## Rheticus: an Earth monitoring service platform fuelled by Sentinel Data.

Last 15-17 March 2016, Planetek Italia participated the Conference on Big Data from Space 2016 (BiDS'16), held in Santa Cruz de Tenerife, Spain, jointly organized by ESA, EUSC and CCR.

The event gave the opportunity to present Rheticus®, the Planetek cloud-based data and services hub designed to deliver products through complex automatic processes and, if appropriate, a minimum interaction with human beings. One of the main purposes of the system is to enable Planetek Italia to shift from the provision of data to the provision of services, intended as continuous access to information from the users.

At the conference, it was showcased how this system applies the Big Data concepts through the fusion of EO and ancillary data – with a particular attention to INSPIRE data – operated through a Big Data infrastructure that supports the batch processing of a continuously increasing volume of data for the generation of environmental indicators and alerts.
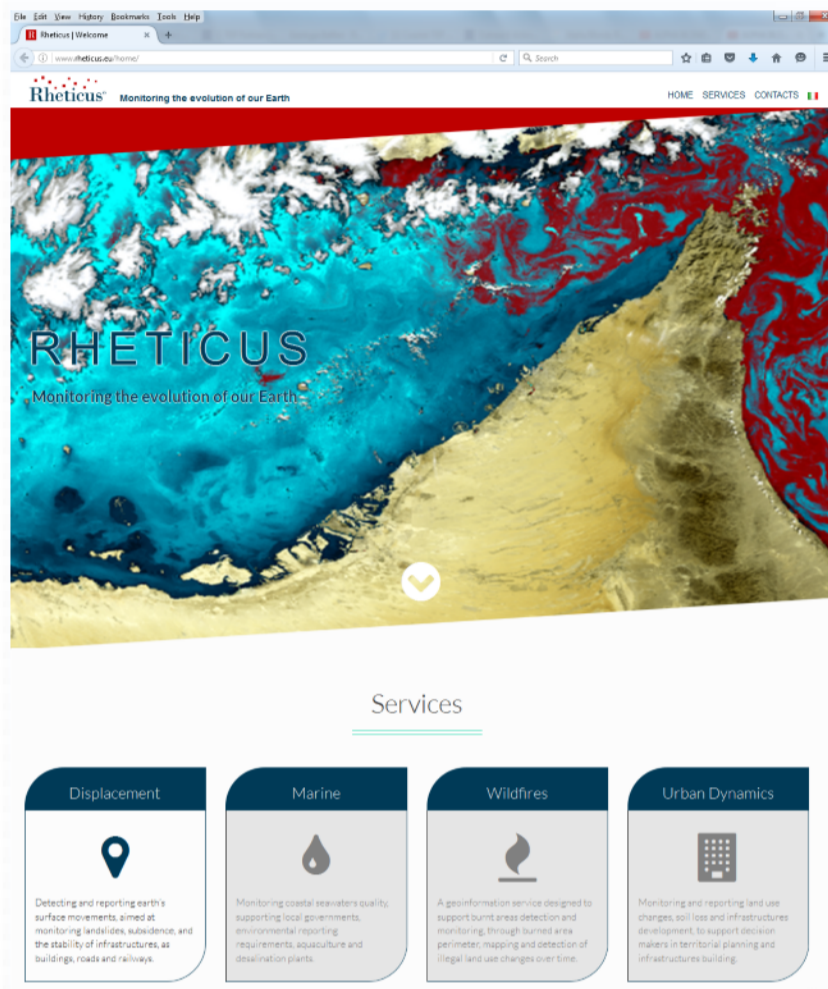
The Rheticus® platform is able to automatically deliver geoinformation services and products to subscribed user in a wide range of application fields, related to land, infrastructures and resources monitoring: wildfires, landslides and displacements, water quality and urban dynamics.

The description of a specific service case – the detection of new artificial areas -, explained in detail in the BiDS'16 paper, gives the opportunity to illustrate the Rheticus® capabilities to generate environmental indicators and alerts through the fusion of EO and ancillary data, and to indicate how the integration of INSPIRE data can add value to the final product, in the context of an operational workflow driven by the Rheticus Big Data infrastructure that supports the batch processing of a continuously increasing volume of data.

The application developed takes advantage from the new generation of Earth Observation data (e.g. Sentinel-1 and Senitnel-2) in combination of data coming from not-EO sources, like INSPIRE data.
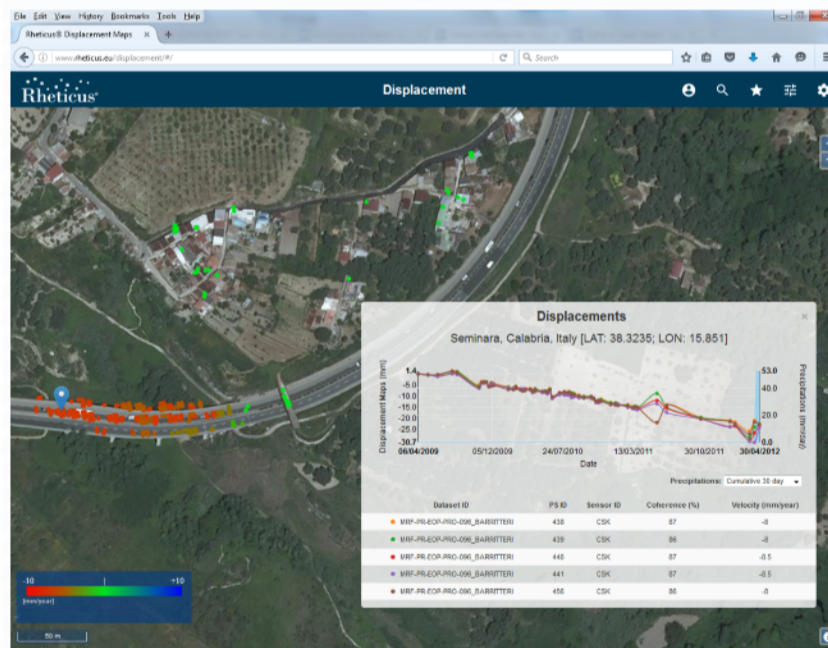
A further characteristic of Rheticus® is the ability to act as an interoperable service node offering processing capabilities within a wider Big Data infrastructure. This concept will be demonstrated in the on-going ESA project Coastal Thematic Exploitation Platform (CTEP). CTEP project is addressing the coastal theme in the context of the Thematic Exploitation Platform (TEP) initiative, whose purpose is to exploit EO big data for the provision of a set of data and tools for thematic communities of users.

The Rheticus webportal has been released at the beginning of April, ready to deliver its first service Rheticus®Displacement.

Rheticus®Displacement is a geoinformation service designed for the monitoring of ground surface movements, aimed at monitoring areas subject to landslides and subsidence, and the stability of infrastructures.

The mapping of the earth's surface movement speed and acceleration is made through the monitoring of points on the ground with high stability called Persistent Scatterers (PS). The PS is produced through the processing of Sentinel-1 images of the European Copernicus programme or COSMO-SkyMed data.

The PS processing algorithm used is SPINUA produced by GAP Srl, a spin-off of the Politecnico di Bari, and has been certified by the Italian Space Agency.
The service is targeted to: Infrastructures and works managers and builders; Public Administration; Planners & professionals in the territory.

Rheticus®Displacement service with some sample data is available at www.rheticus.eu. Links:

- "Rheticus: fusion of Earth observation and INSPIRE data for the environmental monitoring". BIDs2016 proceedings: (paper) (ppt presentation)
- Coastal-TEP webportal
- Rheticus website
- More about BIDs16 on Planetek Italia website