



Numerical modeling of internal mixing and greenhouse gas dynamics in a boreal lake

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One-dimensional k-epsilon numerical model LAKE is used to simulate thermal regime and greenhouse gas dynamics in Lake Kuivajarvi, Finland. The meteorological forcing data along with in-lake variables (temperature, oxygen, methane, carbon dioxide) are provided from raft measurements by University of Helsinki. The model is shown to be capable of reproducing annual cycle of gases' concentration profiles in the lake. A number of internal mixing mechanisms (surface roughness, momentum flux partitioning, internal gravity waves, seiches) are evaluated in LAKE to show their influence on the vertical gas transport.