

National Report of Spain

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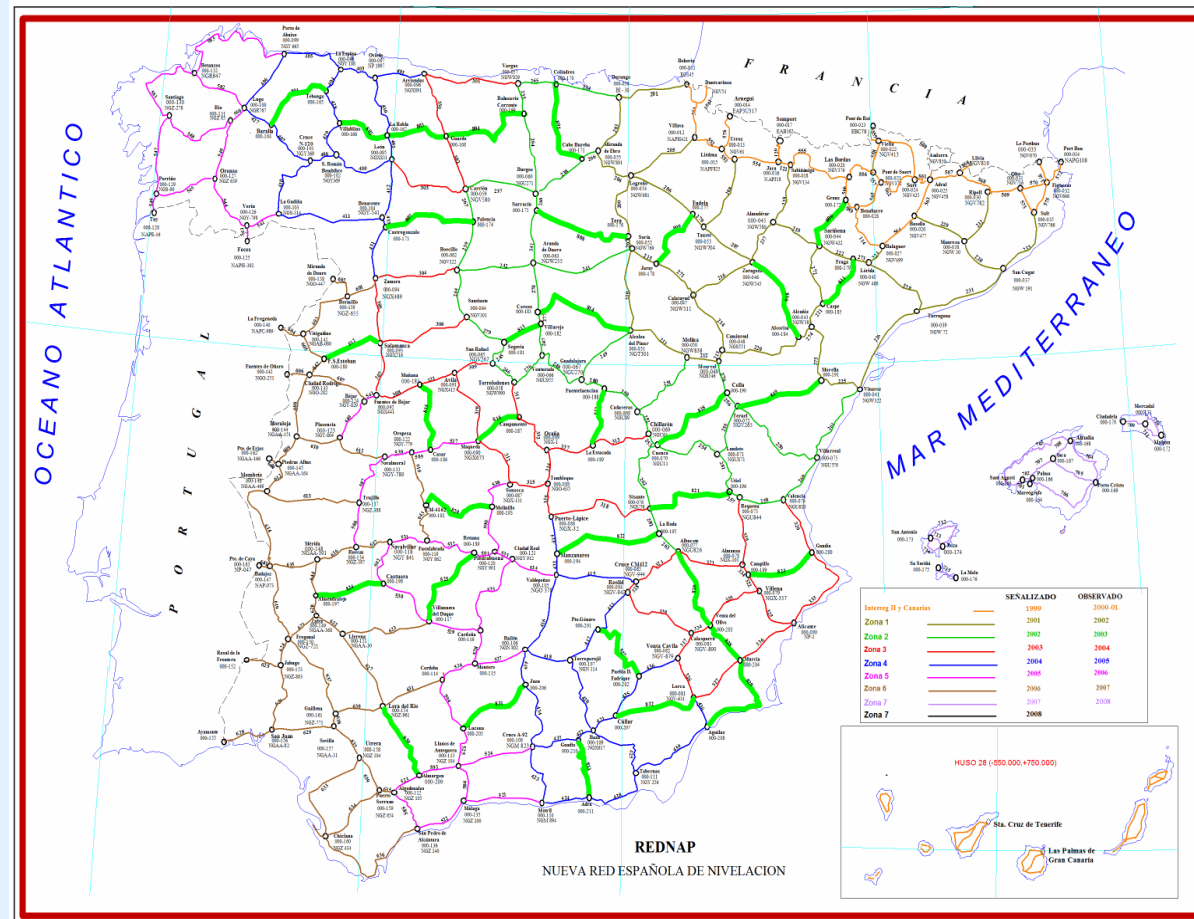
Spanish GNSS Reference Stations Network (ERGNSS)

- 41 permanent stations.
 - 2 IGS
 - 22 EPN
- 7 new stations:
 - MELI (IGS/EPN proposed)
 - RIO1 (EPN proposed)
 - LUGO, FRAG, GIRO, BCLN, PENI.
- RIOJ decommissioned.
- Post-processing:
 - <ftp://ftp.geodesia.ign.es>
- Real-Time Caster:
 - <http://ergnss-ip.ign.es>
- 5 EPN stations RINEX3 – Galileo observations.



Spanish Vertical Reference Network (REDNAP)

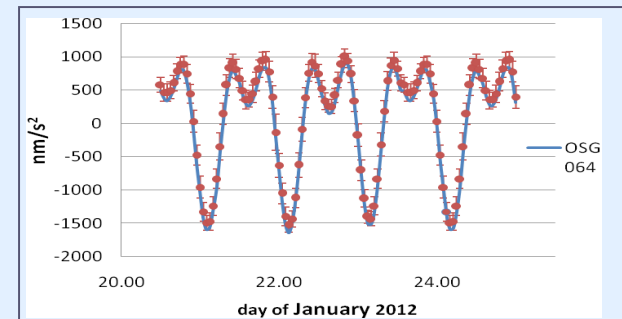
- Total: 19.500 Km
- Densification stage.
 - Maximum leveling-rings length from 500 to 400 Km.
 - Total lenght:
 - 3200 Km (green).
 - Observed:
 - 2400 Km.
 - Levelling lines to ERGNSS / tide gauges.



Superconducting gravimeter

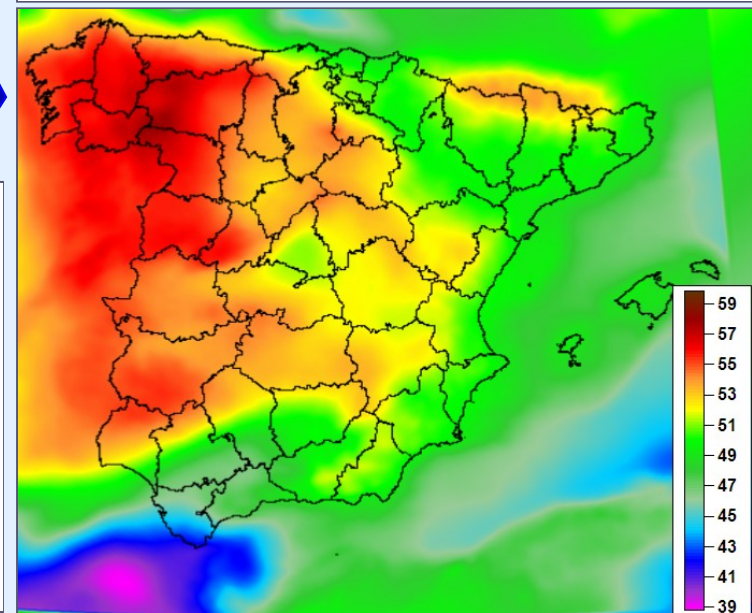
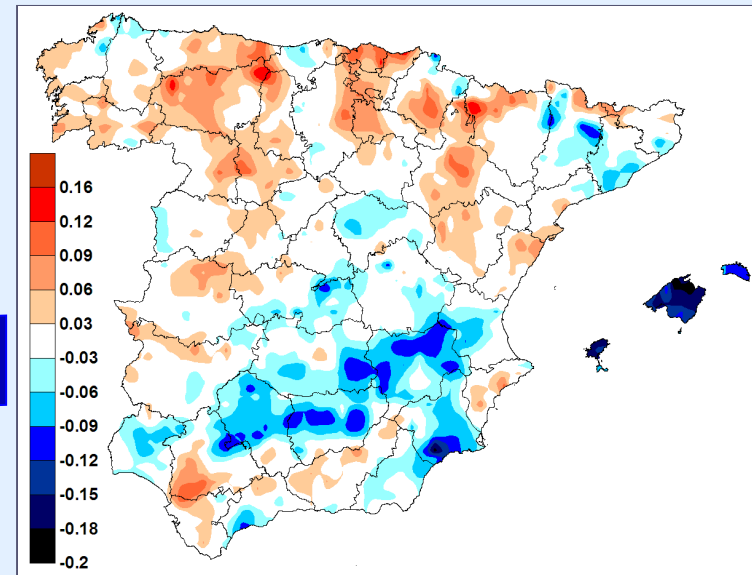
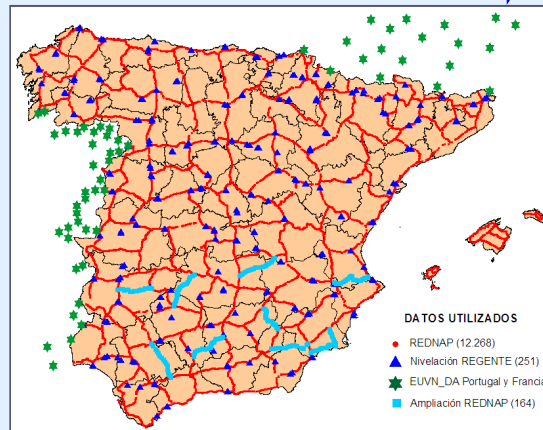
- Yebes observatory – (GNSS, 40 m VLBI).
- April 2011, Global Geodynamics Project (GGP).
- First Tidal Model for the station computed.
- Calibration with FG5 absolute gravimeter.
- Control of internal temperature $\pm 0.1^\circ \text{C}$.

Wave Group	Amplitude [nm/s ²]	δ	phase lead [deg]
Q1	58.7545	1.15667 ± 0.00107	-0.8367 ± 0.0531
O1	306.8689	1.14764 ± 0.00019	-0.221 ± 0.0094
P1	142.7616	1.1536 ± 0.00536	0.3901 ± 0.2701
K1	431.3948	1.12762 ± 0.00875	0.0148 ± 0.4444
J1	24.1301	1.16057 ± 0.00294	0.2936 ± 0.1449
N2	83.1615	1.11066 ± 0.00077	5.0043 ± 0.0396
M2	434.341	1.15105 ± 0.00013	4.5251 ± 0.0064
S2	202.0597	1.18045 ± 0.00034	2.7721 ± 0.0222
K2	54.9064	1.17825 ± 0.00121	3.0789 ± 0.0577
M3	6.4912	1.06363 ± 0.00281	-0.4576 ± 0.1512



EGM08-REDNAP Geoid

- Based on EGM2008 (NGIA) and REDNAP.
- 13.700 REDNAP points with GPS.
- Surface correction applied to gravim. model (MCS algorithm).
- Final precision (350 points tested):
 - Absolute: 3,8 cm
 - Relative: 2 ppm
- Tool and geoid in different formats:
<http://www.ign.es>



IGE Analysis Centre

As a Local Analysis Centre of EUREF

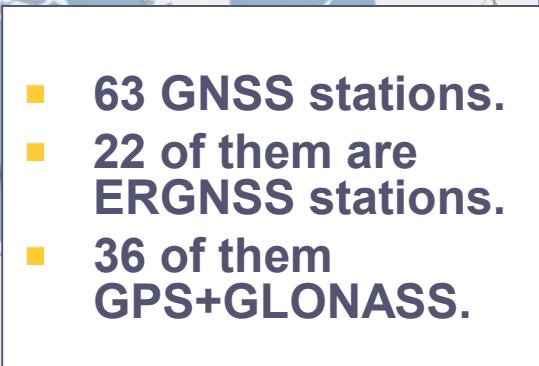
- From 1130 week.
- 63 stations with Bernese 5.0.
- EPN Rapid Analysis project (since 1418 week).

As Analysis Centre

- IBERRED Project (Iberian Region).
- E-GVAP Project (Iberian Region).
 - About 320 stations.
- Canary Volcanic Monitoring GNSS Network.



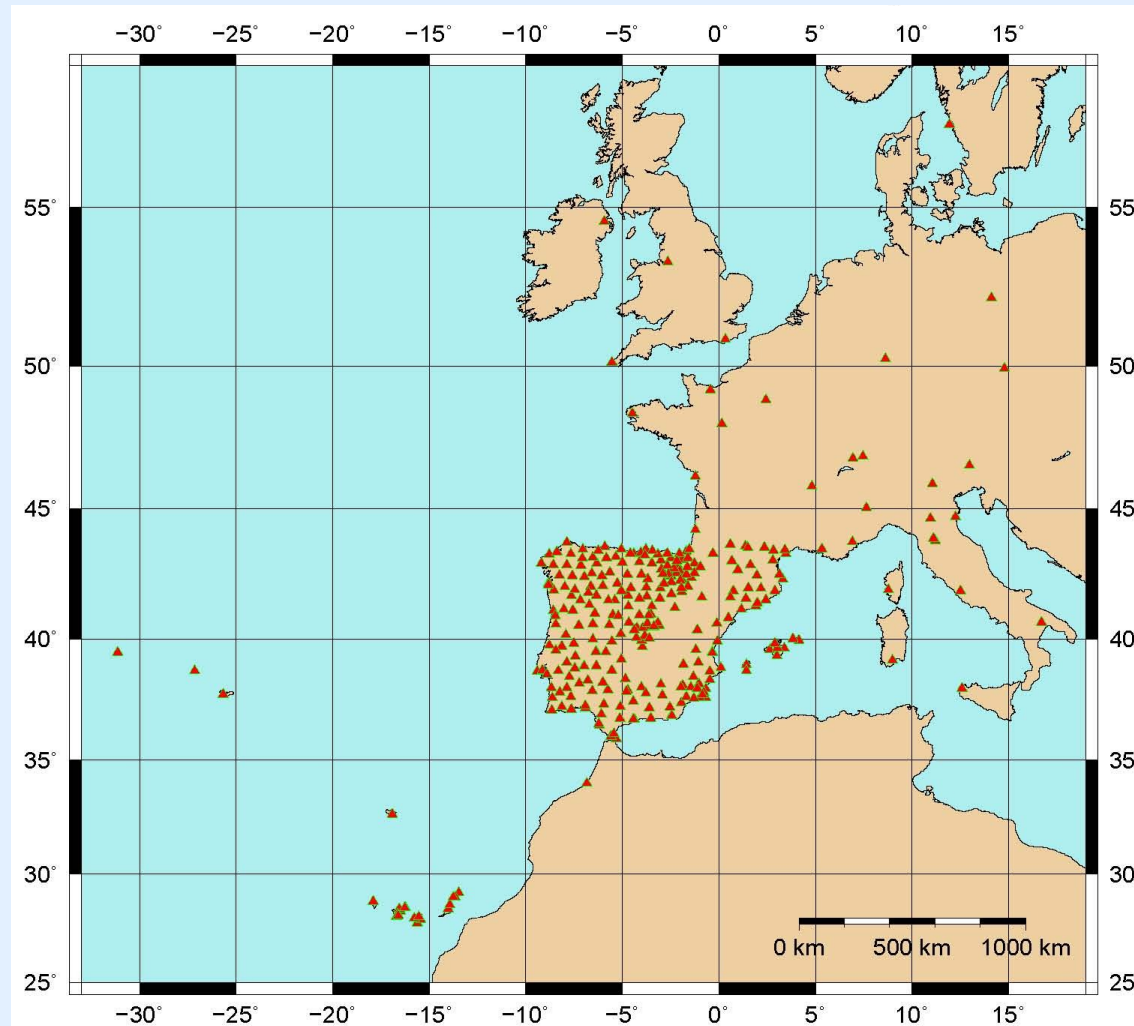
Number of processed stations per week



❖ Other IGE Analysis Centre projects

IBERRED

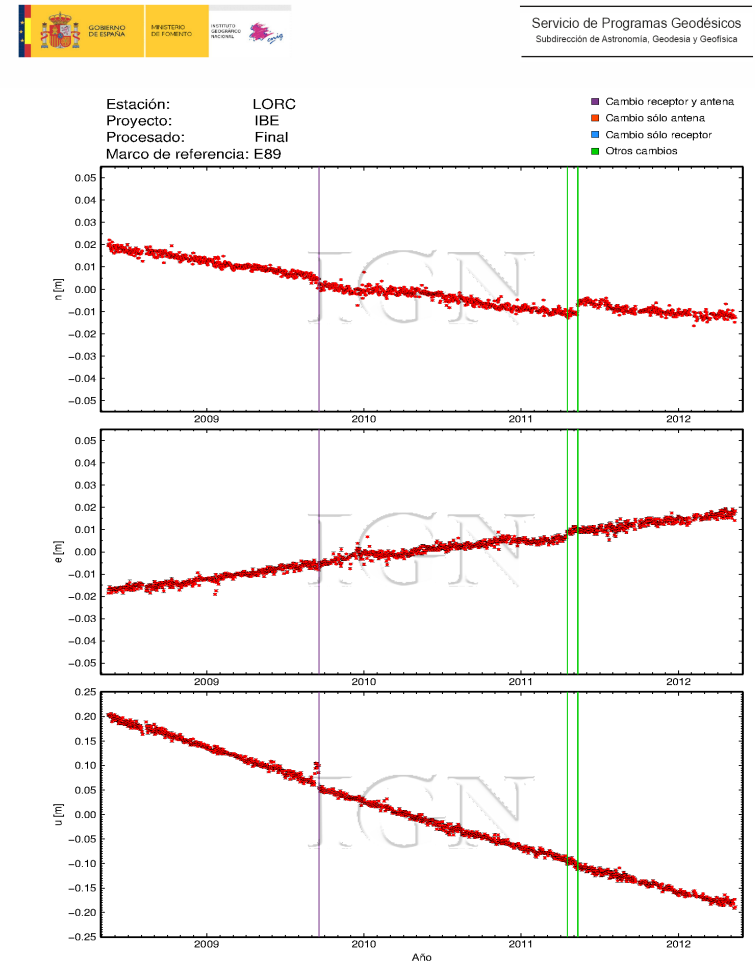
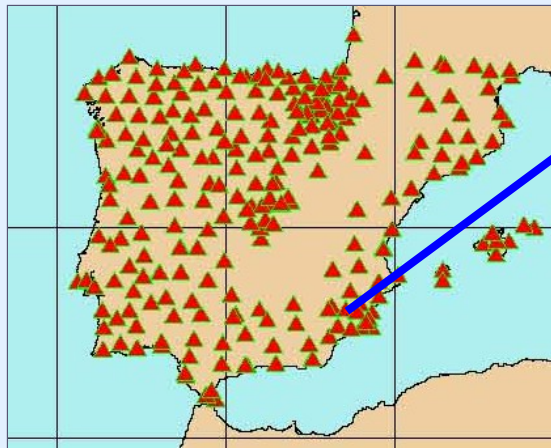
- About 310 stations.
Objectives →
 - Positions requested by GNSS active networks.
 - Coordinates to EGVAP hourly processing.
 - Atmosphere products.
 - Time series.
- Weekly processing.
- Almost the same strategy as EPN LAC.
 - Clustering strategy.
 - Double differences.
 - Final IGS products.



❖ Other IGE Analysis Centre projects

IBERRED Time series

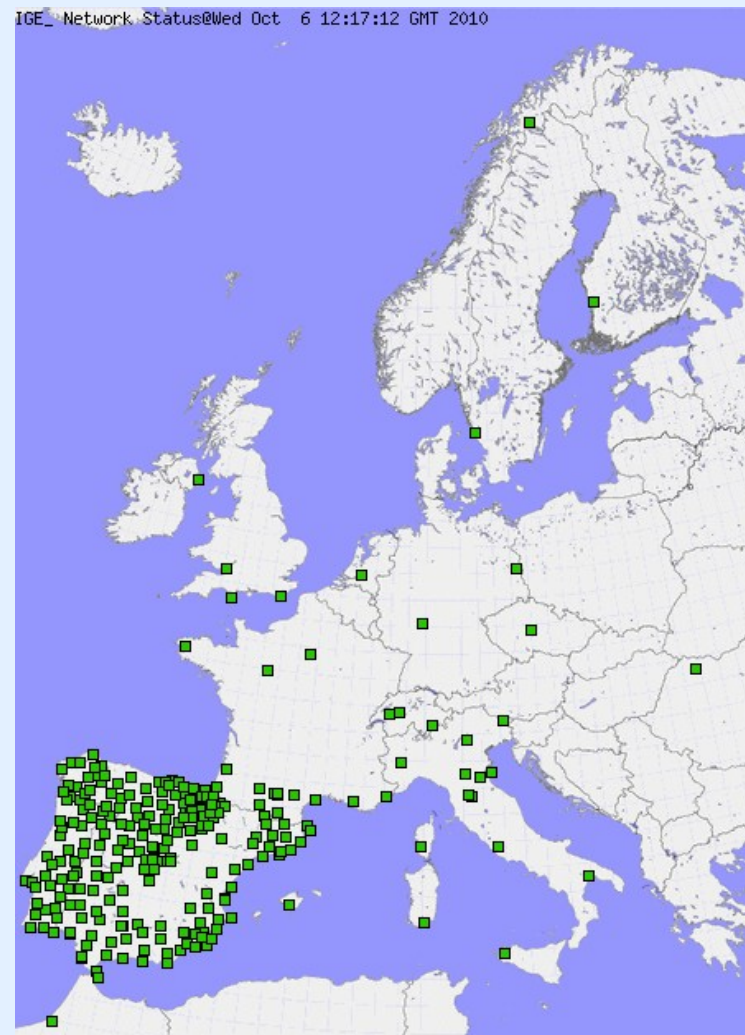
- Subsidence in Lorca.
 - SE of Spain.
 - Due to massive water extraction.
- Vertical velocity: 9,9 cm / yr.
- Horiz. velocity: 1,0 cm / yr.



❖ Other IGE Analysis Centre projects

E-GVAP

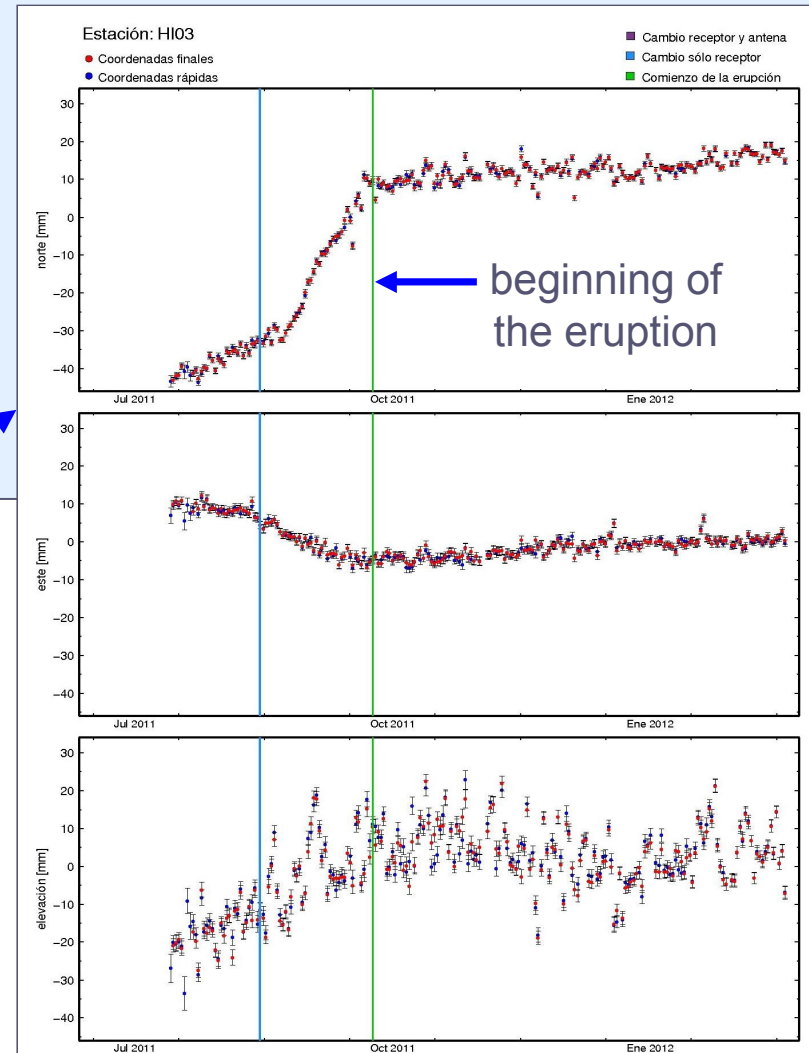
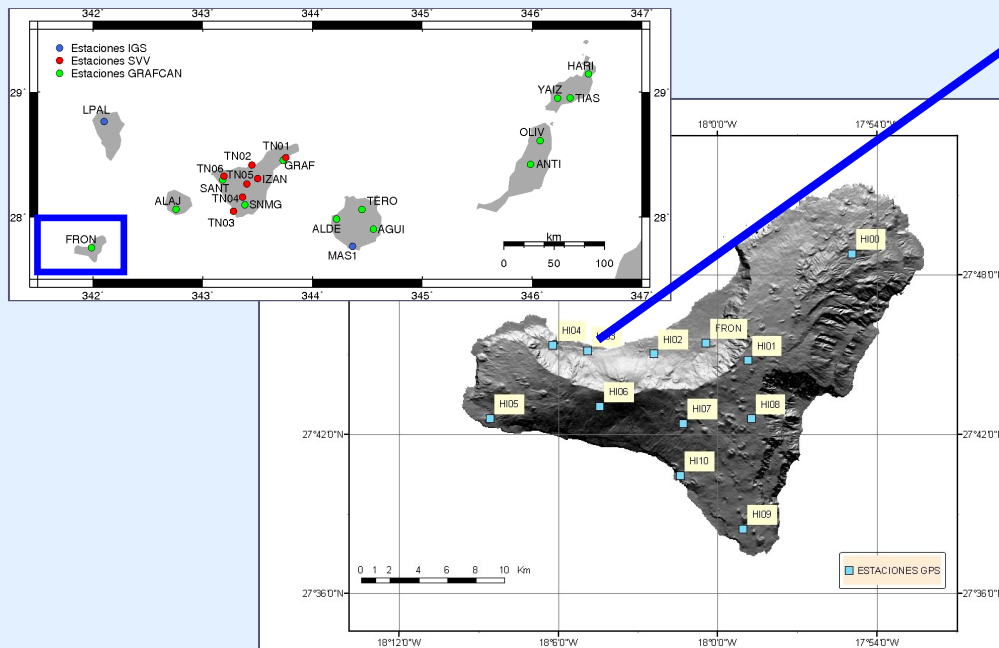
- Intention to get the same IBERRED stations.
- Hourly NRT processing (using coord. from IBERRED process).
 - Objective → ZTD
 - Double differences.
 - Ultra rapid IGS orbits.
 - Finally → last 12 h combined.



❖ Other IGE Analysis Centre projects

Permanent GNSS Network for Volcano Monitoring in the Canarian

- Around 30 stations are processed in and out Canary Islands.
- Oct. 2011 – March 2012: submarine eruption in El Hierro (→ 12 stations).





Many thanks !

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