

Jordon D. Hemingway, Ph.D. |
Postdoctoral Fellow

Harvard University
Dept. of Earth & Planetary Sciences
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Research & Teaching Interests

Broadly-trained geochemist with expertise in biogeochemical cycling. Technical skills include thermodynamic and kinetic modeling, development of new molecular and isotopic techniques, measurement of stable- and radio-isotopes. Author of 15 peer-reviewed publications (plus 3 under review), with 10 as first author. Ability to teach wide range of undergraduate and graduate courses in biogeochemistry, Earth-surface processes, sedimentology, and oceanography.

Research Experience

2017– Postdoctoral Fellow in Geochemistry
Dept. of Earth & Planetary Sciences, Harvard University
Project: Constraining pyrite weathering using oxygen isotopes
Advisor: David Johnston
Project: Deciphering sources of bacteriohopanepolyols using carbon isotopes
Advisor: Ann Pearson

Education

2017 Ph.D. in Marine Chemistry & Geochemistry
MIT/WHOI Joint Program in Oceanography
Thesis: Understanding terrestrial organic carbon export –
A time-series approach
Advisor: Valier Galy
2011 B.S. in Environmental Engineering Sciences & Chemistry
University of California, Berkeley
Project: Mechanisms and consequences of annual estuary mouth closure
Advisor: Mark Stacey

Publications | 10/18 as first author (*Indicates equal contributions)

Under Review

- [1] Eglinton, T.I., Galy, V.V., **Hemingway, J.D.**, Feng, X., Bao, H., Blattman, T.M., Dickens, A.F., Gies, H., Giosan, L., Haghypour, N., Hou, P., Lupker, M., McIntyre, C.P., Montluçon, D., Peucker-Ehrenbrink, B., Ponton, C., Schefuß, E., Schwab, M., Voss, B., Wacker, L., Zhao, M.: Climate control on terrestrial biospheric carbon turnover, *Proceedings of the National Academy of Sciences USA*, under review.
- [2] Elling, F.J.*, **Hemingway, J.D.***, Kharbush, J.J., Becker, K.W., Polik, C.A., Pearson, A.: Episodic marine anoxia driven by diatom-diazotroph symbiosis, *Nature Geoscience*, under review.
- [3] Elling, F.J., **Hemingway, J.D.**, Evans, T.W., Kharbush, J.J., Spieck, E., Summons, R.E., Pearson, A.: Cobalamin-dependent biosynthesis ties amplified 2-methylpanoid production during ocean anoxic events to nitrification, *Proceedings of the National Academy of Sciences USA*, under review.

Selected Publications

- [4] **Hemingway, J.D.**, Olson, H., Turchyn, A.E., Tipper, E.T., Bickle, M., Johnston, D.T.: Triple oxygen isotope insight into terrestrial pyrite oxidation, *Proceedings of the National Academy of Sciences USA*, 117, 7650–7657, 2019.
- [5] **Hemingway, J.D.**, Rothman, D.H., Grant, K.E., Rosengard, S.Z., Eglinton, T.I.,

Derry, L.A., Galy, V.V.: Mineral protection regulates long-term global preservation of natural organic carbon, *Nature*, 570, 228–231, 2019.

- [6] **Hemingway, J.D.**, Hilton, R.G., Hovius, N., Eglinton T.I., Haghpor, N., Wacker, L., Chen, M.-C., Galy, V.V.: Rapid microbial oxidation of lithospheric organic carbon in tropical mountain soils, *Science*, 360, 209–212, 2018.

Additional Publications

- [7] Boral, S., Sen, I.S., Ghosal, D., Peucker-Ehrenbrink, B., **Hemingway, J.D.**: Stable water isotope modeling reveals spatio-temporal variability of glacier meltwater contributions to Ganges River headwaters, *Journal of Hydrology*, 577, 123983, 2019.
- [8] **Hemingway, J.D.**, Spencer, R.G.M., Podgorski, D.C., Zito, P., Sen, I., Galy, V.V.: Glacier meltwater and monsoon precipitation drive Upper Ganges Basin dissolved organic matter composition, *Geochimica et Cosmochimica Acta*, 244, 216–228, 2019.
- [9] Bao, R., McNichol, A.P., **Hemingway, J.D.**, Lardie-Gaylord, M.C., Eglinton, T.I.: Influence of different acid treatments on the radiocarbon content spectrum of sedimentary organic matter determined by RPO/AMS, *Radiocarbon*, 61, 395–413, 2019.
- [10] Kusch, S., Shah-Walter, S.R., **Hemingway, J.D.**, Pearson, A.: Improved chromatography reveals new bacteriohopanepolyol isomers in marine sediments, *Organic Geochemistry*, 124, 12–21, 2018.
- [11] **Hemingway, J.D.**, Kusch, S., Shah-Walter, S.R., Polik, C.A., Elling, F.J., Pearson, A.: A novel method to measure the ^{13}C composition of intact bacteriohopanepolyols, *Organic Geochemistry*, 123, 144–147, 2018.
- [12] Drake, T.W., Guillemette, F., **Hemingway, J.D.**, Chanton, J.P., Podgorski, D.C., Zimov, N.S., Spencer, R.G.M.: The ephemeral signature of permafrost carbon in an Arctic fluvial network, *Journal of Geophysical Research B*, 123, JG004311, 2018.
- [13] **Hemingway, J.D.**, Rothman, D.H., Rosengard, S.Z., Galy, V.V.: Technical note: An inverse method to relate organic carbon reactivity to isotope composition from serial oxidation, *Biogeosciences*, 14, 5099–5114, 2017.
- [14] **Hemingway, J.D.**, Schefuß, E., Spencer, R.G.M., Dinga, B.J., Eglinton, T.I., McIntyre, C., Galy, V.V.: Hydrologic controls on the seasonal and inter-annual variability of Congo River particulate organic matter source and reservoir age, *Chemical Geology*, 466, 454–465, 2017.
- [15] **Hemingway, J.D.**, Gagnon, A.R., Galy, V.V., Grant, K.E., McNichol, A.P., Rosengard, S.Z., Soulet, G., Zigah, P.K.: Assessing the blank carbon contribution, isotope mass balance, and kinetic isotope fractionation of the ramped pyrolysis/oxidation instrument at NOSAMS, *Radiocarbon*, 59, 179–193, 2017.
- [16] Orsi, W.D., Coolen, M.J.L., Wuchter, C., He, L., More, K.D., Irigoien, X., Chust, G., Johnson, C., **Hemingway, J.D.**, Lee, M., Galy, V.V., Giosan, L.: Climate oscillations reflected in the Arabian Sea seafloor microbiome, *Scientific Reports*, 7, 6040, 2017.
- [17] **Hemingway, J.D.**, Schefuß, E., Dinga, B.J., Pryer, H., Galy, V.V.: Multiple plant-wax compounds record differential sources and ecosystem structure in large river catchments, *Geochimica et Cosmochimica Acta*, 184, 20–40, 2016.
- [18] Plata, D., **Hemingway, J.D.**, Gschwend, P.: Polyparameter linear free energy relationship for wood char-water sorption coefficients of organic sorbates, *Environmental Toxicology & Chemistry*, 34, 1464–1471, 2015.

Published Code Packages

- [1] **Hemingway, J.D.**: *Isotopylog*: Open-source tools for clumped isotope kinetic analysis, 2020-, doi:10.5281/zenodo.1158757, 2020.
- [2] **Hemingway, J.D.**: *Fouriertransform*: Open-source tools for FT-ICR MS data analysis, 2017-, doi:10.5281/zenodo.1158757, 2017.
- [3] **Hemingway, J.D.**: *Rampedpyrox*: Open-source tools for thermoanalytical data analysis, 2016-, doi:10.5281/zenodo.839815, 2017.

Presentations | presenting author only (‡Indicates invited presentation)

Seminars and Colloquia

- [1] ‡**Hemingway, J.D.**, Elling, F.J., Kharbush, J.J., Becker, K.W., Polik, C.A., Pearson, A.: Episodic marine anoxia driven by diatom-diazotroph symbiosis, *MIT Department Seminar*, Cambridge, USA, 2019.
- [2] ‡**Hemingway, J.D.**, Rothman, D.H., Grant, K.E., Rosengard, S.Z., Eglinton, T.I., Derry, L.A., Galy, V.V.: Aging and persistence of natural organic matter, *NOSAMS Advisory Panel Meeting* (CFAMS/Schneider Prize Seminar), Woods Hole, USA, 2019.
- [3] ‡**Hemingway, J.D.**, Rothman, D.H., Grant, K.E., Rosengard, S.Z., Eglinton, T.I., Derry, L.A., Galy, V.V.: A theory of natural organic matter preservation, *Harvard University Department Seminar*, Cambridge, USA, 2019.

- [4] ‡**Hemingway, J.D.**, Rothman, D.H., Grant, K.E., Rosengard, S.Z., Eglinton, T.I., Derry, L.A., Galy, V.V.: A theory on the persistence of natural organic matter, *LDEO Department Seminar*, New York, USA, 2019.
- [5] ‡**Hemingway, J.D.**: Linking carbon isotopes and hydrology, *USGS Water Science Center*, New Mexico, USA, 2016.
- [6] ‡**Hemingway, J.D.**, Rothman, D.H., Hilton, R.G., Eglinton, T.I., Galy, V.V.: Quantifying petrogenic organic carbon oxidation in mountainous soils using Ramped PyrOx, *NOSAMS Advisory Panel Meeting*, Woods Hole, USA, 2016.
- [7] ‡**Hemingway, J.D.**, Schefuß, E., Spencer, R.G.M., Dinga, B.J., Pryer, H., Galy, V.V.: Using biomarkers to understand ecosystem structure in large river catchments: Insights from time-series measurements, *WHOI Department Seminar*, Woods Hole, USA, 2016.
- [8] ‡**Hemingway, J.D.**, Schefuß, E., Dinga, B.J., Pryer, H., Galy, V.V.: Central African biomarkers: Paleo insights from modern suspended sediments, *WHOI Department Seminar*, Woods Hole, USA, 2014.
- [9] ‡**Hemingway, J.D.**, Galy, V.V., Hilton, R.G., Hovius, N.: Terrestrial organic carbon export from high-standing tropical islands: Presence of pre-aged soil OC?, *ETH Department Seminar*, Zürich, Switzerland, 2014.

Conference submissions

- [1] **Hemingway, J.D.**, Olson, H., Turchyn, A.V., Tipper, E.T., Bickle, M., Johnston, D.T.: Interpreting triple oxygen isotope signals from geologically preserved sulfate: Insights from modern Himalayan rivers, *AGU Fall Meeting*, San Francisco, USA, 2019.
- [2] ‡**Hemingway, J.D.**, Rothman, D.H., Grant, K.E., Rosengard, S.Z., Eglinton, T.I., Derry, L.A., Galy, V.V.: Reactivity and preservation of natural organic carbon, *Shackleton Meeting*, London, UK, 2019.
- [3] ‡**Hemingway, J.D.**, Rothman, D.H., Grant, K.E., Rosengard, S.Z., Eglinton, T.I., Derry, L.A., Galy, V.V.: Aging and persistence of natural organic matter, *Banff Geobiology Conference*, Banff, Canada, 2019.
- [4] **Hemingway, J.D.**, Rothman, D.H., Grant, K.E., Rosengard, S.Z., Eglinton, T.I., Derry, L.A., Galy, V.V.: Aging and persistence of natural organic matter, *Northeast Geobiology Conference*, Amherst, MA, USA, 2019.
- [5] **Hemingway, J.D.**, Elling, F.J., Polik, C.A., Pearson, A.: Reconstructing past nitrogen cycling: Insights from bacterioplanepolyol ¹³C compositions, *AGU Fall Meeting*, Washington, D.C., USA, 2018.
- [6] ‡**Hemingway, J.D.**, Rothman, D.H., Grant, K.E., Rosengard, S.Z., Galy, V.V.: Persistence of natural organic matter, *AGU Fall Meeting*, Washington, D.C., USA, 2018.
- [7] ‡**Hemingway, J.D.**, Hilton, R.G., Hovius, N., Eglinton T.I., Hagehipour, N., Wacker, L., Chen, M.-C., Galy, V.V.: Rapid microbial oxidation of lithospheric organic carbon in tropical mountain soils, *Goldschmidt*, Boston, USA, 2018.
- [8] **Hemingway, J.D.**, Hilton, R.G., Hovius, N., Eglinton, T.I., Galy, V.V.: Rapid microbial oxidation of rock-derived organic carbon in tropical mountain soils, *Goldschmidt*, Paris, France, 2017.
- [9] **Hemingway, J.D.**, Schefuß, E., Spencer, R.G.M., Dinga, B.J., Eglinton, T.I., McIntyre, C., Galy, V.V.: Hydrologic controls on Congo River particulate organic carbon sources and reservoir age, *AGU Fall Meeting*, San Francisco, USA, 2016.
- [10] ‡**Hemingway, J.D.**, Rothman, D.H., Galy, V.V.: Kinetics and decomposition, *Ramped PyrOx Workshop*, Woods Hole, USA, 2016.
- [11] **Hemingway, J.D.**, Schefuß, E., Dinga, B.J., Pryer, H., Galy, V.V.: Alkanes, alcohols, and fatty acids record complementary signals in fluvial sediments: Insights from a three-year Congo River time-series, *AGU Fall Meeting*, San Francisco, USA, 2015.
- [12] **Hemingway, J.D.**, Schefuß, E., Dinga, B.J., Pryer, H., Galy, V.V.: Plant waxes in Congo River suspended sediments: Applications for paleoclimate and carbon cycling, *ETH Plant-Wax Workshop*, Ascona, Switzerland, 2015.
- [13] **Hemingway, J.D.**, Galy, V.V., Hilton, R.G., Hovius, N.: Typhoon-mediated organic carbon export in the Western Pacific: The role of steep, mountainous rivers, *AGU Fall Meeting*, San Francisco, USA, 2014.
- [14] **Hemingway, J.D.**, Galy, V.V.: The role of terrestrial organic carbon export in the global carbon cycle: Insights from the Ganges-Brahmaputra river system, *Graduate Climate Conference*, Seattle, USA, 2014.
- [15] **Hemingway, J.D.**, Galy, V.V., Hovius, N.: Organic carbon export from steep, mountainous rivers in high-standing tropical islands, *Goldschmidt*, Sacramento, USA, 2014.
- [16] **Hemingway, J.D.**, Galy, V.V., Peucker-Ehrenbrink, B.: Characterizing organic carbon export from four New England rivers, *ASLO Aquatic Sciences*, New Orleans, USA, 2013.

Grants, Fellowships, & Awards | ≈\$384,000 to date

Research Grants

- [1] **EAGER Award: \$100,000 (2018–20, Co-P.I.)**
National Science Foundation
Title: Unraveling riverine sulfate using minor oxygen isotopes
- [2] **Petroleum Research Fund: \$110,000 (2018–20, Co-P.I.)**
American Chemical Society
Title: Linking pyrite weathering to long-term organic matter burial

Fellowships

- [3] **Climate and Global Change (2018, alternate)**
National Oceanic and Atmospheric Administration
Title: Quantifying weathering feedbacks to global change: The importance of pyrite oxidation
- [4] **Graduate Research Fellowship: ≈\$150,000 (2012–15, P.I.)**
National Science Foundation
Title: Predicting sorption of hydrophobic organic contaminants based on molecular properties and intermolecular interactions

Other Awards

- [5] **CFAMS/Schneider Prize, WHOI (\$1000; 2019)**
- [6] **Goldschmidt Travel Grant, Geochemical Society (\$500; 2014)**
- [7] **Coastal Oceans Institute, WHOI (\$2,500; 2013)**
- [8] **Ocean Ventures Fund, WHOI (\$15,000; 2013)**
- [9] **Jonathan Golden Scholarship, BSCES (\$5,000; 2012)**

Teaching & Advising Experience

Teaching Assistant

Responsibilities included developing new class materials, leading class discussions, grading all assignments, and meeting with students individually.
Course: Marine Chemistry, Fall 2013. (G, 15 students)
Institution: Massachusetts Institute of Technology

Advising Experience

Responsibilities included teaching chemical laboratory techniques, instrument training, and aiding in development and execution of research projects.
Mentees: 1 graduate rotation student (2017), 5 undergraduate students (2014–), 1 laboratory researcher (2018–)

Professional Engagement & Activities

Outreach

Activities included serving on conference organizing committees, chairing conference sessions, and publishing outreach articles.

- [1] **Conference Organizing Committees**
Conference: AGU Fall Meeting (2019), Goldschmidt (2018), MIT Water Club (2015), Graduate Climate Conference (2014)
Role: Session (co-)convener; at-large organizer
- [2] **Outreach Articles**
Title: Earth's Riverine Bloodstream
Publication: *Oceanus Magazine*, 51, 12–14, 2015.

Fieldwork

Planned and executed fieldwork campaigns in collaboration with local and international researchers. Targeted either carbonate sedimentary formations or solid and dissolved material transported by rivers and landslides.

- [1] **Agouron Advanced Geobiology Course, Apennines, Italy (2019)**

- [2] **Shale Hills CZO, Central Pennsylvania, USA (2018)**
- [3] **Southern Alps, New Zealand (2017)**
- [4] **Congo River, Republic of Congo (2016)**
- [5] **Garwahl Himalaya, India (2014)**
- [6] **Narragansett Bay, New England, USA (2012–13)**

Peer Reviewer

Biogeosciences; Chemical Geology; Earth & Planetary Science Letters; Geochimica et Cosmochimica Acta; Journal of Geophysical Research; Limnology & Oceanography; Nature; Nature Reviews Earth & Environment; National Science Foundation; Organic Geochemistry; PLOS One; PNAS

Professional Organizations

American Geophysical Union; Geobiology Society; Geochemical Society