UNIVERSITA' DEGLI STUDI DI MILANO - BICOCCA

RELATIONSHIP BETWEEN INPUT AND OUTPUT OF WATER BALANCE IN LOMBARDY PLAIN FROM TICINO RIVER TO OGLIO RIVER

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RESEARCH PROJECT RICLIC-WARM

(Regional Impact of Climatic Change in Lombardy Water Resources: Modelling and Applications)

The target of the project is to develop a scientific methodology in order to evaluate climatic impacts on water resources of Lombardia region.
The project involves: public monitoring authorities (ARPA LOMBARDIA), scientific research authorities (UNIMIB, UNIMI, UNIPV) and regional public authorities (REGIONE LOMBARDIA).

www.riclic.unimib.it

TARGETS OF THIS STUDY

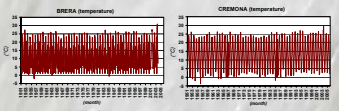
- Rebuilding of pluviometric, hydrometric, discharge and piezometric datasets, necessary to the study of hydrogeological cycle and its evolution.
- Analisys of temporal trend of datasets.
- Comparison between rainfalls datasets and hydrometric/discharge datsets, between rainfalls datasets and piezometric datasets in order to underline possible relationship between them.
- Identifying anomalous drought or wet periods, thanks to SPI.

GLOBAL CHANGE

Hydrogeological system

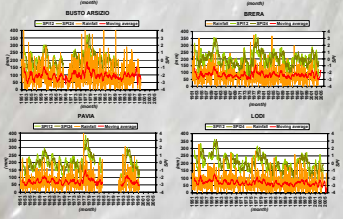
DATA

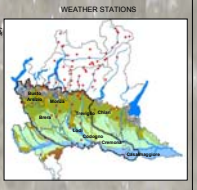
INPUT — rainfall temperature



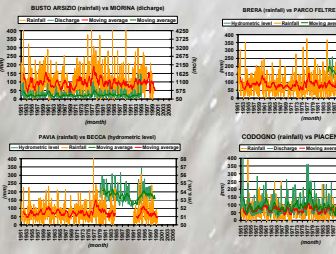
Standardized precipitation index (SPI)

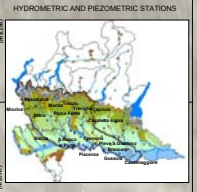
SPI is a tool wich was developed primarily to define and monitor drought. It can also be used to dertimine periods of anomalous wet events.
Technically, the SPI is the number of standard deviations that the observed value would deviate from the long-term mean, for a normally distributed random variable. Since precipitation is not normally distributed, a transformation is first applied so that the transformed precipitation values follow a normal distribution. *(www.wrcc.dri.edu – Western Regional Climate Center)*



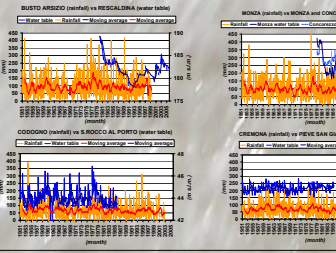


OUTPUT — Superficial water

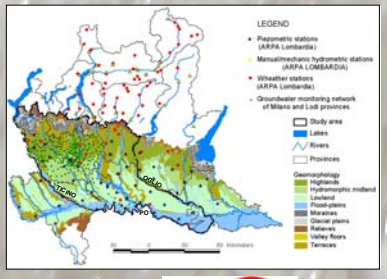




OUTPUT — Groudwater



MONITORING NETWORK



In Lombardia parameters that describe the hydrogeological cycle are monitored by different Monitoring Networks:

- Regional thermometric and pluviometric monitoring network (ARPA Lombardia).
- Manual and mechanic hydrometric monitoring network (ARPA Lombardia).
- Automatic hydrometric monitoring network (ARPA Lombardia).
- Regional piezometric monitoring network (ARPA Lombardia).
- Groundwater monitoring network of Milano and Lodi provinces.

CONCLUSIONS

- This study is only a preliminary analysis of the complex datasets collected.
- The validity of every elaboration is associated to a limited temporal continuity of data.
- The comparison between the pluviometric and hydrometric/discharge datasets shows that surface water is directly correlated to rainfalls.
- The comparison between the pluviometric and piezometric datasets shows that water table level is directly correlated not only to rainfalls, but also to other anthropic factors like pumping and irrigation.

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SESSIONE 59 – T32 – Idrogeologia applicata in aree urbanizzate.