

**Multi-model approach to evaluate the impact of a future well field on forest production  
(South-West of France)  
Abstract n°1538**

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**KEYWORDS:** groundwater model, forest growth model, multilayer aquifer system

In Gironde (SW of France), 98% of drinking water comes from the North Aquitaine multilayered aquifer system. It constitutes a strategic water resource considering the great quality of this water and its natural protection against anthropic pollutions. Nevertheless, some of these aquifers are overexploited. In order to manage these resources, a regional planning of groundwater was approved in 2003. It plans the realization of new facilities to improve the spatial distribution of pumping areas in order to minimize groundwater mining impacts on specific sites. Thus, a new well field is planned in the Medoc region at 35 km west of Bordeaux. It will be composed of 14 wells and will produce 10 million cubic meters by year extract from Oligocene aquifer (150 m below ground surface). In this region, most of the surface is occupied by the Landes forest, which corresponds to a monoculture of maritime pines (*Pinus pinaster*). Soils are mainly composed of sand in which a phreatic aquifer (Plio-Quaternary) is in development. In order to evaluate the impact of the future well field on the Oligocene aquifer and the multilayered aquifer system, a hydrodynamic model (PHONEME) was specially built for this with MARHTE (Thiéry, 2014). It incorporates 8 aquifers and 7 aquitards, covering a total surface of 4,430 km<sup>2</sup>. Simulations done with the groundwater model show a maximum impact of 30 m on the Oligocene and an impact between 0 and 35 cm on the phreatic aquifer. Results from the hydrodynamic model were used to evaluate impact on forest production using the INRA forest growth model GO+ (Lousteau et al., 2012 ). This multi-model approach was done in order to gives some answers on the impacts on the growth of trees with the implementation of a well field and to bring solutions to limit use conflicts.

