CANARY GNSS CENTRE

I. Romero. Canary Advanced Solutions, Telde, Gran Canaria, Spain. nacho@sacsl.es

E. Hernandez. Canary Advanced Solutions, Telde, Gran Canaria, Spain.

A. Rodriguez-Santana. Universidad de Las Palmas de Gran Canaria, Tafira, Gran Canaria, Spain.

P. Abad-Real. Universidad de Las Palmas de Gran Canaria, Tafira, Gran Canaria, Spain.

R. Fernandes. Universidade de Lisboa, UBI/IDL, Portugal.

V. Mendes. Universidade de Lisboa, Facultade de Ciencias (IDL-LATTEX), Lisboa, Portugal.

J. A. Montiel-Nelson. Universidad de Las Palmas de Gran Canaria, Tafira, Gran Canaria, Spain.

GNSS Data and results with a focus on the Macaronesia and Africa
www.canarygnsscenter.org

Abstract

Africa is the continent with the least freely available good public GNSS data for long-term geodetic studies such as the ones promoted by the IGS. The Canary GNSS Center (CGC) is a non-profit effort based in the Canary Islands to offer a free Data Center to all organizations for their public GNSS data for the benefit of a worldwide community. The CGC's ftp and web presence represent the most complete African GNSS data repository serving as a benefit to researchers worldwide. This poster will summarize the CGC, the data holdings and some preliminary results in the context of the AFREF efforts.

Data Availability

The CGC mirrors and makes available freely the public GNSS African data of more than 100 stations for any scientific use. This is done for the convenience of scientists, researchers, and to provide basic quality checking and monitoring of the data. No guarantee or warranty of any kind, implicit or explicit is offered by the CGC for any of the data or the analysis made available through its website.

The data available through the CGC has been recently increased with a distribution agreement with a private company Fugro Seastar AS. The company distributes through the CGC, with an agreed time delay, 11 previously private permanent African GNSS stations from all over the African continent and the Arabian peninsula.

Uncovering and publishing the data from such permanent stations is deemed from the CGC a very useful long term effort. Since operating in Africa can be sometimes difficult, it is necessary to rely on organizations, whether private or public, that

**11 new Fugro/CGC African permanent GNSS stations**

already have infrastructure in place and a commitment to their permanent GNSS stations.

The CGC offers freely its servers and services to check, monitor and make the Macaronesia and African GNSS data available to everyone.

Data Analysis

Canarias and Madeira station GNSS velocities from a 1999.0 to 2010.0 process using repro1 orbits and clocks from SIO (ITRF2005) with GAMIT/GLOBK in a network process of 200 stations. Stations IZAN (in Tenerife), RBIJ (in Madeira) and PSAN (in Porto Santo) have limited amount of data thus the greater velocity uncertainties.


Cortesy V. Mendes, 2010
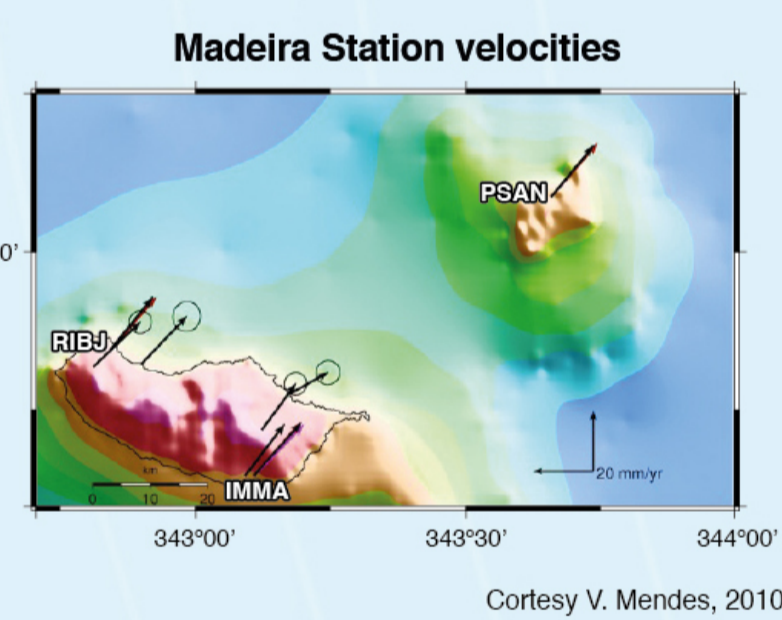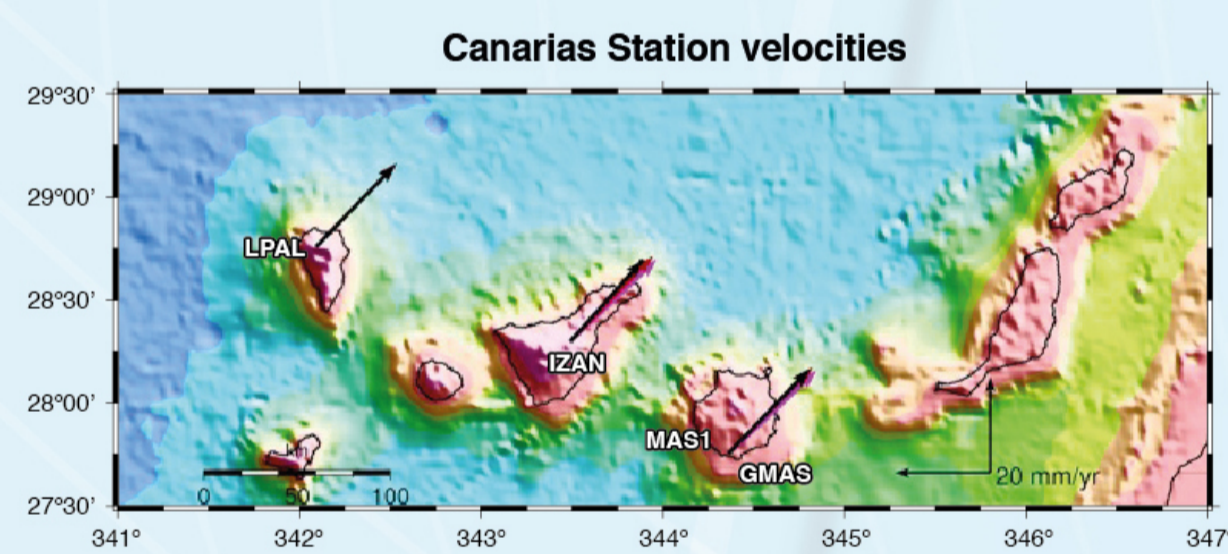
The CGC participated in 2009 in preliminary solutions of reference frame solutions for AFREF08 and AFREF09 by estimating station positions for an agreed African station network for two two-week periods, in 2008 and 2009. The CGC solutions were calculated using the GNSS estimation software NAPEOS (ESA) and combined and compared by the AFREF Coordinator (R. Fernandes, IDL) with solutions from RCMRD(Kenya)/IDL(Portugal) using GIPSY, NRIAG(Egypt)/TUD(Germany) using Bernese, and HartRAO(South Africa) using GAMIT. The rms of daily station repeatability versus each AFREF combination in the plot below shows the CGC contribution to be of high quality and a worthwhile contribution to the AFREF effort.

IAG 2009 – Buenos Aires, Argentina – 31 August 2009
R. Fernandes et al., IAG2009
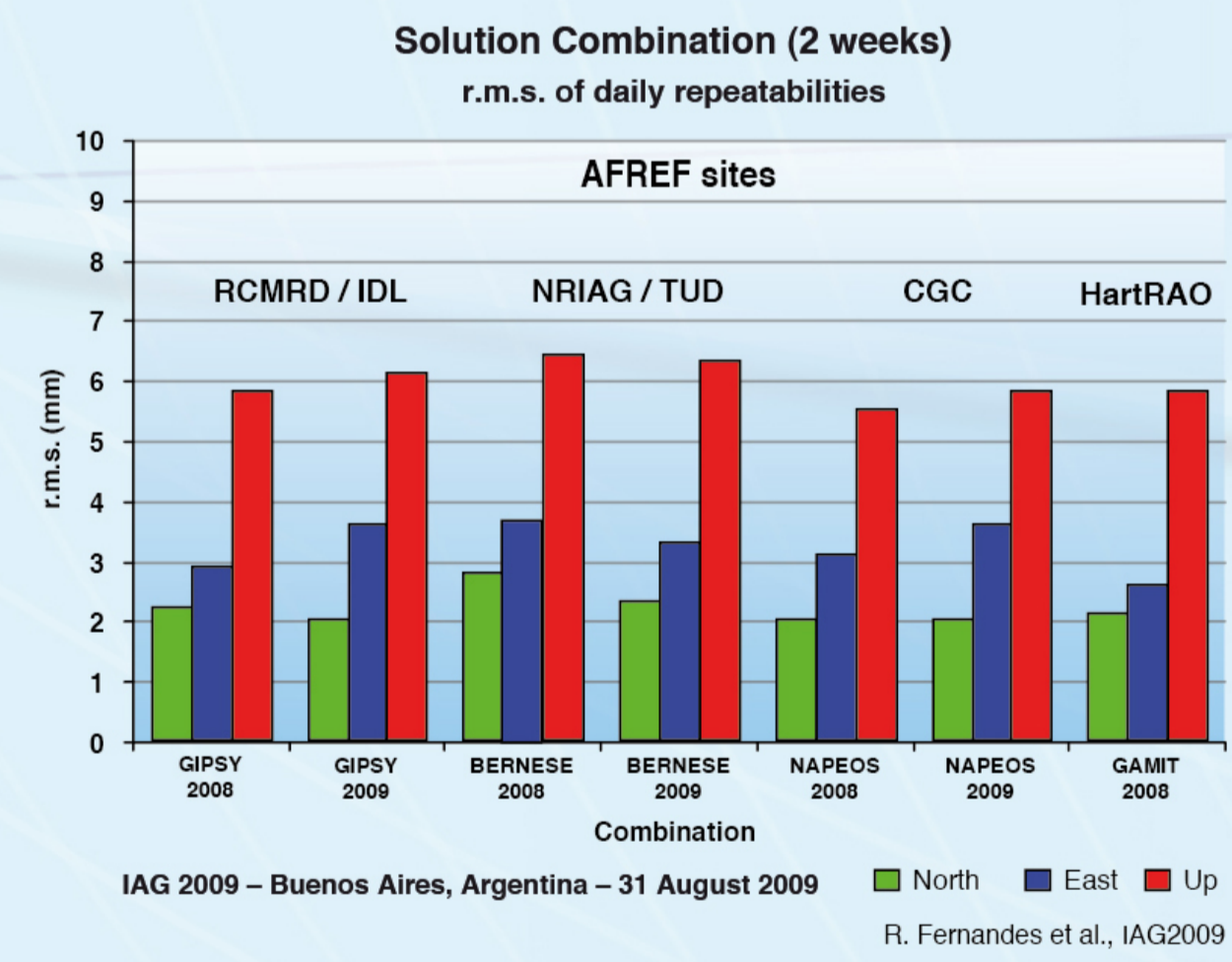
The CGC is processing the data available in its repository to produce station positions, troposphere delays, etc using NAPEOS (ESA) with fixed IGS orbits and clocks. The processing runs covering 2010-2012 include about 100 stations per day and also include a sparse network of worldwide IGS reference stations to aid in fixing the ITRF. The results will help to continue in the study of this region, and its results will be made available through the CGC website. Below is a sample of the initial CGC results for the displacement observed at station FRON in the Canary Island of El Hierro due to recent underwater volcanic activity there in 2011 and 2012.

El Hierro, Canary Islands, Spain
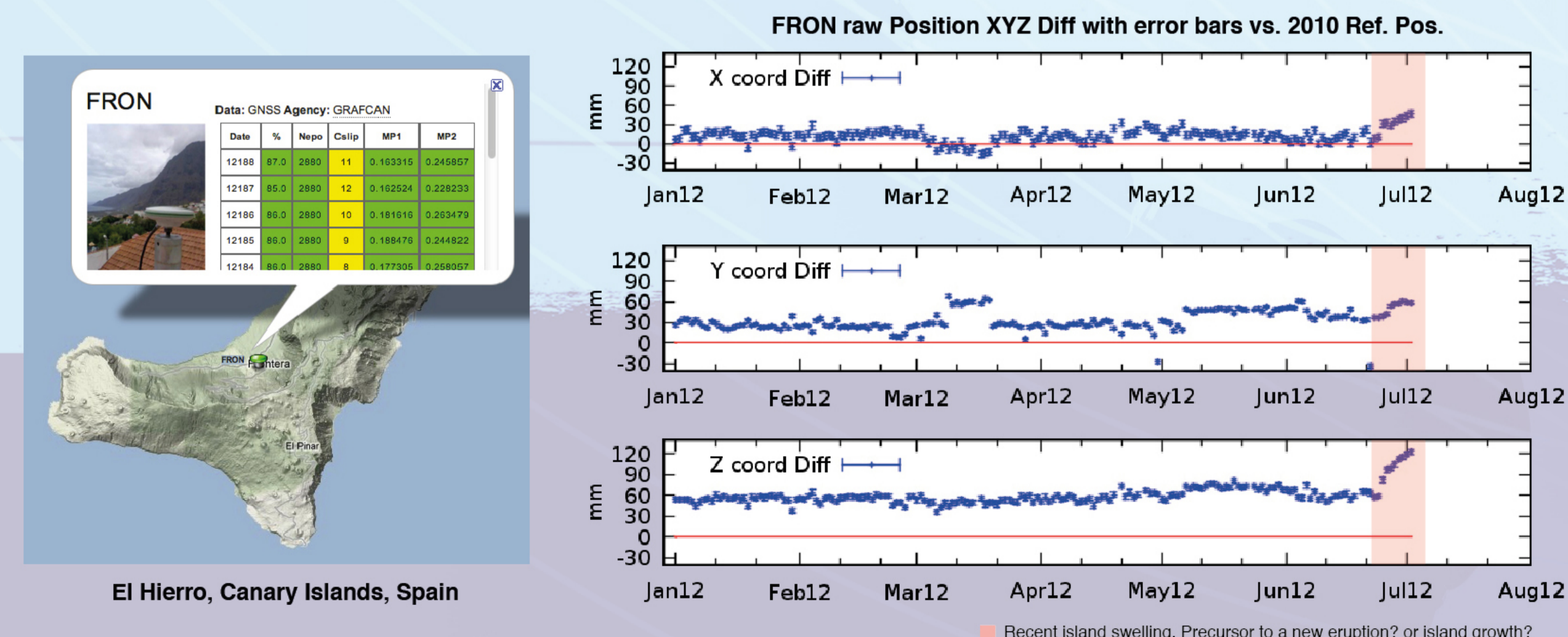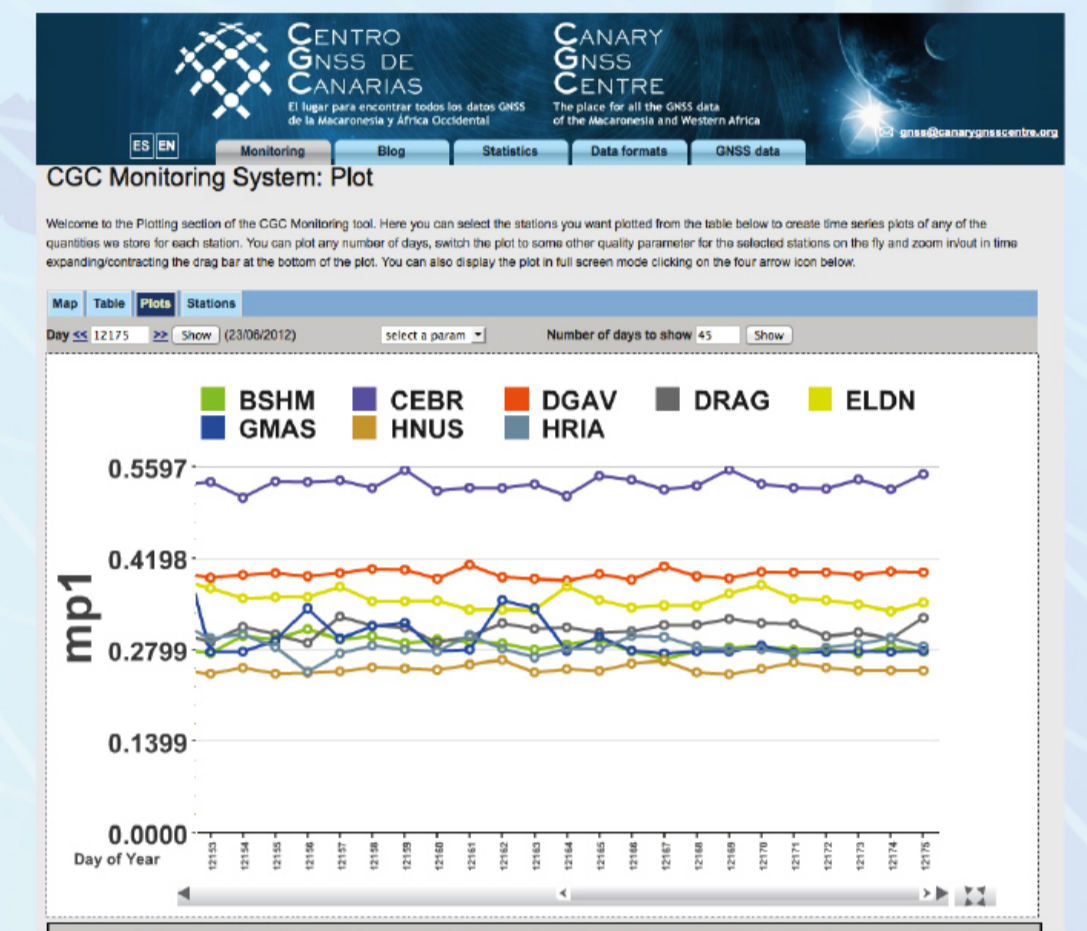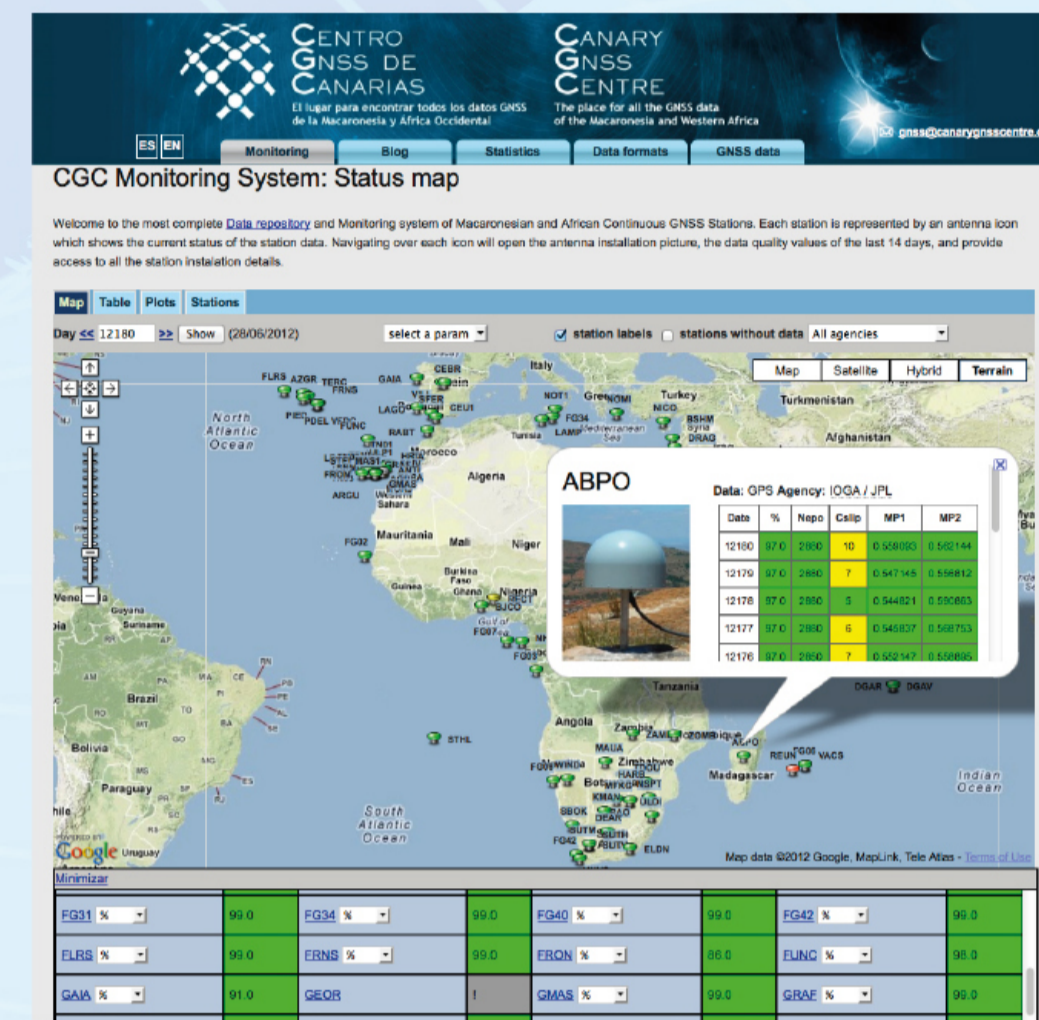
Data Monitoring

The CGC has a modern functional website for the divulgation of GNSS data, statistics, monitoring, results, an a blog to share scientific GNSS news. The CGC website includes a daily GNSS data quality monitoring system where all monitored stations can be checked. The CGC website also includes a GNSS data quality plotting tool, to be able to compare and contrast the time series of any data quality measure over any specified number of days. The website will soon also display processing results from precise network GNSS processing using the Napeos (ESA) processing package. Results such as station positions, troposphere, data residuals, etc will be made available through the CGC of all the CGC stations.

Azores

Madeira

Morocco

Canary Islands

Cape Verde Islands

Mauritania

Senegal

Burkina Faso

Benin

Nigeria

Ivory Coast

www.canarygnsscenter.org