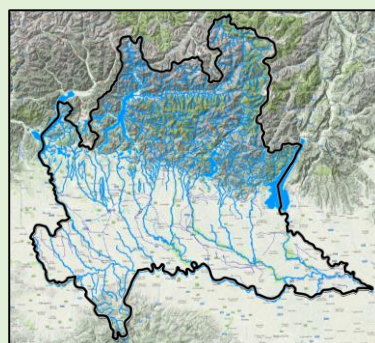


SURFACE WATER, A RESOURCE AND A DANGER TO BE MONITORED: HOW?



WATER USED BY
Ecosystem
Drinking
Agriculture
Industry
Energy production
Tourism
Navigation

LOMBARDY: A REGION OF WATER!



COMPLEX OROGRAPHY
Alps
Hill zone
Po river plain

COMPLEX HYDROGRAPHY
Mountain rivers
Big regulated lakes
Plain rivers
Artificial channels

WATER RESOURCES MANAGEMENT AND FLOOD MONITORING REQUIRE TO KNOW

Discharge and hydrometric levels at

- Mountain catchments
- Inlet and outlet from regulated lakes
- Lakes level and storage
- Confluences
- Flooding areas or sites
- Historical sites (climate)

2006-2016: 10 YEARS OF HARD WORK

30% MAJOR REVISION OF THE HYDRO-NETWORK

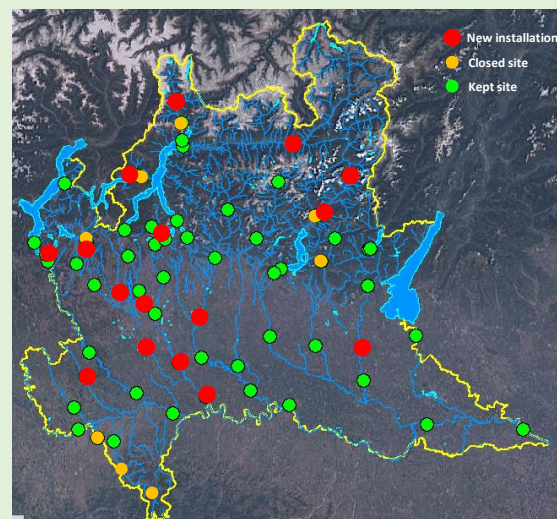
In the last 10 years ARPA performed a major revision of the river gauging network
Around 30% of the network was revised, many stations were closed and other installed

SITE SELECTION CRITERIA

- What do I want know/measure?
- Is it there?
- Can I measure it?
- Can I transmit the data?
- Can I maintain the station and the site?

STATION INSTALLATION STEPS (up to 2.5 years)

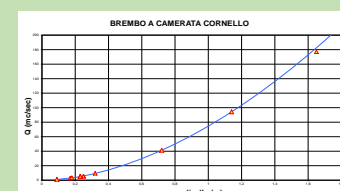
- Project elaboration
- Fund raising
- Instrument purchasing
- Authorisations by authorities (many....)
- Instrument installation



ADOPTED TECHNOLOGY

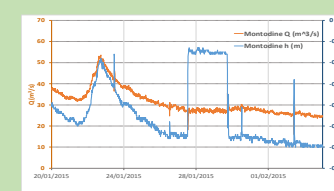
COLLECTING WATER LEVEL AND DISCHARGE

WATER LEVEL GAUGE AND RATING CURVE



Discharge is evaluated by water level only. The rating curve exists and is estimated.

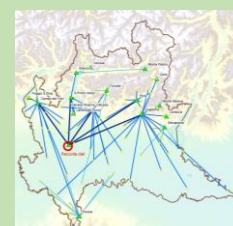
VELOCITY INDEX METHOD FOR NATURAL OR ANTHROPIC BACKFLOWS



Discharge is evaluated by water level and velocity. Artificial changes in water level do not affect the discharge estimation.

DOUBLE SYSTEM DATA TRANSMISSION: DATA GARANTEED EVERY 10 MINUTES

DEDICATED UHF RADIO NETWORK



GPRS MOBILE NETWORK



This double approach ensures a very robust transmission and it allows ARPA to collect and publish data every 10 minutes.

REAL TIME FREE PUBLICATION OF DATA



<http://Idro.arpalombardia.it>

PEOPLE AT WORK EVERY DAY

SPOT DISCHARGE MEASURES

Spot discharge measures are performed on every site in every hydrological condition, at least twice a year, if nothing changes. To recalibrate a rating curve, even more than 10 measures are required.



NETWORK CORRECT WORKING CHECK

Daily, an operator has to follow a check list

- Data are available on web
- Data are available on the Data Base
- Data are transmitted to Civil Protection Agency
- Data values are reliable

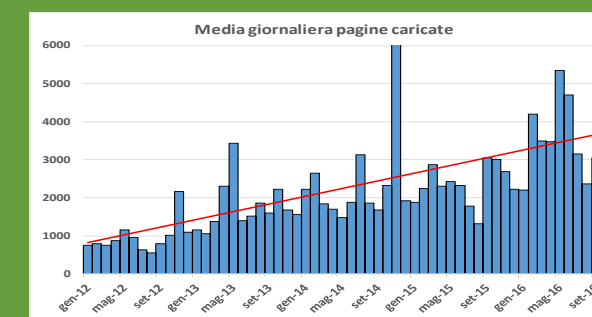


If something does not work the maintenance service is requested.



When the problem is fixed the request is closed

DATA DOWNLOADS BY END USERS



The number of people connecting to our web site is increasing over the years. This confirms the quality of our work and pushes us to continue improving our services