

CLIMATIC CHANGE EFFECTS ON GROUNDWATERS IN MILANO AND LODI PROVINCES.

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This study is a part of the “Regional Impact of Climatic Change in Lombardy Water Resources: Modelling and Applications” (RICLC-WARM) project. This project is based on the analysis of the integrated hydrologic cycle, in the river Adda basin. The match is to develop a methodology to a sustainable management of water resources in a very highly populated and industrialized area. Concerning groundwater, study has been focused on Milano and Lodi provinces. Piezometric levels, hydrometric levels and pluviometric data have been collected. Piezometric data are recorded by a dense groundwater quantitative monitoring network. It's constituted by nearly 145 wells and it's been working since 1979; piezometric levels are on a monthly base. Instead hydrometric and pluviometric data are registered by manual and mechanic stations distributed within the considered provinces and neighbouring areas. This data set has allowed a spatial and temporal analysis of the uppermost unconfined aquifer of Lombardy aquifer system. First of all, a temporal trend analysis has been carried out; long series of piezometric data (1979-2005) have been compared with hydrometric and pluviometric data sets. This comparison, developed also using index such as SPI (Standardized Precipitation Index), has highlighted correlation or not correlation between superficial waters and groundwater and the most important extreme climatic events (drought or flooding) and groundwater. Later, piezometric levels and hydrometric levels of the most important rivers have been elaborated with geostatistical techniques, taking into account the hydrographic network. Piezometric countour maps have been obtained in order to put in evidence differences in the water table levels, on a yearly and seasonal base, to underline the presence of a spatial trend. The project aims to evaluate impacts on groundwater in critical situations, connected with agricultural system, for different climatic conditions and hydrogeological characteristics.