

**Curriculum Vitae (updated July 2020)**

**DALTON S. HARDISTY**

**Assistant Professor**

**Michigan State University**

**hardist1@msu.edu**

*EDUCATION*

B.S. Environmental Science, Mathematics minor, Indiana University, 2005-2009  
M.S. Geology, Indiana University, 2009-2011 (Advisor: Dr. Lisa Pratt)  
Ph.D. Geology, University of California Riverside, CA, 2011-2016 (Advisor: Dr. Tim Lyons)  
Postdoctoral Scholar, Woods Hole Oceanographic Institution 2016-2018 (Advisor: Dr. Sune Nielsen)

*NON-ACADEMIC RESEARCH POSITIONS AND INTERNSHIPS*

2013-2014 Geochemist, IODP Expedition 347, Baltic Sea (3 months)  
2011 Geochemistry Lab and Field Assistant, Indiana Geological Survey (summer), USA  
2010 Geochemistry Laboratory Technician, Indiana University (summer), USA  
2007-2009 Hydrogeology Field Assistant, Indiana Geological Survey, USA  
2007 Mining Reclamation Intern, Peabody Energy, Indiana, USA

*TEACHING EXPERIENCE*

2019- Instructor, Michigan State University, *Oceanography*  
2019- Instructor, Michigan State University, *Environmental Geochemistry*  
2015-2016 Senior Thesis Advisor, University of California Riverside  
2016 Teaching Assistant, University of California Riverside, *Earth's Climate Through Time*  
2012 Teaching Assistant, University of California Riverside, *Oceanography*  
2010-2011 Senior Thesis Advisor, Indiana University  
2010-2011 Teaching Assistant, Indiana University, *Environmental Geology*  
2010 Teaching Assistant, Indiana University, *Earth Science: Materials and Processes*

*FUNDING AWARDS AND SELECTED ACADEMIC HONORS*

2016-2018 Ocean Exploration Institute Project Funding, WHOI  
2016-2018 Doherty Postdoctoral Scholar, Woods Hole Oceanographic Institute  
2016 NASA Postdoctoral Program Fellowship, NASA Astrobiology Program (I declined)  
2015-2016 Dissertation Year Fellowship, University of California Riverside  
2015 SETI Institute student travel grant – Astrobiology Science Conference  
2014-2016 NSF Geobiology and Low-Temperature Geochemistry  
2014-2015 Schlanger Ocean Drilling Fellowship, U.S. Science Support Program  
2014 IODP Post-Expedition Award  
2014 NASA Astrobiology Early Career Collaboration Award

*PEER REVIEW CONTRIBUTIONS*

*Geobiology; Science; Nature Geoscience; Geology; Earth and Planetary Science Letters; Paleooceanography; Biogeochemical Cycles; Canadian Journal of Earth Sciences; Journal of Earth Science; Geochimica et Cosmochimica Acta; Biogeochemistry; Geochemistry, Geophysics, Geosystems; Chemical Geology; Global Biogeochemical Cycles*

*FUNDING PANELS*

National Environmental Research Council external review 2019/2020; American Chemical Society external review 2019; National Science Foundation external reviewer 2018; Executive Secretary for NASA Exobiology proposal review panels, July 2012 and October 2014

*MAJOR GRANT SUPPORT*

<i>Active Grants to Michigan State University (3)</i>					
<b>Title</b>	<b>Agency</b>	<b>Total</b>	<b>MSU Total</b>	<b>Dates</b>	<b>Role / Details</b>
<i>3. Collaborative Research: Manganese Cycling and Coupling Across Redox Boundaries within Stratified Basins of the Baltic</i>	NSF-OCE	\$1,079,651	\$234,763	12/19-11/22	<b>PI at MSU</b> ; PI: Hansel; Co-PIs: Oldham, Wankel
<i>2. Magic Planet</i>	MSU HUB	\$10,000	(internal)	11/19-11/20	<b>Co-PI</b> ; PI: Schrenk; Co-PI: Libarkin
<i>1. Collaborative Research: Experimental constraints on the rates and mechanisms of iodine redox transformations in seawater</i>	NSF-OCE	\$496,792	\$330,152	9/18-8/21	<b>PI</b> ; <b>co-PI</b> : Nielsen;

*CONFERENCE SESSIONS*

Goldschmidt, 2019, co-convener: Modern and Ancient Ocean Anoxia and Organic Carbon Burial: implications for the future

Goldschmidt, 2016, co-convener: The Evolution of Bioessential Trace Elements in Paleomarine Environments

American Geophysical Union, 2015, co-convener: New Insights on Geochemical Cycles toward Redox Proxy Development and Application to the Ancient Ocean and Atmosphere

Goldschmidt, 2015, co-convener: Precambrian Redox Evolution

*INVITED LECTURES*

University of Tennessee (2020); University of Southern California (2019); Lamont-Doherty Earth Observatory (2019); Western Michigan University (2019); Central Michigan University (2018); Woods Hole Oceanographic Institution (2017); University of Massachusetts, Dartmouth (2017); Michigan State University (2017); University of Southern California (2016); Syracuse University (2015)

*PUBLICATIONS*

- [1] **Hardisty, D.S.**, Horner, T.J., Wankel, S.D., Blusztajn, J., & Nielsen, S. G., 2020, Experimental observations of marine iodide oxidation using a novel sparge-interface MC-ICP-MS technique. *Chemical Geology* 532, 119360.
- [2] Fan, H., Nielsen, S.G., Owens, J.O., Auro, M., Shu, Y., **Hardisty, D.S.**, Horner, T.J., Bowman, C.N., Young, S.A., & Wen, H., 2020, Constraining oceanic oxygenation during the Shuram excursion in South China using thallium isotopes. *Geobiology* 18, 348-365.
- [3] Dellinger, M., **Hardisty, D.S.**, Planavsky, N.J., Gill, B.C., Kalderon-Asael, B., Asael, D., Croissant, T., Swart, P. K., & West, A.J., 2020, The effects of diagenesis on lithium isotope ratios of shallow marine carbonates. *American Journal of Science* 320, 150-184.

- [4] Moriyasu, R., Evans, Z.C., Bolster, K.M., **Hardisty, D.S.**, & Moffett, J.W., 2020, The distribution and redox speciation of iodine in the Eastern Tropical North Pacific Ocean. *Global Biogeochemical Cycles* 34, e2019GB006302.
- [5] Zhang, F., Romaniello, S.J., Xiao, S., Lenton, T.M., **Hardisty, D.S.**, Daines, S.J., Li, C., Melezhik, V., Cheng, M., Pokrovsky B., Shi, W., & Anbar, A.D., 2019, Global marine redox changes drove the rise and fall of the Ediacara biota. *Geobiology* 17, 594-610.
- [6] Hancock, L.G., **Hardisty, D.S.**, Behl, R.J., & Lyons, T.W., 2019, A multi-basin redox reconstruction for the Miocene Monterey Formation, California, USA. *Paleogeography, Paleoclimatology, and Paleoecology* 520, 114-127.
- [7] Liu, X.M., **Hardisty, D.S.**, Lyons, T.W., & Swart, P.K., 2019, Evaluating the integrity of the cerium paleoredox tracer during variable diagenesis on the Great Bahama Bank. *Geochimica et Cosmochimica Acta* 248, 25-42.
- [8] Lu, W., Ridgwell, A., Thomas, E., **Hardisty, D.S.**, Luo, G., Algeo, T.J., Saltzman, M.R., Gill, B.C., Shen, Y., Ling, H.F., Edwards, C.T., Whalen, M.T., Zhou, X., Gutches, K.M., Jin, L., Rickaby, R.E.M., Jenkyns, H.C., Lyons, T.W., Lenton, T.M., Kump, L.R., & Lu, Z., 2018, Late inception of a resiliently oxygenated upper ocean. *Science* 361, 174-177.
- [9] **Hardisty, D.S.**, Lyons, T.W., Riedinger, N., Isson, T.T., Owens, J.D., Aller, R.C., Rye, D.M., Planavsky, N.J., Reinhard, C.T., Gill, B.C., Masterson, A.L., & Johnston, D., 2018, An evaluation of sedimentary molybdenum and iron as proxies for pore fluid paleoredox conditions. *American Journal of Science* 318(5), 527-556.
- [10] Raiswell, R., **Hardisty, D.S.**, Lyons, T.W., Canfield, D.E., Owens, J.D., Planavsky, N.J., Poulton, S.W. & Reinhard, C.T., 2018, The iron paleoredox proxies: A guide to the pitfalls, problems and proper practice. *American Journal of Science* 318(5), 491-526.
- [11] Chen, X., Romaniello, S.J., Herrmann, A.D., **Hardisty, D.S.**, Gill, B.C. & Anbar, A.D., 2018, Diagenetic effects on uranium isotope fractionation in carbonate sediments from the Bahamas. *Geochimica et Cosmochimica Acta* 237, 294-311.
- [12] Planavsky, N.J., Slack, J.F., Cannon, W.F., O'Connell, B., Isson, T.T., Asael, D., Jackson, J.C., **Hardisty, D.S.**, Lyons, T.W. & Bekker, A., 2018, Evidence for episodic oxygenation in a weakly redox-buffered deep mid-Proterozoic ocean. *Chemical Geology* 483, 581-594.
- [13] **Hardisty, D.S.**, Lu, Z., Planavsky, N.J., Kah, L.C., Bekker, A., Knoll, A.H., Zhou, X., Osburn, M.R., Loyd, S.J., Jiang, G., Gill, B.C., Diamond, C.W., & Lyons, T.W., 2017, Perspectives on Proterozoic surface ocean redox from iodine contents in ancient and recent carbonate. *Earth and Planetary Science Letters* 463, 159-170.
- [14] Li, C., **Hardisty, D.S.**, Luo, G., Huang, J., Algeo, T.J., Cheng, M., Shi, W., An, Z., Tong, J., Xie, S., Jiao, N., & Lyons, T.W., 2017, Uncovering the spatial heterogeneity of Ediacaran carbon cycling. *Geobiology* DOI: 10.1111/gbi.12222
- [15] Owens, J.D., Lyons, T.W., **Hardisty, D.S.**, Lowery, C., Lu, Z., & Jenkyns, H.C., 2017, Patterns of local and global redox variability during the Cenomanian-Turonian Boundary Event (OAE2) recorded in carbonates and shales from central Italy. *Sedimentology* 63, 168-185.
- [16] Konhauser, K.O., Planavsky, N.J., **Hardisty, D.S.**, Robbins, L.J., Warchola, T.J., Hugaard, R., Lalonde, S.V., Partin, C.A., Oonk, P.B.H., Tsikos, H. and Lyons, T.W., 2017. Iron formations: A global record of Neoproterozoic to Palaeoproterozoic environmental history. *Earth-Science Reviews*, 172, 140-177.

- [17] Zhou, X., Jenkyns, H.C., Lu, W., **Hardisty, D.S.**, Owens, J.D., Lyons, T.W., & Lu, Z., 2017, Records of organically bound iodine during the Cenomanian–Turonian OAE 2: implications for bottom-water conditions and iodine cycling. *Chemical Geology* 457, 95–106.
- [18] Lu, W., Wörmde, S., Halverson, G.P., Zhou, X., Bekker, A., Rainbird, R.H., **Hardisty, D.S.**, Lyons, T.W., Lu, Z., 2017, Iodine proxy evidence for increased ocean oxygenation during the Bitter Springs Anomaly. *Geochem. Perspect. Lett.* 5, 53-57
- [19] Zhang, S., Henehan, M.J., Hull, P.M., Reid, P., **Hardisty, D.S.**, Hood, A., & Planavsky, N.J., 2017, Investigating controls on boron isotope ratios in shallow marine carbonates. *Earth and Planetary Science Letters* 458, 380-393.
- [20] **Hardisty, D.S.**, Riedinger, N., Planavsky, N.J., Asael, D., Andrén, T., Jørgensen, B.B., & Lyons, T.W., 2016, A Holocene history of dynamic water column redox conditions in the Landsort Deep, Baltic Sea (IODP Expedition 347). *American Journal of Science* 216, 713–745
- [21] Robbins, L.J., Lalonde, S.V., Planavsky, N.J., Partin, C.A., Reinhard, C.T., Kendall, B., Scott, C., **Hardisty, D.S.**, Gill, B.C., Alessi, D.S., Dupont, C.L., Saito, M.A., Poulton, S.W., Bekker, A., Lyons, T.W., & Konhauser, K.O., 2016, Trace elements at the intersection of marine biological and geochemical evolution. *Earth-Science Reviews*.
- [22] Zhou, X., Jenkyns, H.C., Owens, J.D., Junium, C.K., Zheng, X., Sageman, B.B., **Hardisty, D.S.**, Lyons, T.W., Ridgwell, A., & Lu, Z., 2015, Upper ocean oxygenation dynamics from I/Ca ratios during the Cenomanian-Turonian OAE 2. *Paleoceanography* 30, 510-526.
- [23] Li, C., Planavsky, N.J., Love, G.D., Reinhard, C.T., **Hardisty, D.S.**, Feng, L., Bates, S.M., & Lyons, T.W., 2015, Marine redox conditions in the middle Proterozoic ocean and isotopic constraints on authigenic carbonate formation: Insights from the Chuanlinggou Formation, Yanshan Basin, North China. *Geochimica et Cosmochimica Acta* 150, 90-105.
- [24] **IODP Expedition 347 Science Party**, 2015, IODP Expedition 347 Report, In Andrén, T., Jørgensen, B.B., Cotterill, C., Green, S., and the Expedition 347 Scientists, Proc. IODP, 347: College Station, TX (Integrated Ocean Drilling Program).
- [25] **Hardisty, D.S.**, Lu, Z., Planavsky, N.J., Bekker, A., Philippot, P., Zhou, X., & Lyons, T.W., 2014, An iodine record of Paleoproterozoic surface ocean oxygenation. *Geology* 42, 619–622.
- [26] **Hardisty, D.S.**, Olyphant, G.A., Bell, J.B., Johnson, A.P., & Pratt, L.M., 2013, Acidophilic sulfur disproportionation. *Geochimica et Cosmochimica Acta* 113, 136-151.

#### CONFERENCE PRESENTATIONS

- [1] American Geophysical Union Ocean Sciences, 2020 (lead author): Constraints on marine OMZ iodine cycling and implications for paleoredox proxy applications
- [2] American Geophysical Union, 2019 (co-author): Estimating pressure and temperature conditions of hydrothermal vent fluid formation: Recent observations at the East Pacific Rise 9°50'N
- [3] American Geophysical Union, 2019 (co-author): Historical Fluxes of Toxic Trace Elements in the Salton Sea Basin
- [4] Geological Society of America, 2018, Oral (lead author): A novel tracer method to provide principal constraints on seawater iodine redox chemistry
- [5] Goldschmidt, 2017, Poster Presentation (lead author): A novel tracer method to provide principal constraints on seawater iodine redox chemistry.

- [6] Goldschmidt, 2016, Oral Presentation (lead author): Spatiotemporal variations in the degree and frequency of Baltic Sea Holocene anoxia (IODP Expedition 347).
- [7] American Geophysical Union, 2015, Poster Presentation (lead author): Assessing potential diagenetic alterations to primary iodine-to-calcium ratios.
- [8] Goldschmidt, 2015, Poster Presentation (lead author): A Holocene history of dynamic water column redox conditions in the Landsort Deep, Baltic Sea (IODP Expedition 347).
- [9] Astrobiology Science Conference, 2015, Oral Presentation (lead author): An oxygen lean Mesoproterozoic surface ocean.
- [10] Southern California Geobiology Symposium, 2015, Poster Presentation (lead author): A Holocene history of unstable, intermediate redox conditions in the Landsort Deep, Baltic Sea.
- [11] Goldschmidt, 2014, Oral Presentation (lead author): An oceanic oxidation event coincident with the Shuram carbonate carbon isotope excursion.
- [12] Southern California Geobiology Symposium, 2014, Oral Presentation (lead author): An oceanic oxidation event coincident with the Shuram carbonate carbon isotope excursion
- [13] American Geophysical Union, 2013, Poster Presentation (lead author): Iodine-to-calcium ratios in carbonates suggest a primary origin for the Precambrian Shuram carbon isotope excursion.
- [14] Goldschmidt, 2013, Poster Presentation (lead author): An Iodine Record of Paleoproterozoic Surface Ocean Oxygenation.
- [15] Southern California Geobiology Symposium, 2013, Oral Presentation (lead author): An Iodine Record of Paleoproterozoic Surface Ocean Oxygenation.
- [16] Goldschmidt, 2012, Oral Presentation (lead author): New insights from FOAM: iron and trace metal cycling in highly sulfidic pore waters beneath an oxic water column.
- [17] American Geophysical Union, 2011, Poster Presentation (lead author): Bacterial disproportionation of elemental sulfur inferred from a field study of stable isotope fractionations between elemental sulfur and pyrite.
- [18] American Society for Mining and Reclamation, 2010, Oral Presentation (lead author): Controls on pH and pyrite oxidation pathways across the phreatic surface of an abandoned coal waste deposit in southwest Indiana.