



Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

PhD position in black carbon biogeochemistry at ETH Zurich Application deadline: April 30

We invite applications for a PhD project on river and ocean biogeochemistry in the Biogeoscience group, Geological Institute, ETH Zurich to begin Sept or summer 2020 (to be discussed). We seek to advance our knowledge of land-sea interactions regarding the fate of fire-derived carbon in tropical and arctic environments.

Fire-derived carbon or “black carbon” (BC) is one of the largest reservoirs of carbon on Earth, yet remains one of the most poorly understood. Carbon-rich residues created from the incomplete combustion of biomass and fossil fuels can counteract greenhouse gas emissions by removing C from fast-cycling (atmosphere-terrestrial) pools to more slowly cycling soil and sedimentary reservoirs, thereby acting as a carbon sink. However, there is a conundrum stemming from estimated fluxes and ages of BC exported by rivers input versus turnover and stocks of BC in the deep ocean, implying crucial gaps in our understanding of this key component of the carbon cycle and how it will respond to climate change.

We focus on arctic and tropical river-ocean systems because of their disproportionately large influence, and because of the rapid pace of change that they are experiencing. Specifically, the project will seek to better constrain the magnitude and nature of BC transfer across the land-ocean aquatic interface using the Mackenzie River-Beaufort Sea and Amazon-Atlantic Ocean as model systems. The PhD project will involve measurement of the abundance, reactivity and carbon isotopic characteristics of molecular tracers of BC in both particulate and dissolved carbon pools spanning the land-ocean aquatic continuum. This will include field work, as well field- and laboratory-based incubation experiments and advanced analytical and instrumental methods (e.g., analytical organic chemistry, accelerator mass spectrometry). Responsibilities will include field and lab work, supervision of bachelor and master students, presentations of results at conferences, and publication in international peer-reviewed journals. During the PhD, which is within the Department of Earth Sciences graduate program at ETH Zurich (URL), there will be the opportunity for travel and interaction with collaborators at the University of Oldenburg and the University of Brussels (ULB). The student will be supervised by Dr. Alysha Coppola, and co-supervised by Dr. Timothy Eglinton.

Requirements include a MSc-degree or equivalent in Earth science, chemistry, biogeochemistry or a related discipline (e.g., physical geography, environmental sciences), and preferably some prior experience in field and analytical methods. Fluency in English is essential, with a planned start in summer or Sept 2020 (to be discussed). Salary will be according to SNF guidelines. Applications should include a CV, motivation letter, copies of your academic qualifications, and a list of at least 3 references, and should be sent via mail or e-mail (as a single pdf file) to Dr. Alysha Coppola (alysha.coppola@geo.ethz.ch). Further information about the Biogeosciences research group can be found at <https://biogeoscience.ethz.ch/>. For further details, please contact Dr. Alysha Coppola (alysha.coppola@geo.ethz.ch) or Tim Eglinton (timothy.eglinton@erdw.ethz.ch).