PAST AND PRESENT EXPERIENCES IN DROUGHT MONITORING IN ITALY

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ISPRA – Institute for Environmental Protection and Research

Rome, Italy

EDO User Meeting, JRC Ispra, 9-10 November 2017

ISPRA – Institute for Environmental Protection and Research

- National Institute that acts under the vigilance and policy guidance of the Italian Ministry of Environment (APAT + ICRAM + INFS)
- Research Institute + National Environment Agency
- Coordinate the SNPA – National System for Environmental Protection (established by Italian Law No. 132/2016)
- National focal point for EIOnet of EEA
- Coordinate the Italian National Committee for Operational Hydrology Services and the Italian National Climate Services Network
- **Supports policies implementation (incl. EU policy)**
  - Define strategies
  - Produce standards and methodologies for monitoring and evaluation of environmental status
  - Make methodologies applicable
  - Organize training activity

SNPA (territorial Environmental Agencies + ISPRA)

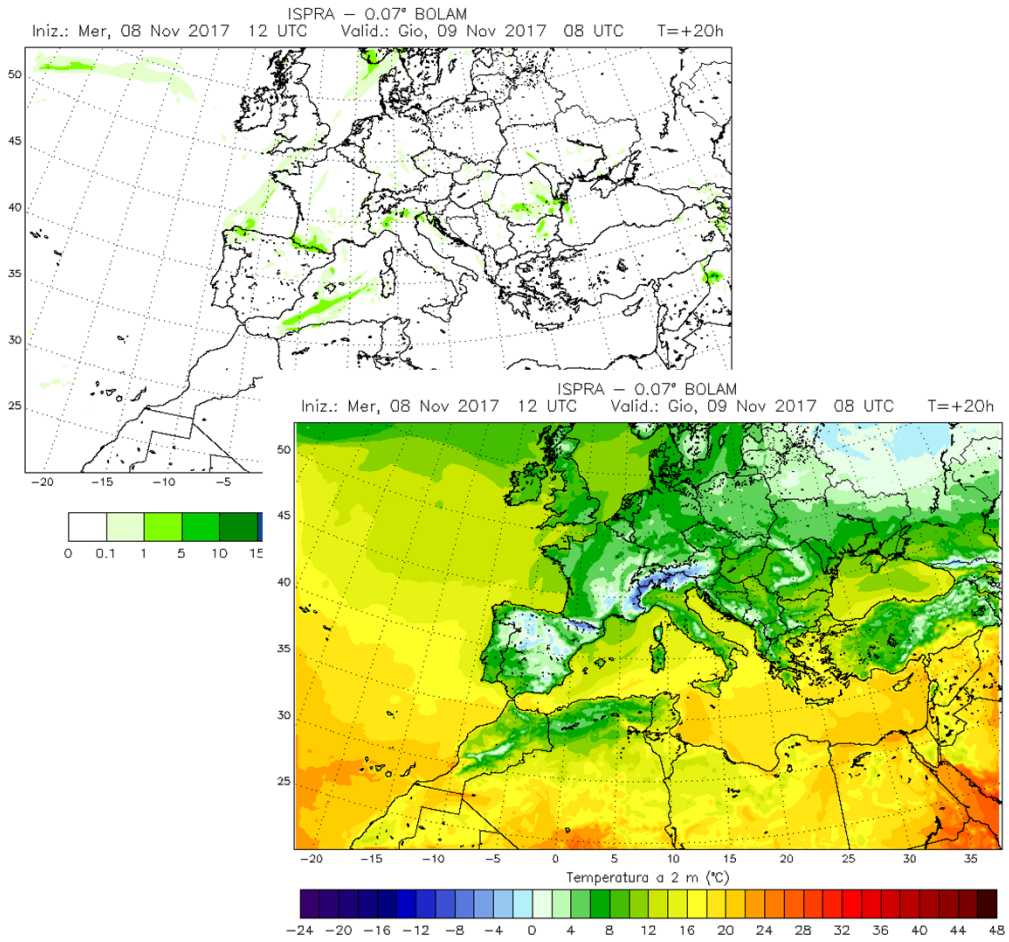
- Responsible for the WFD implementation
- Qualitative monitoring of water resources
- Not all the SNPA regional Institutions are responsible for the hydro-meteorological (quantitative) monitoring

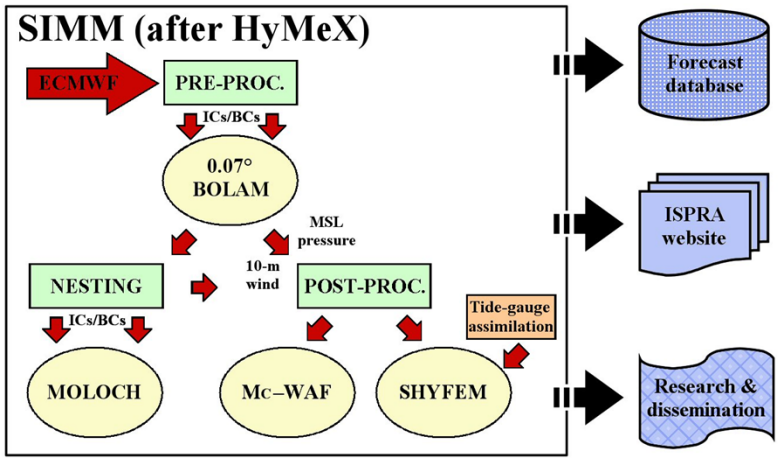
Italian National Committee for Operational Hydrological Services

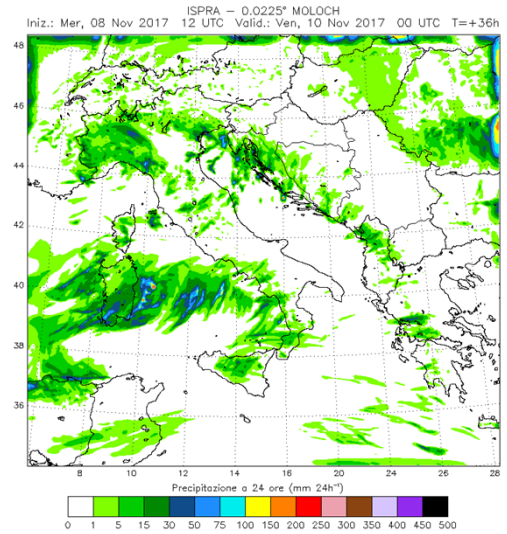
- Established in 2013 to coordinate at national level **regional Institutions** that are responsible for the **hydro-meteorological monitoring** and provide **operational hydrology services**, according to Italian Presidential Decree of the Councils of Ministers (DPCM) on 24 July 2002.
- The Committee includes also the National institutions that, together ISPRA, represent Italy within the WMO Commission for Hydrology, namely the Italian Air Force Meteorological Service and the Italian National Department of Civil Protection.
- The Committee aims at reaching at national scale a homogenous quality level of the provided services, accomplishing the WMO resolutions.
- The Committee acts in agreement with the Italian network of Functional Centers for civil protection and the hydrology scientific community.

→ GIS-based tool for water budget at national scale.

The ISPRA SIMM Hydro-Meteo-Marine Forecasting System

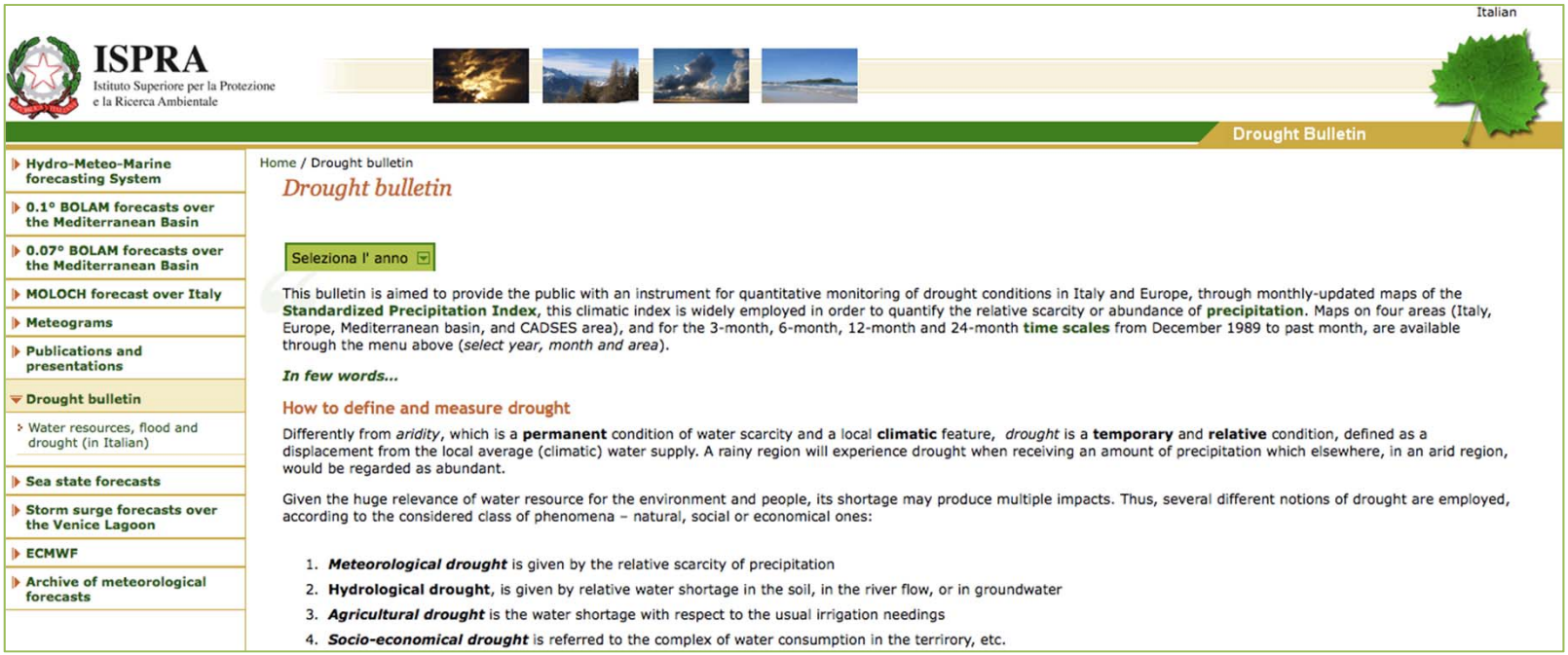






- http://www.isprambiente.gov.it/pre_meteo

The ISPRA drought bulletin



- Prototype developed in the framework of INTERREG IIC Drought project.
- Online version developed in the framework EU project HYDROCARE.
- **Monthly maps of SPI** at 3, 6, 12 and 24 months based on 2.5° NCEP reanalysis, from Dec. 1989 for Italy, Europe, Med Basin & CADSES area.
- http://www.isprambiente.gov.it/pre_meteo/siccitas/index_en.html

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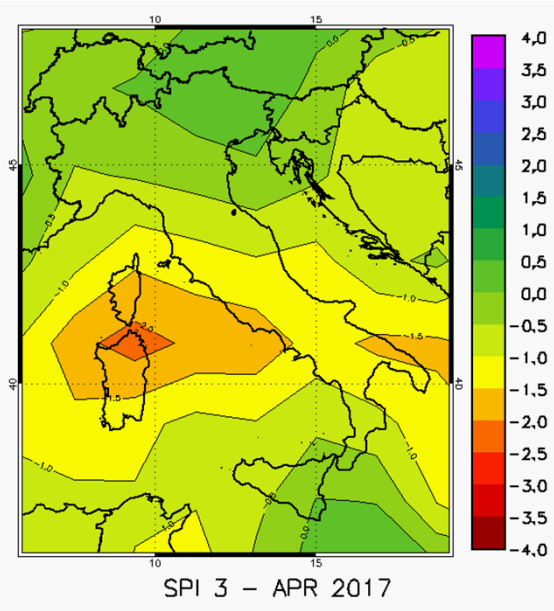

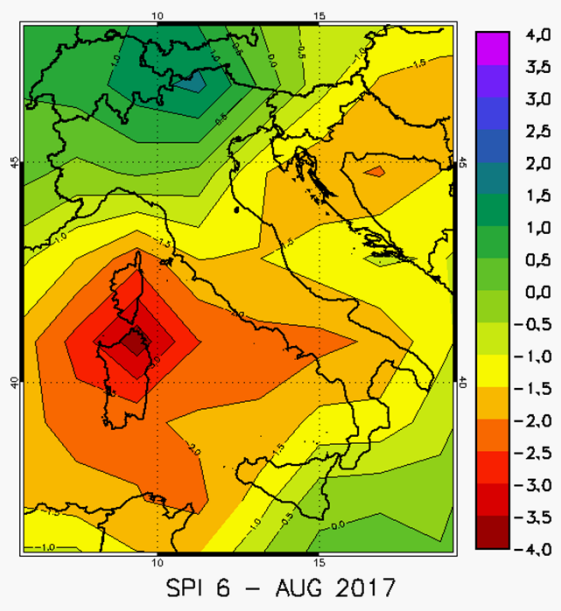

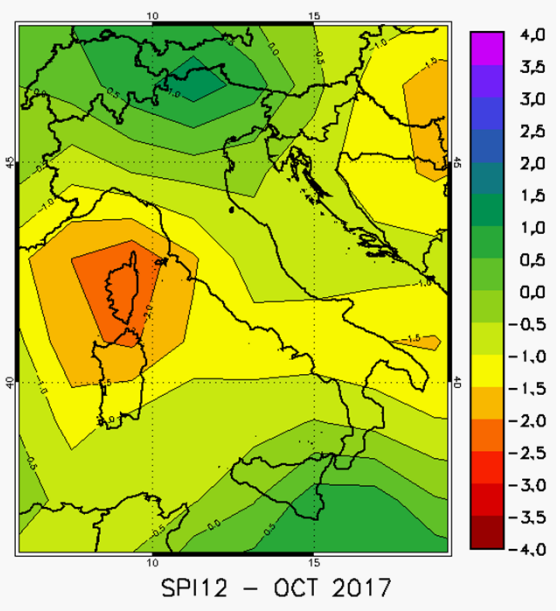

- Provided a useful basis for monitoring drought situations a national scale and for evaluating their magnitude and severity.
- The 12-m SPI over Italy is one of the "Indicators for water resources" published each year in the **ISPRA Environmental Data Yearbook**.
- The **analysis** of the drought events is performed by considering also the **drought indicators provided at regional level** and the **EDO indicators**.

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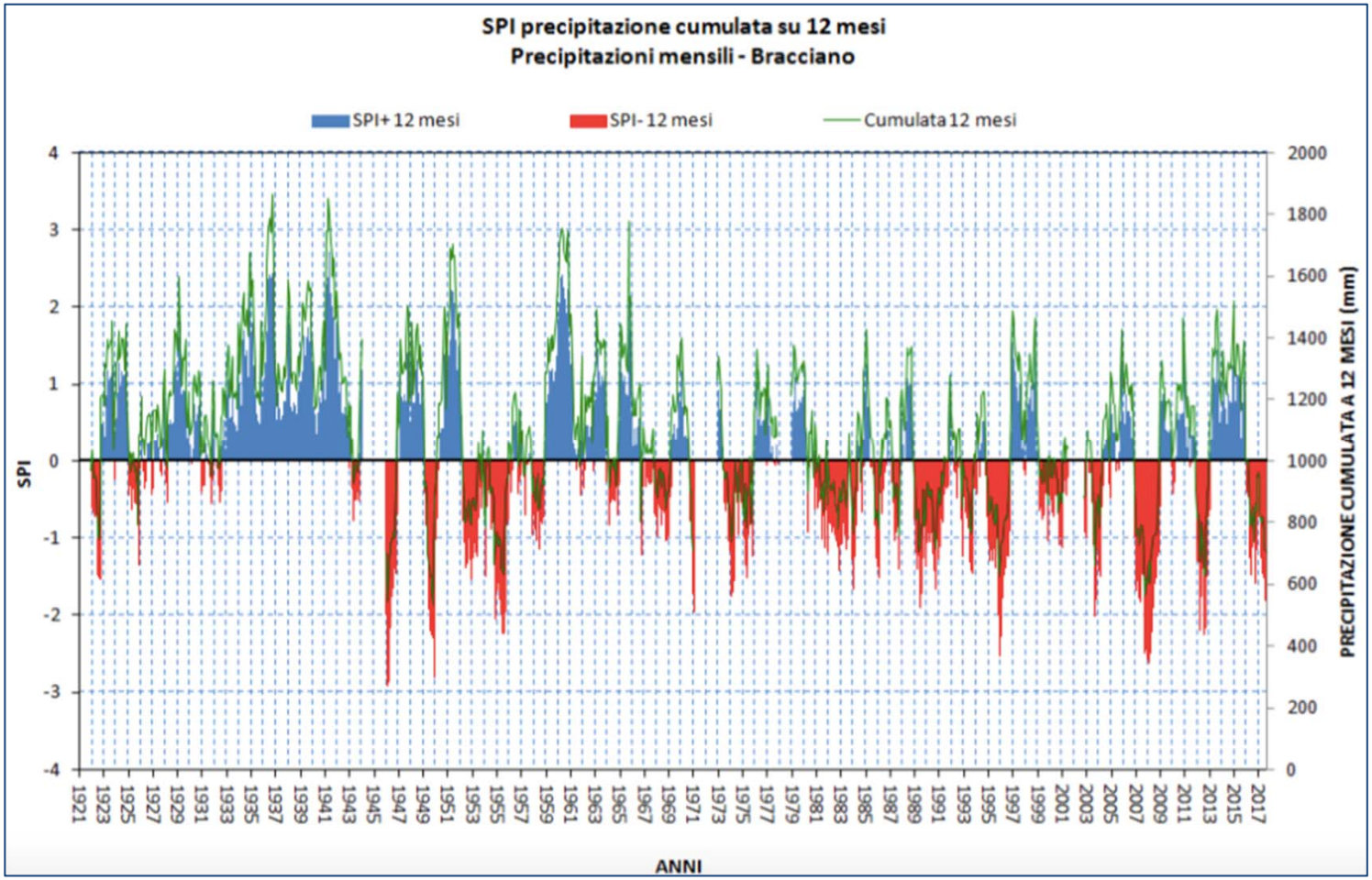
Example of an SPI-based analysis for the Bracciano lake

Tool: ANABASI by ISPRA – Data: Bracciano monthly precipitation by CF Lazio



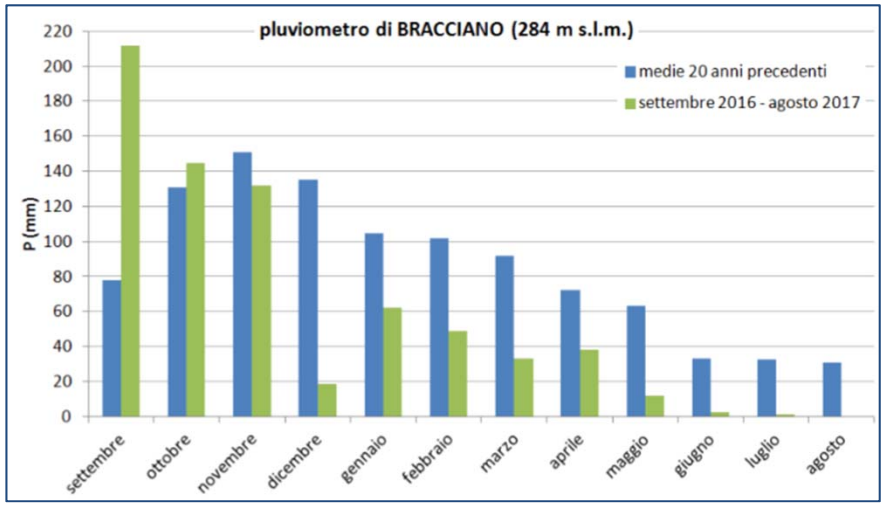
Example of an SPI-based analysis for the Bracciano lake

Tool: ANABASI by ISPRA – Data: Bracciano monthly precipitation by CF Lazio

Mese di riferimento	SPI a 1 mese	SPI a 2 mesi	SPI a 3 mesi	SPI a 6 mesi	SPI a 9 mesi	SPI a 12 mesi	SPI a 24 mesi
settembre 2016	1.5	1.1	0.9	0.2	0.1	-1.0	-0.2
ottobre 2016	0.3	1.1	0.8	0.7	0.3	-1.2	0.0
novembre 2016	-0.1	-0.1	0.7	0.5	-0.2	-0.7	-0.3
dicembre 2016	-2.1	-1.1	-0.9	-0.4	-0.7	-0.6	-0.8
gennaio 2017	-0.5	-1.8	-1.3	-0.5	-0.6	-0.7	-0.8
febbraio 2017	-0.8	-1.0	-2.0	-0.6	-0.8	-1.3	-1.2
marzo 2017	-0.8	-1.4	-1.6	-1.7	-1.2	-1.5	-1.8
aprile 2017	-1.0	-1.5	-1.7	-2.1	-1.3	-1.3	-1.9
maggio 2017	-1.5	-1.8	-2.1	-2.9	-1.4	-1.5	-2.0
giugno 2017	-1.5	-2.6	-2.5	-2.6	-2.3	-1.8	-2.0
luglio 2017	-0.8	-1.9	-2.9	-2.7	-2.7	-1.8	-2.0
agosto 2017	-1.1	-1.8	-2.6	-3.1	-3.6	-1.8	-2.4

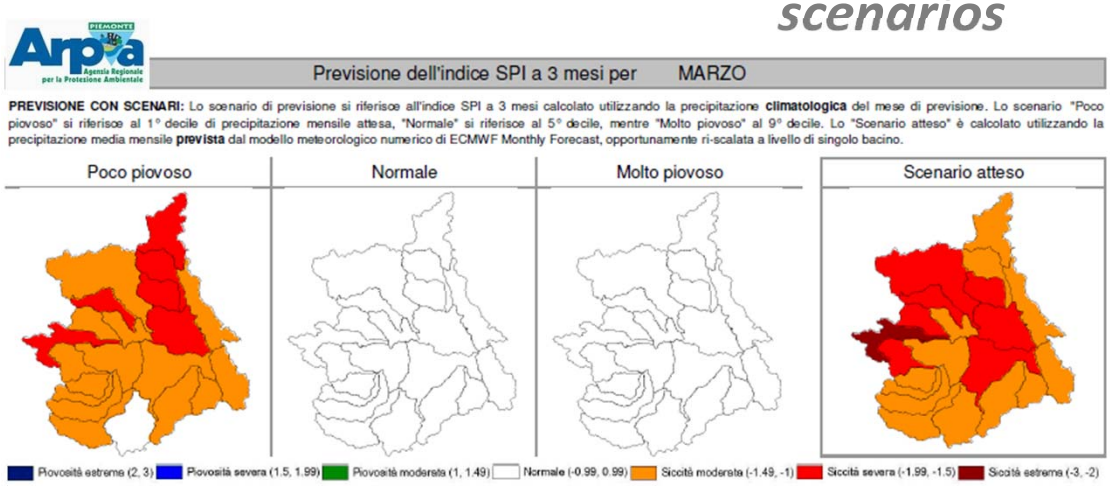
Legenda

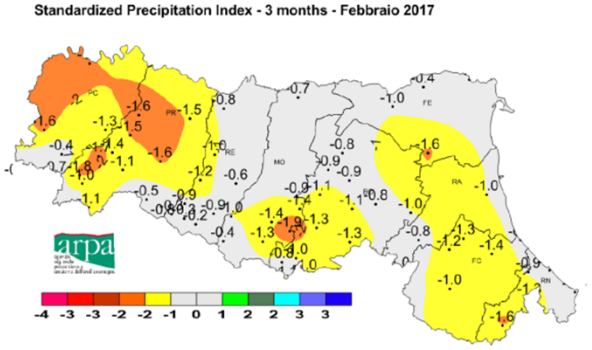
Valori SPI	Classe
SPI > 2	umidità estrema
1.5 < SPI ≤ 2.0	umidità severa
1.0 < SPI ≤ 1.5	umidità moderata
-1.0 ≤ SPI ≤ 1.0	nella norma
-1.5 ≤ SPI < -1.0	siccità moderata
-2.0 ≤ SPI < -1.5	siccità severa
SPI < -2.0	siccità estrema



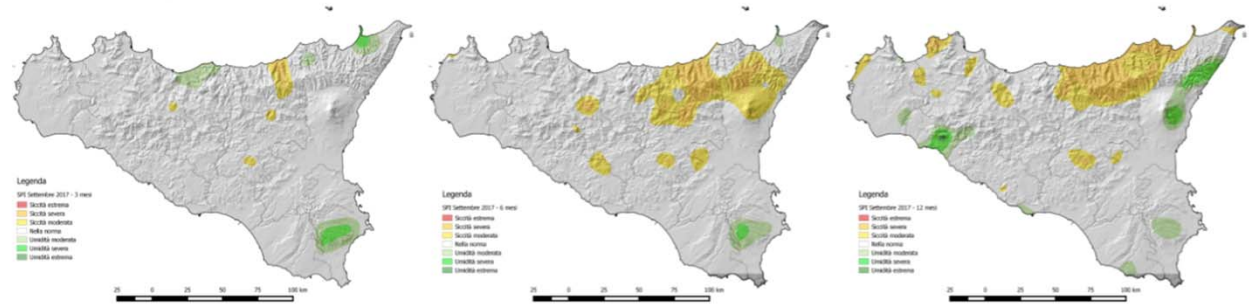
After "*Analisi e valutazione dello stato ambientale del Lago di Bracciano riferito all'estate 2017*", ISPRA report, Oct. 2017

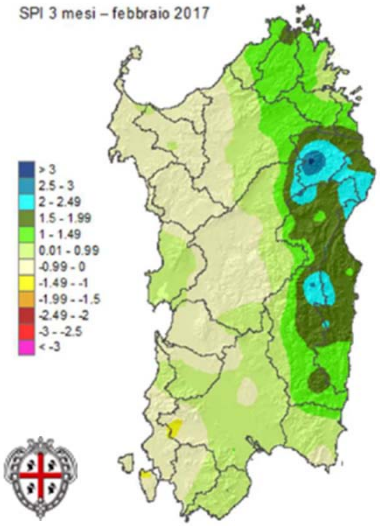
Examples of SPI maps at regional level based on rainfall data and scenarios



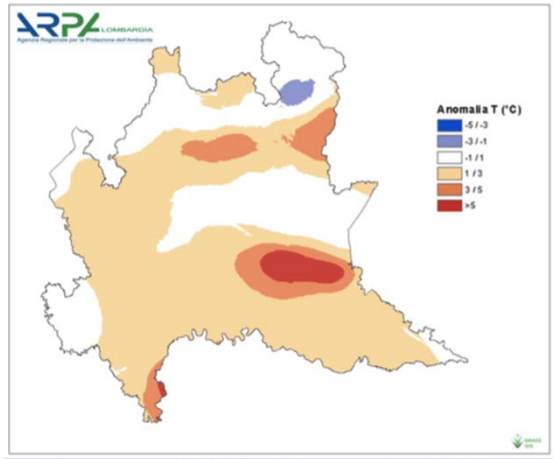


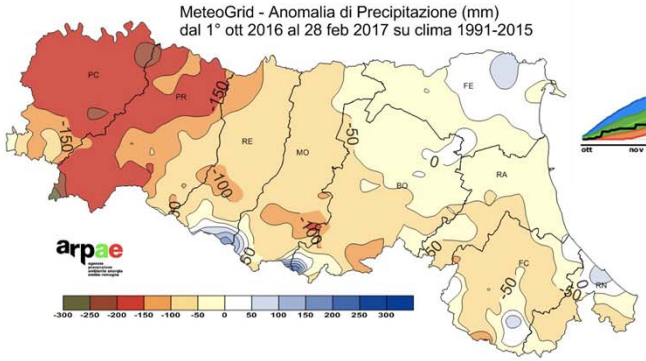
MAPPE DI SPI

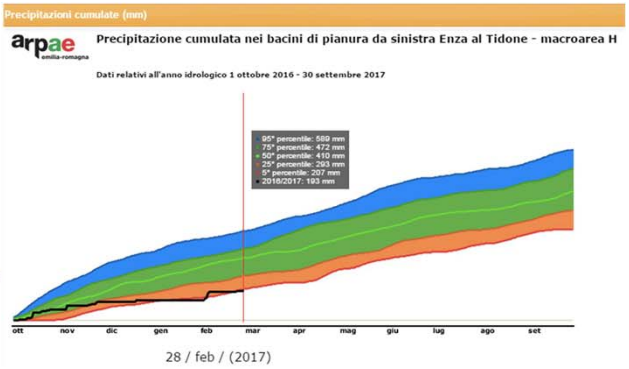


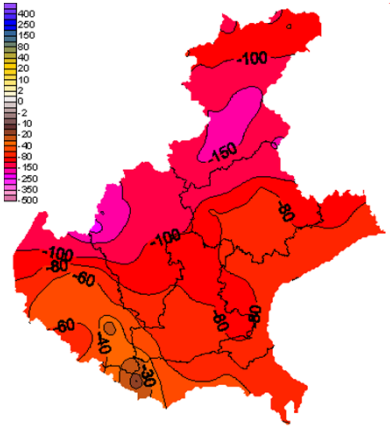


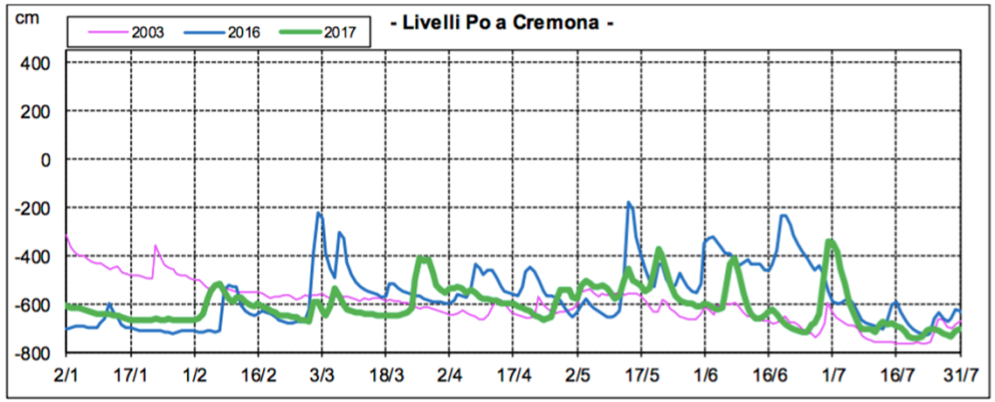
Examples of meteo-hydrological maps/indicators at regional level











Italian National Committee for Operational Hydrological Services

- http://www.hiscentral.isprambiente.gov.it/hiscentral/default.aspx

Network of Observatories for the use of the water resources

- Established in July 2016, after an initiative of the Ministry of Environment and the Italian National Department of Civil Protection.
- Support the management at river basin district level, in particular during drought and water scarcity events.
- Each Observatory includes all the key players at local, regional and national level for the water resources governance that are relevant for the district.
- The Observatories aim at monitoring and forecasting drought and water scarcity situations as well as managing the consequences of such events and reducing their impact on the use and the quality of water resources
- Use consolidated data and drought indicators (incl. those proposed by the WFD CIS “Expert group on Water Scarcity and Drought”).

Network of Observatories for the use of the water resources

- Unlike it could be expected, the northern Italian regions can be also affected by droughts and water scarcity situations.
- A clear and recent example is provided by the drought situation that has been affecting the entire territory of Italy since the end of 2016, starting from the north-eastern Italy, then the Po valley, and after that the center and the southern Italy.
- State of emergency has been declared in several parts of Italy (in 11 out of 20 regions) that faced drought due to a shortage of rainfall and also high temperatures.
- The management of this emergency in terms of
  - Public water supply
  - Water resources used for agriculture
  - Energy production

  was conducted by the Observatories.

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Thanks for the kind attention!