



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

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Title of PhD project: Recent climate change recorded in growth rings and wood anatomical traits of tundra vegetation from Greenland

Providing institute: Institute of Earth Sciences, Faculty of Natural Sciences, University of Silesia in Katowice

Requirements:

1. Master's degree in geography, biology, geology, environmental studies or a related field;
2. Interest in research related to climate change, dendrochronology, dendroclimatology, and changes in the polar environment;
3. Knowledge of statistical tools and methods used in dendrochronology and climatology.
4. Knowledge of basic graphics programs;
5. Good knowledge of English, enabling communication, reading and writing research papers;
6. Experience with microscope slide preparation will be an asset.

Description of the tasks:

1. Analysis of dendrochronological material from different areas of Greenland for dendrochronological measurements and dendroclimatological analyses;
2. Preparation of microscope slides of various Arctic shrub species and quantitative measurements of wood anatomical features (QWA);
3. Acquisition, processing and analysis of meteorological data;
4. Conducting field studies;
5. Preparation of scientific articles and conference presentations;
6. Regular reporting of work progress;
7. Assistance in everyday scientific and didactic activity, including co-maintenance of the equipment in the Dendroclimatological Laboratory of the Institute of Earth Sciences, USil

Summary of the doctoral project:

The Arctic environment is undergoing a rapid change. Since the late 1980s, rising temperatures have led to species shifts and plant expansion, even in areas of polar desert.



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One of the most spectacular phenomena occurring in the Arctic under the influence of climate change is the so-called greening of the tundra. However, this trend has been reversed in recent years, and the phenomenon of browning of the tundra is beginning to appear in many places. To date, studies of climate change in Greenland have mainly used ice cores and other natural proxy data such as lake and deep-sea sediment cores. Previous dendrochronological studies have been spatially limited. The project involves the use of several tundra shrub species, large spatial coverage and modern analytical methods (including the determination and analysis of basic anatomical characteristics of QWA wood). A multi-species network of dendrochronological data from Greenland is important for a proper understanding of the various meteorological threats to tundra communities. Dendroecological studies provide a valuable interdisciplinary approach to understanding the long-term responses of tundra shrub growth to climate variability.

The aim of this PhD project is to determine the temporal and spatial response of Arctic shrubs to contemporary climate change in Greenland by means of climatological and dendrochronological studies. The samples of Greenlandic shrubs that will be used in this work have been collected partially during previous research projects and international collaborations. This will ensure the proper implementation of the project. Complementary fieldwork in selected areas of Greenland is also planned. Laboratory work will be carried out on the basis of the existing research infrastructure at the Dendroclimatology Laboratory of the Institute of Earth Sciences at the University of Silesia. Research will be conducted in cooperation with scientists from other Polish and foreign research centres.

Other information:

The work will be carried out under the supervision of:

dr hab. Magdalena Opała-Owczarek prof. UŚ, magdalena.opala@us.edu.pl, Institute of Earth Sciences, Faculty of Natural Sciences, University of Silesia in Katowice

The Secretary of the IEDS Recruitment Committee: +48 32 3689 380, e-mail:

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Information on the IEDS admissions: <https://www.mssd.us.edu.pl/en/admission-2024-2025>