

**Kate Maher**  
Stanford University  
Full Professor  
Dept. of Earth System Science  
473 Via Ortega, Room 140  
Stanford, CA 94305-4216

## **EDUCATION**

2005: Ph.D. Earth and Planetary Science, *University of California, Berkeley, CA*  
Dissertation Advisor: Donald J. DePaolo  
2002: M.S. Civil and Environmental Engineering, *University of California, Berkeley, CA*  
1999: B.A. Environmental Earth Science, *Dartmouth College, Hanover, NH*

## **EXPERIENCE**

2020-present: Full Professor, Department of Earth System Science, Stanford University  
2019-present: Senior Fellow, Woods Institute for the Environment  
2017-present: Associate Professor, Department of Earth System Science, Stanford University  
2015–2017: Associate Professor, Department of Geological Sciences, Stanford University  
2007–2015: Assistant Professor, Department of Geological and Environmental Sciences, Stanford University  
2007: Visiting Professor, Hydrogeology, Colorado College, Colorado Springs, CO  
2005–2007: Mendenhall Postdoctoral Fellow, U.S. Geological Survey, Menlo Park, CA  
2003–2005: Science and Engineering Graduate Research Fellow, Biogeochemical Dynamics Group, Lawrence Livermore National Laboratory, Livermore, CA  
1999–2003: Graduate Student Researcher, Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA

## **AWARDS AND SCHOLARSHIPS**

2020-2021: Helmholtz International Fellow  
2019: Frontiers of Science Lecturer, University of Utah  
2015-2017: Stanford Fellow, Stanford University  
2015: Fellow, American Geophysical Union  
2015: James B. Macelwane Medal, American Geophysical Union  
2013: CAREER Award, National Science Foundation  
2012: Allen V. Cox Award for Mentoring of Undergraduate Research, Stanford University  
2012: Global Climate and Energy Project (GCEP) Distinguished Lecturer  
2009–2012: Frederick E. Terman Fellow, Stanford University  
2003–2005: Science and Engineering Graduate Research Fellowship (U.C. Berkeley and Lawrence Livermore National Laboratory)  
1999–2000: ARCS Foundation Scholarship

## **PROFESSIONAL ACTIVITIES**

### **2019:**

Senior Fellow, Woods Institute for the Environment  
Member, Rocky Mountain Biological Laboratory (RMBL) Research Committee

### **2019:**

Senior Fellow, Woods Institute for the Environment

Editor, Elements, special volume on “Reactive Transport Modeling”  
Participant, Leading Interdisciplinary Collaborations, Woods Institute  
Participant, “Open Watershed Science”, DOE Environmental System Sciences  
Lead, DOE SBR PI Meeting Workshop on “Open Watershed Science by Design”  
Member, Rocky Mountain Biological Laboratory (RMBL) Research Committee  
Member, Geochemical Society Awards Committee, Urey Medal Committee  
Keynote Speaker, Goldschmidt Conference, Barcelona, Spain  
Invited Lectures: Frontiers of Science, University of Utah, U. Wyoming, UCLA

**2018:**

Lead, “Design of Collaborative Cyberinfrastructure”, DOE Environmental System Sciences  
Member, Data Infrastructure for a Virtual Ecosystem (ESS-DIVE) Advisory Board, DOE Environmental System Sciences  
Member, Rocky Mountain Biological Laboratory (RMBL) Research Committee  
Member, Geochemical Society Awards Committee, Recruitment and Urey Medal  
Theme Organizer, Goldschmidt Conference, Boston, Massachusetts  
The Judd H. and Cynthia S. Oualline Centennial Lectureship in Geological Sciences, UT Austin  
Keynote Speaker, Shaping of the Earth Surface by Biota, Leopoldina German National Academy of Sciences, Halle (Salle), Germany  
Keynote Speaker, Computational Modeling of Water Resources (CMWR), St. Malo, France  
Keynote Speaker, Goldschmidt Conference, Boston, Massachusetts  
Invited Lectures: Princeton University, UT Austin

**2017:**

Co-chair, DOE-BES Workshop on Basic Research Needs for the Energy-Water Nexus, Bethesda, MD  
Co-organizer of AGU workshop "AGU-SEG Hydrogeophysics Workshop: Imaging the Critical Zone", Stanford, CA  
Member, Rocky Mountain Biological Laboratory (RMBL) Research Committee  
Theme Organizer, Goldschmidt Conference, Paris, France  
Keynote Speaker, Gordon Conference “Catchment Science: Interactions of Hydrology, Biology & Geochemistry”, Lewiston, ME  
Invited Lectures: U.C. Berkeley, Penn State University, University of Pittsburg, American Chemical Society, Spring Meeting.

**2016:**

Co-instructor of 2-day short course on reactive transport modeling using Geochemist’s Workbench with Craig Bethke, Yokohama, Japan  
Member, National Science Foundation Review Panel, Integrated Earth Systems  
Member, National Science Foundation Review Panel, Low-Temperature Geochemistry and Geobiology Steering Committee, National Science Foundation Critical Zone Observatory (CZO) Program  
Keynote Speaker: Goldschmidt Conference, Yokohama, Japan  
Invited Lectures: Cornell University, University of Chicago, University of Oregon, Lawrence Berkeley National Laboratory, Freeman-Spogli Institute Roundtable on “Resetting Nuclear Waste”, Rocky Mountain Biological Laboratory

**2015:**

Participant, China-U.S. Critical Zone Observatory Workshop, Guiyang, China  
Participant, DOE-BER, Basic Research Needs for Environmental Management Workshop, Bethesda, MD  
Participant, DOE-BES, Roundtable on Foundational Research Relevant to SubTER, Germantown, MD

Member, National Science Foundation Review Panel, Low-Temperature Geochemistry and Geobiology  
Hiring panel for Research Hydrologist/Research Chemist, U.S. Geological Survey  
Steering Committee, National Science Foundation Critical Zone Observatory (CZO) Program  
Invited Lectures: U.S.G.S. Western Region Colloquium, Menlo Park, CA, Columbia University, “New  
Generation of Scientists”, Fall AGU meeting

**2014:**

Organizer and instructor, Stanford Reactive Transport (StaRT) Summer School, Stanford University  
Co-organizer of NSF workshop on "The Role of Reactive Transport Models in Biogeochemical  
Sciences", Washington DC (National Science Foundation)  
Co-organizer of NSF workshop on “Research Infrastructure in Support of NSF-SEP Grand Challenges”  
Steering Committee, National Science Foundation Critical Zone Observatory (CZO) Program  
Invited Lectures: Geochemistry of the Earth’s Surface (GES10) meeting, Paris, France;  
Energy@Stanford, Stanford University, “Mixing and Reaction Across Scales in Hydrological  
Systems I”, Fall AGU meeting

**2013:**

Co-instructor of 2-day short course on reactive transport modeling using The Geochemist’s Workbench®  
with Craig Bethke, Florence, Italy  
Member, National Science Foundation Review Panel, Hydrologic Sciences Program  
Keynote Speaker: Goldschmidt Conference, Florence, Italy; Deep Carbon Observatory Workshop on  
“Tectonic Fluxes of Carbon”, San Francisco, CA  
Theme Organizer, Goldschmidt Conference, Florence, Italy  
Invited Lectures: Harvard University; Symposium on "Integrating Synchrotron Techniques into  
Environmental Carbon Science”, SSRL (Stanford Synchrotron Radiation Lightsource) Users  
Meeting and Workshop, Stanford University  
Symposium Chair, Goldschmidt Conference: “New Geochemical and Isotopic Proxies for Weathering”  
and “Reactivity of Water-(Gas)-mineral Interfaces from the Nano to the Macroscopic Scale:  
Implications for Weathering, CO<sub>2</sub> Sequestration and Energy-Related Studies”

**2012:**

GCEP (Global Climate and Energy Project) Distinguished Lecturer at Exxon-Mobil, DuPont,  
Schlumberger and General Electric  
Member, Molecular Environmental and Interface Science (MEIS) Advisory Committee, SSRL  
Invited Lectures: University of Oregon, Symposium on “Opportunities with Synchrotron Radiation at the  
Mesoscale” LCLS/SSRL Users' Meeting and Workshop, Stanford University, CA  
Invited Abstracts: American Geophysical Union Fall Meeting, San Francisco, CA; Goldschmidt  
Conference, Montreal, Canada  
Invited Participant: Faculty Voice and Influence Program (VIP), Clayman Institute for Gender Research  
Participant: ICDP/Oman Drilling Workshop

**2011:**

Invited Lectures: Yale University, UC Berkeley, Duke University  
Invited Abstracts: Goldschmidt Conference, Prague, Czech Republic; GCEP (Global Climate and Energy  
Project) Annual Symposium  
Invited Participant in "Design of Global Environmental Gradient Experiments using International CZO  
(Critical Zone Observatory) Networks", University of Delaware, Delaware

**2010:**

Keynote Speaker: Goldschmidt Conference, Knoxville, TN

Co-instructor of 2-day short course on reactive transport modeling using The Geochemist's Workbench<sup>®</sup> with Craig Bethke, Stanford, CA

Invited Lectures: California Institute of Technology, UCLA, Boston University, Rice University

Invited Abstracts: American Geophysical Union Fall Meeting, San Francisco, CA; Geological Society of America Conference, Denver, CO

**2009:**

Invited Participant: "Critical Zone II: Biological Aspects of Weathering", Washington, DC

Participant, DUSEL (Deep Underground Science and Engineering Laboratory) Experimental Coordination Workshop, Lead, SD

Member, DUSEL Experimental Design Team (THMCB)

Symposium Chair, Goldschmidt Conference: "Bridging the gap between theory and the field in critical zone processes"

Invited Lectures: Duke University, UC Davis, U. of Delaware,

Invited Abstracts: American Geophysical Union (AGU) Fall Meeting, San Francisco, CA

Co-editor: "Combined ecological and geologic perspectives in ecosystem studies", *Chemical Geology* (Special Volume)

**2008:**

Symposium Chair, Goldschmidt Conference: "Chemical and isotopic tracers of sediment-pore fluid interactions", Cologne, Germany

Symposium Chair, Goldschmidt Conference: "Isotopic and geochemical insights into the rates and mechanisms of erosion and weathering", Cologne, Germany

Invited Lectures: Lawrence Berkeley National Laboratory

Invited Abstracts: Geological Society of America Fall Meeting, Houston, TX

**2007:**

Symposium Chair, AGU Fall Meeting: "Controls on geochemical and biogeochemical processes in the critical zone", San Francisco, CA

Invited Lectures: Yale University, ETH Zurich, Geological Society of Washington D.C., U.S. Geological Survey, Reston VA

**Other affiliations and appointments:**

Associate Editor, *American Journal of Science* (appointed through 2017)

Member, American Geophysical Union

Member, Geochemical Society

Member, American Chemical Society

Member, Geological Society of America

Reviewer for *PNAS*, *Nature*, *Science*, *Geochimica et Cosmochimica Acta*, *Science*, *Earth and Planetary Science Letters*, *Environmental Science & Technology*, *Chemical Geology*, *Comptes Rendus Geoscience*, *Geological Society of America Bulletin*, NSF (Instruments & Facilities, Hydrology, Geobiology and Low-temperature Geochemistry, Hydrology, Tectonics, and Sedimentology Programs)

**DEPARTMENTAL AND UNIVERSITY SERVICE**

**2020:**

Director, Shared Analytical Facilities, School of Earth, Energy and Environmental Sciences  
Member, Director's Council for the Hasso Plattner Institute of Design  
Member, Nano Facilities Steering Committee, School of Engineering  
Selection Committee, DARE Fellows, Vice Provost for Graduate Education

**2019:**

Director, Shared Analytical Facilities, School of Earth, Energy and Environmental Sciences  
Member, Director's Council for the Hasso Plattner Institute of Design  
Member, Nano Facilities Steering Committee, School of Engineering  
Selection Committee, DARE Fellows, Vice Provost for Graduate Education

**2018:**

Member, Nano Facilities Steering Committee, School of Engineering  
Executive committee and co-Principal Investigator, NNCI@Stanford  
Member, Thinking Matters Governance Board  
Member, Director's Council for the Hasso Plattner Institute of Design  
Selection Committee, DARE Fellows, Vice Provost for Graduate Education  
Selection Committee, Catalyst, School of Engineering

**2017:**

Member (Elect), Faculty Senate, Stanford University (through 2018 due to sabbatical)  
Member (Elect), Steering Committee of the Faculty Senate, Stanford University (through 2018)  
Member, Stanford Long-range Planning, Area Steering Group for Education  
Member, Thinking Matters Governance Board  
Member, University Shared Facilities Committee (Dean of Research)  
Member, Nano Facilities Steering Committee (School of Engineering)  
Executive committee and co-Principal Investigator, NNCI@Stanford  
Director of Undergraduate Studies, GS Undergraduate Major and Minor, GS Department  
Selection Committee, DARE Fellows, Vice Provost for Graduate Education

**2016:**

Member, Stanford University, Policy and Planning Board (PPB)  
Member, Nano Facilities Steering Committee (School of Engineering)  
Executive committee and co-Principal Investigator, NNCI@Stanford  
Director of Undergraduate Studies, GS Undergraduate Major and Minor, GS Department  
Selection Committee, DARE Fellows, Vice Provost for Graduate Education  
Lecturer, Stanford Energy Summer School

**2015:**

Member, Stanford University, Policy and Planning Board (PPB)  
Member, Nano Facilities Steering Committee (School of Engineering)  
Executive committee and co-Principal Investigator, NNCI@Stanford  
Director of Undergraduate Studies, GS Undergraduate Major and Minor, GS Department  
Search Committee, Mantle Processes, Geological Sciences, Stanford University  
Search Committee, Land-Water-Systems, Environmental Earth Systems Science, Stanford University

**2014:**

Member, Faculty Senate, Stanford University (through 2016)  
Director of Undergraduate Studies, GES Undergraduate Major and Minor, GES Department

**2013:**

Member, School of Earth Sciences Teaching Task Force (through 2014)

**2012:**

Member, School of Earth Sciences Distinguished Lecture Program Committee  
Selection Committee, Stanford Interdisciplinary Graduate Fellowship (SIGF) (Environment, Energy and Sustainability) (through 2014)

Member, Stanford Center for Carbon Storage, Stanford University

**2010:**

Advisor for the GES Undergraduate Major and Minor, GES Department

Member, Geochronology Steering Committee, School of Earth Sciences

**2009:**

Member, Jasper Ridge Biological Preserve Advisory Board

Member, Undergraduate Field Program Committee, GES Department (through 2012)

Member, STREAM (Stanford Training, Research & Mentoring) Advisory Board, School of Earth Sciences (through 2012)

Organizer, GES Department Seminar Program (through 2012)

**2008:**

Director, Stanford ICPMS/TIMS Facility, School of Earth Sciences

Member, Undergraduate Curriculum Committee, GES Department (through 2014)

Member, Search Committee, Geochronology, Petrology, Geodynamics position, GES Department

**OUTREACH**

2015-present: Instructor, Teaching Global Change, Teacher Education Program

2014-2016: Organizer/ Instructor, Stanford Reactive Transport Summer School (StaRT)

2009-present: Instructor, Bay Area Geoscapes Teacher Education Program

2008-2009: Mentor for the Association for Women in Science (AWIS)

**PEER-REVIEWED PUBLICATIONS**

(Authors underlined are undergraduate and graduate students or postdoctoral scholars I supervised, ORCID ID: 0000-0002-5982-6064)

Winnick M.J., Druhan J.L., Maher K. (in review) Weathering intensity and lithium isotopes: A reactive transport perspective. *Submitted to American Journal of Science*.

Li Q., Wang L., Perzan Z., Caers J., Brown G.E. Jr., Bargar J.R., Maher K. (in review) Global sensitivity analysis of a reactive transport model for mineral scale formation during hydraulic fracturing. *Submitted to Environmental Engineering Science*.

Le Traon C., Aquino, T., Maher K., Le Borgne T. (in review) Effective kinetics driven by dynamic concentration gradients under coupled transport and reaction. *Geochimica et Cosmochimica Acta*.

Joe-Wong C., Weaver K.L., Brown, S.T., Maher K. (2021) Chromium isotopic fractionation during reduction of chromium(VI) by iron(II/III)-bearing clay minerals. *Geochimica et Cosmochimica Acta*, 292, 235-253.

Chadwick K.D. et al. (2020) Integrating airborne remote sensing and field campaigns for ecology and Earth system science. *Methods in Ecology and Evolution*. 11(11), 1492-1508;  
<https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/2041-210X.13463>.

Joe-Wong C. and Maher K. (2020) A model for kinetic isotope fractionation during redox reactions. *Geochimica et Cosmochimica Acta*, 269, 661-677.

- Lau K.V, Lyons T.W, and Maher K. (2020) Uranium reduction and isotopic fractionation in reducing sediments: Insights from reactive transport modeling. *Geochimica et Cosmochimica Acta*. <https://doi.org/10.1016/j.gca.2020.01.021>
- Lehmann J., Hansel C.M., Kaiser C., Kleber M., Maher K., Manzoni S., Nunan N., Reichstein M., Schimmel J.P., Torn M.S., Wieder W.R., Kögel-Knabner I. (2020) Functional complexity causes persistence of soil organic carbon. *Nature Geoscience*. <https://doi.org/10.1038/s41561-020-0612-3>.
- Li Q., Jew A.D., Brown G.E.Jr., Bargar J.R., Maher K. (2020) Reactive transport modeling of shale-fluid interactions after imbibition of fracturing fluids. *Energy & Fuels*, 34, 5, 5511–5523.
- Tolar B.B., Boye K., Bobb C., Maher K., Bargar J.R., Francis C.A. (2020) Stability of floodplain subsurface microbial communities through seasonal hydrological and geochemical cycles. *Frontiers in Earth Science*, 8(338). <https://www.frontiersin.org/article/10.3389/feart.2020.00338>.
- Winnick M.J., Lawrence C.R., McCormick M., Druhan J.L. and Maher K. (2020) Soil respiration response to rainfall modulated by plant phenology in a montane meadow, East River, Colorado, USA. *Journal of Geophysical Research: Biogeosciences*, 125, e2020JG005924.
- Forsyth J.E., Weaver K.L., Maher K., Saiful Islam M., Fendorf S., Luby S.P. (2019) Sources of blood lead exposures in rural Bangladesh identified using lead isotopes. *Environmental Science & Technology*, 53, 19, 11429-11436.
- Joe-Wong C., Weaver K., Brown S.T., Maher K. (2019) Thermodynamic controls on redox-driven kinetic isotope fractionation. *Geochemical Perspectives Letters*. 10, 20–25, doi:10.7185/geochemlet.
- Kukla T., Winnick M.J., Maher K., Ibarra D.E., Chamberlain C.P. (2019). The sensitivity of terrestrial oxygen isotope gradients to hydroclimate evolution. *Journal of Geophysical Research: Atmospheres*, 124. <https://doi.org/10.1029/2018JD029571>.
- Lefebvre P., Noël V., Jemison N.E., Weaver K.L., Bargar J.R., Maher K. (2019) Isotopic fingerprint of uranium accumulation and redox cycling in floodplains of the Upper Colorado River Basin. *Environmental Science & Technology*, 53, 3399–3409, doi: 10.1021/acs.est.8b05593.
- Li Q., Jew A.D., Kohli A., Maher K., Brown G.E. Jr., Bargar J.R. (2019) Thicknesses of chemically altered zones in shale matrices resulting from interactions with hydraulic fracturing fluid. *Energy & Fuels*, 33, 6878–6889. <https://doi.org/10.1021/acs.energyfuels.8b04527>.
- Liu Y., Winnick M.J., Hsu H.T., Lawrence C.R., Maher K., Druhan J.L. (2019) Modeling transient soil moisture limitations on microbial carbon respiration. *Journal of Geophysical Research: Biogeosciences*, 124, 2222–2247; <https://doi.org/10.1029/2018JG004628>.
- Maher K. and Navarre-Sitchler A. (2019) Reactive transport processes that drive chemical weathering: from making space for water to dismantling continents. In *Reactive Transport in Natural and Engineered Systems* (eds. J. Druhan and C. Tournassat) *Reviews in Mineralogy and Geochemistry*, 85, <http://dx.doi.org/10.2138/rmg.2018.85.12>.
- Maher K. and Mayer K.U. (2019) Tracking diverse minerals, hungry organisms and dangerous contaminants using reactive transport models. *Elements*, 4, 81-86. <https://doi.org/10.2138/gselements.15.2.81>
- McClain C., Fendorf S., Johnson S., Menendez A., Maher K. (2019) Lithologic and redox controls on hexavalent chromium in vadose zone sediments of California’s Central Valley. *Geochimica et Cosmochimica Acta*. <https://doi.org/10.1016/j.gca.2019.07.044>
- Nelson J., Joe-Wong C., Maher K. (2019) Cr(VI) reduction by Fe(II) sorbed to silica surfaces, *Chemosphere*, 234, 98-107.
- Nuriel P., Miller D.M., Schmidt K.M., Coble M.A. and Maher K. (2019) Ten-million years of activity within the Eastern California Shear Zone from U-Pb dating of fault-zone opal. *Earth and Planetary Science Letters*, 521, 1–9

- Dustin M., Bargar J.R., Jew A.D., Harrison A.L., Joe-Wong C., Thomas D.L., Brown G.E.B Jr., Maher K. (2018). Shale kerogen – hydraulic fracturing fluid interactions and contaminant release. *Energy & Fuels*, 32 (9), 8966–8977.
- Hsu H.-T., Lawrence C.R., Winnick M.J., Bargar J.R., Maher K. (2018) Molecular investigation of soil organic carbon composition across a subalpine catchment. *Soils*, 2, 6; doi:10.3390/soils2010006.
- Nelson J., Bargar J.R., Wasylenki L., Brown G.E.B. Jr., Maher K. (2018) Effects of nano-confinement on Zn(II) adsorption to nanoporous silica. *Geochimica et Cosmochimica Acta*, 240, 80-97.
- Vilhelmsen T.N., Maher K., Da Silva C., Hermans T., Hermans T., Grujic O., Park J., Yang G. (2018) Quantifying uncertainty in subsurface systems (In: Quantifying Uncertainty in Subsurface Systems (C. Scheidt, L. Li, J. Caers), Wiley-Blackwell, American Geophysical Union, 217-262 p.
- Winnick M.J., Maher, K. (2018) Relationships between CO<sub>2</sub>, thermodynamic limits on silicate weathering, and the strength of the silicate weathering feedback. *Earth and Planetary Science Letters*, 485, 111–120.
- Zahasky C., Thomas D., Matter J., Maher, K., Benson S. (2018) Multimodal imaging and stochastic percolation simulation for improved quantification of effective porosity and surface area in vesicular basalt. *Advances in Water Resources*, 121, 235-244.
- Druhan J.L., Maher K. (2017) The influence of mixing on stable isotope ratios in porous media: A revised Rayleigh model. *Water Resources Research*, 53, 1101–1124.
- Harrison A.L., Jew A.D., Dustin M. K., Thomas D.L., Joe-Wong C.M., Bargar J.R., Johnson N., Brown G.E.B Jr., Maher K. (2017) Element release and reaction-induced porosity alteration during shale-hydraulic fracturing fluid interactions. *Applied Geochemistry*, 82, 47-62.
- Jew A.D., Dustin M.K., Harrison A.L., Joe-Wong C., Thomas D.L., Maher K., Brown G.E. Jr., Bargar J.R. (2017) Impact of organics and carbonates on the oxidation and precipitation of iron during hydraulic fracturing of shale. *Energy & Fuel*, 31, 3643–3658
- Joe-Wong C., Brown, G.E. Jr., Maher, K. (2017) Kinetics and products of chromium (VI) reduction by iron (II/III)-bearing clay minerals. *Environmental Science & Technology*, 51 (17), 9817–9825.
- Jost A.B., Bachan A., van de Schootbrugge B., Lau K.V., Weaver K.L., Maher K., Payne J.L. (2017) Uranium isotope evidence for an expansion of marine anoxia during the end-Triassic extinction. *Geochemistry, Geophysics, Geosystems*, 18, 3093–3108.
- Lau K.V., Maher K., Brown S.T., Jost A.B., Altiner D., DePaolo D.J.; Eisenhauer A.; Kelley B.M., Lehrmann D.J., Paytan A.; Silva-Tamayo J.C., Yu M., Payne J.L. (2017) The influence of diagenesis, mineralogy, and seawater changes on calcium isotope variations in Lower-Middle Triassic carbonate rocks. *Chemical Geology*. 471, 13-37.
- Lau K.V., Macdonald F.A., Maher K., Payne J.L (2017) Uranium isotope evidence for temporary ocean oxygenation in the aftermath of the Sturtian Snowball Earth. *Earth and Planetary Science Letters*, 458, 282-292.
- Li L., Maher K., Navarre-Sitchler A., Druhan J., Meile C., Lawrence C., Moore J., Perdrial, J. Sullivan P., Thompson A., Jin L., Bolton E., Brantley S.L., Dietrich W., Mayer U., Steefel C.I., Valocchi A.L., Zachara J., Kocar B., Mcintosh J., Bao C., Tutolo B.M., Beisman J., Kumar P., Sonnenthal E. (2017) Expanding the role of reactive transport models in earth surface processes, *Earth-Science Reviews*, 165, 280–301.
- McClain C.N., Fendorf S., Webb S., Maher K. (2017) Quantifying Cr(VI) production and export from serpentine soil of the California Coast Range. *Environmental Science and Technology*, 51, 141–149.
- Nelson J., Wasylenki L., Bargar J.R., Brown G.E.B. Jr., Maher K. (2017) Effects of surface disorder and surface coverage on isotopic fractionation during Zn adsorption onto quartz and amorphous silica surfaces. *Geochimica et Cosmochimica Acta*, 215, 354–376.



- Oster J.L., Kitajima K., Valley J.W., Rogers B., Maher K. (2017) An evaluation of paired  $\delta^{18}\text{O}$  and ( $^{234}\text{U}/^{238}\text{U}$ ) in opal as a tool for paleoclimate reconstruction in semi-arid environments. *Chemical Geology*, 449, 236-252.
- Winnick M.J., Carroll R., Williams K., Maxwell R., Dong W., Maher K. (2017) Snowmelt controls on concentration-discharge relationships and the balance of oxidative and acid-base weathering fluxes in an alpine catchment, East River, Colorado. *Water Resources Research*, doi: 10.1002/2016WR019724.
- Wymore A.S., Brereton R.L., Ibarra D.E., Maher K., McDowell W.H. (2017) Critical zone structure controls concentration-discharge relationships and solute generation in forested tropical montane watersheds. *Water Resources Research*, 53, doi: 10.1002/2016WR020016.
- Wymore, A. S., West, N. R., Maher, K., Sullivan, P. L., Harpold, A., Karwan, D., Marshall, J. A., Perdrial, J., Rempe, D. M., and Ma, L. (2017) Growing new generations of critical zone scientists. *Earth Surf. Process. Landforms*, 42: 2498–2502.
- Brown S., Basu A., Christensen J., Maher K., Weaver K., Reimus P., WoldeGabriel, G., Heikoop, J., Simmons, A., DePaolo, D. (2016) Isotopic evidence for reductive immobilization of uranium across a roll-front mineral deposit. *Environmental Science and Technology*, 50, 6189–6198.
- Caves J.J., Jost A.B., Lau K.V. and Maher K. (2016) Carbon cycle imbalances and a variable weathering feedback. *Earth and Planetary Science Letters*, 450, 152-163
- García del Real P., Maher K., Kluge T., Bird D.K., Brown, G.E. Jr., John C.M. (2016) Clumped-isotope thermometry of magnesium carbonates in ultramafic rocks. *Geochimica et Cosmochimica Acta*, 193, 222-250.
- Ibarra D.E., Caves J. Moon S. Thomas D., Hartmann J. Chamberlain C. P. and Maher, K. (2016) Differential weathering of basaltic and granitic catchments from concentration-discharge relationships. *Geochimica et Cosmochimica Acta*, 190, 265-293.
- Janot N., Lezama Pacheco J.S., Pham D.Q., O'Brien T.M., Hausladen D., Noël V. Maher K., Fendorf S., Williams K.H., Long P.E., Bargar J.R. (2016). Physico-chemical heterogeneity of organic-rich sediments in the Rifle aquifer, CO: Impact on uranium biogeochemistry. *Environmental Science and Technology*, doi: 10.1021/acs.est.5b03208.
- Lau, K.V., Maher, K., Altiner, D., Kelley, B.M., Kump, L.R., Lehrmann, D.J., Silva-Tamayo, J.C., Weaver, K.L., Yu, M., and Payne, J.L. (2016) Marine anoxia and delayed Earth system recovery after end-Permian extinction. *Proceedings of the National Academy of Sciences*, 113 (9), 2360-236.
- Maher K. and von Blanckenburg F. (2016) Surface ages and weathering rates from  $^{10}\text{Be}$ (meteoric) and  $^{10}\text{Be}/^9\text{Be}$ : insights from differential mass balance and reactive transport modeling. *Chemical Geology*, 446, 70–86.
- Maher K. Nielsen L., Johnson N.C., Torchinsky A.B., Weaver K.L., Bird D.K., and Brown G.E., Jr. (2016) A spatially resolved surface kinetic model for forsterite dissolution. *Geochimica et Cosmochimica Acta*, doi: 10.1016/j.gca.2015.11.019.
- Maxwell, R.M., Condon L.E, Kollet S.J., Maher K., Haggerty R., Forrester M.M. (2016) The imprint of climate and geology on the residence times of groundwater. *Geophysical Research Letters*, doi:10.1002/2015GL066916.
- McClain C. and Maher K. (2016) Chromium fluxes and speciation in ultramafic catchments and global rivers. *Chemical Geology*, 426, 135-157.
- Szilas K., Maher K., Bird D.K. (2016) Aluminous gneiss derived by weathering of basaltic source rocks in the Neoproterozoic Storø Supracrustal Belt, southern West Greenland. *Chemical Geology*, 444, 63-80.

- Thomas D., Bird D.K., Arnórsson S., Maher K. (2016) Fluid-rock interactions and trace element mobilization in CO<sub>2</sub>-rich geothermal and non-thermal waters in Iceland. *Chemical Geology*, 444, 158-179.
- Vialle S., Druhan J.L. and Maher K. (2016) Simulations of coupled geochemical and hydrologic processes associated with CO<sub>2</sub> leakage and mitigation strategies in a fractured caprock. *International Journal of Greenhouse Gas Control*, 44, 11-25.
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## **OTHER PUBLICATIONS**

*(These include non-peer reviewed publications and peer-reviewed extended abstracts [\*])*

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- Maher K. and Mayer K.U. (2019) The art of reactive transport model building. *Elements*, 4, 160-164. DOI: 10.2138/gselements.15.2.117.
- \*Li Q., Jew A., Kiss A., Kohli A., Alalli A.A., Kovsky A., Zoback M., Cercone D., Maher K., Brown G.E.B., Bargar J. (2018) Imaging pyrite oxidation and barite precipitation in gas and oil shales Unconventional Resources Technology Conference (URTEC).
- \*Ibarra D.E., Moon S.G., Caves J.K., Chamberlain C.P., Maher K. (2017), Concentration-discharge patterns of weathering products from global rivers, *Acta Geochimica*, 36 (3), 405-409.
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- \*Larsen L., Hajek E., Maher K. et al., (2015) Taking the pulse of the Earth's surface systems, *Eos*, 96,doi:10.1029/2015EO040525.
- \*Druhan J.L., Vialle S., Maher K., Benson S. (2015) A reactive transport model for geochemical mitigation of CO<sub>2</sub> leaking into a confined aquifer. *Energy Procedia*, 63, 4620-4629.
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- \*Druhan J.L. and Maher, K. (2014) A model for the relationship between flow rate and stable isotope fractionation in heterogeneous porous media. *Procedia Earth and Planetary Science* 10, 179-188
- \*Lawrence C., Steefel C.I., Maher K. (2014) Abiotic/biotic coupling in the rhizosphere: A reactive transport modeling analysis, *Procedia Earth and Planetary Science* 10, 104-108.
- \*Druhan J.L. and Maher K. (2013) A reactive transport model for geochemical mitigation of CO<sub>2</sub> leaking into a confined aquifer. In *Assessment of Leakage Detection and Intervention Scenarios for CO<sub>2</sub> Sequestration, CCP3 (CO<sub>2</sub> Capture Project 3) Contingency Planning Final Report* (eds. Benson S., Harris, J., Maher, K., Zoback, M. et al.), p 192.
- \*Vialle S., Druhan, J.L., Maher, K. (2013) Geochemical evolution of a fractured system in the context of underground carbon storage using reactive transport modeling. In *Assessment of Leakage*

*Detection and Intervention Scenarios for CO<sub>2</sub> Sequestration, CCP3 (CO<sub>2</sub> Capture Project 3) Contingency Planning Final Report* (eds. Benson S., Harris, J., Maher, K., Zoback, M. *et al.*), p 192.

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## **ADVISEES AND POSTDOCTORAL SCHOLARS**

### **Current Postdoctoral Fellows:**

Dana Chadwick

Qingyun Li

Tristan Babey

### **Previous Postdoctoral Fellows:**

Jennifer Druhan (Assistant Professor at University of Illinois, Urbana-Champaign)

Anna Harrison (Assistant Professor, Queen's University, Canada)

Natalie Johnson (Environmental consulting)

Corey Lawrence (Research Scientist at the USGS, Denver, CO)

Laura Nielsen (Assistant Professor at UC Berkeley)

Perach Nuriel (Research Scientist, Geological Survey of Israel)

Jessica L. Oster (Assistant Professor at Vanderbilt University)

Aya Schneider-Mor (Research Scientist, Geological Survey of Israel)

Stephanie Vialle (Lecturer at Western Australia University)

Matthew Winnick (Assistant Professor, UMass Amherst)

### **Current Advisees and Track:**

Brian Rogers, PhD student

Zach Perzan, PhD student

Valerie Rosen, PhD student

### **Previous Graduate Advisees:**

Callum Bobb, MS

Megan Dustin, MS

Pablo Garcia del Real, PhD (co-advised with Dennis Bird)

Hsiao-Tieh Hsu, PhD (Chemistry)

Daniel Ibarra, Co-terminal MS

Claresta Joe-Wong, PhD

Natalie Johnson, PhD (Chemical Engineering)

Claire Kouba, Co-terminal MS

Kimberly Lau, PhD (co-advised with Jon Payne)

Cynthia McClain, PhD

Joseph Nelson, PhD

Dana Thomas, PhD (co-advised with Dennis Bird)

Abe Torchinsky, MS

Laura Zalles, Co-terminal MS

### **Undergraduate Advisees:**

*(only those I directly mentored)*

Maceo Porro Hastings, Summer Research Student, MUIR Fellow (2018)  
Andea Scott, Summer Research Student (2018)  
Grace Rainaldi, Summer Research Student (2016)  
Maeve McCormick, Summer Research Student (2016)  
Laura Zalles, Senior Honor's Thesis (2016)  
Pierre Lefebvre, Research Intern, IPGP (2016)  
Aaron Lewis, Summer Research Student (2013)  
Valerie Rosen, Senior Honor's Thesis (2012)  
Claire Kouba, VPUE Summer Scholar (2011)  
Daniel Ibarra, Senior Honor's Thesis, VPUE Summer Scholar (2010)  
Nicole Aguirre, VPUE Summer Scholar (2010)  
Jordanna Deane, VPUE Summer Scholar (2010)  
Alex Stadnyk, Research Assistant (2010)  
Gretchen O'Henley, Summer Undergraduate Research Intern (Earth Systems) (2009)

### **PRIMARY COURSES TAUGHT**

2019: EARTH 100: Research Preparation for Undergraduates (Spring)  
2019: DESINST 215: Design of Data (Spring)  
2019: CEE260C/EESS 221: Contaminant Hydrogeology and Reactive Transport (Winter)  
2018: CEE260C/EESS 221: Contaminant Hydrogeology and Reactive Transport (Winter)  
2018: EARTH 10: Design for a Habitable Planet (Fall)  
2017: EARTH 10: Design in the Age of Climate Change (Spring)  
2017: GES 225/CEE260C/EESS 221: Contaminant Hydrogeology and Reactive Transport (Winter)  
2017: GES 163/263: Introduction to Isotope Geochemistry (Fall)  
2016: GES 225/CEE260C/EESS 221: Contaminant Hydrogeology and Reactive Transport (Winter)  
2015: GES 225/CEE260C/EESS 221: Contaminant Hydrogeology and Reactive Transport (Winter)  
2014: GES 39N: Forensic Geoscience: CSI Stanford (Spring)  
2014: GES 224: Modeling Transport and Transformation in the Environment (Winter)  
2013: GES 39N: Forensic Geoscience: CSI Stanford (Spring)  
2013: GES 276b: Earth's Weathering Engine (Winter)  
2012: GES 276: Earth's Weathering Engine (Fall)  
2012: GES 39N: Forensic Geoscience: CSI Stanford (Spring)  
2011: GES 163/263: Introduction to Isotope Geochemistry (Fall)  
2010: GES 39N: Forensic Geoscience: CSI Stanford (Fall)  
2010: GES 224: Modeling Transport and Transformation in the Environment (Fall)  
2009: GES 39N: Forensic Geoscience: CSI Stanford (Spring)  
2009: GES 163/263: Introduction to Isotope Geochemistry (Fall)  
2008: GES 39N: Forensic Geoscience: CSI Stanford (Spring)  
2008: GES 163/263: Introduction to Isotope Geochemistry (Fall)