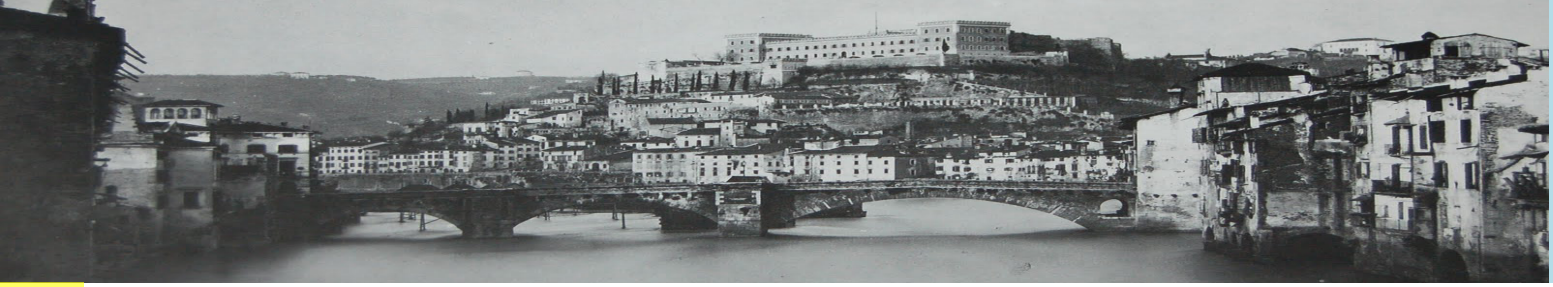

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20-21 Maggio
2019

PRIMO RALLY NAZIONALE DI IDROMETRIA

PROPOSTE OPERATIVE

Silvano Pecora

Servizio Idrografia e Idrologia Regionale e Distretto Po

Struttura Idro-Meteo-Clima

Arpae

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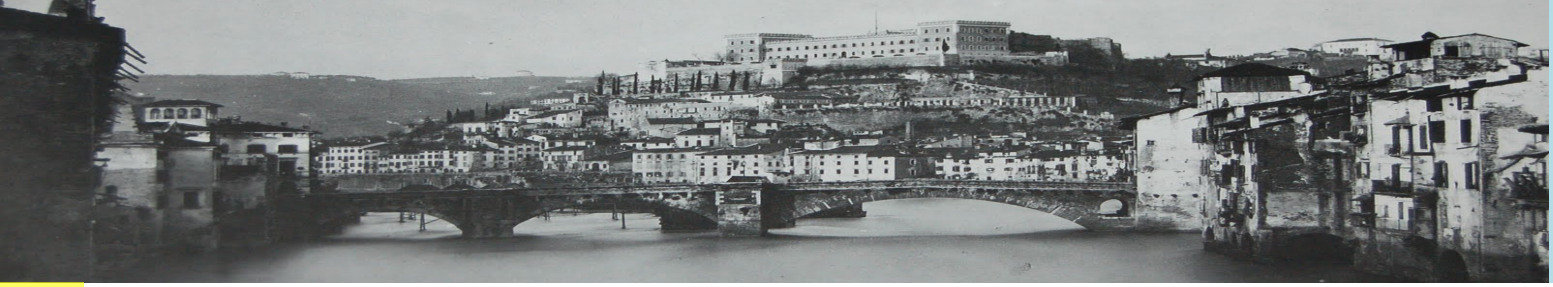
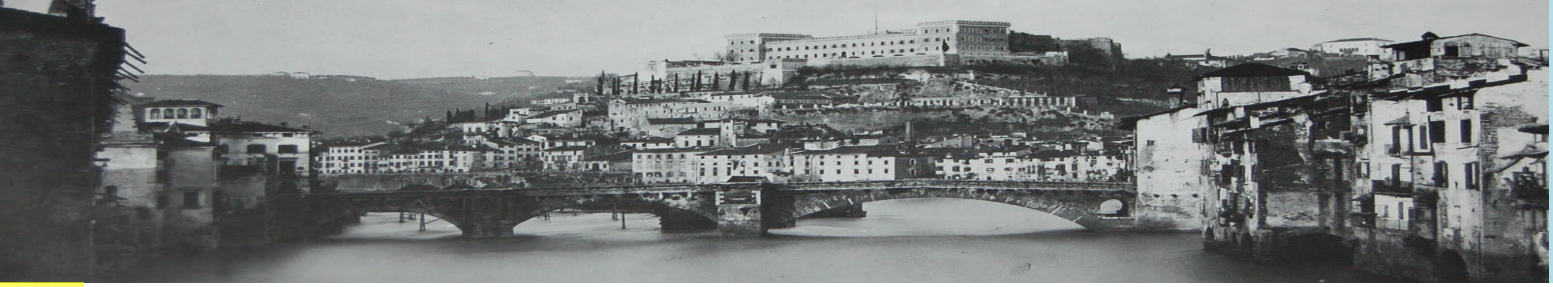
CONSORZIO DI BONIFICA VERONESE



QUALI SONO GLI OBIETTIVI DI LUNGO TERMINE DI UN SERVIZIO IDROLOGICO?

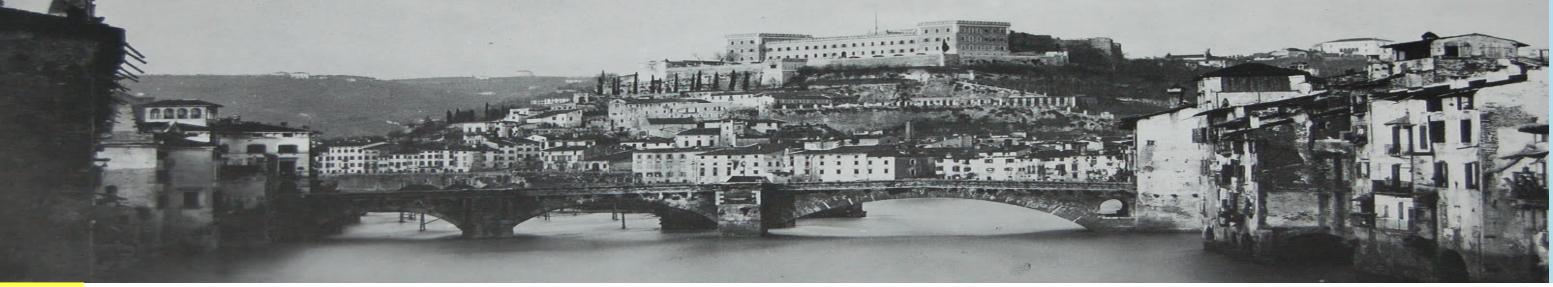
Il confronto con la comunità idrologica internazionale ha individuato otto punti fondamentali che l'idrologia deve considerare nei propri servizi operativi

1) Eventi di piena
2) Eventi di magra
3) Sicurezza alimentare
4) Supporto alla scienza
5) Conoscenza scientifica
6) Disponibilità delle risorse idriche
7) Sviluppo sostenibile
8) Qualità delle acque



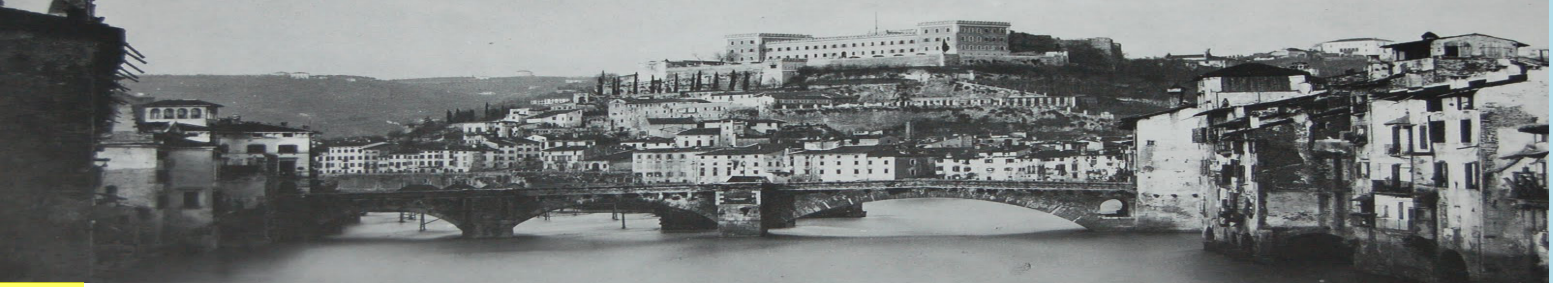
NO ONE IS SURPRISED BY A FLOOD

Risk assessment, proper planning and mitigation are the cornerstones of any National Meteorological and Hydrological Service (NMHS) measure to reduce flood risks. Timely forecasts/warnings must be produced at regional/national/local levels and communicated through appropriate authorities. Current tools for prevention, mitigation and forecasting must incorporate important ancillary data and a thorough understanding of water management and the dynamics of land use. Data and products relevant for flood risk assessment and management should be provided to relevant stakeholders. Achieving this ambition will rely on further integrating the end-to-end early warning systems (E2E EWS) for flood forecasting, the Flash Flood Guidance Systems (FFGS), the Associated Programme on Flood Management (APFM), the Coastal Inundation Forecasting Demonstration Project (CIFDP), together with the Severe Weather Forecasting Demonstration Project (SWFDP) and the Global Data-processing and Forecasting System (GDPFS)



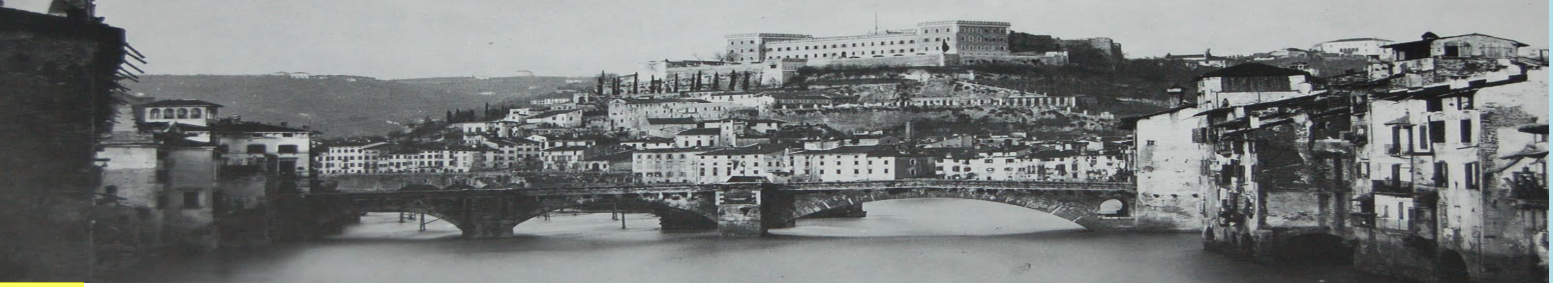
EVERYONE IS PREPARED FOR DROUGHT

Drought risk management should be undertaken by WMO Members and through regional centres. The Integrated Drought Management Programme (IDMP) can serve as a nucleus to further develop necessary alliances and capabilities, including a detailed understanding of hydrological drought mitigation through reservoir operations, natural systems, conservation and the use of local/regional/national water. IDMP should be supported by climatological and hydrological prediction capabilities, water resources management, the Global Hydrological Status and Outlook System (HydroSOS), Regional Climate Centres (RCCs) and GDPFS



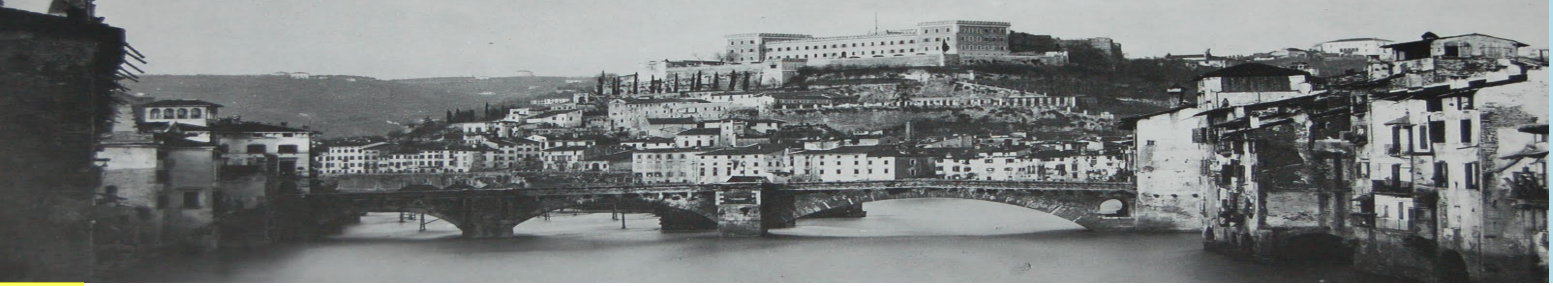
HYDRO-CLIMATE AND METEOROLOGICAL DATA SUPPORT THE FOOD SECURITY AGENDA

WMO should support resolving the equation of water demand for human consumption, irrigation requirements, water availability and potential water storage and should provide advice to optimize rainfed and irrigated agriculture. The water-energy-food nexus should be considered as well. This ambition should be supported by integrating the agrometeorological, climatological and hydrological expertise of WMO with socioeconomic and geophysical data and water resources management practices



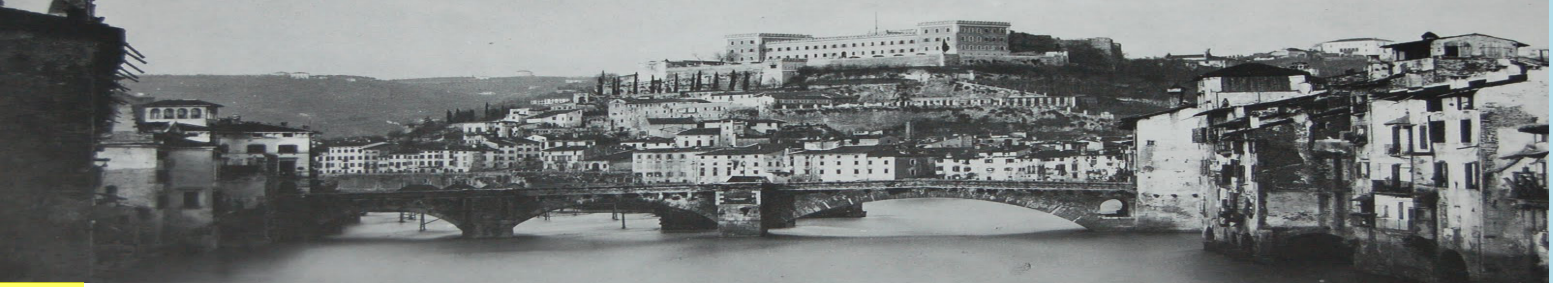
HIGH-QUALITY DATA SUPPORTS SCIENCE

WMO should support Members in accessing proper technology and with respect to the generation of high-quality hydrological data and the corresponding information products and services. This ambition can be realized with support from Global Water Data Centres, can benefit from further developing the Global Hydrometry Support Facility (HydroHub), the World Hydrological Cycle Observing System (WHYCOS), the Meteorological, Climatological and Hydrological Database Management System (MCH), the WMO Hydrological Observing System (WHOS), the Innovation Hub and the Quality Management Framework - Hydrology (QMF-H) and is essential for the wise management of our water resources. The future GDPFS and the upcoming operational phase of the WMO Integrated Global Observing System (WIGOS) and the next generation of the WMO Information System (WIS) 2.0 are expected to support the achievement of this ambition



SCIENCE PROVIDES A SOUND BASIS FOR OPERATIONAL HYDROLOGY

Scientific knowledge should be strengthened to support operational hydrological predictions and modelling as part of an integrated Earth systems approach. This ambition would benefit from an improved understanding of the impacts of various stressors on the hydrological cycle, in support of closing the water balance



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WE HAVE THOROUGH KNOWLEDGE OF THE WATER RESOURCES OF OUR WORLD

An appropriate monitoring system, addressing all the key variables associated with operational hydrology, including the cryosphere, should span the globe and produce information that can be used to optimize the efficiency of existing services, future policies and services and political decision-making from the local to the global scale. Further development of WMO initiatives such as WHOS, HydroSOS and the Global Cryosphere Watch, matched with other international efforts, should support a fully operational World Water Data Initiative and enable local and global assessments of the availability of water resources

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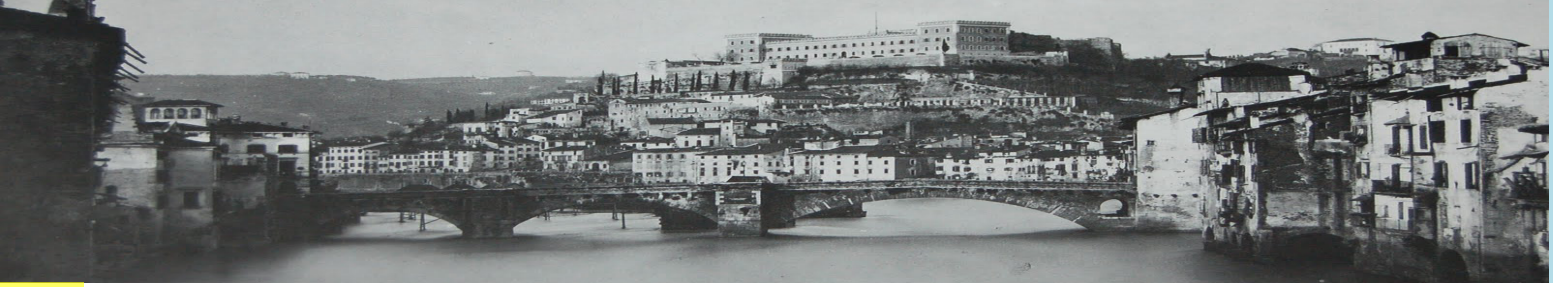
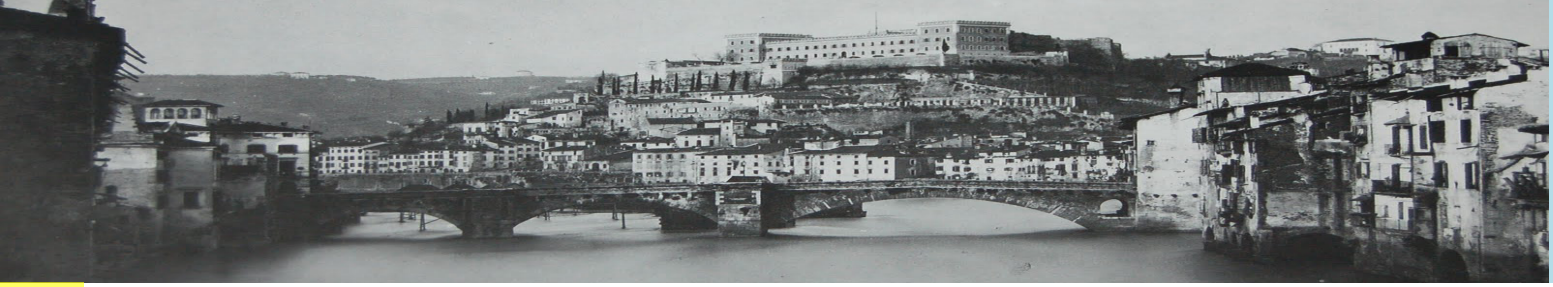


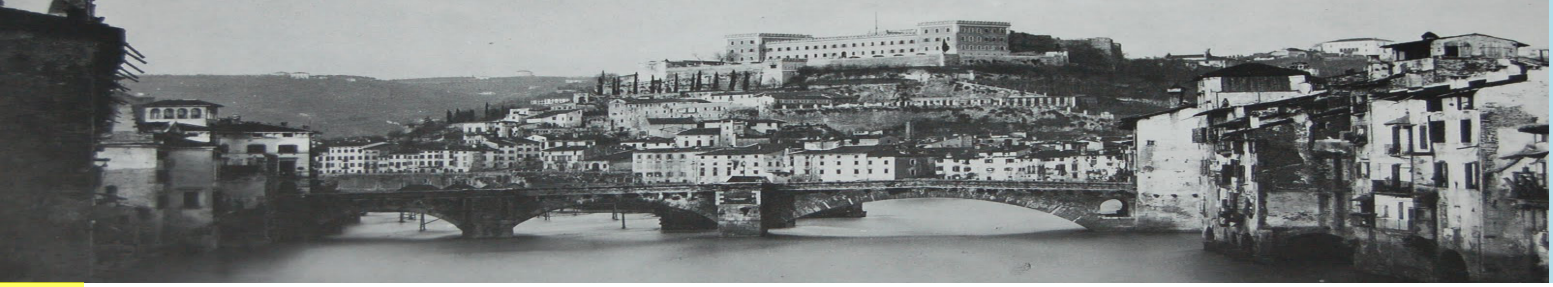
SUSTAINABLE DEVELOPMENT IS SUPPORTED BY HYDROLOGICAL INFORMATION

Hydrological information should be available at all appropriate scales in space and time in order to support all water-dependent sectors for optimal operational water resources management as well as for planning and adapting to transient environmental conditions, particularly those associated with climate change. The future GDPFS should lend itself to being merged with those WMO activities related to the Global Expanded Monitoring Initiative. This ambition is also a great opportunity to include private partners and research in the provision of future services. Changes to hydrological regimes should be tracked and adequately allocated to support water resources management



WATER QUALITY IS KNOWN

Surface and groundwater quality should be permanently monitored as a necessary step to ensure water quality in accordance with different requirements for society and ecosystems, and corrective actions should be applied when necessary. A new partnership will be needed to support this ambition, including existing links to the Global Environment Monitoring System-Water (United Nations Environment Programme), the United Nations Educational, Scientific and Cultural Organization and other relevant stakeholders



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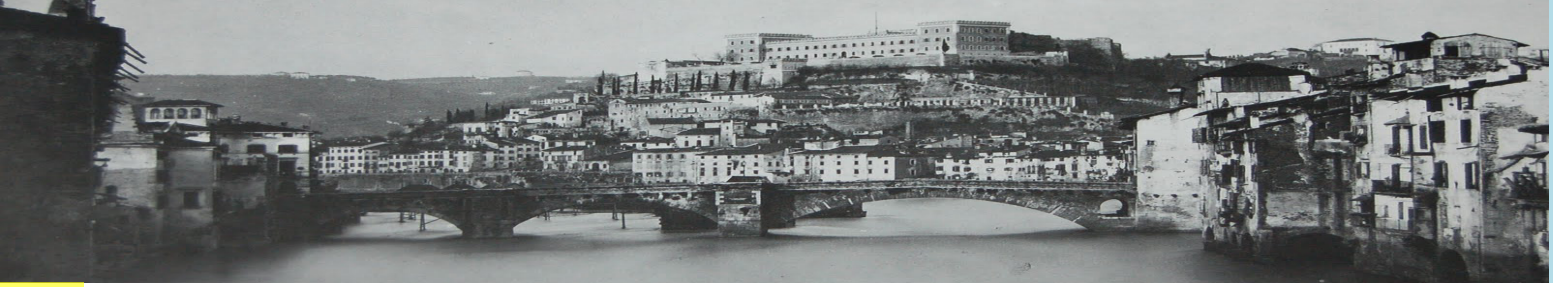
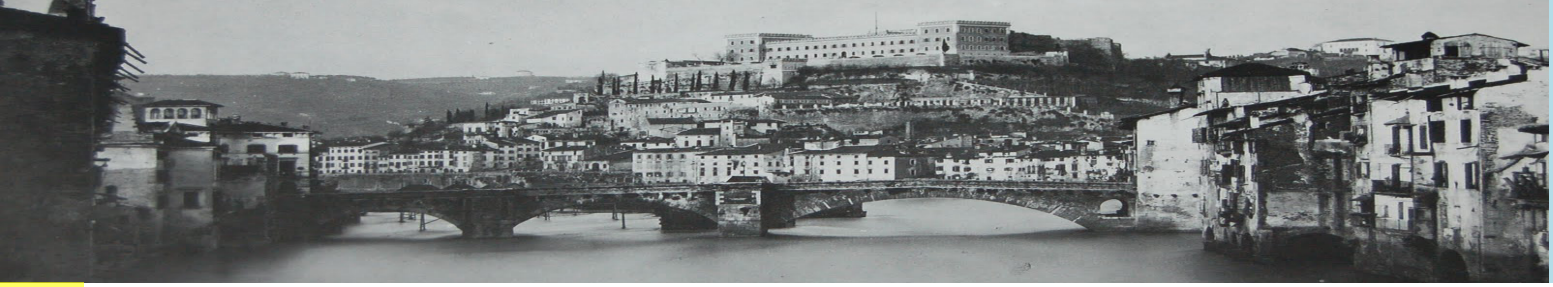


DEFINIZIONE DI IDROLOGIA OPERATIVA

The definition of the term "operational hydrology" shall be:

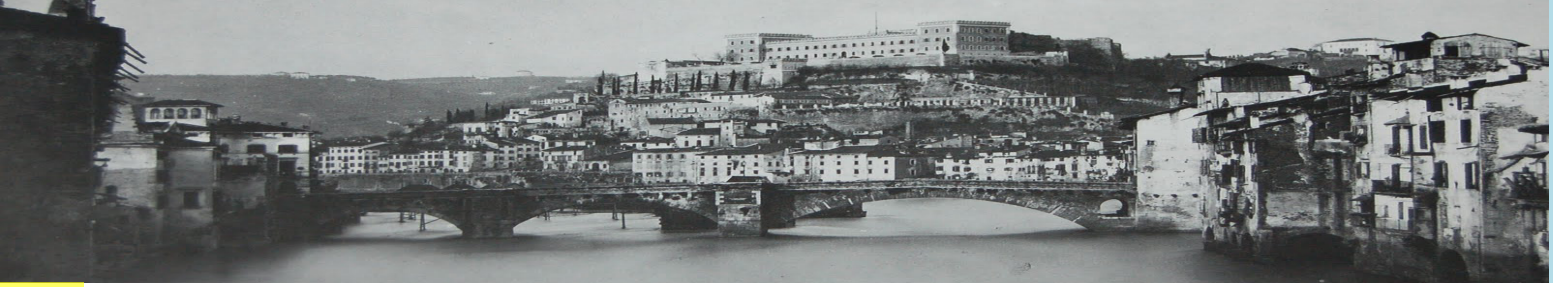
- Measurement of variables related to the hydrological cycle from networks of hydrological, hydrometeorological, and cryospheric stations; collection, transmission, processing, storage, retrieval and dissemination of hydrological data;
- Hydrological forecasting, seasonal hydrological prediction and related functionalities (e.g. forecast verification);
- Research, development and improvement of operational methods, procedures, and techniques in:
  - (a) Network design
  - (b) Observations and instruments
  - (c) Applications of remote sensing data
  - (d) Data transmission and processing
  - (e) Hydrological forecasting and modeling
  - (f) Provision of hydroclimate services
  - (g) Provision of hydrometeorological services
- Provision of hydrological, hydrometeorological, and cryospheric data, assessments, products and services for water resources management, environmental protection and the design of structures; as well as the issuance of warnings and alerts, and assessment of hydrological hazards and risks (pre- and post-event) including consideration of potential effects of climatic change;
- Establishment of standards, guidelines and protocols associated with instruments, methods of observation, forecasts, assessments and data exchange;
- Training of personnel in the collection and analysis of hydrological data, in forecasting, modeling and assessment techniques, and in service delivery.



LE GRANDEZZE IN IDROLOGIA OPERATIVA

The role of WMO in promoting international cooperation in "operational hydrology," as defined above, has historically related in differing degrees to the following variables:

Precipitation amount
Water level of rivers, lakes, reservoirs and estuaries
Water discharge of rivers
Sediment discharge of rivers
Snow and frost extent, depth, and water equivalent
Ice on rivers and lakes
Glacier mass balance
Evaporation and evapotranspiration
Water temperature
Air temperature
Soil moisture (soil water content)
Water quality
Groundwater level



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PUBBLICAZIONE DATI IDROLOGICI

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WHOS
WMO Hydrological Observing System

Home | Services | Tools | About

WMO

ISPRA HIS Sistema informativo idrologico servizio registri Web

Il monitoraggio idrologico italiano viene effettuato mediante una rete federata composta da 19 regioni amministrative e 2 province autonome, insieme con ISPRA, che è l'organo tecnico governativo istituito dal Ministero dell'Ambiente italiano.

Il portale fornisce l'accesso alle osservazioni idrologiche in Italia, comunemente pubblicate come Annali idrologici. In particolare, per le osservazioni in situ, fornisce ulteriori capacità operative, quali un registro nazionale di servizio dati, catalogati utilizzando le norme e le procedure della Geospatial Consortium e l'Organizzazione meteorologica mondiale.

Le interfacce pubblicate sul portale permettono di recuperare i dati idrologici regionali direttamente dai fornitori tramite abilitazione e download.

WEB SERVICE CATALOG SYSTEM

- Brokered services: 19
- Brokered sites: 6088
- Brokered variables: 6
- Brokered values: 73491569
- Geographic extent: [6.704337, 18.48, 35.5017, 47.03659]

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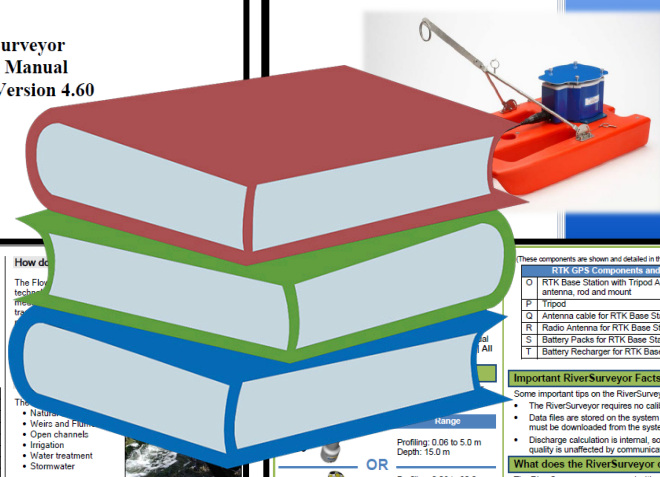
RiverSurveyor System Manual Software Version 4.60

STREAMPRO
ADCP GUIDE

TELEDYNE RD INSTRUMENTS
Everywhereyoulook



FlowTracker® - Quick Start Guide
Handheld ADV® for Velocity and Flow Measurements

This sheet is a quick reference to FlowTracker operation. For more information, refer to the *User's Manual* or the detailed *Technical Manual*, both of which can be found on the software CD or via the **Start | All Programs | SonTek Software** menu after installation.

What's in the case?

Standard Parts

Part description	Qty
FlowTracker	1
Communications/Power Cable	1
AA Battery	8
Toolkit	1
Quick Start Guide (this guide)	1
"Return to Main Menu" alert sheet	1
Software Installation CD (includes Manual)	1

Optional Extras

Part description	Qty
Wading Rod	1
Keypad Mounting Bracket	1
Probe Mounting Bracket (S or J styles)	1

Important FlowTracker facts

Some important tips on the FlowTracker and its use:
- No calibration of the unit is required.
- The Handheld Unit can withstand temporary submersion, but should not be used underwater.
- There is a built-in temperature sensor in the probe.
- Take advantage of the **SmartQC™** features; see manual for details.

What does the FlowTracker do?

The FlowTracker measures velocities with a range as low as 0.001 m/s (0.003 ft/s) and up to 4.5 m/s (15 ft/s). When combined with a wading rod, the FlowTracker can be used to measure the total discharge across a river section.

Basic FlowTracker operation

Install AA batteries in the compartment in the back of the unit. To turn the unit on, hold for one second; to turn off, hold for four seconds. Always follow the on-screen instructions and use the major key functions labeled on the keypad.

Testing the FlowTracker

Before any extended field trip, you should run a system diagnostics test using the BeamCheck software. This software should show signal amplitude plots on top of each other. If not, it is possible the probe may be damaged. A complete description of BeamCheck can be found in the manual. Use BeamCheck to download all files from the recorder and to format it before deployment.

Measuring discharge - Theory

Measuring discharge involves wading across the stream/river while taking measurements of water depth and velocity at different locations (based on ISO/USGS procedures). When combined with depth information, the total discharge can be computed. This diagram shows the *Mid Section Equation* used to compute discharge (*Mean Section* and *Japanese Equations* are also supported):

Mid Section River Discharge Measurement Equation

(These components are shown and detailed in the GPS Quick Start Guide)

RTK GPS Components and Accessories

O	RTK Base Station with Tripod Adapter, GPS antenna, rod and mount
P	Tripod
Q	Antenna cable for RTK Base Station
R	Radio Antenna for RTK Base Station
S	Battery Packs for RTK Base Station (x2)
T	Battery Recharger for RTK Base Station

Important RiverSurveyor Facts

Some important tips on the RiverSurveyor and its use:
- The RiverSurveyor requires no calibration.
- Data files are stored on the system and not the PC. They must be downloaded from the system.
- Discharge calculation is internal, so measurement quality is unaffected by communications losses.

What does the RiverSurveyor do?

The RiverSurveyor measures velocities in 3-D throughout the water column below the ADP. It combines tracking information (from Bottom-Track or optional GPS) to measure the total discharge across a river section.

Assembling the System

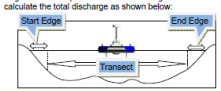
The following instructions apply to Standard configuration systems using the Serial Power/Communications cable directly connected to the system for communications and power.

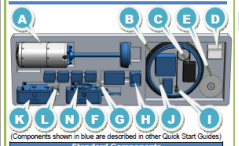
Windows Software Installation

Insert the RiverSurveyor Live CD-ROM into a PC. The Installation Menu should appear automatically. If not, double click on setup.exe in your CD-ROM drive menu. Install RiverSurveyor Live for PC.

Measuring Discharge - Theory

The total discharge through a measurement section is computed based on the mean water velocity in the water column and the cross-sectional area. For the purposes of a measurement, the section is broken into three key components: the Start Edge, the Transect and the End Edge. These components are summed together to calculate the total discharge as shown below:





(Components shown in blue are described in other Quick Start Guides)

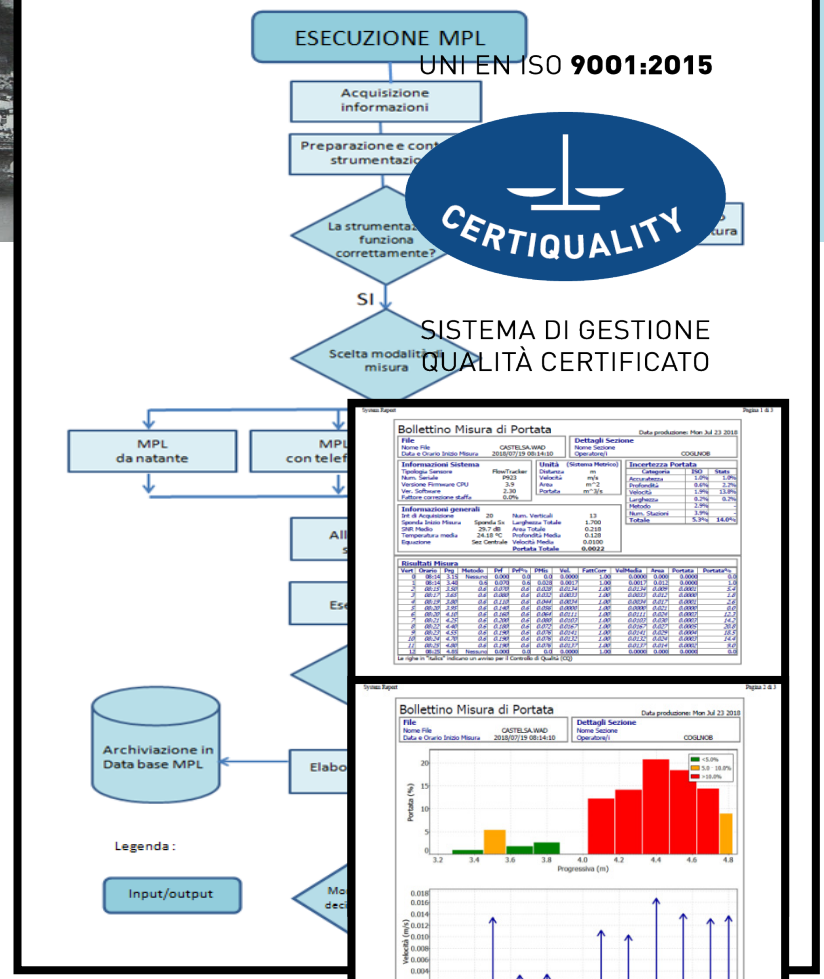
Standard Components

A	S5 or M9 with optional GPS mount and antenna
B	Serial Power/Communications cable(10m) with Adaptor Plug Set (non-US)
C	AC Power Supply
D	Serial to USB Adapter
E	Software and Documentation CD

Optional Components and Accessories

F	Power Communications Module (PCM) with Dummy Plug and 8-Pin Power/Communication cable (1m)
G	Battery Pack for PCM (x2)
H	Battery Recharger
I	Parani Bluetooth dongle Kit
J	Mobile Phone and Watertight Lanyard
K	Spread Spectrum (SS) Base Station
L	Battery Packs for SS Base Station (x2)
M	Hydroboard (not shown)
N	GPS Antenna cable

RiverSurveyor – Quick Start Guide: Getting started with the RiverSurveyor System



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System Manual
Software Version 4.60

StreamPro
ADCP Guide

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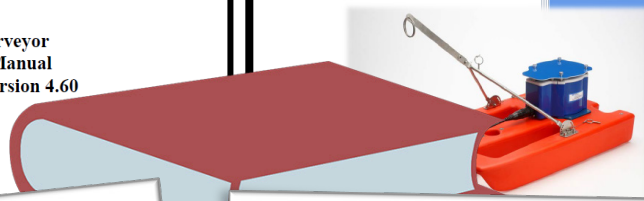
Everywhere

ESECUZIONE MPL

EN ISO 9001:2015

CERTIQUALITY

STEMA DI GESTIONE
UALITÀ CERTIFICATO



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UALITÀ CERTIFICATO

re 0,2 - 0,6 - 0,8	es. prof. 52 cm
--> profondità (cm) x 2	misura a 0,2--> sposta 10 sul 4
--> profondità (cm)	misura a 0,6--> sposta 5 sul 2
--> profondità (cm) / 2	misura a 0,8--> sposta 2 sul 6

mobile su n° barra graduata fissa (0,2 alta/0,8 fondo)

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Arpae Emilia-Romagna

Temi ambientali

Arpae in regione

arpae emilia-romag

trovi in : Arpae /

Arpae si certifica per le misure di portata liquida dei corsi d'acqua

Monitoraggio idrologico in qualità: un traguardo importante per il controllo e la gestione delle risorse idriche in Emilia-Romagna.

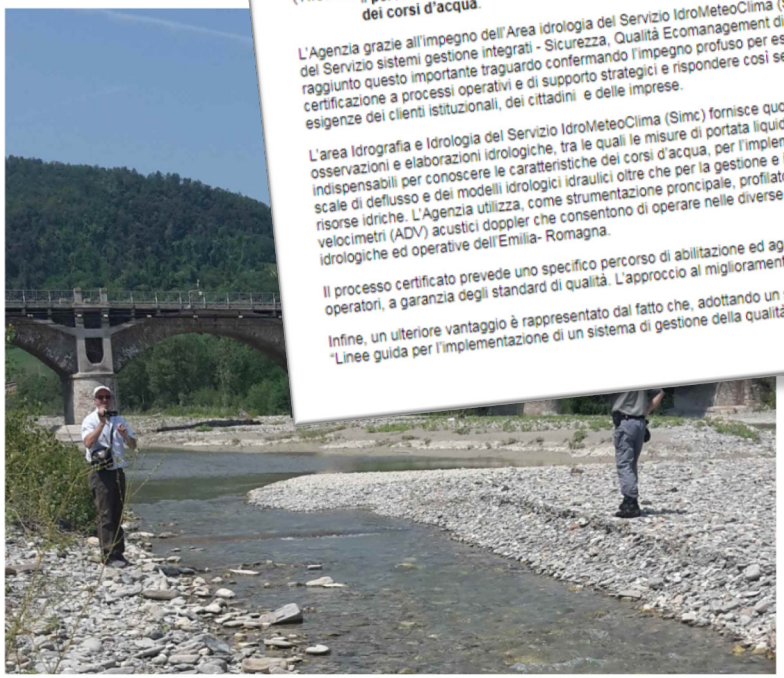
(11/06/18) Arpae Emilia-Romagna ha concluso, con l'audit di Certiquality del 29 maggio scorso, il **percorso di certificazione ISO 9001:2015 relativo alle misure di portata liquida dei corsi d'acqua**.

L'Agenzia grazie all'impegno dell'Area idrologia del Servizio IdroMeteoClima (Simc) di Parma e del Servizio sistemi gestione integrati - Sicurezza, Qualità Ecomanagement di Arpae, ha raggiunto questo importante traguardo confermando l'impegno profuso per estendere la certificazione a processi operativi e di supporto strategici e rispondere così sempre meglio alle esigenze dei clienti istituzionali, dei cittadini e delle imprese.

L'area Idrografia e Idrologia del Servizio IdroMeteoClima (Simc) fornisce quotidianamente osservazioni e elaborazioni idrologiche, tra le quali le misure di portata liquida, attività indispensabili per conoscere le caratteristiche dei corsi d'acqua, per l'implementazione delle scale di deflusso e dei modelli idrologici idraulici oltre che per la gestione e il controllo delle risorse idriche. L'Agenzia utilizza, come strumentazione proncipale, profilatori (ADCP) e velocimetri (ADV) acustici doppler che consentono di operare nelle diverse condizioni idrologiche ed operative dell'Emilia- Romagna.

Il processo certificato prevede uno specifico percorso di abilitazione ed aggiornamento degli operatori, a garanzia degli standard di qualità. L'approccio al miglioramento continuo lascia spazio alla possibilità di estendere ulteriormente il campo di applicazione.

Infine, un ulteriore vantaggio è rappresentato dal fatto che, adottando un sistema di gestione della qualità per le misure di portate liquida, l'Agenzia risulta coerente con le "Linee guida per l'implementazione di un sistema di gestione della qualità in idrologia", (OMM, 2013).



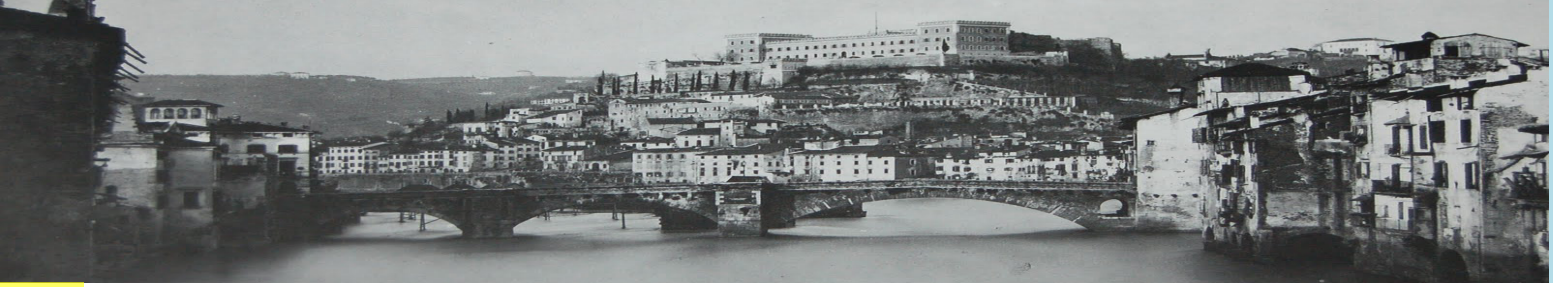
MISURE DI PORTATA

AUTONOME PROVINZ
BOZEN - SÜDTIROL

PROVINZIA AUTONOMA DI

PRIMO RALLY NAZIONALE

ETRIA



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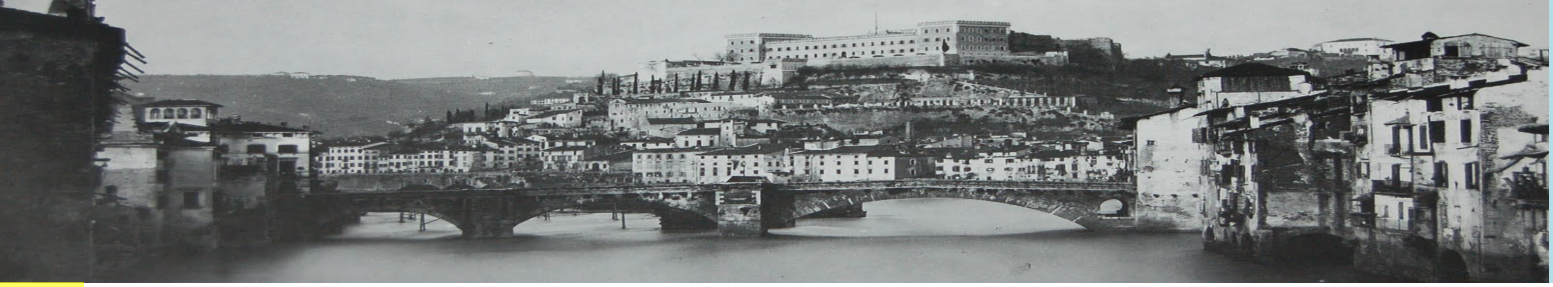
2019

PRIMO RALLY NAZIONALE DI IDROMETRIA

GESTIONE DATI IDROLOGICI



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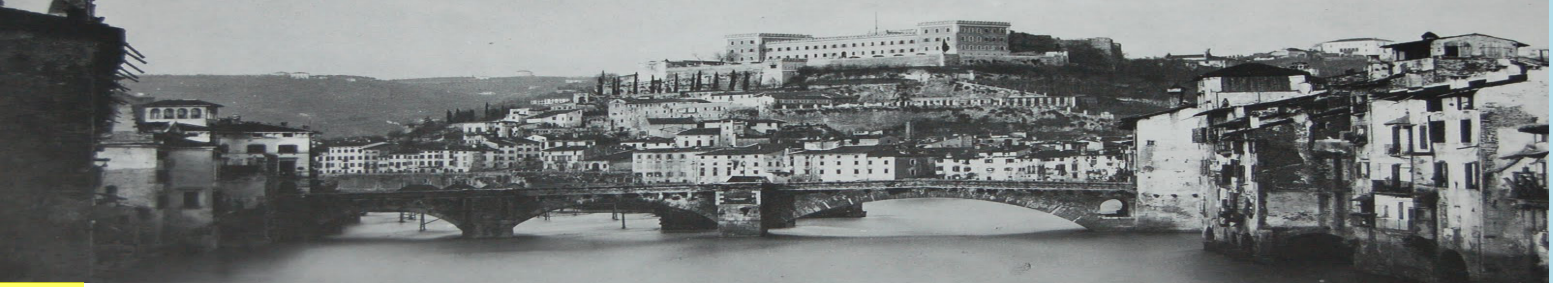

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PRIMO RALLY NAZIONALE DI IDROMETRIA

CONDIVISIONE MODELLISTICA IDROLOGICA

ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale

Sistema Nazionale per la Protezione dell'Ambiente

arpav
Agenzia Regionale per la Prevenzione e Protezione Ambientale del Veneto

arpae
agenzia prevenzione ambiente energia emilia-romagna

AUTONOME PROVINZ BOZEN - SÜDTIROL
PROVINCIA AUTONOMA DI BOLZANO - ALTO ADIGE
PROVINZIA AUTONOMA DE BULSAN - SÜDTIROL

CONSORZIO DI BONIFICA VERONESE

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