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A water table fluctuations model in sandy soil below a coastal pine forest.

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The San Vitale pine forest (*Pinus pinea*) is located near Ravenna in the eastern side of the Po'Plain on the eastern coast of Italy. The pine forest lies parallel to the coast as a narrow belt (about 2 km broad) for a lenght of 11 km.

Although the SanVitale pine forest has a natural drainage, the influence of a surrounding mechanically drained area has to be accounted for a correct water budget determination.

A quite homogeneous sandy soil is present below the vegetation from surface up to a depth of ten meters.

The pine forest was originally located on a topographically elevated area (beach-ridge deposits), as *Pinus pinea* usually grows on dry well drained soils. Subsidence, water pumping and saltwater intrusion are now jeopardizing this delicate wetland environment.

The local scale water budget and water table variations could not be described with widely used infiltration models, thus the construction of a specific water table fluctuations model was required in order to provide reliable information for the water management of the pine forest.

We are monitoring the water table level in a number of observation wells by means of a monthly survey including temperature and electrical conductivity measurements. The observation period started on Autumn 2004 and is still ongoing: a three years inventory gave us the base for the calibration of the water table fluctuation analytical model.

Preliminary investigations were carried out on regional climatic datasets, which furnished daily precipitation and temperature values. Evaporation was calculated on the base of Hamon equation and both the evaporation below pine roots and the evapotranspiration above the root depth have been considered.

Daily water table variations are predicted on the base of climate and vegetation data. Soil properties such as specific yield and retention water were also used as input data.

The direct observations collected during the wells monitoring match well the predicted water table fluctuations.

This correspondence let the data inversion providing informations on some parameters of the hydrologic cycle, which are usually hard to quantify such as the component of precipitation intercepted by the pine forest before reaching the soil, and the interaction between surface and groundwater close to ditches and canals.