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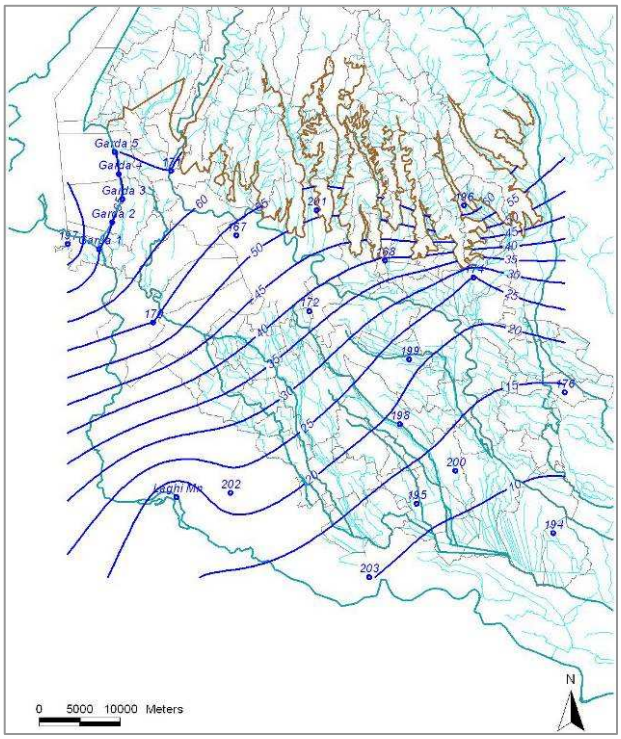
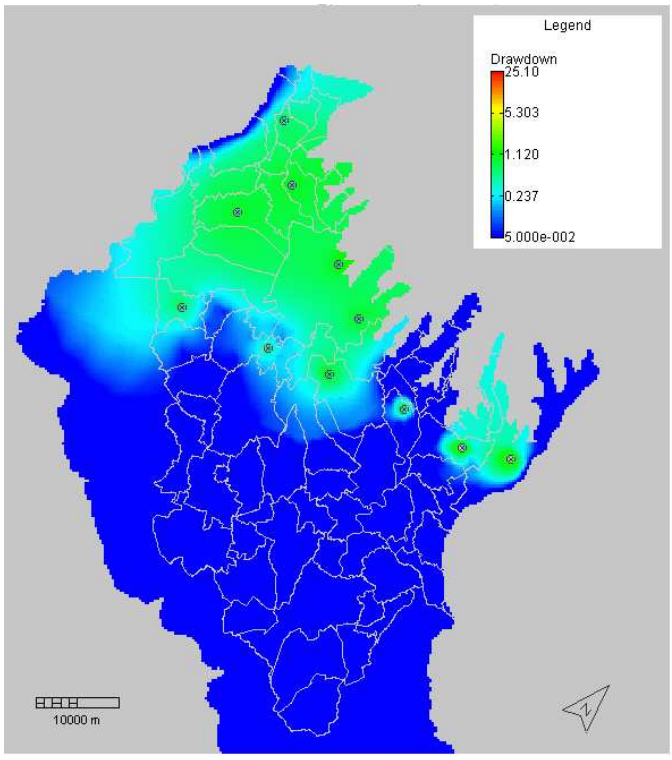
Quantitative Management of Groundwater Resource in Verona Province by Prediction made through a Flow Model

A regional groundwater flow model was built for AGSM Verona, the authority that manages the water supplies of Verona and other towns within the Province.



The model covers a surface area of 2.870 km^2. It is limited to the north by the Monte Baldo massif, the Lessini mountains and the Alpone massif, to the west by the Garda Lake and by the Mincio River, to the south by the Mantova lakes, the Mincio River and the Po River, and to the east by the Agno-Guà river. The model covers the hydrogeological units of the Garda Lake glacial deposits (moraines) and the upper and lower alluvional plains.

A geological and hydrogeological study of the whole province, comprising the Euganei and Berici mountains, was early developed before starting to the modelling process. The model was realised using USGS' finite difference code Modflow within the commercial tool Groundwater Vistas in steady state condition and was calibrated.



The calibrated model was used to calculate the water balance of the investigated area, namely the quantity of water exchanged between the hydrogeological units, rivers and the aquifer and eventually the flow rate of the springs in the area.

The model was used also to define the distribution of availability of water resources to predict the drawdown in different abstraction scenarios.

Based on the outcomes of the modelling process an abstraction condition was defined aimed for minimizing the quantitative impacts and allowed to predict a homogeneous and sustainable groundwater drawdown in the modelled region.