

Meret Aeppli

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meretaeppli.github.io

Education and Training

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

Topic: Carbon Cycling in Soils: Effects of Mineral Redox Reactivity on Anaerobic Microbial Respiration

Advisor: Prof. Dr. S. Fendorf

ETH Zürich, Switzerland, Doctor of Sciences 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

ETH Zürich, Switzerland, M.Sc. in Environmental Sciences 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

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

Thesis: Soil Structure of an Alpine Fen and Its Implications on Below-Ground Methane

Concentrations

Advisor: Prof. Dr. J. Zeyer

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

Concentration: Piano and Vocals

Research Experience

Stanford University, United States, Postdoctoral Fellow in Soil and Environmental Biogeochemistry 09/2019 - present

Linked carbon dioxide production during anaerobic microbial respiration to mineral redox reactivity in floodplain soils.

ETH Zürich, Switzerland, Field Researcher in Environmental Chemistry 07/2019

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

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

Eawag and ETH Zürich, Switzerland, Doctoral Candidate in Environmental Chemistry 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.

ETH Zürich, Switzerland, Graduate Researcher in Environmental Chemistry 09/2013 - 04/2014
Quantified bacteriophage adsorption to natural organic matter and model sorbent surfaces using quartz crystal microbalance with dissipation monitoring.

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

ETH Zürich, Switzerland, Undergraduate Researcher in Environmental Microbiology 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 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: Ad-layer 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; Voegelin, A; Hofstetter, TB; Sander, M. Reduction of Ferric Iron Oxides by Electron Transfer Shuttles: Reconciling Rates with Thermodynamics.

Conference Presentations

Is Carbon Mineralization in Floodplains Controlled by the Redox Reactivity of Iron Minerals? Oral presentation, virtually delivered. *American Chemical Society Fall 2020 Virtual Meeting*, **2020**.

How Does the Redox Reactivity of Iron Minerals Affect Carbon Mineralization in Floodplains? Oral presentation, virtually delivered. *Virtual Goldschmidt Conference*, **2020**.

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, **2018**.

Ferrous Iron-Induced Transformation of Ferrihydrite: Linking Changes in Oxide Mineralogy and Reducibility. Oral presentation. *Interfaces Against Pollution Conference*, La Grande-Motte, France, **2018**.

Investigating Iron Oxide Reduction Using Mediated Electrochemical Analysis. Oral presentation. *Goldschmidt Conference*, Paris, France, **2017**.

Investigating Iron Oxide Reduction Using Mediated Electrochemical Analysis. Oral presentation. *International Conference on the Biogeochemistry of Trace Elements*, Zürich, Switzerland, **2017**.

Thermodynamics of Electron Transfer to Iron Oxides Assessed by Mediated Electrochemical Reduction. Oral presentation. *Swiss Geoscience Meeting*, Geneva, Switzerland, **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, **2016**.

Teaching Experience and Training

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

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

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

Mentoring Experience

Mentor at *Goldschmidt Conference* 06/2020
Supported mentees before, during and after the conference by introducing them to conference objectives and connecting them with scientists in their field.

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.

Supervisor of Undergraduate Student 02/2018 - 06/2018
Thesis (S. Giroud): Kinetics and Thermodynamics of Electron Transfer from Reduced Electron Transfer Shuttles to Iron Oxides.

Supervisor of Graduate Student 09/2017 - 04/2018
Thesis (S. Vranic): Iron Oxide Phase Transformations during Microbial Reduction of Ferrihydrite.

Outreach and Service Activities

Convener at *American Geophysical Union Fall Meeting* expected 12/2020
Convener of Symposium 103775: Soils of the Anthropocene: Ecosystem Scale Implications of Pore-Scale Redox Heterogeneities in Soils.

- Convener at *Goldschmidt Conference* 06/2020
Convener of Session 12b: Coupled Redox Cycling of S, Mn, and Fe: Impacts on Nutrient and Contaminant Dynamics.
- Media Coverage of Field Research in Sweden, *ETH Globe Magazine* 09/2019
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)