PhD project at ETH Zurich, Switzerland, and EU Joint Research Centre, Italy

Sustainable peatland management by mapping, monitoring and modelling the carbon cycle

Expected Start date: November 2021 or as soon as possible thereafter

Duration: 4 years

Responsibilities

Within the CDP framework we are looking for a PhD candidate to improve the mapping of organic soils in EU, model Greenhouse gas (GHG) emissions from peatlands and assess policy scenarios for sustainable peatlands management. Peatlands are highly valuable carbon reservoir and sink but also a major source of emissions when degraded. While accounting for only about 3-5% of the EU land area, they store around 30% of terrestrial carbon, but their spatial distribution and C emissions remain very uncertain. The objective of this PhD will be to improve assessments of spatial distribution of peatlands in the EU and current GHG emissions from peatlands, and assess scenarios for best management. In the first phase, the PhD candidate will elaborate and implement a mapping methodology for peatlands using existing information on organic soils for 1100-1400 points within LUCAS topsoil survey, CORINE Land Cover maps, data from EU Member States, Global Peatlands initiative and bilateral contributions from other EU Research Institutes. In a second phase, the PhD candidate will developed a semi-empirical model to predict CO2 and methane emissions by water table, soil properties, remote sensing vegetation indexes and taking advantage of new data and literature recently published on this issue. This semi-empirical model will compare its outputs with the emissions/removals from LULUCF inventories of Member States. Finally, the PhD candidate will model management scenarios taking into account the objectives of the Green Deal and the Good Agricultural Environmental Condition (GAEC) in the Common Agricultural Policy (CAP). In addition, this part of the PhD will look for the best management (e.g. rewetting) to minimize the emissions of CO2 and CH4. The PhD candidate may further explore peatland restoration scenarios in Switzerland and Scotland, and possibly a third country. The overall PhD project is relevant to EU policies such as the CAP, LULUCF, Biodiversity Strategy 2030, carbon farming and Soil Thematic Strategy.

Requirements

- You have (or are near completion of) a Master in Earth Sciences, Bioscience Engineering, Soil Science, Agricultural Sciences, Environmental Sciences, Geography (or a related field).
- You have a strong interest in soil (biogeochemical processes) research and process-based or statistical modelling, and a demonstrable experience in these topics.
- Experience with the spatial analysis of large-scale datasets and remote sensing is a major asset.
- Experience in machine learning and/or digital soil mapping is also an asset.
- Experience in soil organic carbon processes and assessments an advantage
- You have excellent knowledge of GIS and experience with R, Matlab or Python scripting.
- You work proactively and independently and have good communication skills.
- You have a very good knowledge of English, both spoken and written.
- Relevant publications in peer review journals should be highlighted.
- You are highly motivated, ambitious and result-oriented.

Offer

- We offer a four-year PhD position, based at the Ecosystem Management group at ETH Zurich (Switzerland) and the Joint Research Centre (JRC) of the European Commission in Italy.
- The PhD research will be conducted at both institutions in equal measure, with an expectation of 24 months spent at JRC.
- We offer a competitive fellowship. While at the JRC in Ispra, you will get a contract as a Grant Holder 20. While at ETH Zurich you will be on an ETH Zurich PhD salary scale.
• Supervision will be shared between Prof. Jaboury Ghazoul (ETH Zurich) and Drs. Panos Panagos and Emanuele Lugato (JRC).

For more information please contact Prof. Jaboury Ghazoul (jaboury.ghazoul@env.ethz.ch). The selection process is based on a motivation letter, CV, and interview for shortlisted candidates.

Candidates should at the start of the employment contract with JRC:

• Have the nationality of a Member State of the EU or a country associated to the Research Framework Programs (Horizon2020).
• Candidates from other countries may also apply providing they have a residence and work permit in Italy. They will have to go through the security clearance before they can be granted the GH contract.
• After the selection process, enrol in the PhD programme Science and Policy (https://www.plantsciences.uzh.ch/en/teaching/phdsciencespolicy.html) at ETH Zurich hosted by the Zurich-Basel Plant Science Center (www.plantsciences.ch).

Candidates can apply HERE till August 16, 2021.