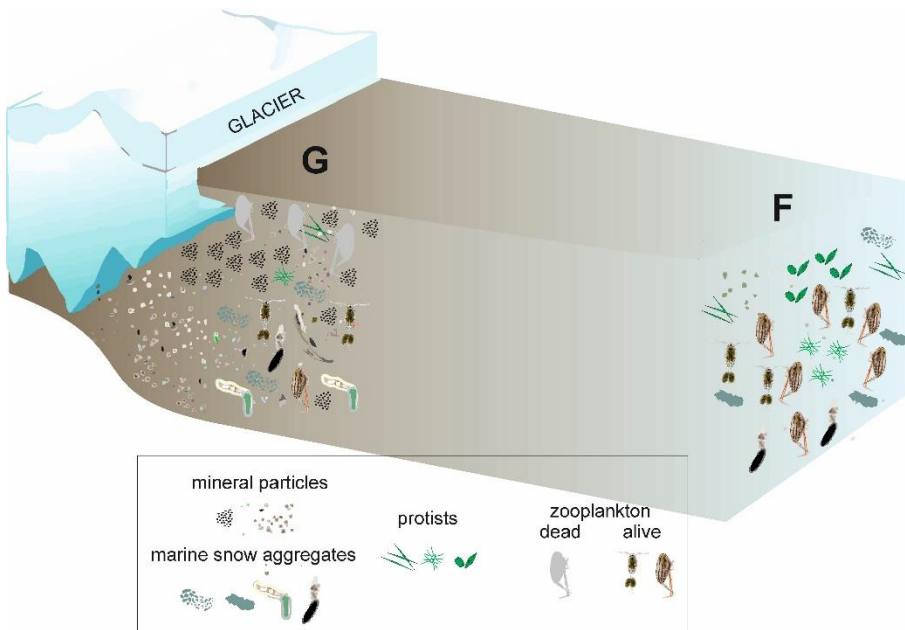


The objective of the project is to analyse the influence of water darkening, due to the intensified glacier/river runoff, on the functioning of the marine pelagic food webs in the Arctic coastal waters. The aim is to quantify how the share of living plankton organisms in relation to mineral and organic particles changes along the gradient from the glacier/river discharge towards the open waters in the fjords of the western Spitsbergen. We **hypothesize** that significant differences will be observed between locations that are close to



the source of glacier/river runoff (G) and the locations situated in the fjord main basin (F) (for details see the conceptual figure). Specifically, we expect higher amount of mineral particles, marine snow aggregates and dead zooplankton in G locations. While better underwater visibility, higher ratio between living/non-living components as well as between photo- and heterotrophic protists will be indicated in F locations.

In general the discharge of glacial water together with suspensions affect so many physical and ecological processes occurring in fjord waters that recognition of this phenomenon remains a great conceptual and methodological challenge, as it requires broad interdisciplinary research in hydrography, optics and plankton ecology together with predator-prey relations. The project sampling would be performed during two summer campaigns (July, 2019 & 2020) from the R/V “Oceania” in different fjords of the west Spitsbergen shelf (e.g., Hornsund, Adventfjord, Kongsfjord). The continuous vertical profiles will be performed by several sensors to measure seawater temperature, salinity and density, the content of the organisms and particles that are actively absorbing light, the mineral suspensions, and the species and size composition of plankton organisms. It would be achieved by the application of both modern laser methods and traditional oceanographic approaches. The water content at particular stations and depth water layers will be attributed to several traits: size, type (mineral vs organic, living vs dead) and composition. As the final result we will parametrize the ‘G-F system’ model that will simulate the composition of various seawater components under different environmental scenarios. .

The project addresses a very important topic regarding the real problems bothering scientists investigating key processes currently occurring in the Arctic, which will have far-reaching consequences for the whole ecosystems. Despite the growing awareness of the scientific community that the phenomenon of coastal water darkening, due to the increased glaciers/rivers runoff, is extremely important for the functioning of polar ecosystems, there is still a lack of holistic research on this issue. Such an evident gap will be filled by this methodically advanced project that perfectly fits the directions of world oceanographic research. Our interdisciplinary study will provide new knowledge about the contribution of living and dead planktonic organisms in relation to organic suspensions and mineral particles, in order to determine their potential accessibility to planktivores. Such comprehensive results will contribute to a much better understanding of currently occurring physical and ecological processes, since it is an important contribution to the development of large-scale research in modern oceanography. The results of the project will be described in several articles published in international peer-reviewed journals and presented at least 4-5 international conferences thematically related to the project.