, massive open online course.

2013 – 2017: Eco-schools outreach program, National Oceanography Centre, Southampton.
