

Meret Aeppli

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Current Position

EPF Lausanne, Switzerland, Tenure Track Assistant Professor, [SOIL](#) laboratory 09/2022 - present

Education and Training

Stanford University, United States, Postdoctoral Fellow 09/2019 - 08/2022

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

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 04/2009 - 09/2009

Concentration: Piano and Vocals

Funding

ENAC Transdisciplinary Cluster grant 05/2023 - 04/2024

“Quantifying soil organic matter formation under microbial consortia amendments (BioSoilStock)”; sponsored by the *School of Architecture, Civil and Environmental Engineering, EPFL*; CHF 50'000.

European Joint Programme for Soil 02/2023 - 01/2024

“The effects of tillage practice on soil carbon sequestration mechanisms (TilSoilC)”; sponsored by the *Swiss National Science Foundation*; CHF 432'844.

Research Partnership Grant with the ASEAN region 02/2023 - 01/2024

“Web viewer development for public flood risk communications”; sponsored by the *ETH Zürich, Leading House Asia*; CHF 15'000.

Project Funding 02/2023 - 01/2026

“Soil organic carbon in Swiss mountain soils: abundance, distribution, and susceptibility to climate change”; sponsored by the *Swiss National Science Foundation*; CHF 510'928.

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.

Honors

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; Schladow, G; Lezama Pacheco, J S; Fendorf, S. Iron Reduction in Profundal Sediments of Ultraoligotrophic Lake Tahoe under Oxygen-Limited Conditions. *Environmental Science & Technology*, **2023**, 57 (3), 1529-1537, [doi:10.1021/acs.est.2c05714](https://doi.org/10.1021/acs.est.2c05714).

Aeppli, M; Thompson, A; Dewey, C; Fendorf, S. Redox Properties of Solid Phase Electron Acceptors Affect Anaerobic Microbial Respiration under Oxygen-Limited Conditions in Floodplain Soils. *Environmental Science & Technology*, **2022**, 56 (23), 17462-17470, [doi:10.1021/acs.est.2c05797](https://doi.org/10.1021/acs.est.2c05797).

Lopez, AM; Nicolini, CM; **Aeppli, M**; Luby, SP; Fendorf, S; Forsyth, JE. Assessing Analytical Methods for the Rapid Detection of Lead Adulteration in the Global Spice Market. *Environmental Science & Technology*, **2022**, 56 (23), 16996-17006, [doi:10.1021/acs.est.2c03241](https://doi.org/10.1021/acs.est.2c03241).

Aeppli, M; Babey, T; Engel, M; Fendorf, S; Bargar, JR; Boye, K. Export of Organic Carbon From Reduced Fine-Grained Zones Governs Biogeochemical Reactivity in Simulated Aquifer. *Environmental Science & Technology*, **2022**, 56 (4), 2738-2746, [doi:10.1021/acs.est.1c04664](https://doi.org/10.1021/acs.est.1c04664).

Aeppli, M; Giroud, S; Vranic, S; Voegelin, A; Hofstetter, TB; Sander, M. Thermodynamic Controls on Rates of Iron Oxide Reduction by Extracellular Electron Shuttles. *Proceedings of the National Academy of Sciences of the United States of America*, **2022**, 119 (3), e2115629119, [doi:10.1073/pnas.2115629119](https://doi.org/10.1073/pnas.2115629119).

Biswakarma, J; Rushworth, D; Srivastava, G; Singh, G; Kang, K; Das, S; Anantharaman, SB; **Aeppli, M**; Popp, AL; Bhuyan, DJ. Organizational Level Responses to the COVID-19 Outbreak: Challenges, Strategies and Framework for Academic Institutions. *Frontiers in Communication*, **2021**, 6:573585, [doi:10.3389/fcomm.2021.573585](https://doi.org/10.3389/fcomm.2021.573585).

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**, 53 (15), 8736-8746, [doi:10.1021/acs.est.9b01299](https://doi.org/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**, 53 (7), 3568-3578, [doi:10.1021/acs.est.8b07190](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1021/es5026917).

Supervision of Junior Researchers

Supervisor of Graduate Student Giulia Marmello, EPFL	03/2023 - present
Supervisor of Doctoral Student Kristina Bright, EPFL	02/2023 - present
Supervisor of Doctoral Student Bence Dienes, EPFL	02/2023 - present
Supervisor of Graduate Student Jonas Müller, EPFL	02/2023 - present
Co-Supervisor of Doctoral Candidate Emily Lacroix, Stanford	01/2022 - 08/2022
Co-Supervisor of Research Assistant Carla Nicolini, Stanford	05/2021 - 07/2021
Supervisor of Research Assistant Sanja Vranic, ETH Zürich	06/2018 - 08/2018
Supervisor of Undergraduate Student Sébastien Giroud, ETH Zürich	02/2018 - 06/2018
Supervisor of Graduate Student Sanja Vranic, ETH Zürich	09/2017 - 04/2018

Teaching Experience and Training

Stanford University, United States , Teaching Assistant Science of Soils (ESS-155), weekly classes in the field and laboratory.	03/2022 - 06/2022
Stanford University, United States , Postdoc Teaching Certificate Comprises teaching training, elective courses and workshops, teaching practice, and teaching portfolio (minimum in-class time: 100 h).	10/2020
ETH Zürich, Switzerland , Teaching Assistant Laboratory Course: Elementary Chemical Techniques (529-0030-00L), yearly three week intensive course.	01/2015 - 12/2018
ETH Zürich, Switzerland , Teaching Assistant Exercises in Mathematics III: Systems Analysis (701-0071-00L), weekly classes.	09/2011 - 09/2012

Invited Talks

- Assessing soil redox processes and their role in element cycling. *WSL-Institut für Schnee- und Lawinenforschung SLF*, Davos, Colloquium, **2023**.
- Redox processes in soils: elucidating the role of iron minerals. *University of Bern*, Bern, Soil Science Colloquium, **2023**.
- Assessing soil redox processes and their role in element cycling. *University of Lausanne*, Lausanne, IDYST Seminar, **2023**.
- Can soil science contribute to improving food and nutrition? *Industrial Board Meeting of the Integrative Food and Nutrition Center at EPFL*, Lausanne, Seminar, **2023**.
- Electron transfer reactions in soils: implications for biogeochemical element cycling, *CLIMACT Seminar Series*, Virtual Seminar, **2022**.

Follow the electrons: redox-active minerals in biogeochemical processes, *Swiss Geoscience Meeting*, Lausanne, Keynote, **2022**.

Follow the electrons: insights into soil carbon cycling. *Swiss Federal Institute of Technology Lausanne*, Lausanne, Seminar, **2022**.

Redox properties of iron minerals: insights from electrochemical analyses and thermodynamic considerations. *German Research Centre for Geosciences*, Virtual Seminar, **2022**.

Exploring Mechanisms of Soil Organic Carbon Stabilization by Tracking Electron Flows in Soils. *Technical University of Munich*, Virtual Public Lecture, **2021**.

Tracking Electrons in Soils: How Electro-Active Minerals Affect Soil Carbon Turnover. *Swiss Federal Institute of Technology Lausanne*, Virtual Public Lecture, **2020**.

Follow the Electrons: How Redox-Active Minerals Affect Soil Carbon. *University of California, Davis*, Virtual Seminar, **2020**.

Redox Reactions In the Environment: What Can We Learn From Mediated Electrochemical Analyses? *Indiana University-Purdue University Indianapolis*, Virtual Seminar, **2020**.

Conference Presentations

Iron Reduction In Profundal Sediments Of Ultra-oligotrophic Lake Tahoe Under Oxygen-limited Conditions. Oral presentation. *Goldschmidt Conference*, Honolulu, Hawaii, United States, **2022**.

Redox Properties of Particulate Electron Acceptors Affect Anaerobic Respiration in Floodplain Soils. Poster presentation. *Gordon Research Conferences on Environmental Science: Water*, Plymouth, New Hampshire, United States, **2022**.

Redox properties of particulate electron acceptors affect anaerobic microbial respiration under oxygen-limited conditions in floodplain soils. Oral presentation, virtually delivered. *European Geosciences Union General Assembly*, **2022**.

Thermodynamic Limitations on Microbial Respiration Using Ferric Iron as Terminal Electron Acceptor. Poster presentation. *American Geophysical Union Fall Virtual Meeting*, **2021**.

Organic Matter Mineralization in Redox-Dynamic Environments: How Does the Redox Reactivity of Particulate Electron Acceptors Affect Microbial Respiration Rates? Oral presentation, virtually delivered. *Virtual Goldschmidt Conference*, **2021**.

Soil Organic Matter Stabilization in Floodplain Soils: Role of Particulate Terminal Electron Acceptors. Poster presentation. *American Geophysical Union Fall Virtual Meeting*, **2020**.

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**.

Memberships and Reviewing Activities

Member

American Chemical Society, American Geophysical Union, Association for Women in Science, ETH Women Professors Forum, European Association of Geochemistry.

Reviewer for Scientific Journals

Applied and Environmental Microbiology, Applied Geochemistry, Biogeochemistry, Biogeosciences, Environmental Science: Nano, Environmental Science & Technology, Environmental Science: Processes & Impacts, Journal of Geophysical Research: Biogeosciences, Nature Reviews Earth & Environment. Complete list available on [Publons](#).

Reviewer for Funding Bodies

Israel Science Foundation, National Science Center Poland, National Science Foundation: Stanford Synchrotron Radiation Lightsource.

Conference Organization

Convener at *Goldschmidt Conference*, Session 12g expected 07/2023

Session 11 b (Theme 11): Iron and manganese minerals and their role in nutrient and contaminant cycling across scales.

Convener at *Goldschmidt Conference*, Session 12g 07/2022

Session 12 g (Theme 12): Environmental redox reactions and their impact on metal and nutrient dynamics.

Convener at *Goldschmidt Conference*, Session 11g 07/2021

Session 11g (Theme 11): Redox-Driven Transformation and Mobility of Contaminants and Nutrients.

Convener at *American Geophysical Union Fall Meeting*, Symposium 103775 12/2020

Symposium 103775: Soils of the Anthropocene: Ecosystem Scale Implications of Pore-Scale Redox Heterogeneities in Soils.

Convener at *Goldschmidt Conference*, Session 12b 06/2020

Session 12b: Coupled Redox Cycling of S, Mn, and Fe: Impacts on Nutrient and Contaminant Dynamics.