External Data for Lake Parameterization in NWP and Climate Modeling

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Abstract. The main challenge from atmospheric modeling for the lake parameterization is the need to consider all the lakes in the atmospheric model domain. Hence, we should know the parameters of all the lakes on the territory, these data will be utilized by a lake model used as a lake parameterization. To provide these data we need a lake database. To be used by different atmospheric models, a lake database should be global and universal. First steps in this direction are described.

Sensitivity tests with the lake model FLake (Mironov, 2006) have shown the crucial influence of the lake depth on modeling results. So, the mean lake depth appeared to be the kea information to be gathered and processed.

The sources of data for the lake database, which was developed, are: the hydrological lake dataset and the dataset for ecosystems. The information about the target grid (the atmospheric model grid, data will be aggregated to in fine) is necessary also. To combine these raw data and to provide the mean lake depth fields for an arbitrary target grid, the interface (software package) was developed. The basic idea for the interface it that there are errors and uncertainties in both sources of raw data, and these errors should be considered. Using of empirical PDFs for aggregation of data to the target grid is highly desirable. The sources of raw data and the main steps how the data are processed by the interface are described. The examples of the fields of the mean lake depth and lake fraction on the target grid are displayed. Main conclusions from the experience and probable next steps are drawn.

References:

Mironov, D. V.,2006: Parameterization of lakes in numerical weather prediction. Part 1: Description of a lake model. German Weather Service, Offenbach am Main, Germany, 41 pp.