

## A Network in Sicily Devoted to Groundwater Monitoring

P.L. Cosentino\*, G. Geraci\*\*, S. Pellerito\*, I. Razo Amoroz\*, T. Vega\*\*

\* Department CFTA, University of Palermo (ITALY)

\*\* Servizio Tecnico Idrografico della Regione siciliana

### Abstract

In the frame of European Communitarian interventions “INTERREG II/C ITALIA – Environmental set up and fight against drought”, in Sicily has been planned and partially installed a remote controlled hydro-meteorological network. A first core was constituted by a set of hydro-metrographic stations, which have been integrated by other phreatimetric wells: all the resulting station-points have been connected with the data center (CRED) of Palermo, by means of GSM transmitting devices. In particular, we have 255 remote stations, divided in eight typologies following the measurements: 42 phreatimetric stations have been installed (see figure) in the first phase, 40 new stations are now in preparation. The project plan includes a total number of stations ranging from 200 to 300, depending on many factors: 1) reliability of the stations with regards to service time and space representativeness of the measurements and 2) number of the different underground aquifers which have to be monitored.

The current work consists in:

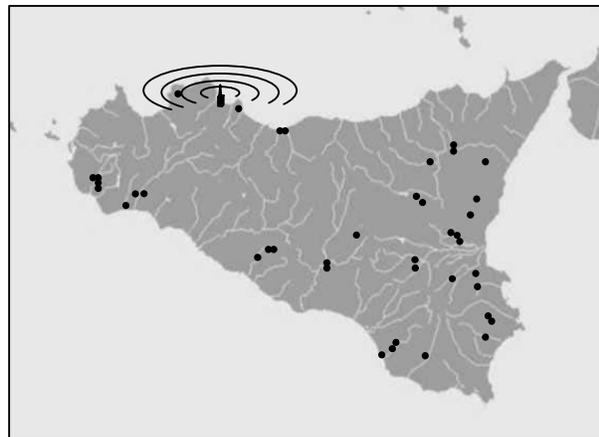
1. Validation of the remote control system and technical test of the network (continuous monitoring of data, reliability and continuity of instruments and transmission);
2. Increase of the number of piezometric stations to obtain a density level useful to optimize the space significance of the controls;
3. Enhance of hydrologic controls on springs and surface water flows in order to build an integrated hydrogeologic network.

General geologic conditions of Sicily induce two types of hydrogeologic settlement in coastal areas:

- A main shallow free-nappe aquifer, constituted by terraced sea deposits
- A main deep aquifer, differently confined, constituted by carbonate formations underlying minor shallow aquifers. These aquifers represent the main underground water resources of southeastern Sicily, which supplies fresh water both for civil and industrial.

The large extension of the Sicilian coastal plains, where important aquifers are flowing into the sea, without any significant and large natural geological barriers, induces sea water intrusion along a large part of the coast. In the recent drought years the transition zone between salt and fresh waters is increasingly raising, so that recent studies accounted for large advancements of isohalines towards hinterland.

Consequently a special attention is paid towards these areas in our project: selected coastal stations will be integrated with thermal and conductive meters located at three different levels along the water columns, so that the movements of the transition zone can be monitored. Furthermore, in the same stations, temperature and atmospheric pressure will be monitored. The main monitored guide parameters will be: temperature, pH, conductivity salinity, redox potential and dissolved oxygen.



First core of 42 phreatimetric stations in Sicily.

The Second International Conference on Saltwater Intrusion and Coastal Aquifers — Monitoring, Modeling, and Management. Mérida, Yucatán, México, March 30 - April 2, 2003

The CRED center of Palermo will accumulate and elaborate incoming data to build a general database implemented on a GIS service, useful for water management in both normal and drought emergency.