DROUGHT OBSERVATORY

Consiglio Nazionale delle Ricerche
Istituto di Biometeorologia

WHY A DROUGHT OBSERVATORY?

The drought is a creeping and complex phenomenon with different types of impacts. Drought dynamics reveals a time gap between the onset of a drought event and the management of the drought emergency, but often this gap is too wide to reduce the impact of drought effectively. Furthermore, drought information is frequently scattered and not enough integrated to support diverse users' needs. Therefore, there is a need to increase preparedness through proactive solutions providing timely and simple information. In other words, an integrated drought climate service could fill the gap. Hence, an effective climate service should respond to different priorities and users' needs and have some main requirements: information continuously updated and timely delivered, expandable platform and on-demand services, products appropriate to the users' competencies and technical skills.

Drought monitoring supports a better resilience reducing the impacts of drought events

THE PROJECT

The Institute of Biometeorology of the National Research Council (IBIMET-CNR), in collaboration with the LaMMA Consortium, created a system to provide a semi-automatic, detailed, timely and comprehensive operational service. This service, initially developed for Tuscany Region, supports decision makers, water authorities, researchers and stakeholders.

INTEGRATION OF GROUND-BASED AND SATELLITE DATA

An Open Source and interoperable SDI (Spatial Data Infrastructure), based on PostgreSQL/PostGIS, integrates satellite images and models. The system produces vegetation and precipitation indices able to track the occurrence and the evolution of a drought event.

THE INDICES: DROUGHT OCCURRENCES AND TRENDS

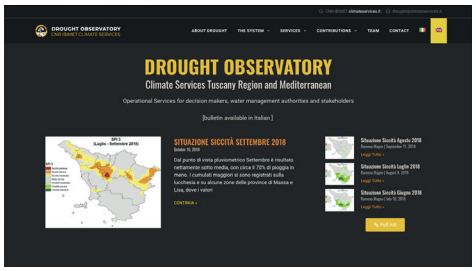
The system is based on a monitoring component and on a forecasting ones, and uses two types of indices:

» direct climate-based indices
» indirect vegetation-based indices.

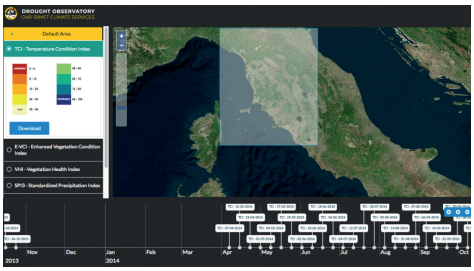
monitoring and forecasting to reduce response time

climate-based and vegetation indices

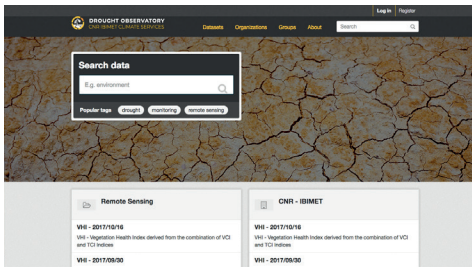
open and interoperable system



HOME PAGE



WEB GIS



OPEN DATA

SERVICES

OPEN DATA

A complete catalogue (CKAN, GeoServer and PostgreSQL) with data and metadata in different formats and standard protocols. Any third-party client applications can easily reuse the spatial data.

WEB GIS

A customized Open Source WebGIS application to integrate different datasets and share maps of drought indices with researchers, decision makers and other stakeholders.

MONTHLY BULLETIN (FOR TUSCANY, ITALY)

Monthly updates on Tuscan drought current and future conditions and local impacts, press releases and useful links.

RESTFUL API

The Drought Observatory RESTFUL APIs for data download and clipping ensure a complete interoperability.

GLOSSARY

A selected list of drought related keywords. Sources: EarthLabs, Intergovernmental Panel on Climate Change (IPCC), National Drought Mitigation Center (NDMC).

SURVEY

The users' survey collects information needs for drought management, to improve effectiveness of the drought operational services.

The SDI built for the Drought Observatory is based on the concept of Open Innovation

TECHNOLOGICAL INFRASTRUCTURE

SOA | OGC | POSTGRESQL

A Service-Oriented Architecture (SOA) based on Open Geospatial Consortium (OGC) standards. It is a Database-centred architecture, with PostgreSQL as DataBase Management System (DBMS).

INNOVATIVE APPROACH

The geographic data flows (from the download of remote sensing and climatic data to the storage of final indices) and all the related geoprocessing functions are integrated in a single environment.

ADVANCED STATISTICAL PROCEDURES

The integration of R Procedural Language into PostgreSQL (PL/pgSQL) through PL/R wrapper allows the creation of advanced statistical procedures.

RESEARCH TEAM

Tiziana De Filippis, Edmondo Di Giuseppe, Ramona Magno, Massimiliano Pasqui, Elena Rapisardi, Leandro Rocchi.

DROUGHT OBSERVATORY
CNR IBIMET CLIMATE SERVICES
https://drought.climateservices.it
drought@climateservices.it

Consiglio Nazionale delle Ricerche
Istituto di Biometeorologia

In collaboration with
CONSORZIO LaMMA