Meret Aeppli

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Current Position

Postdoctoral fellow, Stanford University, United States 09/2019 - present

Topic: Redox reactivity of particulate terminal electron acceptors and their role in controlling carbon cycling in soils.
Advisor: Prof. Dr. S. Fendorf

Education

Ph.D., ETH Zürich, Switzerland 01/2015 - 12/2018

Dissertation: Assessing the control of reduction thermodynamics on electron transfer to iron (oxyhydr-) oxides (Diss. Nr. 25'699)
Advisor: Dr. T.B. Hofstetter
Committee: Dr. M. Sander, Dr. A. Voegelin, Prof. Dr. K. McNeill, Prof. Dr. J. Peña

M.Sc. in Environmental Sciences, ETH Zürich, Switzerland 09/2012 - 01/2015

Concentration: Biogeochemistry and Pollutant Dynamics
Thesis: Interactions of bacteriophages with natural organic matter and model sorbent surfaces
Advisor: Dr. M. Sander

B.Sc. in Environmental Sciences, ETH Zürich, Switzerland 09/2009 - 10/2012

Thesis: Soil structure of an alpine fen and its implications on below ground methane concentrations
Advisor: Prof. Dr. J. Zeyer

Diploma in Music Performance and Production, London Music School, England 04/2009 - 09/2009

Concentration: Piano and vocals

Research Experience

Postdoctoral research, Stanford University, United States 09/2019 - present

Linked carbon dioxide production and organic matter composition to redox reactivity of particulate terminal electron acceptors in anoxic floodplain soils.

Field research assistance, ETH Zürich, Switzerland 07/2019

Characterized electron donating properties of particulate organic matter using oxygenated water in a push-pull approach in wetlands near Filipstad, Sweden.

Research assistance, Eawag, Switzerland 01/2019 - 06/2019
Adapted procedure to analyze compound specific stable isotope data for nitroaromatic explosives.

Dissertation research, Eawag and ETH Zürich, Switzerland 01/2015 - 12/2018
Developed mediated electrochemical approach to characterize redox properties of iron oxides; linked rates and extents of iron oxide reduction to thermodynamic driving force of reaction; quantified changes in redox reactivity of iron oxides during abiotic and microbially mediated iron oxide transformations.

Master thesis research, ETH Zürich, Switzerland 09/2013 - 04/2014
Quantified bacteriophage adsorption to natural organic matter and model sorbent surfaces using quartz crystal microbalance with dissipation monitoring.

Research assistance, ETH Zürich, Switzerland 06/2012 - 08/2012
Analyzed methane production in wetland soil incubations.

Bachelor thesis research, ETH Zürich, Switzerland 02/2012 - 06/2012
Collected wetland soil cores and quantified leaf, moss, and root surface areas along core depths.

Honors

Early Postdoc Mobility Fellowship 09/2019 - 02/2021
Fellowship for postdoctoral research at Stanford University; sponsored by the *Swiss National Science Foundation*; CHF 120'000.

Rising Environmental Leaders Program 01/2020 - 06/2020
Run by the *Stanford Woods Institute for the Environment*; aimed at honing participant's leadership and communication skills to maximize their research impact and connect research to policy and people; one of 20 participants selected from a field of applicants from all seven schools at Stanford.

ETH medal for outstanding doctoral thesis 09/2019
Awarded for "solving important knowledge gaps in the redox reactivity of iron using an interdisciplinary approach". ETH Zürich awards the silver medal and CHF 2'000 to the top 8% of doctoral candidates.

Chemistry Travel Award 05/2017
Travel award for the attendance of Goldschmidt Conference 2017; sponsored by the *Swiss Chemical Society* and *Platform Chemistry* of the *Swiss Academy of Sciences*; CHF 1'000.

Peer-Reviewed Publications

Aeppli, M; Vranic, S; Kaegi, R; Kretzschmar, R; Brown AR, Voegelin, A; Hofstetter, TB; Sander, M. Decreases in iron oxide reducibility during microbial reductive dissolution and transformation of ferrihydrite. *Environmental Science & Technology*, **2019**, doi:10.1021/acs.est.9b01299.

Aeppli, M; Kaegi, R; Kretzschmar, R; Voegelin, A; Hofstetter, TB; Sander, M. Electrochemical analysis of changes in iron oxide reducibility during abiotic ferrihydrite transformation into goethite and magnetite. *Environmental Science & Technology*, **2019**, doi:10.1021/acs.est.8b07190.

Aeppli, M; Voegelin, A; Gorski CA; Hofstetter, TB; Sander, M. Mediated electrochemical reduction of iron (oxyhydr-)oxides under defined thermodynamic boundary conditions. *Environmental Science & Technology*, **2018**, 52 (2), 560-570, doi:10.1021/acs.est.7b04411.

Armanious, A; **Aeppli, M**; Jacak, R; Refardt, D; Sigstam, T; Kohn, T; Sander, M. Viruses at solid water interfaces: A systematic assessment of interactions driving adsorption. *Environmental Science & Technology*, **2016**, 50 (2), 732-743, doi:10.1021/acs.est.5b04644.

Franchini, AG; Henneberger, R; **Aeppli, M**; Zeyer, J. Methane dynamics in an alpine fen: A field-based study on methanogenic and methanotrophic microbial communities. *FEMS microbiology ecology*, **2015**, 91 (3), doi:10.1093/femsec/fiu032.

Armanious, A; **Aeppli, M**; Sander, M. Dissolved organic matter adsorption to model surfaces: Adlayer formation, properties and dynamics at the nanoscale. *Environmental Science & Technology*, **2014**, 48 (16), 9420-9429, doi:10.1021/es5026917.

Manuscripts in Preparation

Aeppli, M; Giroud, S; Vranic, S; Kaegi, R; Voegelin, A; Hofstetter, TB; Sander, M. Linking rates of ferric iron reduction by extracellular electron shuttles to thermodynamics.

Conference presentations

Mediated electrochemical reduction of iron (oxyhydr)oxides under defined thermodynamic boundary conditions. Poster presentation. *Gordon Research Conferences on Environmental Science: Water, Plymouth*, New Hampshire, United States, 06/2018.

Ferrous iron-induced transformation of ferrihydrite: Linking changes in oxide mineralogy and reducibility. Oral presentation. *Interfaces Against Pollution Conference*, La Grande Motte, France, 06/2018.

Investigating iron oxide reduction using mediated electrochemical analysis. Oral presentation. *Goldschmidt Conference*, Paris, France, 08/2017.

Investigating iron oxide reduction using mediated electrochemical analysis. Oral presentation. *International Conference on the Biogeochemistry of Trace Elements*, Zürich, Switzerland, 07/2017.

Thermodynamics of electron transfer to iron oxides assessed by mediated electrochemical reduction. Oral presentation. *Swiss Geoscience Meeting*, Geneva, Switzerland, 11/2016.

Mediated electrochemical reduction of iron oxides: Effects of pH and potential on electron transfer to the oxides. Oral presentation. *European Mineralogical Conference*, Rimini, Italy, 09/2016.

Teaching Experience and Training

Postdoc Teaching Certificate, Stanford University — expected 10/2020
Comprises teaching training, elective courses and workshops, teaching practice, and teaching portfolio (minimum in-class time: 100 h).

Teaching assistance, ETH Zürich — 01/2015 - 12/2018
Laboratory Course: Elementary Chemical Techniques (529-0030-00L).

Teaching assistance, ETH Zürich — 09/2011 - 09/2012
Exercises in Mathematics III: Systems Analysis (701-0071-00L).

Mentoring Experience

Mentor in the Association for Women in Science 09/2019 - present
Provided professional and personal support for undergraduate mentees.

Supervisor of research assistant 06/2018 - 08/2018
Trained research assistant in the laboratory and designed experimental work on iron oxide reduction by reduced electron transfer shuttles.

Supervisor of bachelor student 02/2018 - 06/2018
Thesis (S. Giroud): Kinetics and thermodynamics of electron transfer from reduced electron transfer shuttles to iron oxides.

Supervisor of master student 09/2017 - 04/2018
Thesis (S. Vranic): Iron oxide phase transformations during microbial reduction of ferrihydrite.

Outreach and Service Activities

Convener at *Goldschmidt Conference 2020* expected 06/2020
Convener of Session 12b: Coupled Redox Cycling of S, Mn, and Fe: Impacts on Nutrient and Contaminant Dynamics.

Science Teaching Through Art Program, Stanford University expected 04/2020
Designed infographic on the role of soils in mitigating climate change; presented to the general public (Generation Sci Conference) and local high school students (Cañada College and Los Altos High School).

Media coverage of field research in Sweden, ETH Globe magazine 09/2019
Featured in article about field research in Sweden: Rüegg, P. Waiting for Oxygen. *ETH Globe magazine*, **2019**, 3, 36-41.

Reviewer 06/2019 - present
For *Environmental Science & Technology*, *Environmental Science: Processes & Impacts*.

Scientifica research fair, ETH Zürich and University of Zürich 09/2017
Designed and presented exhibition booth on the degradation of plastics in the environment.

Languages

German: native
English: fluent (CEFR level C2)
French: very good command (CEFR level B2)
Spanish: working knowledge (CEFR level A2)