Modern paleoceanographic studies are based on a number of methods, which use marine organisms to reconstruct environmental conditions in marine settings in the past. Foraminifera are one of the groups commonly used in paleoceanography, mainly due to the excellent preservation of foraminiferal shells (so called tests) in marine sediments, enabling the use of foraminifera as a proxy (indirect source of information) of environmental conditions e.g., the availability of oxygen, water temperature and salinity in the past. The isotopic composition of calcareous shells of foraminifera (especially $\delta^{18}O$ isotopes of oxygen and carbon $\delta^{13}O$) can be used to reconstruct global ice volume, temperature of surface waters, as well as changes in ocean circulation.

The study will be conducted in the Arctic (Svalbard), which is generally recognized as an area where climate changes have disproportionally high impact. The most important signs of global warming in the Arctic are the recession of glaciers and diminishing of the sea ice.

The environmental changes that are observed nowadays in fjords of Spitsbergen are associated with the retreat of the glaciers to the inner glacial bays. Glacial retreat is accompanied by the increased melt water outflow and sedimentary material delivery, leading to increase in the sediment accumulation rate, and changes in productivity and biodiversity. These processes determine the abundance and distribution of benthic fauna in the fjords. In contrast to well described sedimentary environments of fjords, sedimentation processes and their environmental impact in front of the open marine tidewater glaciers are poorly studied. The scarce knowledge of sedimentary patterns near the open marine glaciers fronts and their impact on the foraminiferal fauna can cause a bias in the interpretation of sedimentological and micropaleontological records,. Svalbard fjords were formed during repeated glacial advances and retreats in the Quaternary. However, during the glacial periods, fjords were completely filled with ice and the majority of sedimentation processes and meltwater discharge occurred in the ice and water contact zone in open marine conditions. Therefore, the investigation and comparison of environmental gradients associated with different sedimentary regimes and faunal distribution in glaciated fjords and open marine settings in front of ice caps is crucial for accurate interpretation of paleo-records.

The proposed project will be based on the data form sediment cores retrieved in the fjord of Svalbard and in the vicinity of large open marine tidewater glaciers in the region of Edgeøya and Nordaustlandet. Thanks to such arrangement the correlation between sedimentary conditions and foraminiferal assemblages will be possible. Sedimentary material was pretreated in a way that allows carrying out qualitative and quantitative analysis of communities of foraminifera. The sedimentary material will be subjected to granulometric analysis. Quantity of organic, inorganic carbon and chlorophyll a in the sediment will be determined. The results will be complemented by measurements of seawater temperature and salinity. The obtained data will allow to precisely describe spatial variability of environmental conditions in the Svalbard region and will be used to delineate the sedimentary and environmental gradient in the studied area. Also, the results will allow to verify the established relationships between the foraminiferal biodiversity and environmental conditions in fjords, also in the open marine settings and in the ice-contact zone in the open sea.

Conducted project will extend the knowledge of the communities of foraminifera in the Arctic, resulting in the creation of a model which will be used in further studies on the role of foraminifera in the marine ecosystems. The proposed project will provide a new data on the spatial distribution of benthic foraminifera in the European Arctic, especially in the poorly studied environments in the vicinity of open marine tidewater glaciers. The obtained results will allow to verify the established relationships between the foraminiferal biodiversity and environmental conditions in fjords, also in the open marine settings and in the ice-contact zone in the open sea.

Bringing together the data on contemporary foraminiferal assemblages and environmental gardients will allow us to create a simple method of monitoring the past and present sea environment. The results will be used in further paleoclimatic studies as well as for predicting the direction of future climate changes in the Arctic.