

# The use of bulk and one-dimensional lake models in studies of lake – atmosphere interaction

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The two types of lake models are currently most often used in climate/weather – lake interaction studies: one-dimensional and bulk models. One-dimensional models usually contain more comprehensive physical parameterisations, while the bulk ones are more efficient computationally. The gain in efficiency is apparent, while the shortcomings of “simple” physics of bulk models seem to be poorly understood.

The performance of two lake models is studied against observations: Lake (one-dimensional) (Stepanenko and Lykosov, 2005) and FLake (Mironov et al., 2006). The forcing for these models was the time series of measured meteorological variables in surface layer (if available) or reanalysis data. The observations are in situ measurements of the vertical temperature profiles in lakes, surface temperature and energy fluxes at a number of European and Russian lakes, covering the range of temporal scales from diurnal to multiyear. The correlations and biases between modelled and measured values are studied.

Some future development of parameterisations of hydrological processes for climate studies is reviewed.

## References

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