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CMEMS in support of Arctic research and vice-versa

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The Copernicus Marine Services (CMEMS) for Arctic forecasting have, like a few others, arisen from the oceanographic research community and have then become an operational service in collaboration with meteorological institutes. This ensured the orthodoxy to oceanography research questions that were central 20 years ago and are now core elements of the modelling and assimilation systems operational today.
The vision of an integrated system coupling ocean, sea ice and ecosystem and assimilating data from several satellites and in situ platforms jointly dates back from this period. That vision remains a most attractive feature of the CMEMS services today as a one-stop-shop to obtain mutually consistent forecasts of the ocean, ice and biogeochemical variables, as well as reanalyses over the satellite era.
However, the scientific understanding of the Arctic Ocean is evolving as its rapid warming reveals hitherto overlooked aspects and processes, to which the CMEMS systems must adapt in order to maintain state-of-the-art forecasts. Examples of such aspects are the rheology of sea ice, the assimilation of ecosystem variables and the interactions of waves with the ocean and sea ice. We will take examples from the Arctic MFC system and illustrate cases for which the inclusion of new research is convenient and others for which it is hampered by computational or software limitations.
Reciprocally, we will show examples of applications of the Arctic MFC system that support the Arctic research community.