



## On the numerical study of thermohydrodynamics and biochemistry of inland water bodies

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The study of thermodynamic and biochemical processes of inland water objects using one- and three-dimensional RANS numerical models was carried out both for idealized water bodies and using measurements data. The need to take into account seiche oscillations to correctly reproduce the deepening of the upper mixed layer in one-dimensional (vertical) models is demonstrated. We considered the one-dimensional LAKE model [1] and the three-dimensional model [2, 3, 4] developed at the Research Computing Center of Moscow State University on the basis of a hydrodynamic code combining DNS/LES/RANS approaches for calculating geophysical turbulent flows. The three-dimensional model was supplemented by the equations for calculating biochemical substances by analogy with the one-dimensional biochemistry equations used in the LAKE model. The effect of mixing processes on the distribution of concentration of greenhouse gases, in particular, methane and oxygen, was studied.

The work was supported by grants of the RF President's Grant for Young Scientists (MK-1867.2020.5, MD-1850.2020.5) and by the RFBR (19-05-00249, 20-05-00776).

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