

# Dr. Mark Albert Torres

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## ACADEMIC APPOINTMENTS

### **RICE UNIVERSITY | ASSISTANT PROFESSOR (2017 - )**

Department of Earth, Environmental, & Planetary Sciences 6100 Main Street MS-126, Houston, TX 77005

### **CALTECH | TEXACO POSTDOCTORAL FELLOW (2015-2017)**

Division of Geological & Planetary Sciences

Supervisors: Dr. Michael Lamb and Dr. Woodward Fisher

## EDUCATION

### **UNIVERSITY OF SOUTHERN CALIFORNIA | PH.D. IN GEOCHEMISTRY (2015)**

Advisor: Dr. A. Joshua West

### **PITZER COLLEGE | B.A. IN GEOLOGY WITH HONORS (2010)**

Minor: Environmental Studies

## EXTERNAL FUNDING

|      |                         |  |
|------|-------------------------|--|
| 2020 | Research Funding        | NSF-GOLDEN (Co-I)  |
| 2020 | Research Funding        | NSF-Low T. Geochem. & Geobio. (PI)                       |
| 2019 | Research Funding        | American Chemical Society - Petroleum Research Fund (PI) |
| 2019 | Research Funding        | Alfred P. Sloan Foundation Fellowship (PI)               |
| 2018 | Research Funding        | Microsoft AI for Earth (PI)                              |
| 2015 | Postdoctoral fellowship | California Institute of Technology                       |

## SERVICE & OUTREACH

- Invited reviewer: Geochimica et Cosmochimica Acta, Environmental Science & Technology, Science, Nature Geoscience, JGR-Earth Surface, Earth & Planetary Science Letters and others
- Invited lecturer: U. Utah ('20), UNH - CZO group ('20), WHOI ('20), UT-Austin ('18), Texas A&M ('17), Stanford U. ('16), Brown U. ('16), Caltech ('16), UC-Berkeley ('16), Penn State ('16), UMass Amherst ('15), Pomona College ('15), UCLA ('15), U. of Arizona ('15), and the 2019 Geobiology Summer Course ('19)
- Conference convening: SoCal Geobiology Symposium ('14), AGU session ('16;'19;'20), Goldschmidt session ('18)
- Rice University service: Weiss postdoctoral fellowship selection committee (2016-present), Graduate admissions committee (2017-present), Department seminar committee (2017-present), Department Ombud (2019-present)
- Program coordinator/Student Mentor for USC Young Researchers Program (2010-2014). Program pairs high school students from under-represented communities with STEM graduate students

## TEACHING

- Global Biogeochemical Cycles (ESCI 340) | Spring 2018-2020
- Geochemistry of Earth's Surface (ESCI 407/607) | Fall 2018
- Isotope Geochemistry (ESCI 433) | Fall 2019
- Seminars: Following Carbon (ESCI 555; Fall 2017) | Loess Plateau (ESCI 546; Spring 2019) | Sedimentary Carbon (ESCI 546; Spring 2020)
- Earth & Planetary Surface Environments (ESCI 321) | Fall 2020

## ADVISING

### **RICE GRADUATE STUDENTS:**

H. Zhou (2020-), D. Jana (2020-), W. Larsen (2019-), Y. Hou (2018-), T. Cole (2017-2020), J. Spector (2017)

### **RICE UNDERGRADUATE STUDENTS:**

S. Buchanan (2018), M. Hale (2018-), N. Osmani (2019), J. Alanis (2019), A. D'Souza (2020)

# Publications

## Submitted

- [IR1] T.L. Cole, P.C. Kemeny, and M.A. Torres. The hydrochemical signature of incongruent weathering in Iceland. in prep for ESurf.
- [IR2] P.C. Kemeny and M.A. Torres. Presentation and applications of modeling elements and dissolved isotopes in rivers (ME-ANDIR), a customizable MATLAB model for monte carlo inversion of dissolved river chemistry. submitted to AJS.
- [IR3] P.C. Kemeny, M.A. Torres, M.P. Lamb, S.M. Webb, N. Dalleska, T.L. Cole, Y. Hou, J. Markse, J.F. Adkins, and W.W. Fischer. Organic sulfur fluxes and geomorphic control of sulfur isotope ratios in rivers. submitted to EPSL.
- [IR4] P.C. Kemeny, G.I Lopez, N.F. Dalleska, M.A. Torres, A.J. West, J. Hartmann, and J.F. Adkins. Sulfate sulfur isotopes and major ion chemistry reveal that pyrite oxidation counteracts CO<sub>2</sub> drawdown from silicate weathering in the Langtang-Narayani River system, Nepal Himalaya. in revision at *Geochimica et Cosmochimica Acta*.
- [IR5] M.A. Torres and J.J. Baronas. Modulation of Riverine Concentration-Discharge Relationships by Changes in the Shape of the Water Transit Time Distribution. in revision at *Global Biogeochemical Cycles*.

## Published

- [P1] M.A. Torres, P.C. Kemeny, M.P. Lamb, Cole T.L., and W.W. Fischer. Long-term storage and age-biased export of fluvial organic carbon: field evidence from West Iceland. *Geochemistry, Geophysics, Geosystems*, 2020.
- [P2] S. Dee, M.A. Torres, R. Martindale, A. Weiss, and K. DeLong. The future of reef ecosystems in the Gulf of Mexico: insights from coupled climate model simulations and ancient hot-house reefs. *Frontiers in Marine Science*, 2019.
- [P3] Cin-Ty A. Lee, Hehe Jiang, Rajdeep Dasgupta, and Mark Torres. A Framework for Understanding Whole-Earth Carbon Cycling, page 313–357. Cambridge University Press, 2019.
- [P4] M.A. Torres, S. Dong, A.J. West, and K.H. Nealson. The kinetics of siderophore-mediated olivine dissolution. *Geobiology*, 2019.
- [P5] J.J. Baronas, M.A. Torres, A.J. West, O. Rouxel, B. Georg, J. Bouchez, J. Gaillardet, and D.E. Hammond. Ge and Si isotope signatures in rivers: A quantitative multi-proxy approach. *Earth and Planetary Science Letters*, 503:194–215, 2018.
- [P6] M. A. Torres, G. Paris, Jess F. Adkins, and W. W. Fischer. Riverine evidence for isotopic mass balance in the Earth's early sulfur cycle. *Nature Geoscience*, 2018.
- [P7] M.A. Torres, A.B. Limaye, V Ganti, M.P. Lamb, A.J. West, and W.W. Fischer. Model predictions of long-lived storage of organic carbon in river deposits. *Earth Surface Dynamics*, 2017.
- [P8] M. A. Torres, N. Moosdorf, J. Hartmann, Jess F. Adkins, and A. J. West. Glacial weathering, sulfide oxidation, and global carbon cycle feedbacks. *Proceedings of the National Academy of Sciences*, 2017.
- [P9] M.A. Torres, J.J. Baronas, K.E. Clark, S.J. Feakins, and A.J. West. Mixing as a driver of temporal variations in river hydrochemistry. Part 1: insights from conservative tracers in the Andes-Amazon. *Water Resources Research*, 2017.
- [P10] J.J. Baronas, M.A. Torres, K.E. Clark, and A.J. West. Mixing as a driver of temporal variations in river hydrochemistry. Part 2: Major and trace element concentration dynamics in the Andes-Amazon. *Water Resources Research*, 2017.
- [P11] M. A. Torres, A.J. West, K.E. Clark, G. Paris, J. Bouchez, C. Ponton, S.J. Feakins, Galy V., and J.F. Adkins. The acid and alkalinity budgets of weathering in the andes-amazon system: Insights into the erosional control of global biogeochemical cycles. *Earth and Planetary Science Letters*, 2016.
- [P12] M.A. Torres, A.J. West, and K. E. Clark. Geomorphic regime modulates hydrologic control of chemical weathering in the Andes-Amazon. *Geochimica et Cosmochimica Acta*, 2015.
- [P13] M.A. Torres, A.J. West, and G. Li. Sulphide oxidation and carbonate dissolution as a source of CO<sub>2</sub> over geological timescales. *Nature*, 2014.

- [P14] K.E. Clark, M.A. Torres, A.J. West, R.G. Hilton, M. New, A.B. Horwath, J.B. Fisher, J.M. Rapp, A. Robles Caceres, and Y. Malhi. The hydrological regime of a forested tropical Andean catchment. *Hydrology and Earth System Sciences*, 2014.
- [P15] M.A. Torres and R.R. Gaines. Paleoenvironmental and Paleoclimatic Interpretations of the Late Paleocene Goler Formation, Southern California, USA, Based On Paleosol Geochemistry. *Journal of Sedimentary Research*, 2013.

## Conference Abstracts (since 2017)

- [A1] M. A. Torres, Y. Hou, and T. Cole. The Autogenic Carbon Cycle . In *Gordon Geobiology*, 2020.
- [A2] Yi Hou and Mark Torres. Effects of stochastic sedimentation on organic carbon diagenesis and preservation. In *AGU Fall Meeting 2019*.
- [A3] Trevor Cole, Preston Cosslett Kemeny, Jeffrey A Nittroer, and Mark Torres. Elucidating terrestrial organic carbon burial mechanisms—insights from the western irish namurian basin, county clare, ireland. In *AGU Fall Meeting 2019*.
- [A4] A Joshua West, Valier Galy, Gen Li, Mark Torres, Camilo Ponton, and Sarah J Feakins. Field constraints from the amazon basin reveal a rapid rate constant for oxidation of rock-derived organic carbon. In *AGU Fall Meeting 2019*.
- [A5] Yige Zhang, LI Ziye, Mark Torres, and Benjamin Mills. Neogene burial of organic carbon in the global ocean. In *AGU Fall Meeting 2019*.
- [A6] M.A. Torres, J. Baronas, T. Cole, and N. Osmani. Model-Data Comparison in River Hydrochemistry. In *Goldschmidt Proceedings*, 2019.
- [A7] T. Cole, P. Kemeny, W.W. Fischer, M. Lamb, and M.A. Torres. Evaluating the Environmental and Lithological Controls on Silicate Weathering in Iceland. In *AGU Fall Meeting*, 2018.
- [A8] M.A. Torres, J. Baronas, A.J. West, and R.B. Georg. Using Isotopic Tracers to Decode Concentration-Discharge Relationships. In *Goldschmidt Proceedings*, 2018.
- [A9] J. Gonzalez, M. Torres, M.T. Colucci, S.B. Jacobsen, and C.T. Lee. C, N, H, O, S and Trace Element Determinations in Organic-Rich Sediments and Some Igneous Rocks Types by Tandem LA-LIBS ICP-MS. In *Goldschmidt Proceedings*, 2018.
- [A10] M.T. Colucci, S.B. Jacobsen, J. Gonzalez, M. Torres, , C.T. Lee, D. Savard, R. Neumann, and J.W. Boyce. Tandem LA-ICP-MS & LIBS; A New Micro-Analytical Technique for the Measurement of Every Element in the Periodic Table. In *Goldschmidt Proceedings*, 2018.
- [A11] M.A. Torres, P.C. Kemeny, W.W. Fischer, and M.P. Lamb. Radiocarbon constraints on the coupled growth of sediment and organic carbon reservoirs in fluvial systems. In *Gordon Geobiology*, 2018.
- [A12] N. Moosdorf, M. A. Torres, J. Hartmann, Jess F. Adkins, and A. J. West. Global Carbon Cycle Feedbacks of Glacial Weathering. In *Goldschmidt Proceedings*, 2017.
- [A13] M.A. Torres, P.C. Kemeny, W.W. Fischer, and M.P. Lamb. Radiocarbon constraints on the coupled growth of sediment and organic carbon reservoirs in fluvial systems. In *AGU Fall Meeting*, 2017.
- [A14] P. Kemeny, M.A. Torres, S. Webb, M. Lamb, J.F. Adkins, and W.W. Fischer. Organic Sulfur Fluxes and Isotope Mass Balance in Rivers. In *Goldschmidt Proceedings*, 2017.