Modeling historical lake level fluctuations for Lake Van (Turkey).

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Lake Van is situated on the high plateaus of the Eastern Anatolia (Turkey) at about 43 E longitude and 38.5 N latitude. It has a variable surface area of 3500-3650 km^2 and an average water depth of 170 m, reaching a maximum of 451 m at the middle of Tatvan Basin. Lake Van is the largest soda lake on earth and the fourth largest lake with a closed hydrological basin.

Lake's circulation and thermal structure has been simulated using POM (Princeton Ocean Model), a three-dimensional sigma-coordinate primitive equation model with a free surface. Our simulations were conducted with a horizontal resolution of 1 km and 30 sigma levels. POM is forced with energy and water flux and air temperature fields obtained by dynamical downscaling of NCEP/NCAR Reanalysis data using a mesoscale atmospheric model (MM5). Data corresponding to 1960-2006 period has been downscaled to 9 km horizontal resolution over the Lake Van.

The main aim of this study is to simulate the observed historical water level fluctuations. Lake surface's contribution to the basin moisture balance is calculated from simulated lake surface temperatures. Land contribution is estimated from MM5's surface water balance.