

Lundi 28 février 2005 à 14h30

**Salle 104 de la Maison des Sciences de l'Eau
300, avenue Emile Jeanbrau à Montpellier**

The XX-th century water table drop the Lake Chad basin:
groundwater modelling in the conditions of data scarcity.

Par [Anastasia Boronina](#)

qui termine son séjour de post-doc à HydroSciences Montpellier

Durée de la présentation : 40 mn. En anglais.

Résumé :

The quaternary aquifer of the Lake Chad basin occupies an area of 500,000 km² and consists of aeolian and fluvio-lacustrine sediments.

Water scarcity that has existed in the region due to its arid and semi-arid climate, worsened during the last decades because of the regional decrease of rainfall or/and intensifying water exploitation. A continuous regional drop of the water table up to 0.10 m/year was observed in the past four decades.

The steady state and transient groundwater flow in the quaternary phreatic aquifer was modelled by FEFLOW finite-element simulator. The following questions were addressed to the numerical model: 1) what is the main cause for the long-term drop in piezometry? 2) how will the groundwater table react to possible further shrinkage of the Lake Chad 3) which kind of additional information could help to reduce model uncertainty?

Due to the vast extent of the region and difficulties of its access, the applicability of usual hydrodynamic data (such as K, S, h) is limited. To cope with this data scarcity, the following groundwater modeling methodology was adopted. First, we used *a priori* hydrochemical and geomorphological information to create a conceptual model of regional recharge-discharge. Second, we calibrated absolute values of effective recharge by measured piezometry keeping fixed a single mean value of hydraulic conductivity and specific yield. Third, we estimated the uncertainty of the model conclusions resulted from the uncertainty on hydraulic conductivity.

The main results of the groundwater flow model were calibrated datasets for transmissivity, recharge and evaporation and the regional water balance. The regional reduction of the groundwater storage due to the deficit of rainfall was simulated to be around $3 \times 10^4 \text{ Mm}^3$ for the years 1961-2004.

Contact Séminaires HSM-MSE-ILEE

Muriel Tapiou
HydroSciences Montpellier
UMII - Case MSE
34095 Montpellier cedex 5

Tél. 04 67 14 90 20

Fax 04 67 14 90 10

<http://www.hydrosciences.org/>

<http://www.ifr-ilee.org>