POLAR MARINE ECOSYSTEMS IN THE LIGHT OF NOVEL RESEARCH METHODS

Summary

The polar ecosystems are most impacted by the on-going climate change, therefore, they are currently the main object of scientific interest. Studies in polar marine realm are challenging, since extensive direct oceanographic observations are almost impossible due to remoteness, harsh conditions, extent and complexity of processes shaping that systems. However, they are highly rewarding, bearing elements of scientific discovery.

Novel observational technologies speed up progress in marine research significantly. Accurate analyses of many processes and organisms that were not possible previously using traditional methods, are now implemented and become widely available. Consequently, it is possible to study even the very tiniest marine inhabitants, to automatically estimate a variety of marine resources, follow organisms' dietary components and genetic evolution. Even deep, covered with thick ice ocean habitats are now easily accessible and explored by a great variety of relatively small and affordable automated underwater robots, high resolution cameras and profilers. While satellite observations provide data of both global- and local-scale processes, such as surface water temperature, wave height, properties of ocean currents and ice cover, new software and GPS loggers enable tracking the migrations of various marine species in real time.

Due to the dynamic and complex nature of the oceans, the interdisciplinary approach is the leitmotif of modern and future oceanography. Polar marine researchers are expected to present the full picture of that unique ecosystems. Thanks to modern observation techniques, they are closer than ever to achieve this goal.