CURRICULUM VITAE
John A. Breier Jr., P.E.

Associate Scientist with Tenure
Woods Hole Oceanographic Institution
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EDUCATION

2006	Ph.D. The University of Texas at Austin, Department of Marine Science
1996	DOE Bettis Atomic Power Laboratory, Reactor Engineering School
1995	B.S. cum laude, Texas A&M University, Mechanical Engineering

PROFESSIONAL APPOINTMENTS & EXPERIENCE

2025-present	Associate Scientist with Tenure, Woods Hole Oceanographic Institution
2021-2025	Professor, The University of Texas Rio Grande Valley
2021-2022	Interim Director, School of Earth, Environmental, and Marine Sciences; The University of Texas Rio Grande Valley
2015-2021	Associate Professor (with tenure), The University of Texas Rio Grande Valley
2015-2025	Adjunct Scientist, Woods Hole Oceanographic Institution
2012-2015	Associate Scientist, Woods Hole Oceanographic Institution
2008-2012	Assistant Scientist, Woods Hole Oceanographic Institution
2006-2008	NSF RIDGE2000 Postdoctoral Fellow, Woods Hole Oceanographic Institution
2006	Postdoctoral Researcher, Stanford University
2001-2006	Research Assistant, The University of Texas at Austin, Marine Science Institute
1995-2000	Officer, United States Navy Reserve, Naval Reactors, Nuclear Power Engineer

LICENSURE

Professional Engineer: Texas (135114), Massachusetts (55713)

HONORS AND AWARDS

2011	WHOI Deep Ocean Exploration Institute Fellowship
2006	NSF RIDGE 2000 Postdoctoral Fellowship
2004	E.J. Lund Fellowship in Marine Science, The University of Texas at Austin
2002	Environmental Science Institute Summer Research Fellowship, The University of Texas

RESEARCH INTERESTS

I am an ocean engineer and environmental biogeochemist. I focus on understanding abiotic and biotic coupling in aqueous systems as well as the development of environmental sensors, robotics, and their application to water science. I study water with a focus on the interaction between chemistry and microbial life and how this interplay influences environmental nutrient flows and ecosystem productivity. I am particularly interested in how these interactions vary over time and space because understanding these patterns critically tests our understanding of how

natural aquatic systems function. For this reason, most of my academic career has been focused on advancing the state of the art in environmental observation and studying challenging environmental mixing processes using advanced observing techniques. I use a variety of techniques including remotely operated and autonomous vehicles, sensor networks, and custom instrumentation. I am also interested in the development and application of ocean instrumentation and vehicles for (i) the enhanced study of Earth system processes and analogous processes on water worlds; (ii) dynamic mixing of groundwater, freshwater, seawater, and geofluids; and (iii) chemical and energy exchange between the lithosphere and the ocean.

PROFESSIONAL AFFILIATIONS

American Association for the Advancement of Science
American Geophysical Union
American Society of Limnology and Oceanography
The Geochemical Society
The Geological Society of America
IEEE

PROFESSIONAL ACTIVITIES

NSF Science and Technology Center, Chemical Currencies of a Microbial Planet
UTRGV, School of Earth, Ocean, and Marine Sciences, Diving Control Board Committee
UTRGV, School of Earth, Ocean, and Marine Sciences, Marine Operations and Safety Committee
UTRGV, College of Science, Committee Chair, Standards and Guidelines for Tenure, Promotion, and Annual Review
UTRGV, College of Science, Tenure & Promotion Committee
UTRGV, School of Earth, Environmental, and Marine Sciences, Nontenure Track Promotion and Evaluation Committee Chair
UTRGV, School of Earth, Environmental, and Marine Sciences, Tenure & Promotion Committee
UTRGV, School of Earth, Environmental, and Marine Sciences, Annual Evaluation Committee
UTRGV, School of Earth, Environmental, and Marine Sciences, Ph.D. Planning Committee
UTRGV, College of Sciences, Research Advisory Committee Member
UTRGV, School of Earth, Environmental, and Marine Sciences, Bylaws Committee
NSF GEO Opportunities for Leadership in Diversity Idea Lab Workshop invited participant
NOAA Office of Exploration and Research, From surface to seafloor: Exploration of the water column, Priority Planning Workshop, participant.

JOURNAL REVIEWS

Annales de Limnologie – International Journal of Limnology
Biogeochemistry
Environmental Science & Technology
Frontiers in Earth Science, Marine Geoscience
Geobiology
Geochimica Cosmochimica Acta
Geochemistry, Geophysics, Geosystems
Geophysical Research Letters

IEEE Journal of Ocean Engineering
International Journal of Offshore and Polar Engineering
Journal of Environmental Management
Journal of Geophysical Research Oceans
Limnology & Oceanography
Marine Chemistry
Nature Geoscience
Sensors
Spectroscopy Letters

PROPOSAL REVIEWS
NSF Ocean Technology and Interdisciplinary Coordination
NASA ICEE2 Proposal Review Panelist
NOAA Ocean Exploration and Research
NSF Chemical Oceanography
NSF Hydrological Sciences
NSF Marine Geology
NSF Ocean Acidification

COURSES TAUGHT

2018-2024	Instructor, UTRGV MARS5370, *In Situ* Sensing
2017-2024	Instructor (Team Taught), UTRGV EEMS6320, Biogeochemistry
2023-2024	Instructor, UTRGV ENVR3303, Marine Geology
2022-2023	Instructor, UTRGV ENVR3303, Data Analysis in Environmental Science
2019	Instructor, UTRGV MARS5370, Autonomous Vehicles
2001-2002	Teaching Assistant, UT MNS307, Introduction to Oceanography Laboratory

STUDENTS & POSTDOCS ADVISED

Graduate Students:
Natalia Moore, UTRGV masters student, graduated 2022
Brianna Alanis, UTRGV masters student, graduated 2019
Kirsten Ayers, UTRGV masters student, graduated 2019

Postdoctoral Students:
Eric Chan, UTRGV postdoctoral investigator

Undergraduate Students:
Kristian Posado, UTRGV undergraduate student
Brianna Alanis, UTRGV undergraduate student
Javier Garcia, UTRGV undergraduate student
Mallory Ringham, WHOI Summer Student Fellow
Kevin Mori, WHOI Summer Student Fellow
Olivia Osicki, WHOI Summer Student Fellow
Kevin Guay, WHOI Summer Student Fellow

Kaitlyn McCartney, WHOI Summer Student Fellow

Undergraduate Engineering Senior Design Class Students mentored:
Katie MacKenzie, Smith College
Salomé Stulberg, Smith College
Sarah Pedicini, Smith College
Courtney Murphy, Smith College
Mara Pagano, Smith College
Leena Peters, Smith College
Emma Dalton, Smith College
Modupe Adegoke, Smith College

PARTICIPATION IN SCIENTIFIC EXPEDITIONS

2025 R/V *Atlantic Explorer*, Sep, Bermuda to Woods Hole (remote 2 weeks)
2025 R/V *Atlantic Explorer*, March, Bermuda to Woods Hole (2 weeks)
2023 R/V *Atlantis*, Juan de Fuca Ridge (3 weeks)
2023 R/V *Atlantis*, Tropical Pacific (5 weeks)
2019 E/V *Nautilus*, Gorda Ridge (telepresence 2 weeks)
2019 R/V *Atlantic Explorer*, Bermuda to Woods Hole (2 weeks)
2018 E/V *Nautilus*, Loihi Seamount (telepresence 3 weeks)
2018 R/V *Atlantic Explorer*, Sargasso Sea (multiple week long cruises)
2017 R/V *Neil Armstrong*, US North Atl. shelf break (5 days, *chief scientist*)
2015 M/Y *Alucia* Bikini Atoll, Pacific Ocean (7 days)
2014 E/V *Nautilus* Mississippi and Green Canyons, Gulf of Mexico (9 days)
2013 R/V *Falkor* Mid-Cayman Rise, Caribbean (4 weeks).
2012 R/V *Atlantis* Mid-Cayman Rise, Caribbean (3 weeks).
2010 R/V *Atlantis* North Atlantic Ocean (4 weeks).
2009 R/V *Thomas G. Thompson* Lau Basin/Pacific Ocean (4 weeks).
2007 R/V *Atlantis* East Pacific Rise (3 weeks).
2004 R/V *Kilo Moana* Lau Basin/Pacific Ocean (6 weeks).
2002 R/V *Longhorn* Gulf of Mexico shelf transect (3 days).

PUBLICATIONS

1. Saito, M. A., Saunders, J. K., McIlvin, M. R., Bertrand, E. M., **Breier**, J. A., Brisbin, M. M., Colston, S. M., Compton, J. R., Griffin, T. J., Hervey, W. J., Hettich, R. L., Jagtap, P. D., Janech, M., Johnson, R., Keil, R., Kleikamp, H., Leary, D., Martens, L., McCain, J. S. P., Moore, E., Mehta, S., Moran, D. M., Neibauer, J., Neely, B. A., Jakuba, M. V., Johnson, J., Duffy, M., Herndl, G. J., Giannone, R., Mueller, R., Nunn, B. L., Pabst, M., Peters, S., Rajczewski, A., Rowland, E., Searle, B., Van Den Bossche, T., Vora, G. J., Waldbauer, J. R., Zheng, H., and Zhao, Z.: Results from a multi-laboratory ocean metaproteomic intercomparison: effects of LC-MS acquisition and data analysis procedures, Biogeosciences, 21, 4889–4908, https://doi.org/10.5194/bg-21-4889-2024.
2. Cohen, N.R., Arianna I. Krinos, A.I., Kell, R.M., Chmiel, R.J., Moran, D.M., McIlvin, M.R., Lopez, P.Z., Barth, A., Stone, J., Alanis, B.A., Chan, E.W., **Breier**, J.A., Jakuba, M.V.

Johnson, R., Alexander, H., Saito, M.A., Microeukaryote metabolism across the western North Atlantic Ocean revealed through autonomous underwater profiling, *Nature Communications,* 15, 7325 (2024). https://doi.org/10.1038/s41467-024-51583-4.

3. Chan, E.W., Alanis, B.A., German, C.R., Lim, D.S.S., **Breier**, J.A., (2023) Oxygen and hydrogen isotopic evidence that Kama‘ehuakanaloa (Lō‘ihi) Seamount hydrothermal systems are recharged by deep Pacific seawater, *Deep-Sea Research Part I*, https://doi.org/10.1016/j.dsr.2023.104049.
4. Zhou, Z. Tran, P.Q., Adams, A. M., Kieft, K., **Breier**, J.A., Fortunato, C.S., Sheik, C.S., Huber, J.A., Li, M., Dick, G.J., Anantharaman K., (2023) Sulfur cycling connects microbiomes and biogeochemistry in deep-sea hydrothermal plumes, *ISME J*, https://doi.org/10.1038/s41396-023-01421-0.
5. Hu S.K., Smith, A., Anderson, R., Sylva, S., Setzer, M., Steadmon, M., Frank, K., Chan, E., Lim, D., German, C., **Breier**, J.A., Lang, S.Q., Butterfield, D., Fortunato, C.S., Seewald, J., Huber, J.A., (2022), Globally-distributed microbial eukaryotes exhibit endemism at deep-sea hydrothermal vents, *Molecular Ecology*, https://doi.org/10.1111/mec.16745.
6. Stewart, B.D., Sorensen, J.V., Wendt, K., Sylvan, J.B., German, C.R., Anantharaman, K., Dick, G.J., **Breier**, J.A., Toner, B.M., (2021), A multi-modal approach to measuring particulate iron speciation in buoyant hydrothermal plumes, *Chemical Geology*, https://doi.org/10.1016/j.chemgeo.2020.120018.
7. **Breier**, J.A., Jakuba, M.V., Saito, M.A., Dick, G.J., Grim, S.L., Chan, E.W., McIlvin, M.R., Moran, D.M., Alanis. B.A., Allen, A.E., Dupont. C.L., Johnson, R., 2020, Revealing ocean scale biochemical structure with a deep-diving vertical profiling autonomous vehicle, *Science Robotics*, Vol. 5, Issue 48, eabc7104, doi: 10.1126/scirobotics.abc7104.
8. Zhou, Z., Liua, Y., Pana, J., Cron, B.R., Toner, B.M., Anantharaman, K., **Breier**, J.A., Dick, G.J., Li, M., 2020, Gammaproteobacteria mediating utilization of methyl-, sulfur- and petroleum organic compounds in deep ocean hydrothermal plumes, *The ISME Journal*, doi:10.1038/s41396-020-00745-5.
9. Cron, B.R., Sheik, C.S., Kafantaris, F.C.A., Druschel, G.K., Seewald, J.S., German, C.R., Dick, G.J., **Breier**, J.A. and Toner, B.M., 2019. Dynamic biogeochemistry of the particulate sulfur pool in a buoyant deep-sea hydrothermal plume. *ACS Earth and Space Chemistry*, 4(2), pp.168-182.
10. Chan, E.W., Shiller, A.M., Joung, D.J. , Arrington, E.C., Valentine, D.L., Redmond, M.C., **Breier**, J.A., Socolofsky, S.A., and Kessler, J.D., 2019. Investigations of Aerobic Methane Oxidation in Two Marine Seep Environments: Part 2—Isotopic Kinetics. *Journal of Geophysical Research: Oceans* 124 (11): 8392–99, doi.org/10.1029/2019JC015603.
11. Chan, E.W., Shiller, A.M., Joung, D.J., Arrington, E.C., Valentine, D.L., Redmond, M.C., **Breier**, J.A., Socolofsky, S.A. and Kessler, J.D., 2019. Investigations of Aerobic Methane Oxidation in Two Marine Seep Environments: Part 1—Chemical Kinetics. *Journal of Geophysical Research: Oceans*, 124(12), pp.8852-8868, doi.org/10.1029/2019JC015594.
12. Leonte, M., Wang, B., Socolofsky, S.A., Mau, S., **Breier**, J.A. and Kessler, J.D., 2018. Using Carbon Isotope Fractionation to Constrain the Extent of Methane Dissolution Into the Water Column Surrounding a Natural Hydrocarbon Gas Seep in the Northern Gulf of Mexico. *Geochemistry, Geophysics, Geosystems*, *19*(11), pp.4459-4475.
13. Valentine, D., Fisher, G., Pizarro, O., Kaiser, C., Yoerger, D., **Breier**, J., and J. Tarn, 2016, Autonomous marine robotic technology reveals an expansive benthic bacterial community

relevant to regional nitrogen biogeochemistry, *Environmental Science & Technology*, 50 (20), pp 11057–11065, doi:10.1021/acs.est.6b03584.
14. Wang, B., Socolofsky, S.A., **Breier**, J.A., Seewald, J.S., 2016, Observations of bubbles in natural seep flares at MC 118 and GC 600 using in situ quantitative imaging. *Journal of Geophysical Research: Oceans*, 121(4), pp.2203-2230
15. Socolofsky, S.A., Lavery, A., Kessler, J., Wang, B., **Breier**, J.A., Leonte, M., Chan, E., Raineault, N.A., 2016, Fate and transport of gas bubbles from Sleeping Dragon seep in the northern Gulf of Mexico. *Oceanography* 29(1), 26–27.
16. Breier, C. F., Pike, S. M., Sebesta, F., Tradd, K., **Breier**, J. A., Buesseler, K. O. 2016, New applications of KNiFC-PAN resin for broad scale monitoring of radiocesium following the Fukushima Dai-ichi nuclear disaster, *Journal of Radioanalytical and Nuclear Chemistry*, 307(3), 2193-2200.
17. Li, M., Baker, B.J., Anantharaman, K., Jain, S., **Breier**, J.A., G.J. Dick, 2015, Genomic and transcriptomic evidence for scavenging of diverse organic compounds by widespread deepsea archaea, *Nature Communications* 6, Article number: 8933, doi:10.1038/ncomms9933.
18. Estapa, M.L., **Breier**, J.A. and German, C.R., 2015. Particle dynamics in the rising plume at Piccard Hydrothermal Field, Mid‐Cayman Rise. *Geochemistry, Geophysics, Geosystems*, *16*(8), pp.2762-2774.
19. Govindarajan, A.F., J. Pineda, M. Purcell, J.A. **Breier**, 2015, Species- and stage-specific barnacle larval distributions obtained from AUV sampling and genetic analysis in Buzzards Bay, Massachusetts, USA, *Journal of Experimental Marine Biology and Ecology*, 472, 158-165, http://dx.doi.org/10.1016/j.jembe.2015.07.012.
20. Anantharaman, K., J.A. **Breier**, G.J. Dick, 2015. Metagenomic resolution of microbial functions in deep-sea hydrothermal plumes across the Eastern Lau Spreading Center. *The ISME Journal*, doi:10.1038/ismej.2015.81.
21. Reed, D.C., **Breier**, J.A., Jiang, J., Anantharaman, K., Klausmeier, C.A., Toner, B.M., Hancock, C., Speer, K., Thurnherr, A.M., Dick, G.J., Predicting the response of the deep-ocean microbiome to geochemical perturbations by hydrothermal vents, *The ISME Journal*, 2015, doi:10.1038/ismej.2015.4
22. Sheik, C.S., Anantharaman, K., **Breier**, J.A., Sylvan, J.B., Edwards, K.J., Dick, G.J., 2015, Spatially resolved sampling reveals dynamics of microbial community assembly in rising hydrothermal plumes across a back-arc basin, *The ISME Journal*, 9(6), pp.1434-1445
23. Toner, B.M., German, C.R., Dick, G.J., **Breier**, J.A., 2015, Deciphering the complex chemistry of deep-ocean particles using complementary synchrotron x-ray microscope and microprobe instruments, *Accounts of Chemical Research*, 49(1), pp.128-137
24. Scott, J. J., **Breier**, J. A., Luther III, G. W., Emerson, D. Microbial iron mats at the Mid-Atlantic Ridge and evidence that Zetaproteobacteria may be restricted to iron-oxidizing marine systems, *PLoS One*, 2015, 10.1371/journal.pone.0119284.
25. Bennett, S. A., Dover, C. V., **Breier**, J. A., Coleman, M. Effect of depth and vent fluid composition on the carbon sources at two neighboring deep-sea hydrothermal vent fields (Mid-Cayman Rise), *Deep-Sea Research Part I*, *2015*, 104, 122-133.
26. **Breier**, J.A., Sheik, C.S., Gomez-Ibanez, D., Sayre-McCord, R.T., Sanger, R., Rauch, Coleman, C.M., Bennett, S.A., Cron, B.R., Li, M., German, C.R., Toner, B.M., Dick, G.J., A large volume particulate and water multi-sampler with in situ preservation for microbial and

biogeochemical studies, *Deep Sea Research Part I: Oceanographic Research Papers*, published online 6 September 2014, doi:10.1016/j.dsr.2014.08.008.
27. Jiang, H., **Breier**, J., Physical controls on mixing and transport within rising submarine hydrothermal plumes: A numerical simulation study, *Deep Sea Research Part I: Oceanographic Research Papers*, published online 27 June 2014, doi:10.1016/j.dsr.2014.06.006.
28. Anantharaman, K. Duhaime, M.B., **Breier**, J.A., Wendt, K., Toner, B.M., Dick, G.J., 2014. Sulfur oxidation genes in diverse deep-sea viruses, *Science*, published online 1 May 2014 doi:10.1126/science.1252229.
29. Li, M., Toner, B., Baker, B., **Breier**, J., Sheik, C., Dick, G., 2014. Microbial iron uptake as a mechanism for dispersing iron from deep-sea hydrothermal vents, *Nature Communications*, 5: 3192, doi:10.1038/ncomms4192.
30. Anantharaman, K., **Breier**, J.A., Sheik, C.S., Dick, G.J., 2013. Evidence for hydrogen oxidation and metabolic plasticity in widespread deep-sea sulfur-oxidizing bacteria. *Proceedings of the National Academy of Sciences* 110, 330-335, doi:10.1073/PNAS.1215340110.
31. Peterson, R.N., **Breier**, J.A, Harmon, L.R., Brusa, J., Hutchins, P.R., 2013. Development of a sparging chamber for field radon analysis. *Journal of Radioanalytical and Nuclear Chemistry* 298, 1347-1357, doi:10.1007/s10967-013-2589-5.
32. **Breier**, J.A., Gomez-Ibanez, D., Reddington, E., Huber, J.A., Emerson, D., 2012. A precision multi-sampler for deep-sea hydrothermal microbial mat studies. *Deep Sea Research Part I: Oceanographic Research Papers* 70, 83-90, doi:/10.1016/J.DSR.2012.10.006.
33. **Breier**, J.A., B.M. Toner, S.C, Fakra, M.A. Marcus, S.N. White, A.M. Thurnherr, and C.R. German, 2012, Sulfur, sulfides, oxides, and organic matter aggregated in submarine hydrothermal plumes at 9° 50' N East Pacific Rise, *Geochimica Cosmochimica Acta* 88, 216-236, doi:10.1016/J.GCA.2012.04.003.
34. Holden, J.F., J.A. **Breier**, K.L. Rogers, M.D. Schulte, and B.M. Toner, 2012, Biogeochemical processes at hydrothermal vents: Microbes and minerals, bioenergetics, and carbon fluxes. *Oceanography* 25(1), 196–208, doi:/10.5670/OCEANOG.2012.18.
35. **Breier**, J.A., C.F. Breier, and H.N. Edmonds, 2010, Seasonal dynamics of dissolved Ra isotopes in the semi-arid bays of south Texas, *Marine Chemistry*, 122, 39-50, doi:/10.1016/J.MARCHEM.2010.08.008,
36. **Breier**, J.A., S.N. White, and C.R. German, 2010, Mineral–microbe interactions in deep-sea hydrothermal systems: a challenge for Raman spectroscopy*, Philosophical Transactions of the Royal Society A*, 368, 3067-3086, doi:10.1098/RSTA.2010.0024.
37. **Breier**, J.A., C.R. German, and S.N. White, 2009, Mineral phase analysis of deep-sea hydrothermal particulates by a Raman spectroscopy expert algorithm: Towards autonomous in situ exploration and experimentation, *Geochemistry, Geophysics, and Geosystems*, 10, Q05T05, doi:/10.1029/2008GC002314.
38. **Breier**, J.A., N. Nidzieko, S. Monismith, W. Moore, and A. Paytan, 2009, Tidally regulated chemical fluxes across the sediment–water interface in Elkhorn Slough, California: Evidence from a coupled geochemical and hydrodynamic approach, *Limnology & Oceanography*, 54(6), 1964-1980, doi:/10.4319/LO.2009.54.6.1964
39. **Breier**, J.A., C.R. Rauch, K. McCartney, B.M. Toner, S. Fakra, S.N. White, and C.R. German, 2009, A suspended-particle rosette multi-sampler for discrete biogeochemical

sampling in low-particle-density waters, *Deep Sea Research I*, 56, 1579-1589, doi:/10.1016/J.DSR.2009.04.005.

40. **Breier**, J.A. and H.N. Edmonds, 2007, High ^{226}Ra and ^{228}Ra activities in Nueces Bay, Texas indicate large submarine saline discharges, *Marine Chemistry*, 103, 131-145, doi:/10.1016/J.MARCHEM.2006.06.015
41. **Breier**, J.A., C.F. Breier, and H.N. Edmonds, 2005, Detecting submarine groundwater discharge with synoptic surveys of sediment resistivity, radium, and salinity, *Geophysical Research Letters*, 32, L23612, doi:/10.1029/2005GL024639.

BOOK CHAPTERS

1. Saito, M. A., **Breier**, C., Jakuba, M., McIlvin, M., Moran, D. In *The Chemistry of Microbiomes*, Envisioning a chemical metaproteomics capability for biochemical research and diagnosis of global ocean microbiomes, National Academies Press, 2017; pp 29-36.

CONFERENCE PAPERS

1. Jakuba, M.V., **Breier**, J.A., Gómez-Ibáñez, D., Tradd, K., and M. A. Saito, 2018, *Clio*: An Autonomous Vertical Sampling Vehicle for Global Ocean Biogeochemical Mapping, *IEEE/OES Autonomous Underwater Vehicle Workshop (AUV)*, Porto, Portugal, 2018, doi: 10.1109/AUV.2018.8729797.
2. Yoerger, D. R., Curran, M., Fujii, J., German, C. R., Gomez-Ibanez, D., Govindarajan, A. F., Howland, J. C., Llopiz, J. K., Wiebe, P. H., Hobson, B. W., Katija, K., Risi, M., Robison, B. H., Wilkinson, C. J., Rock, S. M., **Breier**, J. A., 2018, *Mesobot*: An Autonomous Underwater Vehicle for Tracking and Sampling Midwater Targets; *IEEE/OES Autonomous Underwater Vehicle Workshop (AUV)*, Porto, Portugal, 2018, 10.1109/AUV.2018.8729822.
3. **Breier**, J. A., C. G. Rauch, and C. R. German, 2007, A suspended particle rosette sampler for investigating hydrothermal plumes, *OCEANS 2007 IEEE Press*, Vancouver, Canada.
4. **Breier** J. A., 2006, The impact of groundwater flows on estuaries, In Aquifers of the Gulf Coast of Texas, *Report 365*, Texas Water Development Board, Austin, Texas, pp. 165-172.

MANUSCRIPTS IN PREPARATION

1. Smith, A., Milesi, V., Trembath-Reichert, E., Seewald, J.S., German, C.R., Shock, E., Soule, S.A., Alanis, B., Breier, J.A., Chan, E., Cohen, T., Garcia, A., Nawotniak, S.K., Lees, D., Lim, D.S.S., Miller, M., Mirmalek, Z., Raineault, N., Sylva, S., Huber, J., A., Where Land Meets Sea: A Lava-Induced Ephemeral Hydrothermal System Supports Chemosynthesis in the Deep Sea, submitted to *Proceedings of the National Academy of Science* on 19 February 2026.

FUNDED RESEARCH (*this represents ~$8.4 million to date in competitive grant funding to my lab; plus more in terms of the collaborative funding my work enables in these grants*)

1. NSF Ocean Technology and Interdisciplinary Coordination, (**Breier**, Jakuba, Socolofsky, 09/01/2024-8/31/2027, $773,810 to Breier) Collaborative Research: A Multi-Modal Optical Sensing Package for Autonomous Adaptive Biogeochemical Sampling and Particle Characterization
2. Texas Water Development Board (DeYoe and **Breier,** 9/01/2023 - 8/31/2024, $57,454 direct/no indirect costs to Breier) Coastal sediment porewater salinity monitoring in Texas.

3. Texas OneGulf RESTORE Centers of Excellence (**Breier** lead in collaboration with Socolofsky - TAMU & Yang - University of Houston, 1/25/2023 - 2/14/2024, $159,419) An observational study of ship channel and shallow bay interactions and their influence on sediment transport, mixing, and water quality in Corpus Christi Bay.
4. NSF Division of Ocean Sciences (Multi-Institutional Cooperative Agreement led by WHOI and Liz Kujawinski and Mary Ann Moran (Univ. of Georgia) as well as many others, 09/09/2021-09/30/2026, $24,999,972 center total funding, the component for my work integrating the *Clio* vehicle into these activities is $185,405) Science and Technology Center: Center for Chemical Currencies of a Microbial Planet.
5. NOAA-EPP, (FAMU lead, UTRGV component 09/01/2021 – 12/01/24, $4,379,639 to UTRGV: Hicks, **Breier**, Cintra, Fierro Cabo, Temby, Easton), NOAA Cooperative Science Center for Coastal and Marine Ecosystems-II.
6. NSF Chemical Oceanography, (Santoro, Saito, **Breier**, Jakuba, 11/01/2019 - 10/31/2022, $308,612 to Breier) Collaborative Research: Underexplored Connections between Nitrogen and Trace Metal Cycling in Oxygen Minimum Zones Mediated by Metalloenzyme Inventories.
7. NSF Chemical Oceanography, (German, **Breier**, Fitzsimmons, Toner, Xu, 4/4/2019 – 4/3/2021, $299,820 to Breier) Collaborative Research: Hydrothermal Estuaries: What Sets the Hydrothermal Flux of Fe and Mn to the Oceans?
8. NASA, Planetary Science and Technology Through Analog Research program, (Lim, Huber, Nawotniak, German, Shock, Deans, Lees, Cohen, Raineault, Bell, Gold, **Breier**; 09/01/2017 – 08/31/2019, $233,875 to Breier), Systematic Underwater Biogeochemical Science and Exploration Analog.
9. U.S Fish & Wildlife/ Texas Parks and Wildlife (**Breier** and Campbell; 10/01/2017 – 09/31/2018, $238,536 not including cost share), Establishing a harmful algal bloom and plankton community composition observing time-series in the Lower Laguna Madre at Brazos Santiago Pass.
10. NSF Ocean Technology and Interdisciplinary Coordination, (Yoerger, **Breier**, Rock, Robison, OCE-1636510, 01/01/2017 – 12/31/2019, $185,296 to Breier) Collaborative Research: Mesobot: a robot for investigating the ocean interior
11. NSF Chemical Oceanography, (Saito, **Breier**, Jakuba, Johnson, OCE-1658067, 04/01/2017 – 3/31/2020, $310,114 to Breier) Collaborative research: High resolution nitrogen transformation processes at the Bermuda Atlantic Timeseries.
12. NOAA-EPP, (FAMU lead, UTRGV component 09/01/2016 – 08/31/21, $2,374,137, UTRGV: Hicks, Cintra, **Breier**, Fierro Cabo, Temby), Center for Marine and Coastal Ecosystems Consortium.
13. DOD, HBCU/MI Instrumentation, (**Breier**, Hicks, and Kline, 09/01/2016 – 08/31/2021, $452,029) A waveglider for studies of biofouling and ocean primary productivity.
14. The Texas OneGulf Consortium, (**Breier**, Hicks, 05/01/2016 – 10/31/2016, $105,255) LLM-PEM: A Predictive Ecological Model for the Lower Laguna Madre.
15. The Gulf of Mexico Research Initiative, (Ledwell, Lavery, **Breier**, Seewald, Texas A&M University System-02-S120017/S130208/S1402, 9/1/2011 - 12/31/2015, $1,612,595 total; $199,306 to Breier) Tracer Release Experiment in the Gulf of Mexico.
16. NSF Ocean Technology and Interdisciplinary Coordination, (**Breier**, Jakuba & Saito, OCE-1333212, 08/12/2013 – 08/12/2016, $1,308,601 total; $1,084,195 to Breier)

Collaborative Research: An autonomous vertical sampling vehicle for global ocean biogeochemical mapping.

17. The Gordon and Betty Moore Foundation, (Dick, **Breier**, Toner, Jiang, Schloss, Andersson, Klausmeier, 10/19/2010 – 03/01/2014, $381,210 total to Breier), Unveiling the microbiology that underpins deep-sea biogeochemistry
18. The Gordon and Betty Moore Foundation, (**Breier**, 11/01/2010 – 08/31/2013, $253,781), Developing a particulate sampling and in situ preservation system for high spatial and temporal resolution studies of microbial and biogeochemical processes.
19. NSF Ocean Technology and Interdisciplinary Coordination, (Petersen, **Breier**, Singh, OCE-1028990, 09/01/2010 – 08/31/2014 with 1-year no-cost extension, $878,007 total; $696,402 to Breier, 1 year no cost extension) Collaborative Research: Development of a submersible, autonomous Rn-222 survey system.
20. NSF RIDGE2000, (**Breier**, Jiang, Toner, Dick, OCE-1038055, 09/15/2010 – 09/16/2013, $771,644 total; $328,197 to Breier), Collaborative Research: Integrating geochemistry, microbiology, and hydrodynamics: A model for trace element transport and fate in hydrothermal plumes.
21. NSF Ocean Technology and Interdisciplinary Coordination, (**Breier** & Emerson**,** OCE-0926805, 10/01/2009 – 09/30/2012, with 1-year no-cost extension, $292,354 to Breier)) Collaborative Research: High-resolution Microbial Mat Sampler for operation with deep submergence vehicles.
22. NSF RIDGE2000 Marine Geology & Geophysics, (White, German, OCE-0550331, 03/01/2006 – 12/01/2008, $129,500 to **Breier***), Postdoctoral Fellowship: Development of Raman spectroscopy for in situ quantification and speciation of hydrothermal Fe and Mn particulates and sediments; * I wrote this proposal with Sheri White and Chris German and this proposal funded my postdoc with the two of them as my advisors.

CONFERENCE ABSTRACTS

1. Toner, B.M., Achterberg. E.P., **Breier**, J.A., Ditter, A., Fitzsimmons, J.N., German, C.R., Kang, K., Marcus, M.A., Matzen, S.L., Shapiro, D., Steiner, Z., Stewart, B., A ptychographic spectromicroscopy workflow for marine nanoparticles, presented at 2025 *Goldschmidt,* Prague, session 09-FO1
2. Matzen, S., Stewart, B., Steiner, Z., **Breier**, J., Fitzsimmons, J. N., Achterberg, E. P., German, C. R., Toner, B. M. 2025. Novel imaging reveals nanoparticulate hydrothermal iron available for export to ironpoor open ocean waters. Invited talk. American Chemical Society Spring Meeting, March 26, 2025. San Diego, CA
3. Matzen, S., Steiner, Z., Ely, T., **Breier**, J., Fitzsimmons, J., Achterberg, E., German, C.R., Toner, B.M., Nanoparticulate iron oxyhydroxides in carbon matrices is a signature of hydrothermal vents regardless of plume chemistry, presented at 2024, AbSciCon Conference, Providence, RI, session 417.
4. **Breier**, J.A., Moore, N., Jakuba, M., Dalpe, A.J., Silvia, M., Fujii, J., Joyce, T., Albers, J.B., Santoro, A., Saito, M.A., German, C.R., Robotic vehicles with integrated sampling and sensing capabilities enabling new modes of targeted, high spatial resolution biogeochemical observation: lessons learned from oxygen depleted zones and hydrothermal plumes, presented at 2024 *AGU Ocean Sciences Meeting,* abstract OT11A-06
5. Moore, N., Albers, J.B., Santoro, A., Jakuba, M., Saito, M.A., **Breier**, J.A., Enabling

targeted, autonomous collection of marine microbial communities for incubation experiments: first deployments in an oxygen depleted zone, presented at 2024 *AGU Ocean Sciences Meeting,* abstract OT43A-06

6. German, C.R., Xu, G., Fitzsimmons J.N., **Breier**, J.A., Toner, B.M., Jenkins, W.J., Gledhill, M., Moffett, J.W.,, Silvia, M., Tagliabue, A., Walker, S.L., Hydrothermal estuaries: what sets the Fe flux from submarine venting to the oceans?, presented at 2024 *AGU Ocean Sciences Meeting,* abstract OB41C-08

7. Matzen, S., Z. Steiner, T. Ely, J. **Breier**, Jr., J. Fitzsimmons, E. Achterberg, C. R. German, B. M. Toner. Carbon matrices support transport of nanoparticulate iron from hydrothermal vents to open ocean waters. Session 12g, August 21, 2024. Goldschmidt Conference, August 18-23, Chicago, IL.
8. Farsi, M., Li, M., **Breier**, J.A., Socolofsky, S.A., Yang, D., Large-eddy simulations of ship channel and shallow bay interactions under wind and wave forcings, 76th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, 2023, Washington, DC, Session A28
9. Matzen, S.L., Steiner, Z., Ely, T., **Breier**, J.A., Fitzsimmons, J.N., Achterberg, E.P., German, C.R., Toner, B.M., Effects of hydrothermal plume iron to sulfur ratio on export of trace iron from hydrothermal vents to open ocean waters, presented at *2023 Fall AGU Meeting*, San Francisco, abstract B32D-09
10. Cohen, N., Krinos, A., Alexander, H., Kellogg, R., Chmiel, R., Moran, D., McIlvin, M., Lopez, P., **Breier**, J.,Jakuba, M., Johnson, R., and Saito, M., Comparing microeukaryote metatranscriptomes and metaproteomes captured using an autonomous underwater vehicle, presented at 2023 *ASLO Meeting*
11. Moore, N., and **Breier**, J.A., A custom in-situ sensor network to examine primary productivity dynamics in coastal ecosystems, presented at 2022 *Fall AGU Meeting,* Chicago, abstract OS45C-1216
12. Moore, N., and **Breier**, J.A., Developing ad hoc in-situ sensor networks to investigate changes in primary productivity in seagrass ecosystems through observations in patterns of dissolved oxygen, presented at 2022 *AGU Ocean Sciences Meeting*
13. Cohen, N., Krinos, A., Alexander, H., Kellogg, R., Chmiel, R., Moran, D., McIlvin, M., Lopez, P., **Breier**, J.,Jakuba, M., Johnson, R., and Saito, M., Metabolic profiles and ecological roles of diverse protists across a coastal-offshore biogeochemical gradient in the North Atlantic Ocean, presented at 2022 *AGU Ocean Sciences*
14. **Breier**, J.A., Jakuba, M., German, C., and Saito, M., Global ocean biogeochemical mapping enabled by autonomous sampling vehicles, presented at 2022 *AGU Ocean Sciences*
15. Chan, E.W., **Breier**, J. A., German, C., Huber, J.A., Kobs-Nawotniak, S., Shock, E., Raineault, N., Hauer, M., Krasnosky, K., Sylva, S., Hu, S.K., Smith, A.R., Milesi, V.P., and Lim, D.S.S., Going the last kilometer: Overcoming challenges to discovering life-supporting gradients on Ocean Worlds, presented at 2020 *AGU Ocean Sciences*.
16. Medley, C., **Breier**, J. A., Jakuba, M., Chan, E.W., Johnson, R.J., Montgomery, Q.W., Lopez, P., and Saito, M., Comparison of HPLC derived phytoplankton pigments from autonomously collected samples and CTD methods to evaluate the integration of autonomous vehicles as platforms for enhancing ocean time-series programs, presented at 2020 *AGU Ocean Sciences*.
17. Jakuba, M., **Breier**, J. A., Saito, M., and Johnson, R.J., *Clio*: Toward routine operations for a

fast vertical profiling vehicle designed for global ocean biogeochemical mapping, presented at 2020 *AGU Ocean Sciences*.

18. Yoerger, D., Curran, M., Fuji, J., Gomez-Ibanez, D., Govindarajan, A., Howland, J., Llopiz, J., Wiebe, P., Hobson, B., Katija, K., Risi, M., Robinson, B., Rock, S., **Breier**, J.A., and Wilkinson, C.J. At-sea testing of the Mesobot midwater robot, presented at 2020 *AGU Ocean Sciences*.
19. Saito, M., McIlvin, M., Chan, E., Moran, D., Searle, B., Cohen, N., Kellog, M.M., Chmiel, R., Lopez, P., Pacheco, F., Anderson, Z., Johnson, R.J., Jakuba, M., and **Breier**, J.A., Gradients in functional capabilities in the Sargasso Sea as determined by metaproteomes collected by the biogeochemical AUV Clio, presented at 2020 *AGU Ocean Sciences*.
20. Wackett, A., Breier, J.A., Cron, B.R., Dick, G., Dunshee, A., Gartman, A., German, C.R., Tamura, N., Toner, B.M., From hot to cold: Assessing the mineralogical diversity of hydrothermal vent plume particles on Earth with an eye towards hydrothermally active icy ocean worlds, presented at 2020 AGU Fall Meeting.
21. Chan, E. and **Breier**, J. A., Toward synoptic and coordinated autonomous aerial and surface drone observations of estuarine biogeochemistry, presented at 2019 *ASLO Aquatic Sciences* Meeting
22. **Breier**, J.A., Jakuba, M., Saito, M., Chan, E., Mcilvin, M., Moran, D., Alanis, B., and Johnson, R., Revealing ocean biochemical structure with high-resolution sampling from an autonomous underwater profiling vehicle: *Clio*, presented at 2019 *ASLO Aquatic Sciences* Meeting
23. Smith, A.R., Alanis, B., **Breier**, J.A., Chan, E., German, C., Nawotniak, S.K., Lo'ihi Seamount: a window to ocean worlds, presented at 2019 *Astrobiology Science Conference* Meeting
24. Saito, M., McIlvin, M., Moran, D., Chan, E., Alanis, B., Lopez, P., Hawco, N., Lomas, M., Bates, N., Sedwick, P., Johnson, R., Jakuba, M., **Breier**, J.A., Metaproteomic characterization of seasonal dynamics at the bermuda atlantic time series using the biogeochemical AUV Clio, presented at 2019 *ASLO Aquatic Sciences* Meeting
25. **Breier**, J. (*invited*), Overcoming Barriers in Time and Space: Reimagining the Possible with Robotic Oceanography, 2018 *Gordon Research Conference Marine Microbes*.
26. **Breier**, J. A., Jakuba, M., Saito, M.A., Dick, G., Gomez-Ibanez, D., Tradd, K., Grim, S.L., Chmiel, R., McIlvin, M.R., Noble, A.E., Alanis, B., Kellogg, M.M., Garcia, J., *Clio* a vertical sampling AUV for next-generation ocean sectional studies, 2018 *AGU Ocean Sciences*.
27. German, C. R., Lim, D. S. S., **Breier**, J. A., Huber, J. A., Nawotniak, S. K., Shock, E., Raineault, N., Time series study of hydrothermal venting at Lō′ihi seamount following the 2018 Kilauea eruption, presented at 2018 *AGU Fall Meeting*.
28. Yoerger, D., **Breier**, J. A., Curran, M., Fuji, J., German, C., Gomez-Ibanez, D., Govindarajan, A., Hobson, B., Howland, J., Katija, K., Llopiz, J., Pontbriand, C., Risi, M., Robinson, B., Rock, S., Wiebe, P., Mesobot: An Autonomous Underwater Vehicle For Tracking And Sampling Midwater Targets, 2018 *AGU Ocean Sciences*.
29. Govindarajan, A. F., Copley, N., **Breier**, J., Wares, J. P., Bucklin, A., Metagenetic zooplankton analyses to explore water column biodiversity, Abstract 29701, presented at 2017 *ASLO Aquatic Sciences* Meeting
30. **Breier**, J. A., Peterson, R., Bailey, J., Gomez-Ibanez, D., A submersible dissolved radon detection system for submarine groundwater discharge studies, Abstract 29827, presented at

2017 *ASLO Aquatic Sciences* Meeting

31. Yoerger, D. R., **Breier**, J. A., German, C. R., Govindarajan, A. F., Katija, K., Llopiz, J. K., Robison, B. H., Rock, S. M., Wiebe, P. H., Mesobot: a new autonomous robot for midwater research and exploration, Abstract 29991, presented at 2017 *ASLO Aquatic Sciences* Meeting
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33. **Breier**, J.A., Estapa, M.L., German, C.R., 2016, Iron partitioning between the dissolved and particulate phase within a rising hydrothermal plume: Beebe Vents, Piccard Hydrothermal Field, Mid-Cayman Rise, Abstract CT23A-08, presented at 2016 *AGU Ocean Sciences* Meeting
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35. Govindarajan, A.F., Pineda, J., Purcell, M., **Breier**, J., Cross-shore and vertical distributions of invertebrate larvae using autonomous sampling coupled with genetic analysis, Abstract IS13A-05, presented at 2016 *AGU Ocean Sciences* Meeting
36. Cron, B., Toner B., **Breier** J., Dick G., Jiang H., 2015, Speciation of iron and sulfur in mineral-organic aggregates from the Von Damm Mid-Cayman rise hydrothermal vent, *Goldschmidt Abstracts*, 616
37. Buesseler K., Charette M., **Breier** J., Pike S., Henderson P., Kipp L., Tradd K., 2015, Revisiting radionuclide sources at the Marshall Islands, *Goldschmidt Abstracts*, 416
38. **Breier**, J. A.; Toner, B.; Sheik, C.; Jiang, H. S., Dick, G., 2014, Deep-sea hydrothermal plumes: chemical, microbial, and physical controls on mass and energy transfer between the lithosphere and the ocean, Abstract 16559 presented at 2014 *AGU Ocean Sciences* Meeting.
39. Reed, D. C., **Breier**, J. A., Jiang, H., Klausmeier, C. A., Dick, G. J., Coupled microbial-geochemical dynamics in a model deep-sea hydrothermal plume, Abstract 16166 presented at 2014 *AGU Ocean Sciences* Meeting.
40. Gomez-Ibanez, D., McCartney, K., German, C., Yoerger, D., **Breier**, J., Recent advances in geochemical and biological sampling instrumentation: from remote and autonomous vehicles to the *Clio* biogeochemical profiler, Abstract 16609 presented at 2014 *AGU Ocean Sciences* Meeting.
41. Dick, G., Li, M., Toner, B.M., Cron-Kamermans, B., Baker, B.J., **Breier**, J.A., Sheik, C.S., 2013, The geomicrobiology of iron in deep-sea hydrothermal plumes, Abstract B14B-04 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec. ***Invited***.
42. **Breier**, J.A., B. Toner; C. Sheik; K. Anantharaman; J. B. Sylvan, K. J. Edwards, P. R. Girguis; K. Wendt, J. Sorensen, A. Madison, G. W. Luther, H. Jiang, G. Dick, 2012, Linking hydrothermal plume geochemistry with deep-sea microbial community structure along the Eastern Lau Spreading Center, Abstract B44B-05 presented at 2012 Fall Meeting, *AGU*, San Francisco, Calif., 3-7 Dec.
43. Dick, G., J.A. **Breier**, B.M. Toner, C. Sheik, B.R. Cron, M. Li, D.R. Reed, K. Anantharaman, B.J. Baker, S. Jain, C.A. Klausmeier, H. Jiang, C.R. German, J. Seewald, S.P. Sylva, J.M. McDermott, S.A. Bennett, 2012, Microbial geochemistry in rising plumes of two hydrothermal vents at the Mid-Cayman Rise, Abstract OS22B-05 presented at 2012 Fall Meeting, *AGU*, San Francisco, Calif., 3-7 Dec, ***Invited***.

44. Huber, J.A., J. Reveillaud, E. Reddington, J.M. McDermott, S.P. Sylva, J.A. **Breier**, C.R. German, J. Seewald, 2012, Subseafloor Microbial Life in Venting Fluids from the Mid Cayman Rise Hydrothermal System, Abstract B41F-03 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec, ***Invited***.
45. Cron, B.R., B.M. Toner, S.A. Bennett, C.R. German, G. Dick, J.A. **Breier**, 2012, The spatial distribution and speciation of iron in buoyant hydrothermal plumes of the Mid-Cayman Rise, Abstract OS13B-1741 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
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47. Toner, B.M., J.A. **Breier**, K.J. Edwards, S.C. Fakra, C.R. German, M.A. Marcus, O.J. Rouxel, 2012, Measuring the speciation of iron in hydrothermal plume particles, Abstract presented at 2012 *Goldschmidt* Conference.
48. **Breier**, J.A., O. Osicki, H. Jiang, K. Anantharaman, G. Dick, Wendt, K., Sorenson, J.V., B. Toner, 2011, Mineral formation and trace element uptake in rising hydrothermal plumes of the Lau basin, Abstract OS23B-01 presented at 2011 Fall Meeting, *AGU*, San Francisco, Calif., 5-9 Dec.
49. Jiang, H., J.A. **Breier**, G. Dick, B. Toner, 2011, Computational fluid dynamics simulation of the rising portion of a seafloor hydrothermal plume, Abstract OS11B-1472 presented at 2011 Fall Meeting, *AGU*, San Francisco, Calif., 5-9 Dec.
50. Sorenson, J.V., B. Toner, G. Dick, J.A. **Breier**, H. Jiang, 2011, Major and trace-element speciation in deep-sea hydrothermal plumes of Eastern Lau Spreading Center, Abstract OS23B-02 presented at 2011 Fall Meeting, *AGU*, San Francisco, Calif., 5-9 Dec.
51. Wendt K., K. Ananatharaman, J.A. **Breier**, G.J. Dick, K.J. Edwards, P.R. Girguis, J.V. Sorensen, J. Sylvan, B. M. Toner, 2011, Biogeochemical patterns and processes in buoyant, deep-sea hydrothermal plumes, Abstract presented at 2011 *Goldschmid*t Conference.
52. **Breier**, J. A., S. N. White, and C. R. German, 2010, Applications and challenges for the application of Raman spectroscopy in deep-sea hydrothermal systems*, GeoRaman* 2010, ***invited plenary speaker***.
53. **Breier**, J. A., K. Anantharaman, B. M. Toner, and G. J. Dick, 2010, Biotic-abiotic interactions in deep-sea hydrothermal plumes, Abstract presented at 2010 *Goldschmidt* Conference.
54. **Breier**, J.A., K. Anantharaman, J.B. Sylvan, S.N. White, K.J. Edwards, G. Dick, B.M. Toner, 2010, Early-stage hydrothermal particle formation along the Eastern Lau Spreading Center *Eos Trans. AGU*, 91(26), Ocean Sci. Meet. Suppl., Abstract IT45G-12.
55. Toner, B.M., S.C. Fakra, M.A. Marcus, O. Rouxel, K.J. Edwards, C.R. German, J.A. **Breier**, 2009, Integrated biogeochemistry of mid-ocean ridge hydrothermal plumes (Invited), *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract OS12A-01.
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57. **Breier**, J. A., N. Nidzieko, S. Monismith, and A. Paytan, 2006, Quantifying seawater recirculation through subtidal estuarine sediments in Elkhorn Slough, California: coupling Ra isotope geochemistry with hydrodynamic modelling, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract B22C-08.

58. **Breier**, J. A., C. F. Breier, and H.N. Edmonds, 2006, Regional-scale investigation of submarine discharge to Texas bays, *Eos Trans. AGU*, 87(36), Ocean Sciences Meet. Suppl., Abstract OS14A-05.
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60. **Breier**, J.A., Jr. and H.N. Edmonds, 2005. Seawater circulation in coastal sediments. *Texas Bays and Estuaries*, Annual Meeting.
61. **Breier**, J.A., Jr. T.A. Villareal, and H.N. Edmonds, 2004. Radium derived groundwater fluxes and nutrient inputs to Nueces Bay, Texas. *EOS, Trans. AGU*, 84(52), 84(52), Ocean Sciences Meet. Suppl., Abstract OS21D-05.
62. Edmonds, H. N., C. R. German, J. A. **Breier**, D. P. Connelly, A. Townsend-Smalls, J. A. Resing, C. Aumack, E. T. Baker, and C. H. Langmuir, 2004. Plume mapping and shipboard chemical data used to locate new vent sites in the Lau Basin. *EOS, Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract B13A-0191.
63. **Breier**, J.A., Jr., H.N. Edmonds, T.A. Villareal, 2002. Measuring groundwater inflow to Nueces Bay using natural radium isotopes as tracers. *National Estuarine Research Reserve System* 2003 Spring Symposium
64. **Breier**, J.A., Jr., H.N. Edmonds, T.A. Villareal, and L. Tinnin, 2002. Groundwater and nutrient infiltration in an inverse estuary: Nueces Bay, Texas. *The Geological Society of America*, 34, Fall Meeting, Abstract 156-7.
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PUBLICATIONS (non-peer reviewed)

1. **Breier**, J.A., H.N. Edmonds, and T.A. Villareal, 2004, Submarine groundwater discharge and associated nutrient fluxes to the Corpus Christi Bay system, *Report 2002483416*, 54 pp., Texas Water Development Board, Austin, TX.

GENERAL INTEREST PUBLICATIONS (non-peer reviewed)

1. Evans, S., Birch, J., **Breier**, J.. Jakuba, M., Saito, M., J. Robidart, 2019, Ocean robots uncover microbial secrets, *Microbiology Today*, February issue.

INVITED SEMINARS

1. The University of Hawaii at Manoa, March 2024
2. Woods Hole Oceanographic Institution, April, 2024
3. Woods Hole Oceanographic Institution, October, 2022
4. The University of Texas at San Antonio, April, 2022.
5. The University of Texas at Austin, Port Aransas, October, 2021.
6. Texas A&M University, Corpus Christi, July, 2021.
7. Gordon Research Conference, Italy, July, 2018
8. Texas A&M University, College Station, September, 2016.
9. The University of Texas at Austin, Marine Science Institute, November, 2015.

10. The University of Texas Pan American, Biological Sciences, October, 2014.
11. Nautilus Science Communication Workshop, University of Rhode Island, 2014, Gulf Integrated Spill Research: SEEP 2014 Expedition.
12. Deep Ocean Exploration Institute, Woods Hole Oceanographic Institution, Board of Trustees Meeting 2012, Exploring the Limits of Life: Chemosynthesis in the Deep Sea.
13. Woods Hole Oceanographic Institution, Applied Ocean Physics & Engineering, April, 2008.
14. The University of New Hampshire, Earth Sciences Department, March 30, 2007.
15. Aquifers of the Gulf Coast of Texas Conference, Texas Water Development Board, 2006. The impact of groundwater flows on estuaries.
16. The University of Texas at Austin, Environmental Science Institute, October 25, 2002. The Dynamics of groundwater inflow and coastal nutrient supply: A study of Nueces Bay, Texas

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