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Stanford University
Associate Professor
Dept. of Earth System Science
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Stanford, CA 94305-2115

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

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

2018: Woods Institute Fellow, Leading Interdisciplinary Collaborations
2015-2017: Stanford Fellow, Stanford University
2015: James B. Macelwane Medal, American Geophysical Union
2015: Fellow, 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

2018:

Organizer and Facilitator, “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
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, 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 The 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, CO₂ 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[®] 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, American Chemical Society
Member, Geological Society of America
Member, Geochemical Society
Member, Mineralogical Society of America
Member, Association for Women in Science
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

(all activities are ongoing unless otherwise noted)

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

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)

- Nelson J., Joe-Wong C., Maher K. (submitted) Cr(VI) reduction by Fe(II) sorbed to silica surfaces. *Environmental Science and Technology*.
- Lefebvre P., Noël V., Jemison N.E., Weaver K.L., Bargar J.R., Maher K. (submitted) Isotopic fingerprint of uranium accumulation and redox cycling in floodplains of the Upper Colorado River Basin. *Environmental Science and Technology*.
- Forsyth J.E., Weaver K.L., Maher K., Saiful Islam M., Fendorf S., Luby S.P. (submitted) Turmeric contributes to elevated blood lead levels among pregnant women in rural Bangladesh: evidence from lead isotope ratios. *Environmental Health Perspectives*.
- Kukla T., Winnick M.J., Maher K., Ibarra D.E., Chamberlain C.P. (in revisions). The sensitivity of terrestrial oxygen isotope gradients to hydroclimate evolution. *Journal of Geophysical Research: Atmospheres*.
- McClain C., Fendorf S., Johnson S., Menendez A., Maher K. (submitted) Lithologic and redox controls on hexavalent chromium in vadose zone sediments in California. *Geochimica et Cosmochimica Acta*.
- Liu Y., Winnick M.J., Hsu H.T., Lawrence C.R., Maher K., Druhan J.L. (submitted) Modeling transient soil moisture limitations on microbial carbon respiration. *Biogeochemistry*.
- Joe-Wong C., Weaver K., Brown S.T., Maher K. (submitted) Thermodynamic controls on redox-driven kinetic isotope fractionation. *Geochemical Perspectives Letters*.
- 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.
- 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.
- 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.
- Winnick M.J., Maher, K. (2018) Relationships between CO₂, thermodynamic limits on silicate weathering, and the strength of the silicate weathering feedback. *Earth and Planetary Science Letters*, 485, 111–120.
- 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.
- 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}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_2 -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_2 leakage and mitigation strategies in a fractured caprock. *International Journal of Greenhouse Gas Control*, 44, 11-25.
- Basu A., Brown S., Christensen J., DePaolo D., Reimus P., Heikoop J., Wolde-Gabriel G., Simmons A., House B., Hartmann M., Maher, K. (2015) Isotopic and geochemical tracers for U(VI) reduction and U mobility at an in situ recovery U mine. *Environmental Science and Technology*, 49, 5939–5947.
- Druhan J.L., Vialle S., Maher K., and Benson S. (2015) Numerical simulation of reactive barrier emplacement to control CO_2 migration;” in *Carbon Dioxide Capture for Storage in Deep Geologic Formations – Results from the CO_2 Capture Project*, Vol. 4, Karl F. Gerdes (editor), CPL Press.
- Lammers L.C., Brown G.E. Jr., Bird D.K., Thomas B., Johnson N.C., Rosenbauer R.J. and Maher, K. (2015) Reservoir oxidation by geologically sequestered CO_2 . *Geochimica et Cosmochimica Acta*, 155, 30-46.
- von Blanckenburg F., Bouchez J., Ibarra D., Maher K. (2015) Stable runoff, weathering, and erosion fluxes into the oceans over Quaternary climate cycles. *Nature Geoscience*. 10.1038/ngeo2452
- Oster J.L., Ibarra D.E., Winnick, M., Maher, K. (2015) Steering of the westerly storm track over western North America at the Last Glacial Maximum. *Nature Geoscience*, 8, 201-205.
- Chamberlain C.P., Winnick M.J., Mix H.T., Chamberlain S.D., Maher, K. (2014) The impact of Neogene grassland expansion and aridification on the isotopic composition of continental precipitation. *Global Biogeochemical Cycles*, 28 (9), 992-1004.
- Ibarra D. E., Egger A. E, Weaver K. L, Harris C. R., Maher, K. (2014) Rise and fall of late Pleistocene pluvial lakes in response to reduced evaporation and precipitation: Evidence from Lake Surprise, California. *Geological Society of America Bulletin*, 126(11-12):1387-1415.

- Johnson N.C., Thomas B., Maher K., Rosenbauer R., Bird D., Brown G.E., Jr. (2014) Olivine dissolution and carbonation rates at 60°C and 100 bar. *Chemical Geology*, 373, 93-105.
- Lawrence C., Harden J. and Maher, K. (2014) Modeling the influence of organic acids on chemical weathering in a natural soil system. *Geochimica et Cosmochimica Acta*, 139, 487-507.
- Maher K. and Chamberlain, C. P. (2014) Hydrologic regulation of chemical weathering and the geologic carbon cycle. *Science*, 343, 1502-1504.
- Maher K., Ibarra D. E., Oster J. L., Miller D. M, Redwine J. L., Reheis M. C. and Harden J. H. (2014) Uranium isotopes in soils as a proxy for past infiltration and precipitation across the western United States. *American Journal of Science*, 314, 821-857.
- Massey M. S., Lezama-Pacheco J. S., Nelson J. M., Fendorf S., Maher, K. (2014) Uranium incorporation into amorphous silica. *Environmental Science & Technology*. 48 (15), 8636–8644.
- Maher K., Bargar J. R. and Brown G. E., Jr. (2013) Environmental speciation of the actinides. *Inorganic Chemistry*, 52 (7), 3510–3532.
- Weiss, D. J., Harris, C.H., Maher K., Bullen, T. (2013) A teaching exercise to introduce stable isotope fractionation of metals into geochemistry courses. *Journal of Chemical Education*, 90, 1014–1017.
- DePaolo D. J., Lee V., Christensen J. N. and Maher K. (2012) Uranium comminution ages: Sediment transport and deposition time scales. *Comptes Rendus Geoscience*, 344(11–12), 678–687.
- Oster J. L., Ibarra D. E., Harris C. and Maher K. (2012) The influence of eolian deposition and rainfall on the U-isotopic composition of soil water and soil minerals. *Geochimica et Cosmochimica Acta*, 88, 146-166
- Maher K. (2011) The role of fluid residence time and topographic scales in determining chemical fluxes from landscapes. *Earth and Planetary Science Letters*, 312, 48-58
- Yoo K., Weinman B., Mudd S. M., Hurst M. D., Attal M., Maher K., (2011) Evolution of hillslope soils: The geomorphic theater and the geochemical play. *Applied Geochemistry*, 26, S149–S153.
- Dosseto A., Hesse P., Maher K., Fryirs K. and Turner S.P. (2010) Climatic control of continental erosion via climate induced vegetation shift. *Geology*, 38, 395–398.
- Fantle M. S., Maher K. and DePaolo D. J. (2010) Isotopic approaches for quantifying the rates of marine burial diagenesis. *Reviews in Geophysics*, 48, 1–38.
- Maher K. (2010) The dependence of chemical weathering rates on fluid residence time. *Earth and Planetary Science Letters*, 294, 101–110.
- Maher K., Steefel C. I., Stonestrom D. A. and White A.F. (2009) The role of secondary minerals and reaction affinity in regulating weathering rates at the Santa Cruz marine terrace chronosequence. *Geochimica et Cosmochimica Acta*, 73, 2804–2831.
- Singer D. M., Maher K., and Brown G. E. Jr. (2009) Uranyl-chlorite sorption/desorption: evaluation of different U(VI) sequestration processes. *Geochimica et Cosmochimica Acta*, 73, 5989–6007.
- Steefel C.I., Maher K. (2009) Fluid–rock interaction: a reactive transport approach. In *Thermodynamics and Kinetics of Water-Rock Interaction* (eds. E. H. Oelkers and J. Schott) *Reviews in Mineralogy and Geochemistry*, 70, p. 485–532.
- White A. F., Schulz M. S., Stonestrom D. A., Vivit D. V., Fitzpatrick J., Bullen T., Maher K. and Blum A.E. (2009) Chemical weathering of a marine terrace chronosequence, Santa Cruz, California II: controls on solute fluxes and comparisons of long-term and contemporary mineral weathering rates. *Geochimica et Cosmochimica Acta*, 73, 2769–2803.
- Conrad M. E., DePaolo D. J., Maher K., Gee G. W., Ward A. L. (2007) Field evidence for strong chemical separation of contaminants in the Hanford vadose zone. *Vadose Zone Journal*, 6, 1031–1041.

- Maher K., Wooden J.W., Paces J.B., Miller, D. M. (2007) $^{230}\text{Th}/\text{U}$ dating of surficial deposits using the ion microprobe (SHRIMP-RG): a microstratigraphic perspective. *Quaternary International*, 66, 15–28.
- DePaolo D. J., Maher K., Christensen J. N., and McManus J. (2006) Sediment transport time measured with U-series isotopes: results from ODP North Atlantic drift Site 984. *Earth and Planetary Science Letters*, 248, 379–39.
- Maher K., Christensen J. N., DePaolo D. J. (2006) U-Sr isotopic speedometer: flow and chemical weathering rates in aquifers. *Geochimica et Cosmochimica Acta*, 70, 4417–4435.
- Maher K., Steefel C. I., and DePaolo D. J. (2006) The mineral dissolution rate conundrum: insights from reactive transport modeling of U isotopes and pore fluid chemistry. *Geochimica et Cosmochimica Acta*, 70, 337–363.
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OTHER PUBLICATIONS

(These include non-peer reviewed publications and peer-reviewed extended abstracts)

- Li Q., Jew A., Kiss A., Kohli A., Alalli A.A., Kovscek 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.
- Hochella M. Jr, Mogk D., Maher K. (2016) The new Earth and environmental nanoscience and technology centers sponsored by NSF. *Elements*, 12 (1), 77-78).
- Kiss A.M., Jew A.D., Claresta Joe-Wong, C., Maher K., Liu Y., Brown G.E.B Jr., and Bargar J. (2016) Synchrotron-Based Transmission X-ray Microscopy for Improved Extraction in Shale During Hydraulic Fracturing. SPIE, San Diego, California.
- 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_2 leaking into a confined aquifer. *Energy Procedia*, 63, 4620-4629.
- Bao Z., Benson S.M., Cui Y., Dionne J.A., Maher K., Boerjan W., Halpin C., Nelson R., Nichols D. Ralph J., Ramakrishnan T.S. (2014) In Search of Clean, Affordable Energy. *Oilfield Review* 26, 1-15.
- Steefel C.I., Druhan J.L., Maher K. (2014) Modeling coupled chemical and isotopic equilibration rates. *Procedia Earth and Planetary Science* 10, 208-217.

- Maher K. and Druhan J.L. (2014) Relationships between the transit time of water and the fluxes of weathered elements through the critical zone. *Procedia Earth and Planetary Science* 10, 16-22.
- 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 CO₂ leaking into a confined aquifer. In *Assessment of Leakage Detection and Intervention Scenarios for CO₂ Sequestration, CCP3 (CO₂ 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 CO₂ Sequestration, CCP3 (CO₂ Capture Project 3) Contingency Planning Final Report* (eds. Benson S., Harris, J., Maher, K., Zoback, M. *et al.*), p 192.
- Benson S., Harris, J., Maher. K., Zoback, M. et al. (2013) Assessment of Leakage Detection and Intervention Scenarios for CO₂ Sequestration CCP3 (CO₂ Capture Project 3) Contingency Planning: White Paper on Existing Literature. p 79.
- Holloway J. M., Ewing S. A., Maher K. (2009) Combined ecological and geologic perspectives in ecosystem studies: Preface. *Chemical Geology*, 267, 1-2.

ADVISEES AND POSTDOCTORAL SCHOLARS

Current Postdoctoral Fellows:

Dana Chadwick
Qingyun Li

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:

Callum Bobb, PhD student
Sami Chen, PhD student
Gurinder Nagra, PhD student
Claresta Joe-Wong, PhD student
Valerie Rosen, PhD student
Zach Perzan, PhD student

Previous Graduate Advisees:

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

Hsiao-Tieh Hsu, PhD student (Chemistry)
Laura Zalles, Co-terminal MS
Joseph Nelson, PhD student
Cynthia McClain, PhD student
Megan Dustin, MS
Kimberly Lau, PhD (co-advised with Jon Payne)
Pablo Garcia del Real, PhD (co-advised with Dennis Bird)
Natalie Johnson, PhD, Chemical Engineering (co-advised with Gordon Brown)
Daniel Ibarra, Co-terminal MS
Claire Kouba, Co-terminal MS
Abe Torchinsky, MS

Undergraduate Advisees:

(only those I directly supervised)

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)
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

2018: DESINST 215: Design of Data (Spring)
2016: 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)

FUNDING HISTORY:

Lead Principal Investigator:

- “EAGER: Can remotely imaged vegetation characteristics provide a window into soil nutrient cycles?”, \$299,820, NSF Signals in the Soils, 9/1/2018 to 8/30/2020.
- “Development of a molecularly informed biogeochemical framework for reactive transport modeling of subsurface carbon inventories, transformations and fluxes” \$600,000, DOE-SBR, 8/01/2017 to 7/31/2020.
- “A multiscale approach to modeling carbon and nitrogen cycling within a high elevation watershed”, \$570,000, DOE-SBR, 8/01/2015 to 7/31/2018.
- “CAREER: A hydrologic thermostat for the global carbon cycle”, \$450,000, NSF-EAR, 3/1/2013 to 2/29/2019.
- “Reactivity of CO₂ in the subsurface”, \$1,260,258, Global Climate and Energy Project (GCEP), GCEP-48942, 9/15/2010 to 8/31/2014.
- “Neotectonic history of the Eastern California Shear Zone (ECSZ) based on U-Pb/U-Th (SHRIMP-RG) dating of syntectonic precipitates”, \$139,874, NSF, EAR, 09/01/2013 to 08/31/2015.
- “Development of U Isotopes ($\delta^{235/238}\text{U}$) as a tool for reconstructing the extent of global seawater anoxia” \$100,000, American Chemical Society, 09/01/2013-08/31/2015
- “High-resolution records of atmospheric circulation and past rainfall from soils based on U-series and stable isotope SIMS approaches”, \$355,865, NSF, EAR-0921134, 8/15/2009 to 7/31/2013.

Co-investigator:

- “EFRC: Center for Mechanistic Control of Water-Hydrocarbon-Rock Interactions in Unconventional and Tight Oil Format”, \$10,750,000, DOE-BES, 9/1/18 – 8/30/22.
- “Groundwater Quality Science Focus Area: Hydrologically driven biogeochemical processes controlling water quality”, \$3,000,000, DOE-BER, 9/30/17 – 10/1/20.
- “Pore scale control of gas and fluid transport at shale matrix-fracture interfaces”, \$939,000, DOE-NETL 10/01/16 – 09/30/18.
- “NNCI: Stanford Nano Shared Facilities”, \$6,468,382, NSF-NNCI, 09/01/15 – 08/31/20.
- “Chemical control of fluid flow and contaminant release in shale microfractures”, \$548,045, DOE-NETL 9/01/14 – 03/31/16.
- “Contingency planning for intervention in unexpected migration of CO₂”, \$600,000, CCP3, 04/01/2012 to 09/30/2013.
- “Collaborative Research: Geochronology of Carbonate Mineralization in the Lithosphere”, \$59,515, NSF, EAR-1019894, 9/1/2010 to 8/31/13.
- “Collaborative Research: Coupled Thermal-Hydrological-Mechanical-Chemical-Biological (THMCB) Experimental Facility at DUSEL Homestake”, \$67,019, NSF, CMMI-0927398, 8/15/2009 to 7/31/13.