

An interoperable research data infrastructure to support climate services development

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CONTEXT

Accessibility and availability, re-use and re-distribution of scientific data are prerequisites to build climate services across Europe. In the framework of “European Research and Innovation Roadmap for Climate Services” the research community is called upon to respond to a new challenge to produce raw data, and also processed information to provide European climate services with high quality and scientifically proved data. A prerequisite for this challenge is the development of infrastructures that ensure access, management and preservation of data, technical support for a coordinated and harmonious management of data that, in the framework of Open Data Policies, should encourage the use of a transdisciplinary approach and collaboration.

OBJECTIVE

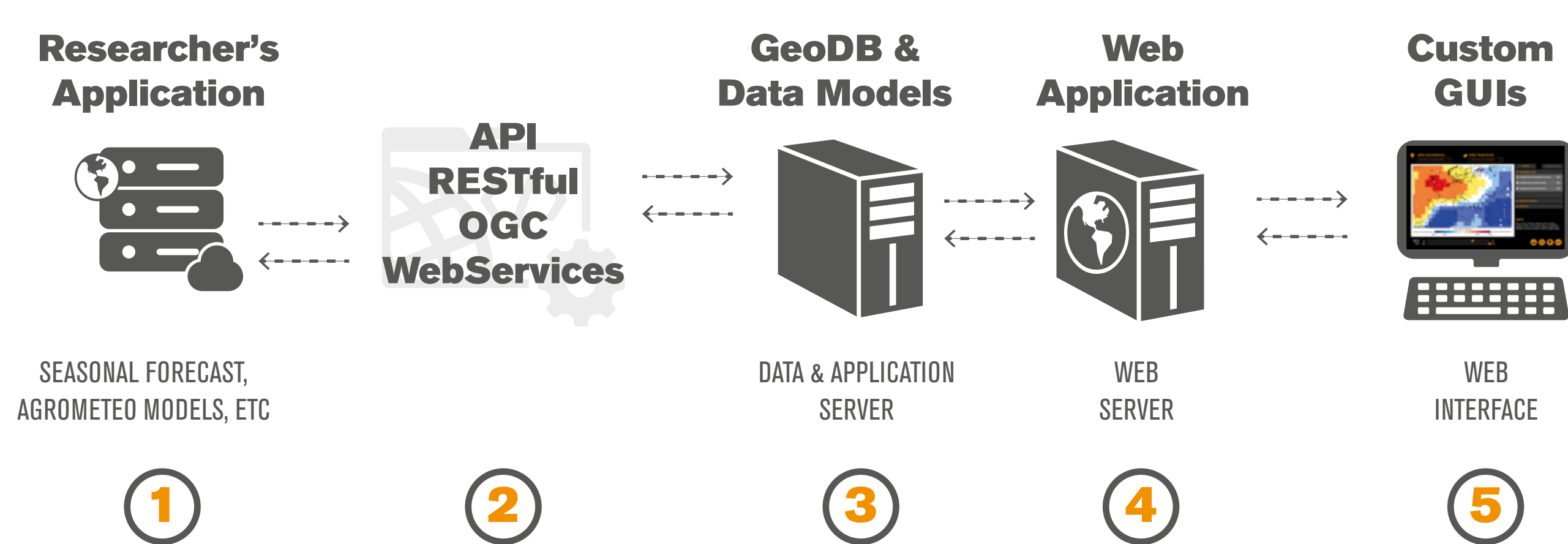
The aim of this work is to deploy an interoperable and open data prototype climate service portal in order to help the scientific community to share relevant and timely products and services.
The purpose is to advance geo-information best practices, knowledge sharing and capacity building for the improved sharing and application of climate information, tailored to the users' needs.

METHOD

The spatial data infrastructure components are organized in typical client-server architecture. Following the guidelines, principles and specifications of Infrastructure for Spatial Data Information in Europe (INSPIRE) the implementation service includes :

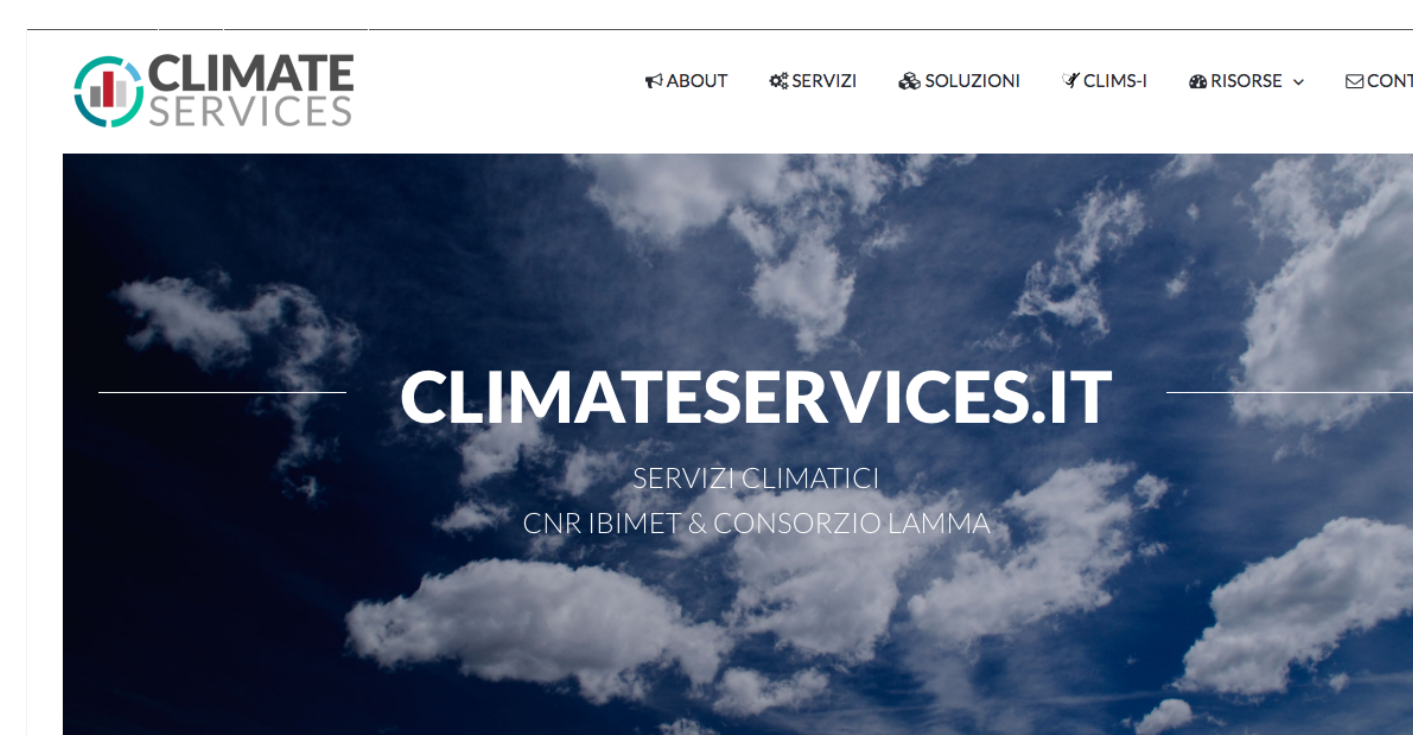
- Information model: data model and encoding for system data acquisition
- Analysis of data flow and design of communication network
- Interface model and web services for data flow management
- Use of a participative and interdisciplinary approach among Institute research units
- Adoption of a User Consultation Process to design users' web interfaces (front-end)

INFRASTRUCTURE COMPONENTS



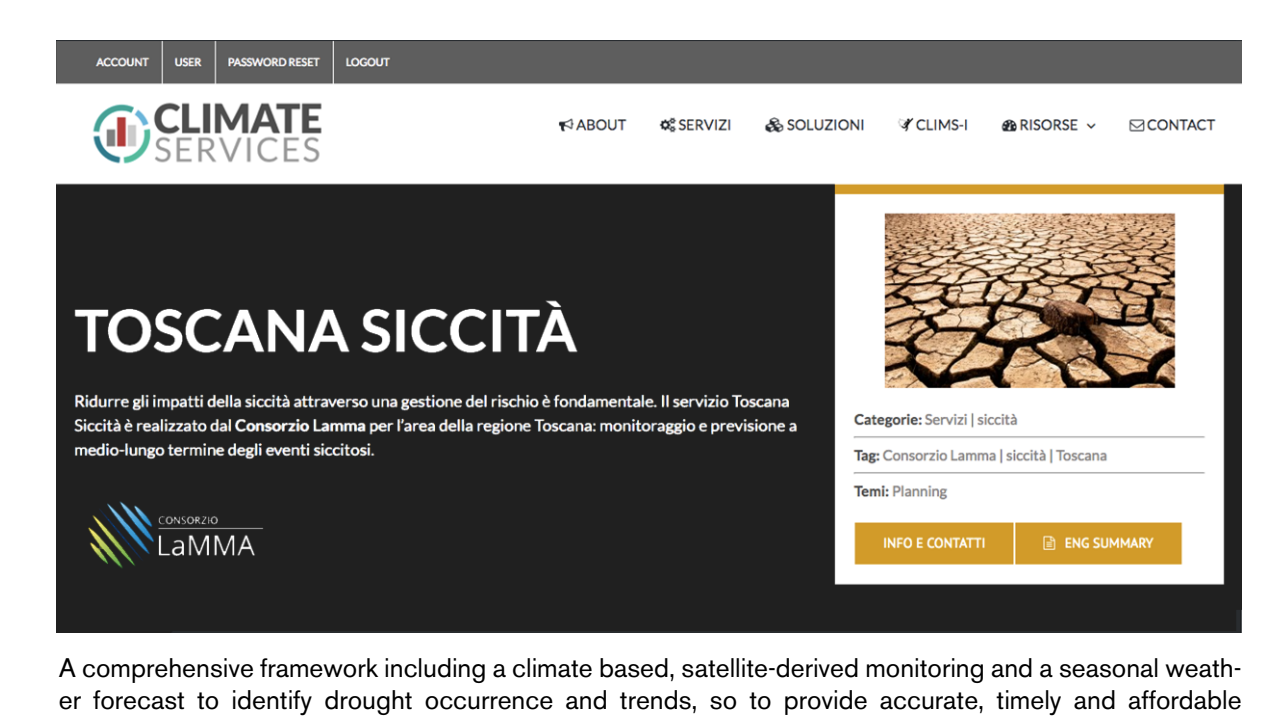
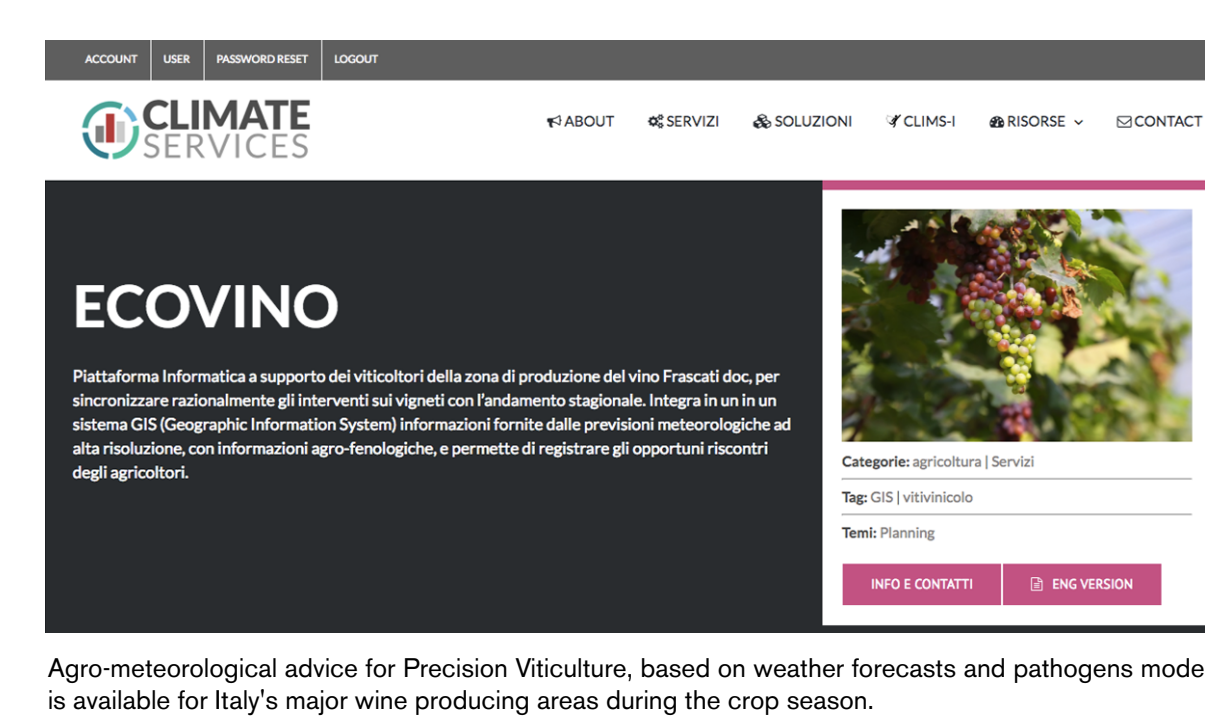
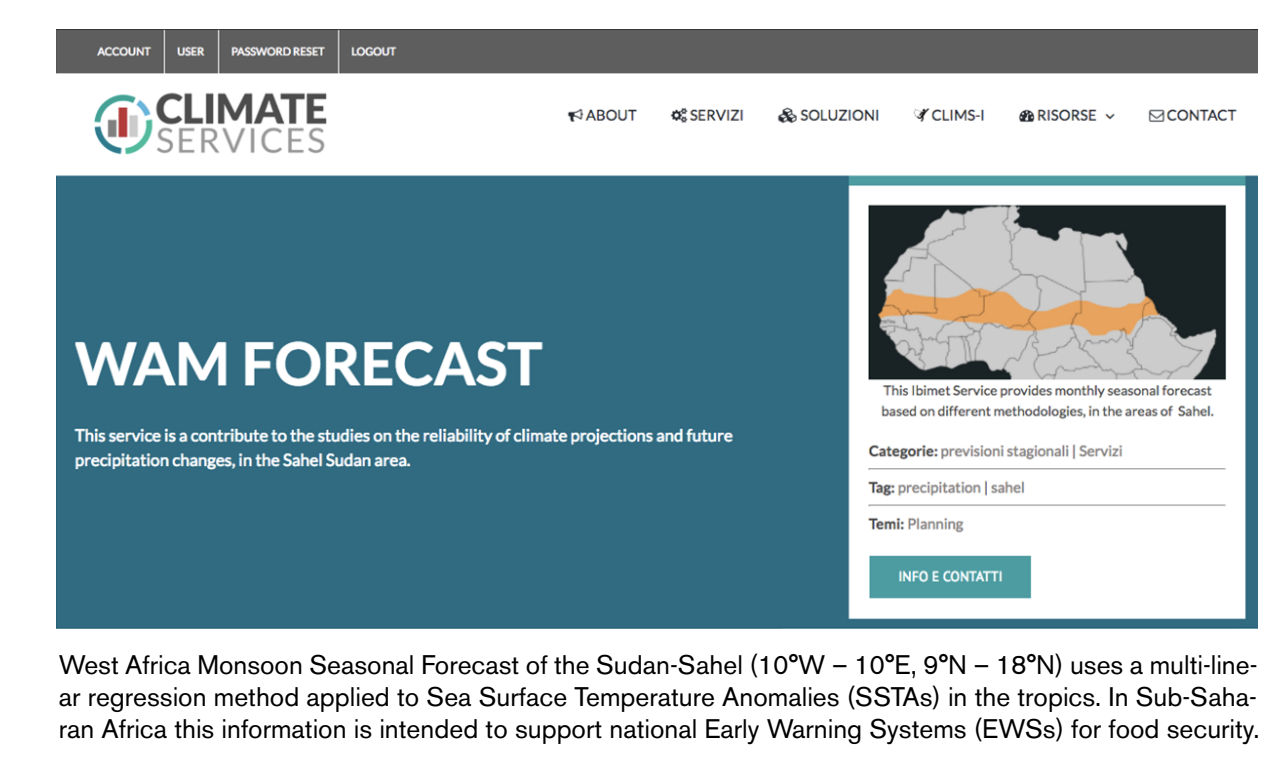
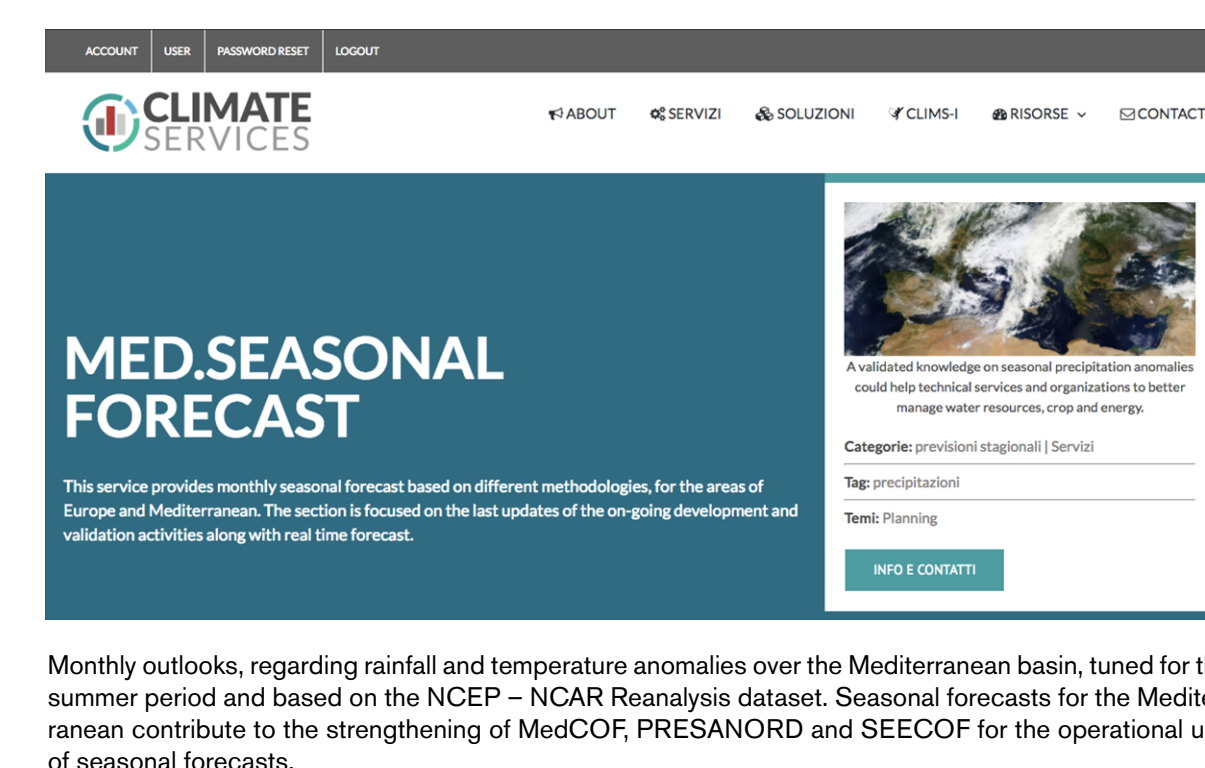
- The results of research projects and data analysis procedures are fragmented among research units. Selected products (i.e. seasonal forecast, agro-meteorological models, environmental monitoring procedures) and raw data are sent to the data server via Restful servlet, API (Access programming Interfaces) or standardized Open Geospatial Consortium (OGC) Web Services connection.
- All data are stored automatically by means of the web services in the Geo-DataBase following the data model implemented for each specific application.
- Conceptual design of the GeoDB is based on the entity-relation model. UML (Unified Modeling Language) as formal language adopted in the ISO TC/211 context for geomatic data description has been used as formal data-set definition.
- The Web Applications for climateservice.it enable the user to view and analyze all data stored in the application GeoDBs. The customized web applications have been developed using J2EE technology with Java Server Faces and PrimeFaces library for GraphicUserInterface (GUI) customization.
- Through a common Internet browser, it is possible to view all collected data in table or chart format. Interface functions allow data to be exported and-metadata visualized. Advanced and user-friendly data analysis tools are under development.

CLIMATE SERVICE PORTAL

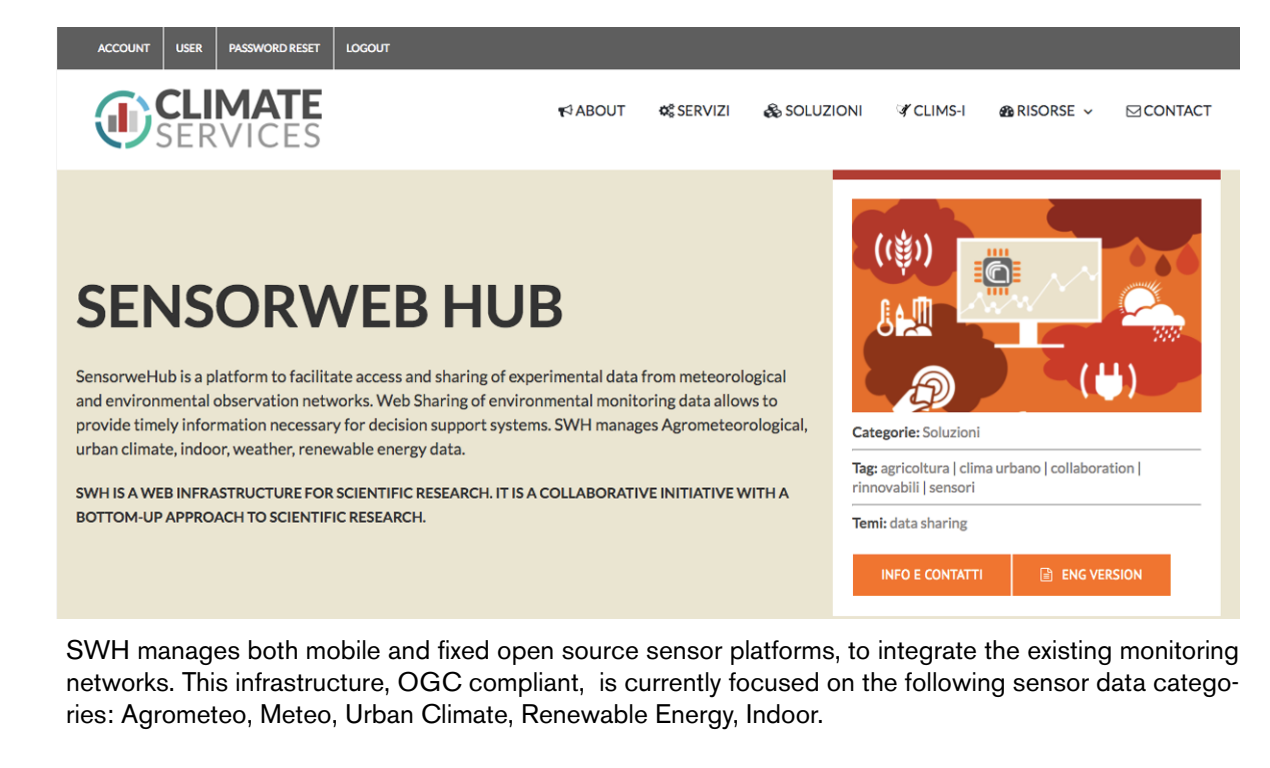
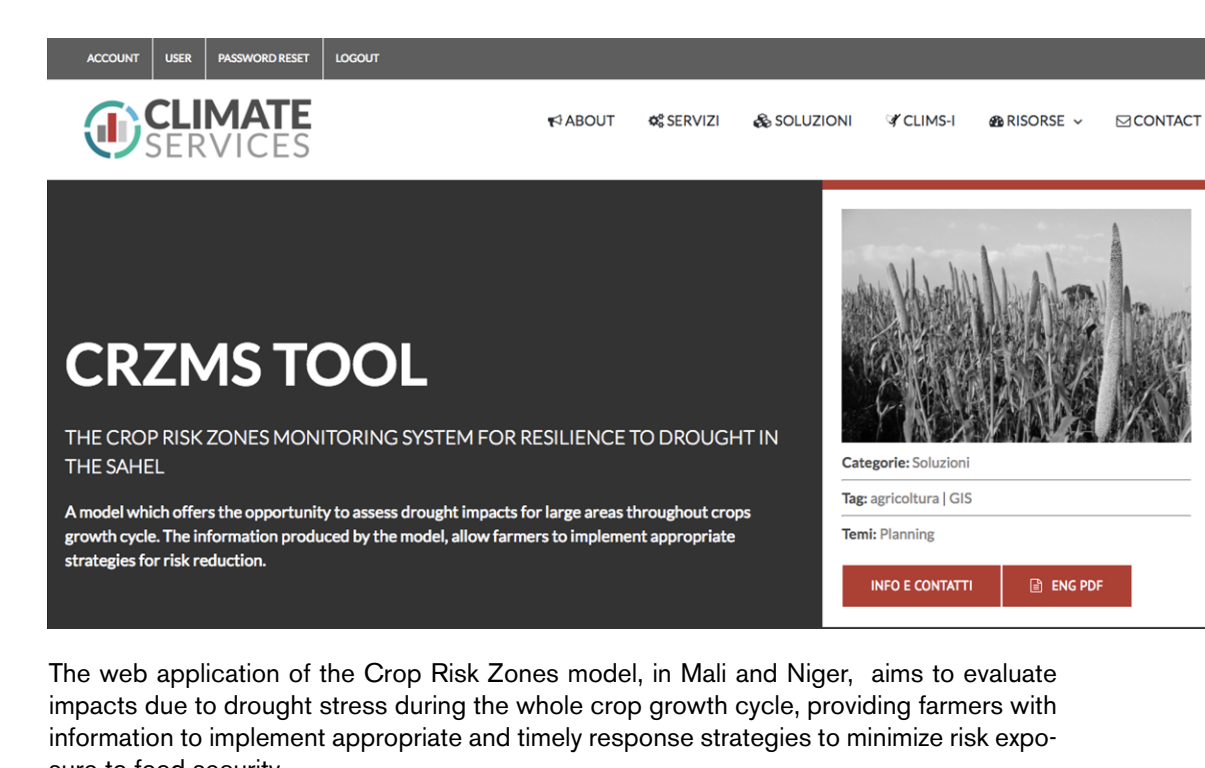


The Portal will be the access point to the services and solutions developed by CNR-Ibimet, to facilitate the access to each project. It will also provide a select bibliography, resources and news.

SERVICES



SOLUTIONS



RESULTS AND CONCLUSIONS

The Institute of Biometeorology, aiming at contributing to the sharing and integration of research data, has developed a research data infrastructure to support the scientific activities conducted in several research projects at national and international level. The availability of structured raw data as such as customized information paves the way for building a climate services purveyor to support adaptation, mitigation and risk management.

The proposed architecture uses open source tools to ensure sustainability in the development and deployment of web applications with geographic features and custom analysis, as requested by the climate services under development. The work is a bottom-up collaborative initiative among different research units that embrace an approach to research and innovation based on co-design, co-development and co-evaluation of Climate Services.

ACKNOWLEDGEMENTS

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