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RESEARCH INTERESTS

Geobiology of tectonic margins, microbe-mineral interactions, environmental geochemistry, astrobiology, and geoscience education.

EDUCATION

2006 Ph.D., Earth and Planetary Sciences, Washington University, St. Louis, MO
2003 A.M., Earth and Planetary Sciences, Washington University, St. Louis, MO 1995
B.A., Swarthmore College, Swarthmore, PA

EMPLOYMENT AND AFFILIATIONS

2017-present Associate Professor, University of Rhode Island, Department of Geosciences
2010-2017 Assistant Professor, University of Rhode Island, Department of Geosciences
2007-2010 NASA Postdoctoral Fellow, NASA Ames Research Center, Exobiology Branch/NAI Ames Team. Field work in the Josephine and Coast Range (northern California, USA), Dun Mountain (New Zealand), and Bay of Islands (western Newfoundland, Canada) ophiolites: integrating field and analytical data in modeling the habitability of the ultramafic subsurface. Advisor: Dr. T.M. Hoehler
2000-2006 Doctoral Scholar. *Geochemistry, Mineralogy, and Geobiology of Subducting Sediments at the Costa Rica Convergent Margin*. Department of Earth and Planetary Sciences, Washington University, St. Louis, MO. Advisors: Drs J.P. Amend and J.D. Morris
2004 Atlantis shipboard scientist. Expedition 301T: Costa Rica Hydrogeology. Ocean Drilling Program, Texas A&M University, College Station, TX.
2002 JOIDES Resolution Shipboard Sedimentologist. Leg 205: Fluid Flow and Subduction Fluxes across the Costa Rica Convergent Margin. Ocean Drilling Program, Texas A&M, College Station, TX.

PENDING GRANTS

Cardace, D., Moseman-Valtierra, S. NASA EPSCoR FY2020CAN: Gas Fluxes from Planetary Serpentinites: Observations of Peridotites in Northern California and Southwestern Puerto Rico (\$750,000 to URI).
Cardace, D., Crespo-Medina, M., McDowell, W., Meyer-Dombard, D.R., Olsen, A. NASA EXOBIOLOGY Solicitation. Defining Carbon Residues and Redox Patterns in a Cradle-of-Life Environment on Earth (\$TBD).

FUNDED GRANTS

Cardace, D. Olsen, A., Crespo-Medina, M., and W. McDowell. NASA EPSCoR RID: Investigating Rocks Common to Earth and Mars in southwestern Puerto Rico: setting up a new field laboratory for ongoing research (\$25,000 to URI).
Cardace, D. and M. Rivero Hudec. NASA EPSCoR RID: Critical Habitats on Earth and Mars: acid drainage from mafic rock weathering (\$15,000 to URI).

- Cardace, D.** Biofilm Adhesion on Monovalent and Divalent Minerals. NASA subaward from Brown University to fund MS student M. Wilson for one year of research fellowship, NASA Rhode Island Space Grant Consortium. (2018-2019, \$44,332 to URI).
- Craver, V., G. Bothun, **D. Cardace**, D. Roxbury, N. Howlett. NSF CBET MRI: Track 1, Acquisition of a Confocal High Content Screening System to Enhance Bioengineering and Biomedical Research. (Award # #1828057, 2019-2020, \$893,169 to URI)
- Cardace, D.** Mapping Carbonaceous Matter In Serpentinites. NASA subaward from Brown University to fund MS student A. Sousa for one year of research fellowship, NASA Rhode Island Space Grant Consortium. (2017-2018, \$43,035 to URI).
- Cardace, D.** Microbial Attachment Processes. NASA subaward from Brown University to fund MS student M. Wilson for one summer of research fellowship, NASA Rhode Island Space Grant Consortium. (2017, \$8,925 to URI).
- Cardace, D.** (PI). Deep Carbon Observatory, Deep Energy Award. Flux & Fate of Reduced Carbon in a Carbonate-capped, Serpentinizing System: Palawan, Philippines. (9/15/16-3/15/16, \$8,960 to URI).
- Cardace, D.** (PI). NASA Astrobiology Institute. Enhancing Participation in Serpentine Days 2016 Conference, Sète, France. (8/1/16-10/15/16, \$18,800 delivered as travel grants to listed participants from the NASA Astrobiology Institute).
- Cardace, D.** Connecting Serpentinite Whole Rock Geochemistry to Astrobiology. NASA subaward from Brown University to fund MS student R. Hart for one year of research fellowship, NASA Rhode Island Space Grant Consortium. (2016-2017, \$42,000 to URI).
- Cardace, D.** Tackling the Astrobiological Potential of Hydrothermal Processes: Comparing distributions of minerals and organics in Earth's seabed hydrothermal deposits and serpentinites using Micro-FTIR. NASA subaward from Brown University to fund MS student A. Johnson for one year of research fellowship, NASA Rhode Island Space Grant Consortium. (2015-2016, \$41,500 to URI).
- Savage, B. (URI), **Cardace, D.** (URI), Kortz, K. (CCRI), Rieger, D. (CCRI). NSF: IUUSE: GEOPATHS IMPACT. *Strengthening Rhode Island's Geology Education Through Partnership, a CCRI-URI joint initiative.* (Award# 1540719, 2016-2019, \$311,994 to URI)
- Templeton, A. (PI, Univ. of Colorado), McCollom, T. (Co-I, Univ. of Colorado), Mayhew, L. ((Co-I, Univ. of Colorado), Cleland, C. (Co-I, Univ. of Colorado), Spear (Co-I, Colorado School of Mines), Boyd (Co-I, Montana State Univ.), Shock (Co-I, Arizona State Univ.), Hoehler (Co-I, NASA ARC), Schrenk (Co-I, Michigan State Univ.), Tominaga (Co-I, Michigan State Univ.), **Cardace** (Co-I, Univ. of Rhode Island), Brazelton (Co-I, Univ. of Utah), and Ono (Co-I, MIT). NASA Astrobiology Institute Cooperative Agreement Notice Cycle 7, Solicitation Number NNH13ZDA017C. *Rock-Powered Life: Revealing mechanisms of energy flow from the lithosphere to the biosphere.* (2014-2019, \$7 million to UC-Boulder/\$478,731 to URI)
- Kelley (PI), Carey (Co-PI), and **Cardace** (Co-PI). NSF Earth Sciences Instrumentation and Facilities (NSF EAR-IF) Program. *Acquisition of a Fourier-Transform Infrared Spectrometer for igneous petrology, volcanology, and geobiology research.* (Award#1258940, 6/1/2013-5/31/2014, \$155,522 to URI)
- Oyanedel-Craver and **Cardace** (Co-I). RIN2 award, Rhode Island Consortium for Nanoscience and Nanotechnology, funded by the National Institute of Standards and Technologies (Grant No. 60NANB10D139). *Biogeochemical response to exposure of nanoparticles containing rare earth elements* (8/2-12/31/2012, \$8,000)
- Cardace** (PI) and Meyer-Dombard (PI). Funded by the NSF Geobiology and Low Temperature Geochemistry Program. *Geobiology of high pH springs in the Philippines – probing the deep biosphere* (Award# 1146910, 2/15/12-1/31/14, \$139,828 total/\$63,357 to URI)
- Schrenk & Daniel (Project Advocates), with Project Investigators Bartlett, **Cardace**, Dong, Forsyth, Hoehler, Huber, Itävaara, Kieft, McMillan, Onstott, Seewald, Sherwood Lollar, Sobott, Stepanauskas, and van Heerden. Funded by the Sloan Foundation, Deep Carbon Observatory. *Deep Life I: Microbial*

Cardace, c.v.

Carbon Transformations in Rock-Hosted Deep Subsurface Habitats. (2012-2014, \$1.5 million to Eastern Carolina Univ./\$38,081 to URI)

Cardace (PI), Boving, Carey, Fastovsky, Kelley, Klinger, Laliberte, Savage, and Veeger. Funded by the URI Office of the Provost through the Innovative Approaches Using Technology RFP. *Building Long Term Science Literacy at URI Through Geosciences* (2/1 – 12/31/2012, \$37,105)

Cardace (PI). Funded by the URI Office of Online Learning. *Engaging Advanced Online Study in the Geosciences*. (8/1-12/31/2011, \$2,024)

Gold, Stolt, **Cardace** (Co-I), Oyanedel-Craver, Addy, Lowder. Funded by University of Rhode Island, College of the Environment and Life Sciences Equipment CARES. *Gas Chromatography Upgrades to Promote Research on Climate Change, Water Quality, Bioenergy and Ecosystems* (2/14/11 – 2/14/12, \$36,448)

Cardace (Science Lead), Hoehler, McCollom, and Schrenk. Funded by the NASA Astrobiology Institute Director's Discretionary Fund. *Drilling Serpentinizing Coast Range Ophiolite: new integrative opportunity for the astrobiology community* (8/2010– 2/2011, \$146,349 to URI)

Meyerson, Amador, McWilliams, Preisser, Brown, Maynard, Casagrande, Mitkowski, **Cardace** (Co-I). Funded by the Champlin Foundation, through the University of Rhode Island. *Bringing global climate change to the classroom: Interdisciplinary teaching, outreach and research activities on the effects of elevated CO₂* (10/2010 – 10/2011, \$125,000 to URI)

Publications (*graduate student author, ** undergraduate author)

In preparation

Shepard, Z., Zhang, Y., **Cardace, D.**, Oyanedel-Craver, V. Development of Ceramic Water Filter Clays Selection Criteria. *Water*.

Taylor, A.*, Hausrath, E., **Cardace, D.**, Olsen, B., and A.A. Olsen. In Revision. Trace element chemistry resulting from the interaction of biotically produced organic acids and serpentinite: A potential biosignature. *Astrobiology*.

Hart, R.* and **Cardace, D.** Low Temperature Habitable Environments on Ocean Worlds Fueled by Serpentinization. *Astrobiology*.

Sousa, A.* and **Cardace, D.** Spectral Deconvolution of FTIR and Raman Spectra of Ultramafic Lithologies: Identifying the Organics Inventory. *Astrobiology*.

Johnson, A.* and **Cardace, D.** Spectroscopic Investigations of Organics Embedded in Travertines. *American Mineralogist*.

Hart, Carnevale, Wilkinson and **Cardace**. Mineralogy and Petrography of Serpentinites of the Coast Range Ophiolite in California, USA. *American Mineralogist*.

In review

Tominaga, M., Ortiz, E., Einsle, J.F., Vento, N.F.R, Schrenk, M.O., Buisman, I., and **Cardace, D.** Tracking on-going weathering processes in mantle peridotite. *GRL*.

Published

Sabuda, M., Brazelton, W.J., Putman, L.I., McCollom, T.M., Hoehler, T.M., Kubo, M.D.Y., **Cardace, D.**, Schrenk, M.O. 2020. A dynamic microbial sulfur cycle in a serpentinizing continental ophiolite. *Environmental Microbiology*.

Seyler, L., Brazelton, W., McLean, C., Putman, L., Hyer, A., Kubo, M., Hoehler, T.M., **Cardace, D.**, and M. Schrenk. 2020. Carbon Assimilation Strategies in Ultrabasic Groundwater: Clues from the Integrated Study of a Serpentinization-Influenced Aquifer. *mSystems*00607-19R1

Vallalar, B., Meyer-Dombard, D.R., **Cardace, D.**, C.A. Arcilla. 2019. Multimetal Resistant, Alkalitolerant Bacteria Isolated from Serpentinizing Fluid-Associated Sediments and Acid Mine

- Drainage in the Zambales Ophiolite, the Philippines. *Geomicrobiology Journal*, DOI: [10.1080/01490451.2019.1628132](https://doi.org/10.1080/01490451.2019.1628132)
- Meyer-Dombard D.R., Osburn M.R., **Cardace D.**, Arcilla C.A. 2019. The Effect of a Tropical Climate on Available Nutrient Resources to Springs in Ophiolite-Hosted, Deep Biosphere Ecosystems in the Philippines. *Frontiers in Microbiology* 10, 761. DOI=10.3389/fmicb.2019.00761
- Kortz, K., **Cardace, D.**, and B. Savage. 2019. Affective factors during field research that impact student retention in the geosciences. *Journal of Geoscience Education*. <https://doi.org/10.1080/10899995.2019.1652463>
- Fallatah, O. A.*, Ahmed, M., Cardace, D., Boving, T., and A. S. Akanda. 2018. Assessment of Modern Recharge to Arid Region Aquifers Using an Integrated Geophysical, Geochemical, and Remote Sensing Approach. *Journal of Hydrology* (2018), doi: <https://doi.org/10.1016/j.jhydrol.2018.09.061>
- Ortiz, E.*, Tominaga, M., **Cardace, D.**, Schrenk, M., Hoehler, T.M., Kubo, M., and D. Rucker. 2018. Geophysical Characterization of Serpentinite Hosted Hydrogeology at the McLaughlin Natural Reserve, Coast Range Ophiolite. *Geophysical Characterization of Serpentinite Hosted Hydrogeology at the McLaughlin Natural Reserve, Coast Range Ophiolite. Geochemistry, Geophysics, Geosystems* 19(1):114-131.
- Meyer-Dombard, D., Casar, C.*, Simon, A., **Cardace, D.**, Schrenk, M., Arcilla, C. 2018. Biofilm formation and potential for iron cycling in serpentinization-influenced groundwater of the Zambales and Coast Range Ophiolites. *Extremophiles*, 1-25.
- Van der Ent, A.*, **Cardace, D.**, Tibbett, M., G. Echevarria. 2018. Ecological implications of pedogenesis and geochemistry of ultramafic soils in Kinabalu Park (Malaysia) *Catena* 160 (2018): 154-169.
- Twing, K. I.*, Brazelton, W. J., Kubo, M. D. Y., Hyer, A. J., **Cardace, D.**, Hoehler, T. M., Schrenk, M. O. (2017). Serpentinization-Influenced Groundwater Harbors Extremely Low Diversity Microbial Communities Adapted to High pH. *Frontiers in Microbiology*, 8, 308. <http://doi.org/10.3389/fmicb.2017.00308>
- Wang, D.T.*, Gruen, D.S., Sherwood Lollar, B., Hinrichs, K., Stewart, L.C., Holden, J.F., Hristov, A.N., Pohlman, J.W., Morrill, P.L., Könneke, M., Delwiche, K.B., Reeves, E., Sutcliffe, C., Ritter, D.J., Seewald, J.S., McIntosh, J.C., Hemond, H.F., Kubo, M.D., **Cardace, D.**, Hoehler, T.M., and S. Ono. 2015. Unique non-equilibrium clumped isotope signals in microbial methane. *Science*. Published online 5 March 2015. DOI:10.1126/science.aaa4326
- Cardace, D.**, Meyer-Dombard, D.R., Woycheese, K.M.* and C.A. Arcilla. 2015. Feasible Metabolisms in High pH Springs of the Philippines. *Front Microbiol.* 2015; 6: 10. Published online 2015 Feb 10. doi: [10.3389/fmicb.2015.00010](https://doi.org/10.3389/fmicb.2015.00010)
- Meyer-Dombard, D.R., Woycheese, K.M.*, Yargıçoğlu, E.N.*, **Cardace, D.**, Güleçal, Y.*, Temel, M., and E. Shock. 2015. High pH microbial ecosystems in a newly discovered, ephemeral, serpentinizing fluid seep at Yanartaş (Chimaera), Turkey. *Front Microbiol.* 2014; 5: 723. Published online 2015 Jan 19. doi: [10.3389/fmicb.2014.00723](https://doi.org/10.3389/fmicb.2014.00723)
- Woycheese*, K.M., Meyer-Dombard, D.R., **Cardace, D.**, Argayosa, A.M., and C.A. Arcilla. Out of the dark: Transitional subsurface-to-surface microbial diversity in a terrestrial serpentinizing seep (Manleluag, Pangasinan, the Philippines). 2015. *Frontiers in Microbiology, Special Issue: Portals to the Deep Biosphere.* *Front Microbiol.* 2015; 6: 44. Published online 2015 Feb 19. doi: [10.3389/fmicb.2015.00044](https://doi.org/10.3389/fmicb.2015.00044)
- Cardace, D.**, Meyer-Dombard, D.R., Olsen, A., and Parenteau, M.N.. 2014. Bedrock and Geochemical Controls on Extremophile Habitats. In *Plant Ecology and Evolution in Harsh Environments* (Eds. Rajakaruna, Boyd, and Harris). Nova Science Pub., Inc. Series in Environmental Research Advances. ISBN-10: 1633219550.
- Crespo-Medina, M., Twing,* K.I., Kubo, M.D., Hoehler, T.M., **Cardace, D.**, McCollom, T., and M.O. Schrenk. 2014. Microbial Metabolism of Carbon Compounds in Continental Serpentinite Fluids. *Front*

- Microbiol. 2014; 5: 604. Published online 2014 Nov 14. doi: [10.3389/fmicb.2014.00604](https://doi.org/10.3389/fmicb.2014.00604)
- Oyanedel-Craver, V., Narkiewicz, S., Genovesi, R., Bradshaw, A., and **D. Cardace**. 2014. Effect of Local Materials On The Silver Sorption and Strength of Ceramic Water Filters. *Journal of Environmental Chemical Engineering*, 2(2), 841-848.
- Cardace, D.**, Hoehler, T., McCollom, T., Schrenk, M., Carnevale, D., Kubo, M., and Twing, K. 2013. Establishment of the Coast Range ophiolite microbial observatory (CROMO): drilling objectives and preliminary outcome. *Scientific Drilling*, 16: 45–55, www.sci-dril.net/16/45/2013/ doi:10.5194/sd-1645-2013
- Schifman*, L., **D. Cardace**, K. Kortz, K. Saul, A. Gilfert, A.I. Veeger, and D.P. Murray. 2013. Sleuthing Through the Rock Cycle, an on-line guided inquiry tool for middle and high school geoscience education. *Journal of Geoscience Education* Vol. 61, No. 3, pp. 268-279 (doi: 10.5408/12-326.1).
- Cardace, D.** and T.M. Hoehler. 2011. Extremophiles in serpentinizing systems: Implications for life on the Early Earth and Other Planets. In: *Serpentine: A Model for Evolution and Ecology*. Edited by: Susan Harrison and Nishanta Rajakaruna, University of California Press.
- Cardace, D.** and T.M. Hoehler. 2009. Serpentinizing Fluids Craft Microbial Habitat. In: *Proceedings of the Sixth International Conference on Serpentine Ecology*. *Northeastern Naturalist* (Steuben, Maine) Special Issue 5: 272-284.
- Cardace, D.** and J.D. Morris. 2009. Geochemical evidence for sediment accretion in the Costa Rica Frontal Prism. *Geology* 37: 891-894, doi:10.1130/G25631A.1
- Cardace, D.**, J.D. Morris, A.D. Peacock, and D.C. White. 2006. Habitability of seafloor sediments at the Costa Rica convergent margin. In Morris, J.D., Villinger, H.W., and Klaus, A. (Eds.), *Proc. ODP, Sci. Results*, 205, 1–26 [Online]. Available from World Wide Web: <http://www.wodp.tamu.edu/publications/205_SR/VOLUME/CHAPTERS/213.PDF>.

CONFERENCE PRESENTATIONS AND ABSTRACTS (*graduate student author, ** undergraduate author)

2018

- Cardace, D.**, Kortz, K.M., Rieger, M.D., Savage, B., and A. Greda. (2018) The Importance of Situational Factors in Classroom, Field, and Laboratory Settings to Recruitment and Retention in the Geosciences for 2YC and Early 4YC Undergraduates, Paper ED43A-06 to be presented at the 2018 AGU Fall Meeting, Washington, D.C., 10-16 Dec.
- Cardace, D.**, Kubo, M.K., Schrenk, M.O., McCollom, T.M., and Hoehler, T.M. (2018) Shifting Bioenergetics Over the Lifetime of Serpentinizing Systems. Paper B23E-1867 presented at the 2018 AGU Fall Meeting, Washington, D.C., 10-16 Dec.
- Templeton, A.S., Ellison, E.T., Rempfert, K.R., Nothhaft, D.B., Spencer, Zeigler, K.D., Mayhew, L.E., Boyd, E.S., Fones, E., Glombitza, C., Kraus, E.A., Spear, J.R., Zaloumis, J., Sousa, A., **Cardace, D.**, Matter, J.M., Kelemen, P.B., and Oman Drilling Project Phase II Science Party. (2018) Identifying subsurface biologically-mediated processes occurring during modern water/rock interaction in the Samail ophiolite. Paper V23H-2930 presented at the 2018 AGU Fall Meeting, Washington, D.C., 10-16 Dec.
- Hart, R.M., **Cardace, D.** (2018) Effect of Changing the Interior and Seawater Compositions of Enceladus on Serpentinization-driven Habitability. *Geological Society of America Abstracts with Programs*. Vol. 50, No. 6, ISSN 0016-7592. doi: 10.1130/abs/2018AM-324803
- Kortz, K.M., Greda, A.M., Savage, B., **Cardace, D.**, Rieger, D.M., and Harik, S. (2018) Differences in Interest and Desire to Major in Introductory Geoscience Courses by Gender and Minority Status. *Geological Society of America Abstracts with Programs*. Vol. 50, No. 6, ISSN 0016-7592. doi: 10.1130/abs/2018AM-318572

Cardace, D., Anwar, M., Schrenk, M, McCollom, T, Kubo, M & Hoehler, T.M. (2018) Quantifying Subsurface Mixing of Groundwaters at the Coast Range Ophiolite Microbial Observatory. Goldschmidt Abstracts, 2018 337.

Hart, R. & **Cardace, D.** (2018) Serpentinization-Driven Habitability in Terrestrial Planet Mélanges Terrains. Goldschmidt Abstracts, 2018 956.

Sousa, A. & **Cardace, D.** (2018) Analysis of Organic Films on Serpentinite Wafers Via Micro Fourier Transform Infrared (μ FTIR) Spectroscopy and X-Ray Photoelectron Spectroscopy (XPS) Analyses. Goldschmidt Abstracts, 2018 2392.

2017

Cardace, D., Schrenk, M.O., McCollom, T.M., Hoehler, T.M. 2017. Aqueous Geochemical Dynamics at the Coast Range Ophiolite Microbial Observatory and The Case for Subsurface Mixing of Regional Groundwaters. Paper V43D-2711 presented at the 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec., 2017.

Vento, N., Ortiz, E., Tominaga, M., Beinlich, A., Einsle, J., Buisman, I., Ringe, E., Schrenk, M.O. and **D. Cardace**. Characterizing and quantifying superparamagnetic magnetite particles in serpentinized mantle peridotite observed in continental ophiolite complexes. Paper OS53D-2202 presented at the 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec., 2017.

Kortz, K.M., **Cardace, D.**, Savage, B., Rieger, D.M. Field research internships: Why they impact students' decisions to major in the geosciences. Paper ED13B-1469, presented at the 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec., 2017.

Hart, R. and **D. Cardace**. Modeling Late-State Serpentinization on Enceladus and Implications for Methane-Utilizing Microbial Metabolisms. Paper P43B-2289 presented at the 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec., 2017.

Meyer-Dombard, D.R., Woycheese, K.M., **Cardace, D.**, Vallalar, B., and C.A. Arcilla. Can Surface Seeps Elucidate Carbon Cycling in Terrestrial Subsurface Ecosystems in Ophiolite-hosted Serpentinizing Fluids? Paper B11G-0243 presented at the 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec., 2017.

Sousa, A. and **D. Cardace**. Characterization of Serpentine Samples from the Coast Range Ophiolite Microbial Observatory with μ -FTIR and XRD. Paper P41B-1017 presented at the 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec., 2017.

2016

Johnson, A.*, Kubo, M.D., and **Cardace, D.** Using MicroFTIR to Map Mineral Distributions in Serpentinizing Systems. Abstract submitted to the 2016 Fall Meeting of the American Geophysical Union Session B001: 4 Billion Years of Serpentinization on Earth and Beyond.

Meyer-Dombard, D.R., **Cardace, D.**, Woycheese, K.M., Vallalar, B.*, Casar, C.*, Simon, A., Arcilla, C.A. Exploring the Deep Biosphere in Ophiolite-hosted Systems: What Can Metabolic Processes in Surface Seeps Tell Us About Subsurface Ecosystems in Serpentinizing Fluids? Abstract submitted to the 2016 Fall Meeting of the American Geophysical Union Session B001: 4 Billion Years of Serpentinization on Earth and Beyond.

Ortiz, E.*, Tominaga, M., **Cardace, D.**, Schrenk, M.O., Hoehler, T.M., and Kubo, M.D. Geophysical Characterization of in situ Serpentinization Processes at the Coast Range Ophiolite Microbial Observatory (CROMO) Abstract submitted to the 2016 Fall Meeting of the American Geophysical Union Session GP009: Imaging the crust using magnetic, gravity and electromagnetic methods.

Sabuda, M*., Kubo, M.D., **Cardace, D.**, Hoehler, T.M., Schrenk, M.O. Iron and Sulfur Geochemistry in Serpentinizing Groundwaters: Relationships to Microbiological Processes. Abstract submitted to the

2016 Fall Meeting of the American Geophysical Union Session B045: Interdisciplinary linkages to better understand microbial metabolism in the deep subsurface.

Schrenk, M.O., **Cardace, D.**, Williams, L.I.*, Hoehler, T.M., Hyndman, D.W., Kubo, M.D., and McCollom, T.M. Effects of Environmental Perturbations and Seasonal Dynamics upon Microbial Populations in Serpentinite-hosted Groundwater. Abstract submitted to the 2016 Fall Meeting of the American Geophysical Union Session B088: Understanding and predicting hydro-biogeochemical responses of terrestrial-aquatic ecosystems to perturbation.

Vallalar, B.*, Meyer-Dombard, D.R., **Cardace, D.**, Arcilla, C.A. Heavy Metal Resistant, Alkalitolerant Bacteria Isolated From Serpentinizing Springs in the Zambales Ophiolite, Philippines. Abstract submitted to the 2016 Fall Meeting of the American Geophysical Union Session B001: 4 Billion Years of Serpentinization on Earth and Beyond.

Woycheese, K.M., Meyer-Dombard, D.R., **Cardace, D.**, Arcilla, C.A., and S. Ono. Metagenomic analysis of carbon cycling and biogenic methane formation in terrestrial serpentinizing fluid springs. Abstract submitted to the 2016 Fall Meeting of the American Geophysical Union Session B001: 4 Billion Years of Serpentinization on Earth and Beyond.

Savage, B., Kortz, K., **Cardace, D.**, Rieger, D. Improving Geoscience Education Pathways Through Engaging Scientific And Career Experiences: Progress and Logistics. Fall 2016 National Meeting of the Geological Society of America. GSA Abstracts with Programs Vol. 48, No. 7, paper 182.

Cardace, D., Hoehler T., Kubo, M., Schrenk, M., McCollom, T. Aqueous Geochemical Dynamics at the Coast Range Ophiolite Microbial Observatory (CROMO). The 4th international 'Serpentine Days' workshop, supported by the Société Française de Minéralogie et de Cristallographie (SFMC), September 25-29, 2016 (Sète, Southern France).

Sabuda, M., Kubo, M., Hoehler, T., **Cardace, D.**, and M. Schrenk. Investigations of methane, sulfur, and iron in the serpentinite subsurface using depth-resolved biogeochemical analyses, stable isotope geochemistry, and microcosm approaches. The 4th international 'Serpentine Days' workshop, supported by the Société Française de Minéralogie et de Cristallographie (SFMC), September 25-29, 2016 (Sète, Southern France).

Woycheese, K., Meyer-Dombard, D., **Cardace, D.**, Arcilla, C. Carbon cycling in serpentinizing springs of the Zambales Ophiolite. The 4th international 'Serpentine Days' workshop, supported by the Société Française de Minéralogie et de Cristallographie (SFMC), September 25-29, 2016 (Sète, Southern France).

2015

INVITED ORAL TALK. **Cardace, D.**, Biological Processes Related to Serpentinization: Expected vs Observed Patterns In Session 8394, Geology, Geophysics, Geochemistry and Biology of Serpentinization Processes on Earth and Other Planets. For the Fall Meeting of the American Geophysical Union, 14-19 December, 2015.

INVITED ORAL TALK. **Cardace, D.**, Kortz, K., D. Rieger, and B. Savage. Improving Geoscience Education Pathways through Engaging Scientific and Career Experiences. In T87: Supporting Geoscience Student Transfer: Collaborations, Partnerships, and Practices for Success. For the National Meeting of the Geological Society of America, Baltimore, MD., 1-4 November 2015.

Cardace, D., Hoehler, T.M., McCollom, T.M., Schrenk, M.O., and M.D. Kubo. Integration of 3 Consecutive Years of Aqueous Geochemistry Monitoring Serpentinization at the Coast Range Ophiolite Microbial Observatory (CROMO), Northern California, USA. Abstract 7515 presented at 2015 Astrobiology Science Conference, Chicago, IL., 14-19 June, 2015.

- Cardace, D.**, Meyer-Dombard, D.R., and C.A. Arcilla. Mineralogical Diversity in Ultramafic Host Rock and Travertines Associated with High pH, Actively Serpentinizing Springs in the Philippines. Oral Presentation 7514 presented at 2015 Astrobiology Science Conference, Chicago, IL., 14-19 June, 2015.
- Cardace, D.** Modeling Water-Rock Interactions in Ophiolite-Hosted Peridotites. Paper No. 4-7 in thematic session T20: Evolution of Minerals in Diverse Environments: Geobiological and Geochemical Aspects. Presented at the 50th Annual Meeting of the Northeastern Section of the Geological Society of America, Bretton Woods, NH, 23-25 March, 2015.
- Casar, C.*, Meyer-Dombard, D.R., **Cardace, D.**, A. Simon. Characterizing Subsurface Microbial Iron Reduction in a Martian Analog Serpentinizing System: Zambales Ophiolite, Philippines. Abs. 7365, 2015 Astrobiology Science Conference, Chicago, IL., 14-19 June, 2015.
- Johnson, A. M.*, Moore, D.C., and **Cardace, D.** MicroCT Imaging of Travertine Seep Deposits Associated with Serpentinizing Groundwaters. Paper No. 27-1 in thematic session T20: Evolution of Minerals in Diverse Environments: Geobiological and Geochemical Aspects. Presented at the 50th Annual Meeting of the Northeastern Section of the Geological Society of America, Bretton Woods, NH, 23-25 March, 2015.
- Meyer-Dombard, D.R., **Cardace, D.**, Woycheese, K.M.*, C. Arcilla. Habitats in Serpentinizing Fluids of the Philippines: Complex Interactions Between Surface and Subsurface Biospheres. Abstract 7406, 2015 Astrobiology Science Conference, Chicago, IL., 14-19 June, 2015.
- Olsen, A.A., Taylor, A.R.*, Hausrath, E.M., Lively, J.M., Olsen, B.J., and **Cardace, D.** Chemical Signatures of Biological Impacts on Serpentinite Weathering. Paper No. 4-8 in thematic session T20: Evolution of Minerals in Diverse Environments: Geobiological and Geochemical Aspects. Presented at the 50th Annual Meeting of the Northeastern Section of the Geological Society of America, Bretton Woods, NH, 23-25 March, 2015.
- Shaikh, M.** and **Cardace, D.** How Do Microbe-Mineral Interactions In Earth's Ocean Respond to Ocean Acidification? Paper No. 58-7 in thematic session T17. Ecohydrology Science and Sustainability. Presented at the 50th Annual Meeting of the Northeastern Section of the Geological Society of America, Bretton Woods, NH, 23-25 March, 2015.
- Twing, K.I.*, Brazelton, W.J., Kubo, M.D., Hoehler, T.M., **Cardace, D.**, McCollom, T.M., M. O. Schrenk. Exploration of Mineral-Microbe Interactions in the Serpentinite Subsurface. Abstract 7176, 2015 Astrobiology Science Conference, Chicago, IL., 14-19 June, 2015.
- Woycheese, K.*, Yargıçoğlu, E.N.*, Güleçal-Pektas, Y.*, **Cardace, D.**, and D.R. Meyer-Dombard. Comparative phylogentic and metagenomic analysis of an ultrabasic continental serpentinizing fluid seep at Yanartaş (Turkey). Abstract 7634 presented at 2015 Astrobiology Science Conference, Chicago, IL., 14-19 June, 2015.

2014

- Casar, C.*, Meyer-Dombard, D.R., Simon, A., **Cardace, D.**, C. Arcilla. Microbially-influenced Fe-Cycling within high pH serpentinizing springs of the Zambales Ophiolite, Philippines. Abs. V53A-4819, 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec., 2014.
- Woycheese*, Meyer-Dombard, **Cardace, D.**, Arcilla. Genetic legacy of the deep subsurface recorded in the outflow channel of a terrestrial serpentinizing seep (Luzon, Philippines) Abs. B11H-0131, 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec., 2014.
- Wang, D.T.*, Gruen, D.*, Morrill, P.L., Rietze, A., Nealson, K.H., Kubo, M.D., **Cardace, D.**, Shrenk, M.O., Hoehler, T.M., McCollom, T.M., Etiope, G., Hosgormez, H., Schoell, M., and S. Ono. New Isotopic Constraints on the Sources of Methane at Sites of Active Continental Serpentinization. Abs.V53A-4823, 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec., 2014.

2013

- Cardace, D.**, Meyer-Dombard, D.R., Arcilla, C.A., Hoehler, T.M., McCollom, T.M., Schrenk, M.O. (2013) Microbial Metabolic Landscapes Derived from Complementary Mineralogical, Aqueous Geochemical, and Gas Data Associated with High pH, Actively Serpentinizing Springs in the Coast Range Ophiolite (CA,USA) and Zambales and Palawan Ophiolites (Philippines). Abs. B13C-0503, 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Meyer-Dombard, D.R., **Cardace, D.**, Woycheese, K.M. , Vallalar, B.* , C.A. Arcilla. 2013. Exploring the deep biosphere through ophiolite-associated surface springs . Abstract B13C-0505, presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Woycheese, K.M.* , Meyer-Dombard, D.R., **Cardace, D.**, Gulecal, Y., C.A. Arcilla. 2013. Ecology of Two Terrestrial Serpentinizing Fluid Seeps Offers A Glimpse of the Deep Biosphere. Abs. B13C-0510, 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Meyer-Dombard, D.R., **Cardace, D.**, Woycheese, K.M.* , Swingley, W., Schubotz, F., E. Shock. 2013. Inferring deep biosphere function and diversity through (near) surface biosphere portals. Abs. B22F07, 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
- Schrenk, M.O., Brazelton, W.J., Twing, K.I.* , Kubo, M., **Cardace, D.**, Hoehler, T.M., and McCollom, T.M. (2013) Microbiology of Ultrabasic Groundwaters of the Coast Range Ophiolite, CA. Abs. B13C0508, 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
- Scott, T.J.* , Arcilla, C.A, **Cardace, D.**, Hoehler, T.M., McCollom, T.M., Meyer-Dombard, D.R., Schrenk, M.O. (2013) Evaluation of Heterotrophy in in Serpentinite-Associated Waters from the Coast Range Ophiolite, Northern California, USA and the Zambales Ophiolite, Philippines. Abs. B13C-0487, 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Stander, A.* , Nelms, M., Wilkinson, K., Dyar, M.D., **Cardace, D.** (2013) Potential Hydrogen Yields from Ultramafic Rocks of the Coast Range Ophiolite and Zambales Ophiolite: Inferences from Mössbauer Spectroscopy. Abstract B13C-0482 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Evans, N.** , Kortz, K., and **Cardace, D.** (2013) How well do college students with little to no geoscience experience identify and understand the formation of landscapes? 125th Annual Meeting of the Geological Society of America (27–30 October 2013) Paper No. 125-14.
- Scott, T.J.* , Hoehler, T.M., McCollom, T.M., Schrenk, M.O., **Cardace, D.** 2013. Evaluation of Heterotrophy in Serpentinite-associated Waters from the Coast Range Ophiolite, Northern California, USA. 125th Annual Meeting of the Geological Society of America (27–30 October 2013) Paper No. 364-17.
- Stander, A.* , Nelms, M., Wilkinson, K., Dyar, M.D., **Cardace, D.** (2013) Complementary X-Ray Diffraction, Moessbauer Spectroscopy, and Thin Section Petrography of Terrestrial Serpentinites: Implications for Serpentine Sites on Mars. 125th Annual Meeting of the Geological Society of America (27–30 October 2013) Paper No. 44-11.
- Meyer-Dombard, D.R., Woycheese, K.M.* , **Cardace, D.**, C.A. Arcilla. 2013. Geochemistry of Microbial Environments in Serpentinizing Springs of the Philippines. Asia Oceania Geosciences Society 10th Annual Meeting - 24 to 28 June 2013, Brisbane Convention & Exhibition Centre, Australia, Paper No. IG19-D2-PM2-P-007 (IG19-A005)
- Meyer-Dombard, D.R., Valallar, B., **Cardace, D.**, Argayosa, A., Argayosa, V., C.A. Arcilla. 2013. Microorganisms Cultured from Serpentinizing and Hydrothermal Fluids in Philippines Springs. Asia Oceania Geosciences Society 10th Annual Meeting, 24-28 June 2013, Brisbane Convention & Exhibition Centre, AUS, Paper IG19-D2-PM2-P-008 (IG19-A006)
- Cardace, D.**, Meyer-Dombard, D.R., C.A. Arcilla. 2013. Mineralogical Diversity in Ultramafic Host Rock and Travertines Associated with High pH, Actively Serpentinizing Springs in the Philippines. Asia

Oceania Geosciences Society 10th Annual Meeting, 24-28 June 2013, Brisbane Convention & Exhibition Centre, AUS, Paper IG19-D2-PM2-P-011 (IG19-A012)

Cardace, D. 2013. Mineral Records of Habitability: Lessons Learned from Continental Serpentinites (Oral Talk). Paper 55-3. 48th Annual Regional Meeting of the Geological Society of America Northeastern Section Northeastern Section (18–20 March 2013).

Cardace, D., O'Donnell, A., Murray, D.P., and Veeger, A.I. 2013. Connecting in-service teachers to Google Earth and Google Mars through the NSF-MSP-RITES Project (Oral Talk). Paper 52-4. 48th Annual Regional Meeting of the Geological Society of America Northeastern Section Northeastern Section (18–20 March 2013).

2012

Cardace, D., Carnevale D.*, Hoehler T., McCollom T., Schrenk M. (2012) Active Serpentinization in the Coast Range Ophiolite: Intersections of Petrography, Geochemistry, and Bioenergetics. Abstract #4491 presented at the Astrobiology Science Conference, Atlanta, GA, 16-20 April.

Cardace, D. (2012) Contrasting Microbe-Mineral Interactions in Continental vs. Submarine Serpentinites. Paper No. 13-1, 47th Annual Regional Meeting of the Geological Society of America Northeastern Section, Hartford, CT, 18-20 March.

Cardace, D. and L. Schifman* (2012) Technology-rich, guided inquiry on-line resources for the middle and high school science classroom facilitated by the NSF-MSP-funded RITES Project. Paper No. 142, 47th Annual Regional Meeting of the Geological Society of America Northeastern Section, Hartford, CT, 18-20 March.

Schifman, L.*, **Cardace, D.** J. Caulkins, K. Kortz, and K. Saul (2012) Documenting the design and inclassroom success of an online learning module covering the rock cycle created by the NSF-MSP funded RITES Project. Paper No. 28-10, 47th Annual Regional Meeting of the Geological Society of America Northeastern Section, Hartford, CT, 18-20 March.

Cardace, D. (2012) **INVITED.** Ultramafic Mineralogy of the Coast Range and Oman Ophiolites: Minerals As Records Of Biogeochemical Evolution. NSF-IODP-DCO Workshop on Scientific Drilling in the Samail Ophiolite, Sultanate of Oman, September 13-16, 2012 Palisades, NY.

McCann, A.** and **Cardace, D.** (2012). Mineralogical and Geochemical Trends in Mini-Cores from Carbonate Seep Deposits in a Mars Analog Serpentinizing Environment. Abstract B43G-0512 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Twing, K.I.*, Brazelton, W.J., Kloysuntia, A., **Cardace, D.**, Hoehler, T., McCollom, T.M., and M.O. Schrenk. (2012) Identity and Metabolic Potential of the Serpentinite Subsurface Microbiome. Abs. B51A-0480, 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Brazelton, W., **Cardace, D.**, Fruh-Green, G., Lang, S. Q., Lilley, M. D., Morrill, P.L., Szponar, N., Twing, K. I.*, and M.O. Schrenk. (2012) Biogeography of serpentinite-hosted microbial ecosystems. Abs. B41F-07, 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Bowman, A.*, **Cardace, D.**, and P. August. (2012) Informing geobiology through GIS site suitability analysis: locating springs in mantle units of ophiolites. Abstract B43G-0513 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Cardace, D., Carnevale, D.*, Schrenk, M.O., Twing, K.I.*, McCollom, T.M., Hoehler, T.M. (2012) Mineral Controls on Microbial Niche Space in Subsurface Serpentinites of the Coast Range Ophiolite, Northern California Abstract B43G-0511 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Cardace, D., Schifman, L.*, Kortz, K., Saul, K., Veeger, A.I. and D.P. Murray. (2012) Bringing Geoscientific Practices to Schools Through Guided Inquiry and the NSF-MSP-funded RITES Project. Abs. 43A-0725, 2012 Fall Meeting, AGU, San Francisco, CA, 3-7 Dec.

Woycheese, K.M.*, Yargicoglu, E. N.*, **Cardace, D.**, Meyer-Dombard, D R. (2012) From the Belly of the Beast: Biogeochemistry and geomicrobiology of a fluid seep at Chimaera [Yanartas], Turkey. Abstract B43G-0510 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

2011

Cardace, D. & Meyer-Dombard, D.R. (2011) Geobiology of Turkish serpentinite formation waters. Abstract #42 presented at the Seventh International Conference on Serpentine Ecology, Coimbra, Portugal, 12-16 June.

Cardace, D., Schiffman, I., Caulkins, J., Kortz, K.M., and Saul, K. (2011) Developing Guided Inquiry Online Resources for the Middle and High School Science Classroom through the NSF-MSP-funded RITES Project. Abstract ED53C-0809 presented at the 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.

Cardace, D., Meyer-Dombard, D.R. (2011) Bioenergetics of Continental Serpentinites. Abstract B51B0400. Presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

Carnevale*, D., **Cardace, D.**, McCann*, A., and T.M. Hoehler (2011). Mineralogy and Geochemistry of Coast Range Ophiolite, CA Rock Cores Keys to Understanding Subsurface Serpentinite Habitability on Mars. Abs. B51B-0401, 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

McCann*, A.R., **Cardace, D.**, D. Carnevale, and B.L. Ehlmann (2011) Mineralogy of Surface Serpentinite Outcrops in the Coast Range Ophiolite: Implications for the Deep Biosphere and Astrobiology. Abs. B51B-0402, 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

McCann*, A.R., **Cardace, D.**, and D. Carnevale (2011) Technology-Enhanced Science: Using an Online Blog to Share a Collaborative Field Study for Research and Education. Abstract ED13A-0808. Presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec

2010

Cardace, D., Meyer-Dombard, D.R., Hoehler, T.M., and N. Uzunlar (2010), Complex serpentinitizing systems and the deep biosphere: metabolic opportunities depend on the geochemistry of mixing waters, Abs. B51A-0333, 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.

2003-2009

D. **Cardace** and T.M. Hoehler. 2010. Subsurface Investigation of the Coast Range Ophiolite, Northern California: Field Campaign Findings. The NASA Astrobiology Science Conference, League City, TX. Abstract 5564.

D. **Cardace**, T.M. Hoehler, B.A.Roberts, and A.L. Foster. 2009. Fluid chemistry and associated biological potential in diverse serpentinitizing systems of New Zealand's south island. *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract B23C-0393.

D. **Cardace**, T.M. Hoehler, B.A.Roberts, and A.L. Foster. 2009. Actively Serpentinizing Seeps in the Bay of Islands Ophiolite, western Newfoundland: a window into the deep biosphere. Fall 2009 Meeting of the Geological Society of America, Geological Society of America *Abs.with Programs*, Vol. 41, No. 7, p. 378, Abstract 141-15.

D. **Cardace** and T.M. Hoehler. 2008. Geochemical Characterization of Subsurface Microbial Habitat Produced by Serpentinization: Preliminary Results from Coast Range Ophiolite Formation Fluids. *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract B53C-0511.

D. **Cardace** and T.M. Hoehler. 2008. Serpentinization and Fuel for Biofilms. Fall 2008 Meeting of the Geological Society of America (October 5-9, 2008), Abstract 215-10.

D. **Cardace** and T.M. Hoehler. 2008. Serpentinizing Fluids Craft Microbial Habitat: Using Geochemistry and Thermodynamics to Identify Metabolic Niches in the Subsurface. Sixth International Conference on Serpentine Ecology (June 16-23, 2008), Bar Harbor, ME.

- D. **Cardace**, J.P. Amend, J. Morris. 2005. Metabolic Potential of the Deep Subseafloor at Selected Convergent Margins, Eos Trans, AGU, Fall Meet. Suppl., Abstract B31A-0964.
- D. **Cardace**, Morris, Peacock, White. 2004. Methane Production In Forearc Sediments, Costa Rican Convergent Margin, Eos Trans, AGU Fall Meet. Suppl., Abs B43B-0163.
- D. **Cardace**, J. Morris, M. Underwood, G. Spinelli. 2003. Implications of Smectite Subduction, Costa Rican Convergent Margin, Eos Trans, AGU Fall Meet. Suppl., Abs. T52C-0290.
- R.F. Dymek, K. Abbott, R. Buchwaldt, D. **Cardace**, S. Fernandes, M. Singleton, R. Valentine, and R. Couture. 2003. From the indoor lab to the outdoor lab: using XRF data in aid of interpreting field relationships, Geological Society of America Abstracts with Programs, Vol. 35, No. 6, September 2003, p. 122, Paper No. 46-44.

TEACHING & MENTORING

- 2020 **Researching across the curriculum workshop participant (pending)**
- 2020 **EliReview implementation workshop participant to enhance peer review in courses.**
- 2019 HIT Seminar participant in facilitating Writing Effectively general education courses.
- 2017-2018 Team teaching of Honors Colloquium course HPR233 on ORIGINS. Instruction and lab coordination for Earth Materials (GEO320) and Aqueous Geochemistry (GEO562).
- 2015-2016 Instruction of lecture section of Understanding the Earth (GEO103), revision of labs and instruction of Earth Materials (GEO320), and instruction of Analytical Geochemistry (GEO532).
- 2016 Re-design for implementation of the new general education program of aspects of Understanding the Earth (GEO103, A1 and B4 Outcomes) and Earth Materials (GEO320, D: Integrate and Apply Outcome). Supervision of Geosciences Internships (GEO 397).
- 2016 Mentorship of two undergraduate summer research projects through the RI EPSCoR SURF Program (O. Griffin and J. Hecker). Mentorship of two undergraduate summer research projects through the URI Coastal Fellows Program (S. Noone and E. Brouillet).
- 2016 Undergraduate and transfer student advisor for the Department of Geosciences.
- 2016 Facilitation of the Dr. Roger Larson Memorial Field Camp Fund, which now encompasses (1) an operating account to which J. Grenier will be giving \$8,400 per year through 2020, totaling \$33,600, funding 80% of two student awards, and (2) an endowed account which J. Grenier will fund at \$25,000 per year for her lifetime, to ensure future field camp participation by URI students.
- 2016 Mentorship of undergraduates in support of applications to numerous geosciences, planetary sciences, and ocean sciences competitions. (E. Santos won the \$1000 Rhode Island Society of Environmental Professionals (RISEP) award for 2016; S. Noone won a \$500 NASA Rhode Island Space Grant 2016 summer travel award).
- 2015 Mentorship of undergraduate summer research project through the RI EPSCoR SURF Program (T. Losure).
- 2015 Undergraduate Advisor for the Department of Geosciences.
- 2014 Design and instruction of lecture section of Understanding the Earth (GEO103), for 55 students. Revision of labs and instruction of Earth Materials (GEO320); supervision of Geosciences Internships (GEO 397).
- 2014 Mentorship of four undergraduate summer research projects through the Rhode Island Space Grant (O. Raji), RI EPSCoR SURF (M. Shaikh), Coastal Fellows (B. Beauchene), and Science & Engineering Fellows (D. Ogbemudia-Pratt) programs.
- 2014 Undergraduate Advisor for the Department of Geosciences.

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- 2013 Mentorship of undergraduates in support of applications to numerous ocean exploration and diving awards (B. Grenier), and Rhode Island Mineral Hunters and the AIPG undergraduate student scholarship program (G. Conley, J. Duffy).
- 2013 Mentorship of three undergraduate summer research projects through the RI EPSCoR SURF (P. Killian), Coastal Fellows (G. Conley), and Science & Engineering Fellows (O. Raji) programs.
- 2013 Undergraduate Advisor for the Department of Geosciences.
- 2013 Design and instruction of Aqueous Geochemistry (GEO468/590, 4 credit course with new labs), supervision of Geoscience Internships (GEO 397).
- 2012 Design and instruction of Geosciences Workshops for Teachers (GEO920) and Geosciences Internships (GEO 397).
- 2012 Mentorship of 3 undergraduate research projects through the Coastal Fellows (R. Hollis, G. Conley) and Science & Engineering Fellows (N. DosSantos) programs. 2012 Undergraduate Advisor for the Department of Geosciences.
- 2010-2011 Design and instruction of Global Warming (GEO 305) and Earth Materials (GEO320).
- 2011 Undergraduate Advisor for the Department of Geosciences. URI Coastal Fellows Internship Mentor (A. McCann).
- 2010 Undergraduate Advisor for the Department of Geosciences.
- 2009 NASA Academy Mentor. Undergraduate Research Project Title: *Establishing reference mineral profiles of natural serpentines for the CheMin XRD and XRF instrument to fly on Mars Science Laboratory in 2009*. NASA Ames Research Center, Moffett Field, CA.
- 2004 Adjunct instructor. Designed and taught *Introduction to Geology*. University College in Arts and Sciences at Washington University, St. Louis, MO.
- 2003 Adjunct instructor. Designed and taught all aspects of *Earth Sciences*. St. Louis Community College, Kirkwood, MO.
- 2000-2006 Teaching Assistant. *Field and Structure, Solar System, Earth Materials, Introduction to Geochemistry, Environmental Geochemistry, Biogeochemistry*. Dept. of Earth and Planetary Sciences, Washington University, St. Louis, MO.
- 1999-2000 Teaching Assistant. *Introduction to Geology laboratory sections*. Department of Geology and Geophysics, University of Minnesota, Minneapolis, MN.
- 1995-1999 U.S. National Park Service Park Ranger. Wind Cave and Carlsbad Caverns NP.
- 1991-1995 Course of study in teaching methods, practice, and assessment, with secondary school teaching certification. Swarthmore College Program in Education, Swarthmore, PA.

AWARDS AND HONORS

- 2004-2005 Dissertation Writing Fellowship Award, Washington University
- 2004 & 2001 Wheeler Graduate Fellowship, Washington University, May-August
- 2003-2004 Outstanding TA Award, Washington University
- 2002-2003 Letter of Recognition as Outstanding TA, Washington University
- 2001-2002 Outstanding TA Award, Washington University
- 1999-2000 Outstanding TA Award, University of Minnesota-Twin Cities

INVITED TALKS

- University of California-Davis, Davis, CA. June 2016.
- College of the Atlantic, Bar Harbor, ME. April 2016.
- Boston College, Department of Geology and Geophysics, Chestnut Hill, MA. February 2015. Bryn Mawr College, Department of Geology. March 2014.

MIT, Chemical Oceanography & Geobiology Group. March 2014.
Brown University Planetary Science Lunch Bunch Featured Speaker. January 2014.
NASA Astrobiology Institute Executive Council. December 2013.
Woods Hole Oceanographic Institute. April 2012.
University of Maine, Orono, Department of Earth Sciences. October 2010.
San Jose State University, Biological Sciences. April 2010.
University of Rhode Island, Geosciences. October 2009.
Smithsonian Institute, Mineral Sciences Department. October 2009.
University of Illinois at Chicago, Department of Earth and Environmental Sciences. April 2009.
University of California-Davis, McLaughlin Reserve Public Lecture. March 2009.
Boston College, Department of Geology and Geophysics, Chestnut Hill, MA. February 2009.
Amherst College, Department of Geology, Amherst, MA. March 2009.
Otago University Department of Geology, Dunedin, New Zealand. February 2009.
New Zealand Department of Conservation, Te Anau, New Zealand. February 2009.
Denver Museum of Nature and Science, Denver, CO. December 2008.
Denison University, Department of Geosciences, Granville, OH. November 2008.

ADDITIONAL ANALYTICAL, COMPUTATIONAL, AND FIELD SKILLS Analytical chemistry of waters, sediments, and rocks by ICP-MS, XRF, INAA
Mineralogy via microFTIR, bulk x-ray diffraction, SEM, TEM, petrography
Phospholipid fatty acid and quinone microbial biomarker analyses
Water, sediment, and biofilm sampling in marine and terrestrial surface and subsurface settings
Lacustrine coring raft set up, coring practice, and core handling
Sediment grain size studies and subsequent laser particle size analyses
Thermodynamic modeling with speciation/solubility tools (EQ3/6, Geochemist's Workbench)
Field geology/geochemistry/mineralogy
Cave mapping and geobiological surveys, GIS modeling

WORKSHOP EXPERIENCES

2019 **Teaching for Learning Workshop, University of Rhode Island, Office of Advancement of Teaching and Learning.**

2016 Participant in the August 2016 General Education Implementation Workshop as a member of the first general education course reviews.

2016 Representative of the NSF-IUSE-GEOPATHS PI cohort at the Envisioning the Future of Undergraduate STEM Education Symposium, Washington D.C.

2015 Participant in the August 2015 General Education Workshop as representative faculty from URI-CELS-Geosciences.

2015 National Association of Geoscience Teachers (NAGT) and the CCRI Center for Innovative Teaching, Learning, and Assessment (CITLA) Workshop, "Active learning techniques and the noncognitive, or metacognitive, aspects of our students' learning." May 19, 2015, 9 am to 3 pm, led by visiting speaker Dr. David McConnell, CCRI Knight Campus.

2014 Workshop for Early Career Geoscience Faculty. (6/22-27) Co-sponsored by NAGT and NSF. University of Maryland, College Park, MD.

2014 Reactive Transport Modeling Short Course (3/6 & 3/7) Hosted by the University of Pennsylvania, Department of Earth and Environmental Science, Phil., PA.

2013 Deep Carbon Observatory (DCO) International Science Meeting. (3/3-3/5) Sponsored by the Sloan Foundation. U.S. National Academy of Sciences, Washington, DC.

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- 2012 Workshop on Scientific Drilling in the Samail Ophiolite, Sultanate of Oman. (9/13-9/16) Sponsored by the NSF, Sloan Foundation-Deep Carbon Observatory, and the International Continental Drilling Project. Palisades, NY.
- 2010 Teaching Climate Change: Lessons from the Past, web workshop (October 21-27) Sponsored by On The Cutting Edge, SERC, and NSF.
- 2010 Designing Effective and Innovative Courses, web workshop (May 26-27 and June 3-4) Sponsored by On The Cutting Edge, SERC, and NSF.
- 2008 Education Research II: Conducting Quantitative Geoscience Education Research. Short Course 525 of the 2008 Fall Meeting of the Geological Society of America, Houston, TX.
- 2006 On Developing Teaching Philosophies, co-organizer. The Graduate Student Senate and the Teaching Center at Washington University.
- 2005 Designing Teaching Philosophies and Portfolios workshop, co-organizer. The Graduate Student Senate and the Teaching Center at Washington University.
- 2005 Assessing Learning: what you need to know to kickstart your teaching career workshop, co-organizer. The Graduate Student Senate and the Teaching Center at Washington University.
- 2005 Effective Course Design for Future Faculty workshop, co-organizer. The Graduate Student Senate and the Teaching Center at Washington University.
- 2005 Molecular Geomicrobiology. Short Course of the 2005 Fall Meeting of the American Geophysical Union, San Francisco, CA.
- 2004 How to Get a Research Program Started at a Primarily Undergraduate Institution (PUI) workshop. Council on Undergraduate Research, Geosciences Division, Fall 2004 Meeting of the American Geophysical Union.
- 2004 Mapping the Future of GIS workshop. Washington University in St. Louis, MO.
- 2004 Preparing Future Faculty workshop. On The Cutting Edge, University of Minnesota-Twin Cities, Minneapolis, MN.

EDUCATIONAL OUTREACH

- 2016 Faculty sponsor of the URI Outreach Center “Earth Rocks” day camp for elementary school age students. July 2016.
- 2015 Featured Speaker, Peacedale Public Library. "Rhode Island Geology" July 2015.
- 2015 Recruitment pizza lunch to connect CCRI and URI geoscience programs.
- 2014 Featured Speaker and Family Gallery Event Leader. *Earth Day Celebration* at the Rhode Island Museum of Natural History. April 2014.
- 2014 Three webcasts on “Extreme Life In Rocks” presented in series for RI teachers, on geobiological research in the Philippines. February 2014.
- 2013 Presenter of talk entitled “Rock-fueled Life in Earth’s Subsurface” at the 6th Annual URI Academic Summit, *Transformative Scholarship in the 21st Century*.
- 2010-2013 50% time commitment to the NSF-Math Science Partnership-funded Rhode Island Technology Enhanced Science (RITES) Project. Duties included: designing, facilitating, participating actively in Fall and Spring Conferences for hundreds of RI in-service teachers; representing URI and RITES at school events state-wide (focused on teacher professional development and/or science academic enrichment for students in the forms of all school assemblies and small group inquiry based learning projects); designing and delivering professional development workshops (on-line and face-to-face) in the academic year and in the summer for RITES participant-teachers; participating in NSF-MSP site visits as presenter and discussion group member; carrying out science education research; participating in GRRL Tech outreach event as panelist.

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- 2011 Speaker, Museum of Science, Boston, MA. “Inspiring Minds: Meet Women in Science” program, discussing research with public of all ages. Audience ~50 General Public.
- 2009 NASA Digital Learning Network, <http://erc.arc.nasa.gov/dln/speakers/jan14.html>
- 2004-2006 Speaker, St. Louis Science Speakers and Scientist in the Classroom/Partners in Education. St. Louis Academy of Science, St. Louis, MO.
- 2005 Panelist, Expanding Your Horizons, A Conference for 7th through 10th grade young women. The Mathematics-Science Network of Greater St. Louis, MO.

COMMITTEES

Committee member, CELS Space Committee Chairperson, 2019 to present.

Committee member, URI-BES-Environmental and Earth Sciences Graduate Specialization, Fall 2010 to present, Graduate Specialization Coordinator, 2019 to present.

Committee member, Environmental Studies Exploratory Committee, Spring 2011 to 2014.

Committee member, College of the Environmental and Life Sciences Faculty Advisory Committee, Spring 2011 to 2013.

Environmental and Earth Sciences Research Group Seminar Facilitator, Fall 2011 to Fall 2012.

ACADEMIC AND COMMUNITY SERVICE

Session co-chair for the NASA Astrobiology Science Conference, June 2017.

Member of the Local Organizing Committee for Goldschmidt 2018 (Boston, MA).

Member of the Planning Committee for the International Serpentine Ecology Conference, San Luis Obispo, CA, 2018.

Science Writing Fellow with the SciWrite@URI team, an NSF initiative to strengthen writing practice at the graduate and undergraduate levels.

Session co-chair for the Northeastern Section of the Geological Society of America Conference, Pittsburgh, PA, March 2017.

Author of the 2014 Multicultural Faculty Fellow Proposal for the Department of Geosciences.

Collaborator and co-author of three separate URI 2014 Cluster Hire Proposals entitled *STEM Education*, *Ocean Exploration*, and *Hazards*.

Session co-chair. “Evolution of Minerals in Diverse Environments: Geobiological and Geochemical Aspects” Northeastern Regional Meeting of the Geological Society of America. 3/23-25, 2015. Bretton Woods, NH.

Co-Editor, Special Issue “Terrestrial Portals Into the Deep Biosphere,” *Frontiers in Extreme Microbiology* [papers to be handled in 2014-2015], with Drs D’Arcy Meyer-Dombard, Eric Boyd, and John Spear.

Radio show team member for the Aesthetics Cluster hire initiative with Reyes, DeBruin, Foster, Howard, Morrison, and Brierly (*The Beauty Salon*, Mondays, 12:30PM, wriu.org)

Session co-chair. “Mineral Transformations in the Environment: Geobiological and Geochemical Aspects” Northeastern Regional Meeting of the Geological Society of America. 3/18-20, 2013. Bretton Woods, NH.

Session co-chair. “Serpentinization in Astrobiology: From Molecular to Cosmic Scales” April 2012 Astrobiology Science Conference. 4/16-4/20, 2012. Atlanta, GA.

Session co-chair. “Biogeochemical Cycling in Deep Subsurface Ecosystems” Fall 2011 meeting of the American Geophysical Union. 12/4-12/9, 2011. San Francisco, CA.

Session co-chair. “Technology Integration in K–16 Geoscience Education” Spring 2012 regional meeting of the Geological Society of America. 3/18-3/21, 2012.

Astrobiology coordinator, International Serpentine Ecology Society, <<http://ultramafic-ecology.org/>>.

Reviewer for manuscripts submitted to *Chemical Geology*, *Geobiology*, *Frontiers in Microbiology*, *GSA Today*, and the *Ocean Drilling Program*, and proposals submitted to the NSF Geobiology and Low

Cardace, c.v.

Temperature Geochemistry Program, the NSF Biological Oceanography Program, and the NASA Astrobiology Institute.

Association for Women in Science, St. Louis Chapter, Secretary 2005-2006, Steering committee member, 2004-2006.

President, Washington University Graduate Student Senate, 2004-5. Coordinated health and transportation policy initiatives and associated opinion surveys for ~1300 member constituency of graduate students. Drafted and presented to administration a position paper titled “Addressing Gender Equity in Academia and Raising the Bar in Graduate Education: An Assessment of Child Care at Washington University in St. Louis and Recommendations for Future Action.”

PROFESSIONAL AFFILIATIONS

Member of American Geophysical Union, Geological Society of America, Geochemical Society, Mineralogical Society of America, Geochemical Society, Association for Women Geoscientists, Association for Women in Science, Council on Undergraduate Research, National Association of Geoscience Teachers, Cave Research Foundation, National Speleological Society.

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