Institute for Geophysics
Jackson School of Geosciences
The University of Texas at Austin
attias@ig.utexas.edu
OCEEMlab

SUMMARY

The overarching theme of my research focuses on dynamic Earth processes associated with marine *geohazards* and *resources* from the upper mantle to the ultra-shallow crust. I am particularly fascinated by Lithosphere-Biosphere feedback loop interactions. I primarily use passive (MT) and active (CSEM) marine electromagnetic techniques, which I integrate with seismic reflection and tomography, gravity, magnetic, and oceanographic data to study complex oceanic lithosphere mechanisms.

RESEARCH INTERESTS

- The interplay between mantle plume, submarine freshwater, and marine biodiversity in volcanic systems
- Hot-spot mantle plume geodynamics and submarine volcanism
- Slab rollback-driven toroidal and poloidal mantle flows at back-arc subduction zones and their role in the evolution of continental breakup
- Oceanic mid-ocean ridge transform faults' role in quasi-periodic earthquake cycles
- Impact of ice-sheet retreat and isostatic rebound on fluid flow dynamics and marine gas hydrate dissociation in polar regions
- Subsea CO2 storage sites time-lapse monitoring
- Characterization of seafloor minerals at hydrothermal vent fields along seafloor spreading ridges

EDUCATION

2013–2017	Ph.D., Marine Geophysics, University of Southampton, National Oceanography Centre, UK
2012–2013	MRes., Geology & Geophysics, University of Southampton, UK
2000–2003	B.Sc., (First Class Honors), Marine Sciences and Physical Oceanography, Ruppin Academic Centre, Israel

PROFESSIONAL EXPERIENCE

2023–	**Assistant Research Professor**, Institute for Geophysics, Jackson School of Geosciences, The University of Texas at Austin
2022–2023	**Research Associate**, Institute for Geophysics, Jackson School of Geosciences, The University of Texas at Austin
2022–	**Guest Investigator**, Geology & Geophysics, Woods Hole Oceanographic Institution
2022	**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

RESEARCH GRANTS

2024-2027	NSF-OPP #2245625: Collaborative Research: Impact of ICE-sheet retreat and geological controls on Fluid flow dynamics of the Antarctic Peninsula continental margin (ICEFLAME): a marine EM survey. Pending: $380,820
2023-2026	NSF-EAR #2320020: Collaborative Research: NSF-BSF: Analyzing the hydraulic functioning of connected onshore-offshore freshened groundwater reserves. Pending: $738,880
2018–2021	NSF-EPSCoR #1557349: Submarine freshwater mapping offshore Hawai'i. Grant: $240,000

PUBLICATIONS

* *h-index*: 10, of peer-reviewed publications: 10, # of citations: 532 (09.25.23 on google scholar)

Yilo, K. N., K. Weitemeyer., T. A. Minshull., J. Bull., H. M-Moreno., **E. Attias**., R. Gehrmann., and I. F-Suarez. Marine CSEM synthetic study to assess the detection of CO_2 escape and saturation changes within a submarine chimney connected to a CO_2 storage site, (in-print, ***Geophys. J. Int***).

Chase, B., and **E. Attias**. 3-D magnetic imaging of submarine freshwater channeled by magmatic intrusions offshore Hawai'i, (in-prep).

Attias, E., S. Constable., D. Sherman., K. Ismail., C. Shuler., and H. Dulai, (2021). Marine electromagnetic imaging and volumetric estimation of freshwater plumes offshore Hawai'i, ***Geophys. Res. Lett***., 48(7), e2020GL091249.

Attias, E., D. Thomas., D. Sherman., K. Ismail., and 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 and 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.

Attias, E., K. Weitemeyer, S. Hölz, Samer Naif, T. A. Minshull, A. I. Best, M. Jegen-Kulcsar, and 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. Gehrmann, **E. Attias**, M. Jegen-Kulcsar, T. A. Minshull and 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.

Attias, E., Rob. L. Evans, Jimmy Elsenbeck, Samer Naif, and Kerry Key, (2017). Conductivity structure of the lithosphere-asthenosphere boundary beneath the eastern North American margin. ***Geochem. Geophys. Geosyst***., 18(2), 676–696.

Attias, E., K. Weitemeyer, T. A. Minshull, A. I. Best, M. Sinha, M. Jegen-Kulcsar, S. Hölz, and 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:

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

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

FIELD & LAB EXPERIENCE

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. PI's: *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 marine port. Company: *EDT*.

2006–2008 **Research Associate**, Israel. Wingate Institute Molecular Genetic Lab. See associated publications above.

TEACHING

2023: Electromagnetic methods component in the Potential Field in Geophysics (GEO 365P/383P) course, 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

2023	Marine Seismic Research Operations Committee (MSROC) Meeting
2022	UT Austin, Institute for Geophysics 50^{th} Anniversary Symposium
2022	International Workshop on Offshore Freshened Groundwater Research
2022	Institute for Geophysics, the University of Texas at Austin. Seminar Series
2021	University of Bremen. Department of Geoscience Winter Colloquium
2021	COOPERATE EM. Monthly meeting
2021	Marine Seismology Symposium, Frontiers in Marine Electromagnetics
2021	Weizmann Institute of Science, Department of Earth and Planetary Sciences. Monthly seminar
2020	University of Hawai'i, School of Ocean and Earth Science and Technology. Friday seminar
2019	National Oceanography Centre, Southampton, UK. Monthly seminar
2018	Scripps Institution of Oceanography. Marine EM laboratory consortium. Annual meeting
2016	University of Texas at Austin, Jackson School of Geosciences. Monthly seminar

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

Developing and running a one-week geophysics field course for the GeoFORCE outreach program at UT Austin's Jackson School of Geosciences. GeoFORCE introduces high school students from underserved school districts to careers in geosciences and STEM (2023).

Academic Adviser to the ATX Science Olympiad UT Austin Student Organization (2023).

Leading the *Geophysics & Tectonics* division journal club (Dec 7th, 2021), Department of Earth Sciences, University of Hawai'i.

Informal advisor of Ph.D. candidate Naima Yilo, University of Southampton (2018-present). Research topic: Monitoring CO_2 sequestration using marine CSEM. Advisors: Tim Minshull, Jon Bull, Karen Weitemeyer.

Mentor, undergraduate, and master students from the School of Ocean and Earth Science and Technology, University of Hawai'i (2018-2021).

Advisor, British Geophysical Association, *Postgraduate Research in Progress Meeting*, University of Southampton (2018).

Member, graduate school committee, the University of Southampton (2015–2017).

Member, environmental sub-committee, National Oceanography Centre, Southampton (2014–2017).

Service: Comunnity

Bimonthly meetings with Hawai'ian communities to provide updates on the *'Ike Wai* project (2018–2020).

Mentor, K*ā*n'eohe Community College, Hawai'i: TRiO STEMulate program, educational program to prepare low-income first-generation high school students for college (2019).

Facilitator, FutureLearn *Exploring Our Oceans*, massive open online course, UK (2017) .

Eco-schools outreach program, National Oceanography Centre, Southampton, UK (2013–2017).