



Interoperable webservices for sharing data and products of the International DORIS service.

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What are DORIS and IDS?

DORIS (Doppler Orbitography and Radiopositioning Integrated by Satellite) is a French satellite system used for the precise orbit determination of satellites, especially for altimetric missions (Topex/Poseidon, Jason-1,-2,-3, Envisat, Cryosat-2, Saral, Sentinel-3, HY-2...). Knowing the satellite orbit with a high accuracy (~1cm) is crucial for monitoring the sea level variations from altimetry measurements. In addition to its functions in orbitography, DORIS as a space surveyor is also a terrestrial positioning system that has found many applications in geodesy and geophysics.

The **International DORIS Service (IDS)** is a service of the International Association of Geodesy (IAG) created in 2003, to provide a support, through DORIS data and products, to geodetic, geophysical, and other research and operational activities, and to give access to data, derived products and informations related to the DORIS system. IDS contributes to the realization of the International Terrestrial Reference Frame (ITRF), and participates in the Global Geodetic Observing System (GGOS).

IDS web services

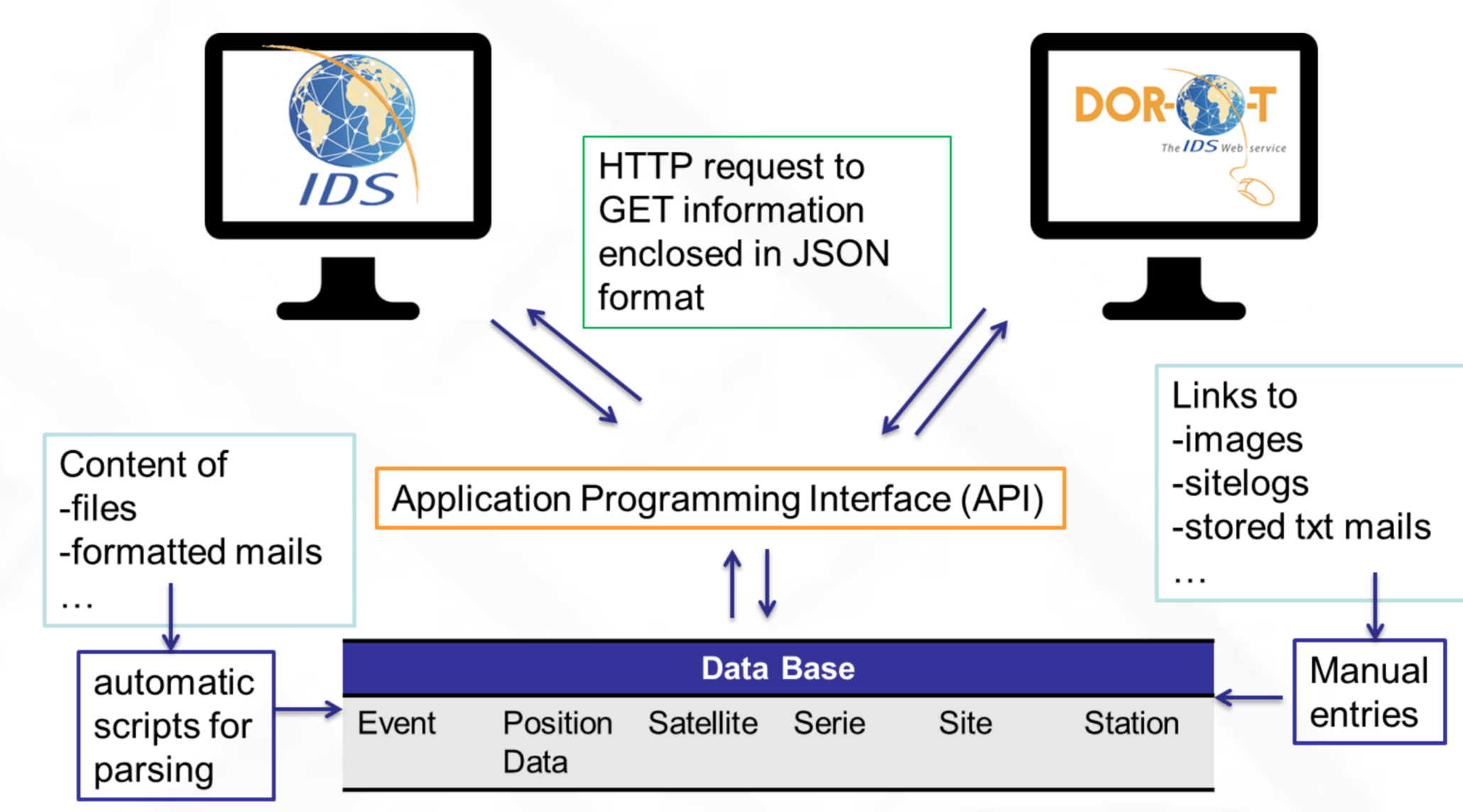
IDS has developed services for sharing data and products with the users. Metadata and interoperable web applications are proposed to explore, visualize and download the key products such as the position time series of the geodetic points materialized at the ground tracking stations. An API REST has been developed to request metadata through HTTP protocol.

Currently, metadata provide information about:
-**Satellites**: characteristics of the mission (start, end, instruments, orbit,...) ; photo; video; links to mass and maneuvers files
-**Stations**: characteristics of the station (start, end, DOMES number, site, technique, ...); links to photos, sitelogs, dorismails, ...
-**Sites**: name, country, latitude, longitude, altitude
-**Events** (station, system, earthquake, data)

They also include the time series of station positions (**PositionData**) (i.e. date, dN, dE, dU + sigmas) and the name of the **Series**.

Metadata and API

Metadata and API are used by the web site: <https://ids-doris.org> and the web service: <https://ids-doris.org/webservice>



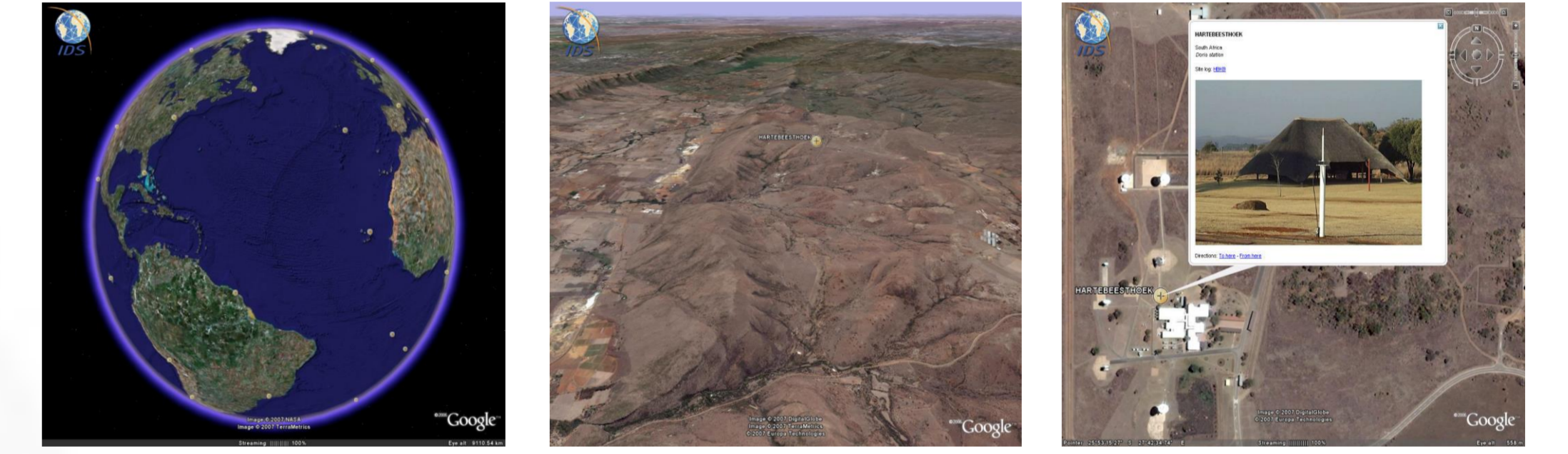
API query: some examples

All information available about the DORIS satellites
<https://apps.ids-doris.org/api/v1/satellite>
only the positions of station "ROUB" from time series ids17wd05 before 2008 :
<https://apps.ids-doris.org/api/v1/position/ids17wd05/roub?q=date<2008-01-01>

IDS website

Metadata and API are used to generate tables, create pages, produce the kml file of the network for Google Earth

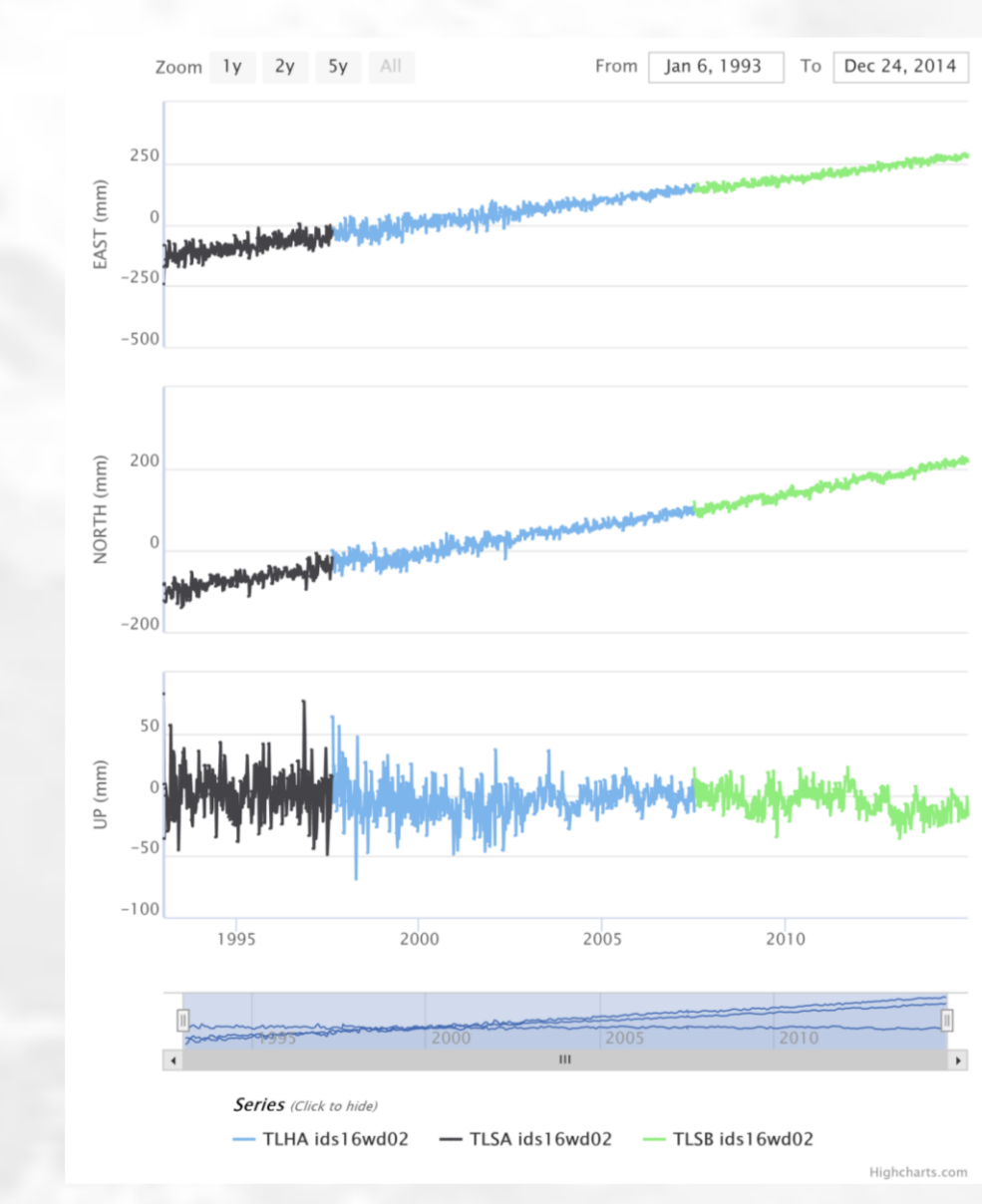
Network on Google Earth
<http://ids-doris.org/network/googleearth.html>



IDS webservice

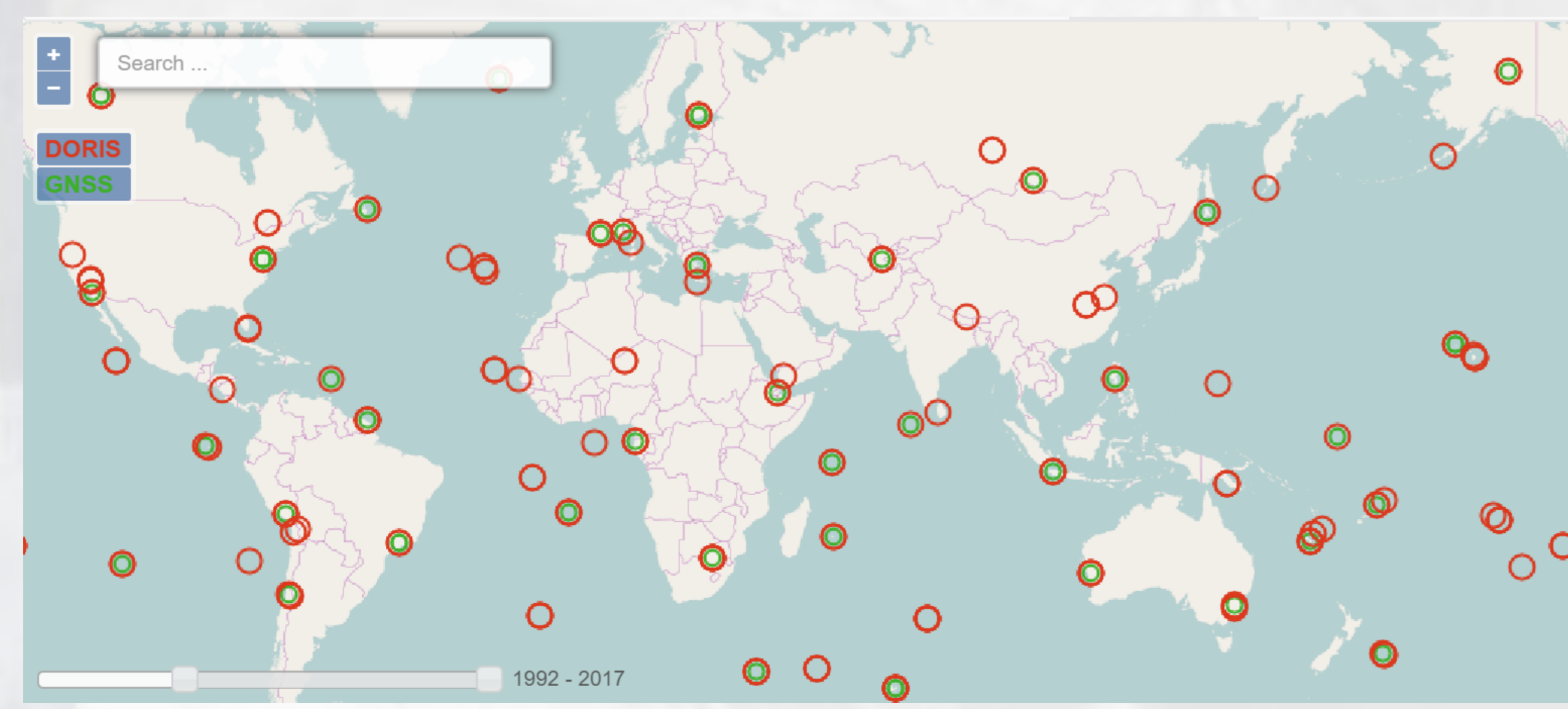
The tools propose d by the webservice are

A family of plot tools to:
-visualize time series (station positions, EOP, orbit residuals, combined parameters)
-download the time series and the graphs
-get statistics



Additional data can be displayed such as station events, nearby Earthquakes. This service allows comparing time evolutions of coordinates for DORIS and GNSS stations in co-location, thanks to a collaboration with the IGS Terrestrial Frame Combination Center

A network viewer to:
-visualize the DORIS network
-select sites to visualize time series or see the sitelog



Services of the plottools and the network viewer

Conclusions

For several years, IDS has been developing webservices for exploring, visualizing and downloading DORIS-derived products. The Global Geodetic Observing System (GGOS) encourages the IAG Services to develop such interoperable facilities on their website. The objective for GGOS is to set up an interoperable portal through which the data and products produced by the IAG Services can be served to the user community. For this achievement, the IAG Services should adopt common metadata thesaurus to describe data and products, and interoperability standards to share them.

The objective of the IDS is to collect data from other services in order to compare DORIS station position time series with others types of observations. That is done with time series for GNSS collocated stations from IGS, and Earthquakes close to DORIS station from USGS. It could be improved with time series from other techniques (SLR, VLBI, tide gauges) or from geophysical models (e.g. atmospheric and oceanic loading)

Our future plans for the IDS webservices

- Complete the database (with station velocities, DORIS-related articles, site description forms (sitelogs) ...)
- Develop commands to get data from interoperable services (USGS, IAG services? others?)
- Set up a catalogue of metadata of the data and products