

(F)FUND - Filter Feeders UNDER change

- unknown annual feeding strategies to be revealed by underwater time-lapse imagery

The project focuses on a large and taxonomically diverse group of animals associated with the seabed and playing an important role in the circulation of matter and energy flow in the coastal zone of polar regions – filter feeders such as barnacles, bivalves, sea squirts or sedentary polychaetes. We will trace their feeding activity continuously throughout the year, simultaneously at Spitsbergen (78 ° N) and in Northern Norway (68 ° N). By comparing the responses of filtering fauna to temporarily varying food availability between these two regions we will (1) explore the environmental flexibility of feeding strategies of different filter feeders under distinct conditions, and (2) predict the directions of future changes of the shallow-water Arctic ecosystem. This is based on the assumption that both regions, although distant from each other and different in prevailing conditions, are under the influence of the same North Atlantic Current, and that the Arctic fauna of Spitsbergen is impoverished fauna of Norway. In the era of the so-called "Atlantification" of high latitudes, meaning a stronger influence of warmer highly saline waters originating from the lower latitudes, all regularities observed in sub-Arctic have a great chance to apply in the near future also in the Arctic, which is only 1000 km away. Thanks to the use of specially designed autonomous underwater time-lapse camera systems, taking photographs every 15 minutes for up to four months at the bottom, we will be able to monitor filter feeders remotely, and collect data that is not available to date. There are very few projects of this type, which is why we expect that just by studying the feeding activity during the polar night, or addressing the seasonal differences we will bring a lot of completely new information and discoveries expanding our current knowledge on polar zoobenthos (i.e. animals associated with the seabed). By comparing the feeding strategies between Spitsbergen and Norway, we will be able to evaluate, among others, whether Arctic filter feeding organisms will begin their foraging activity earlier (?), will they feed more frequently in winter during the polar night (?), and therefore, produce more organic matter even during this typically low production season? All this is of great importance for the functioning of the Arctic benthos and, more broadly, the entire polar ecosystem. The project will also contribute to the development of new scientific topics in such research areas as environmental and evolutionary adaptations, recognized as the main issues of modern ecology and evolution. Thanks to realization of (F)FUND we will be able to answer the question how seasonal environments with different resource levels will influence annual life histories of different species? Revealing this is important because resource limitation is huge driving force which underlines most recent theories and models on life history evolution.