Developments for the EUREF Regional Data Centre at BKG

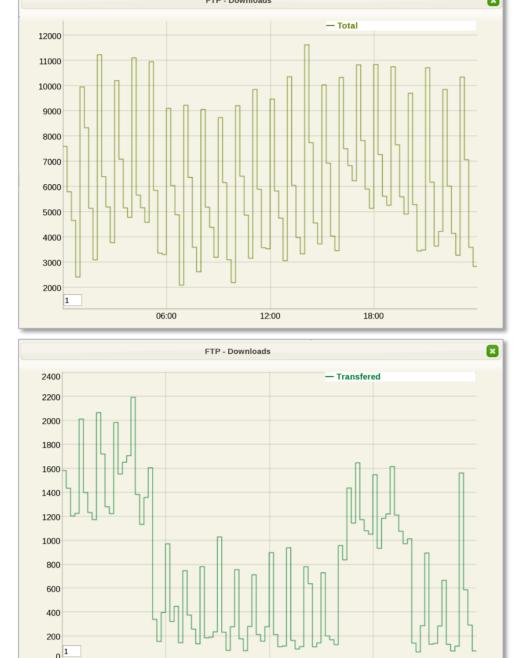
M. Goltz, A. Rülke, E. Wiesensarter

GDC Data Sheet



Upper left: # of FTP-uploads Upper right: # of FTP-downloads Lower right: FTP-downloads in MB

All data per quarter of an hour Example of 14th March 2015

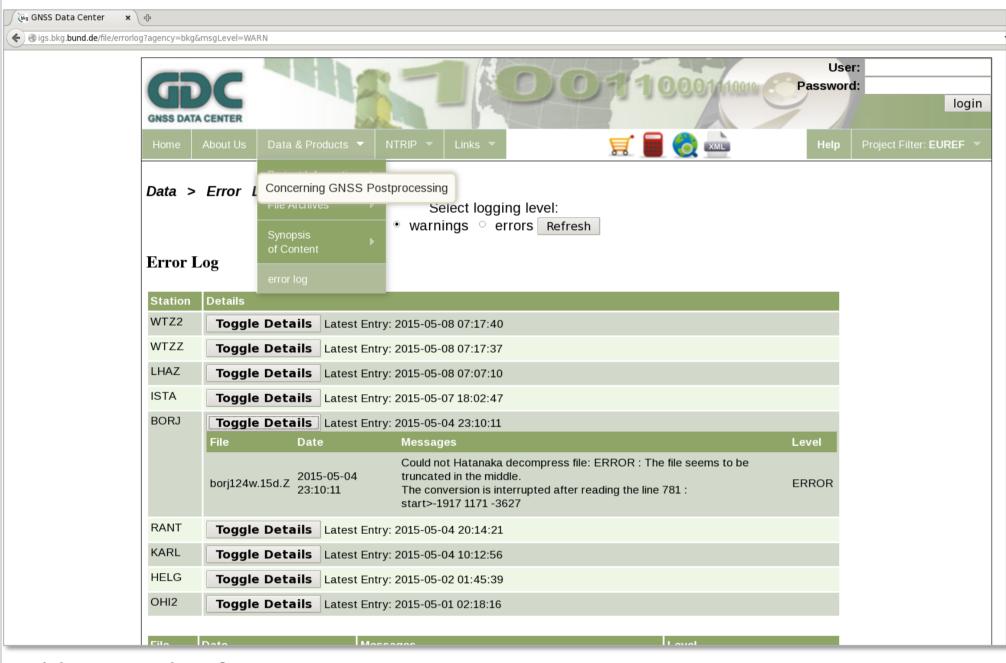


Since 1992 the Federal Agency for Cartography and Geodesy (BKG) is operating a GNSS Data Center (GDC) for global, regional and national purposes. The aim is to provide reliable and non-restricted access to GNSS observational and navigational data. Access is possible via ftp for routine and frequent up- and downloading and via http for interactive processes.

Some key measures of the GDC are:

- ~ 10 million files in archives
- ~ 2 TB of GNSS data
- ~ 50.000 FTP-uploads of RINEX-files daily
- ~ 400.000 FTP-downloads daily summing up to 75 GB
- > 450 visitors via HTTP daily, about 50% of them located in Europe

QC for Station Operators



Public error-log for station operators

GDC routinely performs data-checks of all incoming files. For example, RINEX-headers are compared to sitelog-entries, plausibility-checks for file-size and number of observations are performed. Erroneous files are stored in a special directory and deleted or reprocessed later.

To give station operators the possibility to check easily for problems concerning uploaded files a public error-log has been added to the GDC-website. It lists errors and warnings ordered by stations. Uploaders have the possibility to check:

all stations

http://igs.bkg.bund.de/file/errorlog

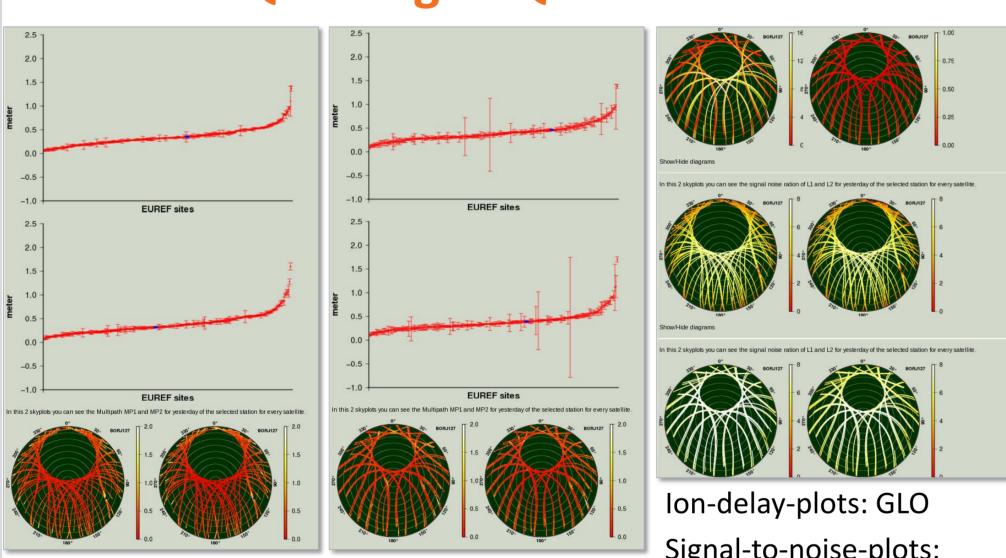
stations run by a certain agency (agency = pref. abbr. as in sitelog), e.g.

http://igs.bkg.bund.de/file/errorlog?agency=bkg

a single station (site = FourCharacterId), e.g.

http://igs.bkg.bund.de/file/errorlog?site=helg

RINEX v2-QC using TEQC

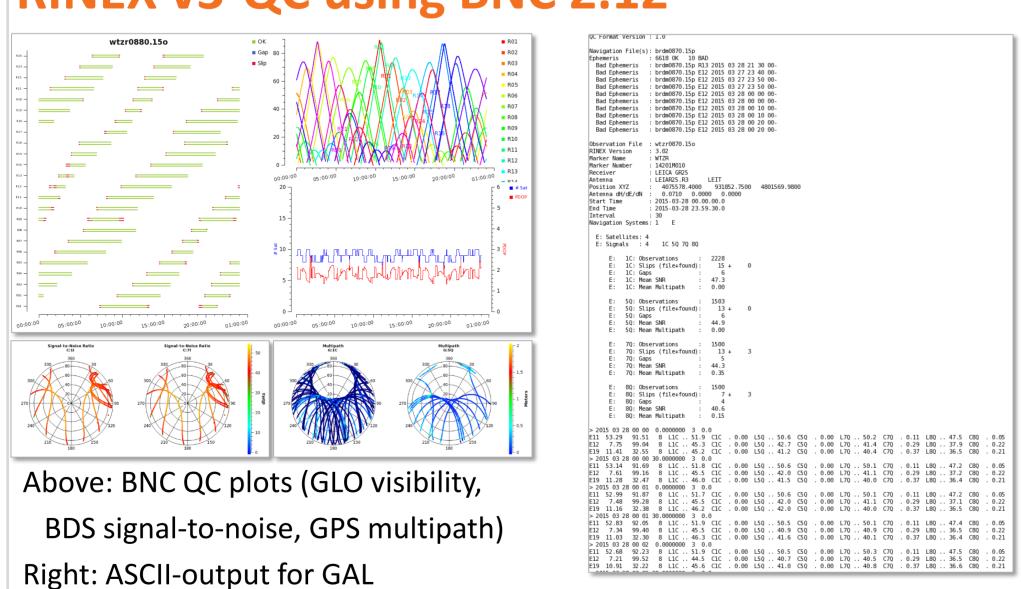


Multipath-plots: GPS Multipath-plots: GLO Signal-to-noise-plots: GPS, GLO

A quality-check is performed daily for stored RINEX-files and the results are available on the GDC-website. RINEX v2 files are checked with TEQC and the output plotted for GPS and GLONASS with the Generic Mapping Tool (GMT). The plots present results related to the station (e.g. skyplots) and related to the project (e.g. comparison of multipath-values). Skyplots are used to visualize multipath, ionospheric delay and signal-noise for the station. Plots for expected and complete observations, multipath and cycle slips show a comparison of all stations of a project where the selected station is marked.

With introduction of RINEX v3 and additional satellite-constellations this routine reaches its limits. To provide quality-information on RINEX v3 files GDC will use BNC 2.12 which processes in addition to GPS and GLONASS the upcoming systems. All frequencyinformation can be used and the quality-check is profoundly configurable.

RINEX v3-QC using BNC 2.12



The BKG Ntrip Client (BNC) has been developed since 2005. Originally developed for decoding, encoding and synchronizing of GNSS real-time data it has been extended by many features: orbit and clock correction combination, precise point positioning, zenith total delay estimation, etc.

One of the modules covering quality checking (QC) of RINEX v2 has been recently extended to RINEX v3 files (Söhne et al., 2015). QC is implemented for six different constellations or systems (GPS, GLONASS, Galileo, BeiDou, QZSS, and SBAS). Beside graphical outputs for Multipath, signal-to-noise, PDOP, etc. a protocol file is created. Following a short summary at the beginning, the file has a RINEX v3-like structure. This way, e.g. time series for each satellite of each constellation and each signal can be analyzed and visualized.

http://igs.bkg.bund.de/ GDC:

http://software.rtcm-ntrip.org/export/HEAD/ntrip/trunk/BNC/src/bnchelp.html **BNC** documentation:

