



Challenges in validating model results for first year ice

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In order to assess the quality of model results for the distribution of first year ice, a comparison with a product based on observations from satellite-borne instruments has been performed. Such a comparison is not straightforward due to the contrasting algorithms that are used in the model product and the remote sensing product. The implementation of the validation is discussed in light of the differences between this set of products, and validation results are presented.

The model product is the daily updated 10-day forecast from the Arctic Monitoring and Forecasting Centre in CMEMS. The forecasts are produced with the assimilative ocean prediction system TOPAZ. Presently, observations of sea ice concentration and sea ice drift are introduced in the assimilation step, but data for sea ice thickness and ice age (or roughness) are not included. The model computes the age of the ice by recording and updating the time passed after ice formation as sea ice grows and deteriorates as it is advected inside the model domain. Ice that is younger than 365 days is classified as first year ice. The fraction of first-year ice is recorded as a tracer in each grid cell.

The Ocean and Sea Ice Thematic Assembly Centre in CMEMS redistributes a daily product from the EU-METSAT OSI SAF of gridded sea ice conditions which include "ice type", a representation of the separation of regions between those infested by first year ice, and those infested by multi-year ice. The ice type is parameterized based on data for the gradient ratio GR(19,37) from SSMIS observations, and from the ASCAT backscatter parameter. This product also includes information on ambiguity in the processing of the remote sensing data, and the product's confidence level, which have a strong seasonal dependency.