



## **Verification of lake surface water temperature and ice on/off dates in ECMWF IFS model**

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Lakes modify the structure of the atmospheric boundary layer. They can intensify winter snowstorms, increase/decrease surface temperature and amount of precipitation. At European Centre for Medium-Range Weather Forecasts (ECMWF) lake parametrization was introduced in 2015. Inland water bodies (lakes, reservoirs, rivers and coastal waters) are simulated by the Fresh-water Lake model FLake, which was chosen to be included in the Integrated Forecasting System (IFS) for its intermediate complexity, particularly adapted for numerical weather prediction and climate applications.

A lake mask consistent with the upgraded land-sea mask has been recently produced. Inland water bodies can have significant impact on local climate (over 1 K difference in 2 meter temperature) and on local weather (up to 10 K difference in 2 meter temperature), so prior to operational use any new water land maps have to be verified by numerical experiments. In order to see how different (and more accurate) boundary conditions of the IFS model can be by using new upgraded land water map and lake cover lake water surface temperature (LSWT) observations and lake ice melting and freezing dates from Finnish Environment Institute (SYKE) were compared with surface offline (no feedback of the surface into the atmosphere) version of the IFS CY43R3 model with newly available ERA5 reanalysis as forcing were run at triangular cubic octahedral grid Tco1279, what corresponds to high horizontal resolution approximately 9 km, output lake mixed-layer temperature and ice on/off dates. Experiment results for the whole 5 year period (from 2010.01.01 to 2014.12.31) and based on separate lake seasons will be presented.