

# Meret Aeppli

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## Education and Training

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**Stanford University, United States**, Postdoctoral Fellow 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

**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

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**Stanford University, United States**, Postdoctoral Fellow in Soil and Environmental Biogeochemistry

09/2019 - present

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

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

Quantified electron donating properties of particulate organic matter using oxygenated water in 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

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**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

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**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/fu032.

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

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**Aeppli, M;** Giroud, S; Vranic, S; Kaegi, R; Voegelin, A; Hofstetter, TB; Sander, M. Reduction of ferric iron oxides by electron transfer shuttles: reconciling rates with thermodynamics.

## Conference Presentations

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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, 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, **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

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**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

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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 on iron oxide reduction by reduced electron transfer shuttles.

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

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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

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