Arctic regions, and especially Spitsbergen, suffer increase of heat transport, which is carried by Atlantic waters. This transport, together with atmospheric circulation and general global climate change, makes dramatic changes in physical environment and thus phenology and distribution of marine species. Physical properties changes are visible through melting season acceleration and hydrological properties of Arctic waters. Those changes , together with changes in biotic part, are subject of intense scientific interest leading to better understanding of the biotic systems functioning-- both marine and terrestrial. Increasing meltwater runoff with high sediment load into Arctic waters, as also other changes in physical environment cause changes in biotic ones. Although the picture of the marine Arctic ecosystem is still incomplete and demands intensive basic researches, it is so far known that in the Arctic fjords ecosystems of a littoral zone, especially in the sheltered parts of the coast, the main role as primary producers plays an underwater meadows. In the polar zones, underwater meadows, often most productive, providing fresh organic carbon both for the land areas and the surrounding deep areas below the euphotic zone. Although they cover only 0,1 % of the seas and ocean's floor worldwide, their input to the global productivity is as high as 5% of total primary production (Smith, 1981).

In contrast to the organic carbon produced in the pelagic zone, carbon of macroalgae origin lasts longer on the bottom and serves a source of food for a longer period of time. Knowledge of the distribution of these habitats is essential for estimating the overall productivity of the Arctic area and processes occurring at the sea-shore interface. This seems to be particularly important in the face of tracking the dynamics of climate change in the Arctic.

More over macroalgae are sensitive for environmental changes. They can be a good indicator of ecosystem health and evolution. Changes in environmental factors (temperature, salinity, turbidity, current velocity) may limit or change their spatial distribution as well as health.

All of this leads to broad scale mapping of marine benthos which is required for better understanding of fjord's ecosystems and the influence of global climate change on its functioning. Presented project's main aim is to create a map of macroalgae occurrence in one of the Spitsbergen's fjords- Isfjorden. Few biological studies of Isfjorden showed differences in the biodiversity of macroalgae over decades, but any regular monitoring of their habitats hasn't been conducted yet. Therefore it is planned to combining acoustic data and video images together with statistical analysis, which will result in a background data for future analyzes of the Arctic ecosystems.

In the aspect of predicting the ecosystem changes under rapid climate change, it is crucial to know the state of the environmental conditions and interplay between hydrological conditions and biotic part of the ecosystem. In contrary to relatively transparent water of lower latitudes seas, Arctic waters are turbid (it's predicted to be more and more), direct visual (by means of aerial or satellite photography) is limited. Thus only hydroacoustic methods lead to proper mapping of underwater meadows.

To sum up, without this basic knowledge about present state of fjordic environmental components, it is almost impossible to judge the vectors of environmental changes. This project therefore includes a pioneering research, however, it is based on a team with extensive experience in research of the Arctic areas, and professional skills in the fields of biology, oceanography, underwater acoustics and modeling.