**DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
UNIVERSITY OF SOUTHERN DENMARK, ODENSE**

Mathematics seminar

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An SDE wind model applied to a hydrodynamic lake model

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Authors

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Abstract

Accurate modelling of lake water temperature is important in multiple contexts. Firstly, empirical time series and thermal imagery data have found a trend of increasing lake surface temperature around the globe during the last decades.

Lake water temperature warming alters the lake stratification period, changes the thermocline depth and reduces ice cover. In the ecological context, increased lake water temperature alters biomass size, contributes to cyanobacteria bloom formation and alters thermal refuge conditions, threatens vulnerable freshwater fish faunas, alters greenhouse gas fluxes, and affects metabolic rate and balance.

In our studies, the popular 1-dimensional lake model Simstrat [1] has been applied to the very well surveilled lake Årungen near Oslo, with focus on how the stratification of the lake is influenced by the input data (weather conditions), in particular the effect of the wind. For this aim, an SDE wind model has been developed, and results of using this model are compared with results from measured data.

[1] Goudsmit et.al., 2002.

Host: David Kyed