



Międzynarodowa Środowiskowa Szkoła Doktorska
przy Centrum Studiów Polarnych
w Uniwersytecie Śląskim w Katowicach

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41-200 Sosnowiec
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Reference No: IEDS/2020/IO PAN/01

Title of PhD project:

Characteristics of organic matter released from permafrost

Leading unit: International Environmental Doctoral School associated with the Centre for Polar Studies at the University of Silesia in Katowice (IEDS) - Institute of Oceanology Polish Academy of Sciences

Mode of study: full-time

Degree to be obtained: PhD in the field of natural sciences, in the discipline of Earth and related environmental sciences

Duration: 4 years (8 semesters), from October 2020

Language: English

Scholarship: 4000 PLN per month throughout the entire period of the study (4 years)

Requirements and regulations: www.mssd.us.edu.pl/kandydat-mssd/

Registration online: www.irk.us.edu.pl

Conditions of recruitment:

https://www.mssd.us.edu.pl/wp-content/uploads/2020/06/Regulamin_projekty-NCN.pdf

Deadline: 27th August 2020

Required documents: § 8, section 3:

https://www.mssd.us.edu.pl/wp-content/uploads/2020/06/requirement_IEDS_2020_2021.pdf

Requirements:

1. MSc degree (or equivalent) in chemistry (preferred), oceanography, environmental protection or related disciplines.
2. Knowledge on carbon cycling in the environment.
3. Experience in laboratory work and chemical analyses.
4. Knowledge of potentiometric titration methods, elemental analysis, pH measurements



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5. Very good written and spoken English.
6. Experience in fieldwork, public presentations and preparation of scientific manuscripts will be an additional advantage.

Tasks description:

1. Preparation and conducting fieldwork, participation in research cruises to Spitsbergen and Greenland.
2. Performing chemical analyses to assess the acid-base properties of organic matter released from permafrost.
3. Conducting incubation experiments to characterize bioavailability (lability) of organic matter released from permafrost.
4. Performing statistical analyses and interpretation of the obtained results.
5. Preparing scientific articles
6. Presenting the obtained results at national and international scientific conferences.

Abstract

Permafrost is a very important element of the global carbon cycle. It is estimated that its surface layer contains 1035 ± 150 Pg (Pg = 1015g) of organic carbon (OC), which is about 50% of the total OC stored in surface soil layers. Climate change, which is particularly intense in the Arctic, leads to the permafrost thawing. Remineralization of the organic matter released in that way and the resulting CO₂ emissions, although still not fully quantified, have been identified as an important mechanism affecting the climate and global carbon cycle. Much less attention is paid to research on the composition and chemical structure of organic compounds released from permafrost deposits, and in particular to assessing their acid-base properties.

The main goal of the doctoral dissertation will be to characterize bioavailability (lability) of the organic matter released from permafrost and to assess its acid-base properties. Field studies will be conducted in Spitsbergen and Greenland, while the analytical part in the laboratories of the Institute of Oceanology of the Polish Academy of Sciences in Sopot. The PhD student's tasks will include: (1) preparation and conducting fieldwork and participation in research cruises (2) performing experiments to assess the acid-base properties of organic matter released from permafrost, (3) conducting incubation experiments to characterize bioavailability (lability) of organic matter, (4) performing statistical analyzes and



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interpretation of the obtained results, (5) preparing scientific articles, (6) presenting the obtained results at national and international scientific conferences.

The proposed PhD work will be part of the PROSPECTOR project (PROSPECTOR: do Permafrost-Released OrganicS amPlify ocEan aCidificaTiOn in the aRctic?) funded by the Polish National Science Centre and conducted at the Institute of Oceanology of the Polish Academy of Sciences in Sopot.

Other information:

1. The supervisor will be dr hab. Karol Kuliński, prof. IO PAN; kroll@iopan.pl; Institute of Oceanology Polish Academy of Sciences, Sopot
2. The scholarship will be paid as a part of the PROSPECTOR project.
The candidate must undergo competitive recruitment for the NCN project.
Information about the competition procedure for the PROSPECTOR project:
<https://www.ncn.gov.pl/baza-ofert/?akcja=wyswietl&id=182805>
3. Contact to the Secretary of the IEDS Admission Committee: +48 32 3689 380, polarknow@us.edu.pl, www.mssd.us.edu.pl.