

National Report of Spain

Instituto Geográfico Nacional



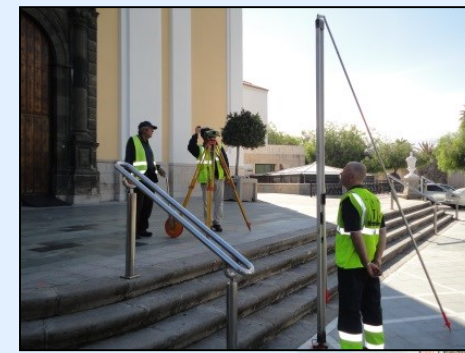
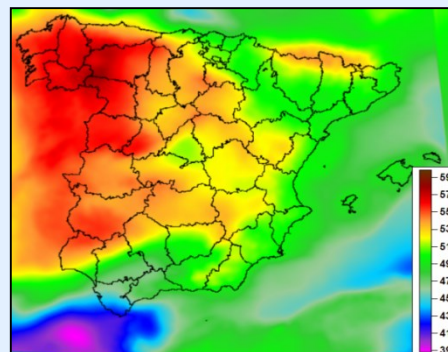
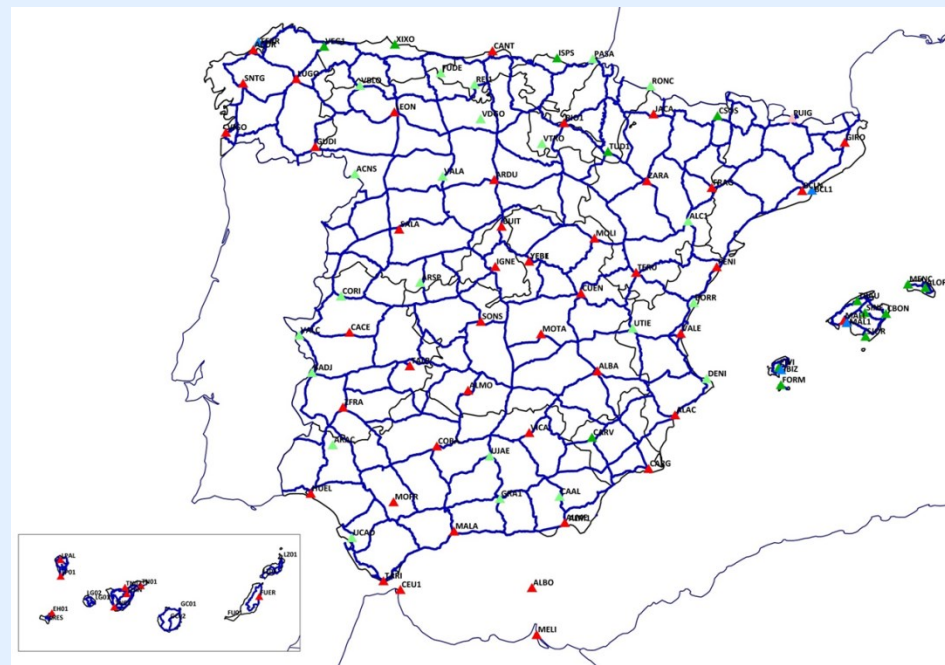
Spanish GNSS Reference Stations Network (ERGNSS)

- Currently: 72 GNSS permanent stations.
 - 3 IGS + 24 EPN.
 - Most of them, Galileo.
- Reaching agreements and reforming some stations from regional networks.
- Ending 2016: National ERGNSS network with about 90 stations.
- Local Data Center:
 - <ftp://ftp.geodesia.ign.es>



Spanish Vertical Reference Network (REDNAP)

- About 25,000 benchmarks along about 20,000 km.
- Final densification stage.
- Levelling lines to EGNSS and tide gauges.
- Improving the combined EGM08_RED NAP geoid.
- Absolute gravity of permanent stations and tide gauges



IGE Analysis Centre

Local Analysis Centre of EUREF

- Final products.
 - Rapid products.
 - DAC: EUREF Dense Velocity Field project (~ 360 stations).
 - Repro-2 finished (125 EPN stations, 1996 → 2014).
- } 65 EPN stations

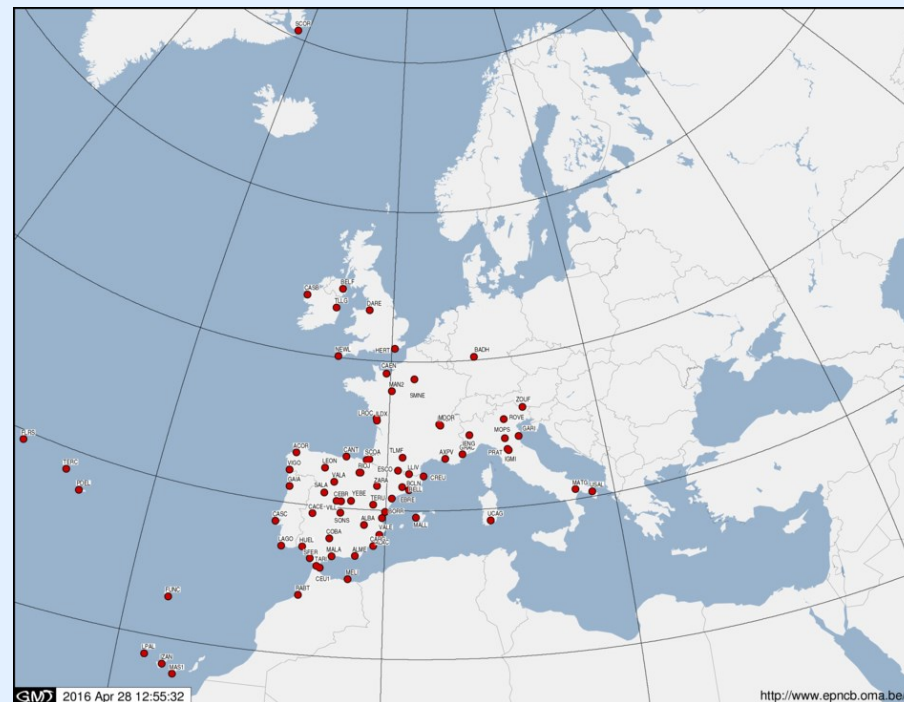
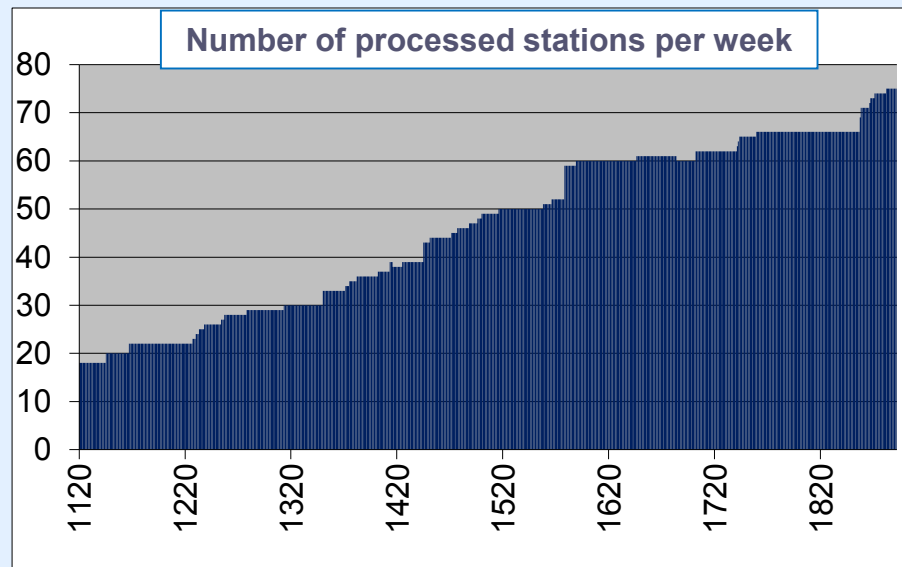
Other projects

- IBERRED Project (time series) → About 360 stations.
- E-GVAP Project (EUMETNET) → Same stations IBERRED.
- National coordinates ETRF00 → About 240 stations.



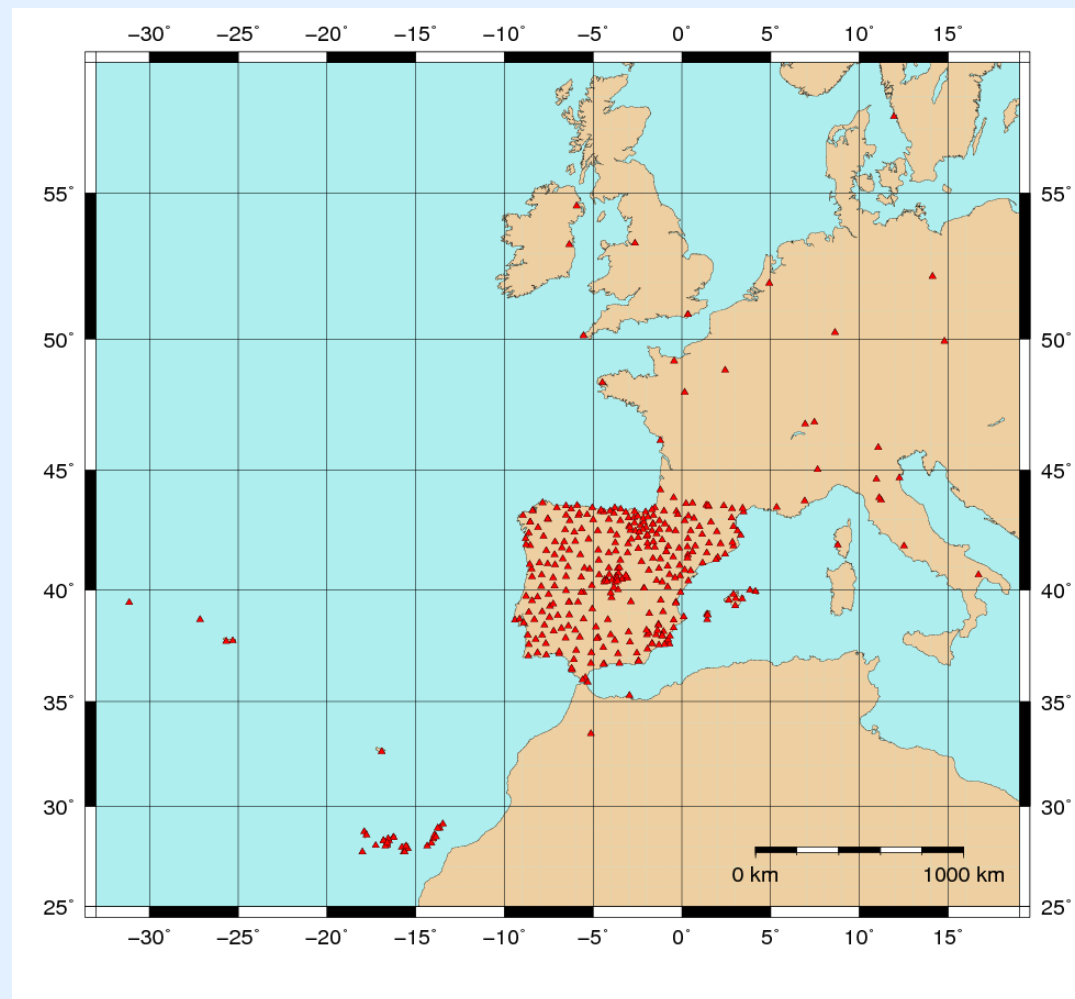
IGE EUREF LAC

- BSW 5.2.
- 75 EPN stations (26 IGN)
- 63 GPS + GLONASS.
- 14 individual calibration.
- Final & rapid products.



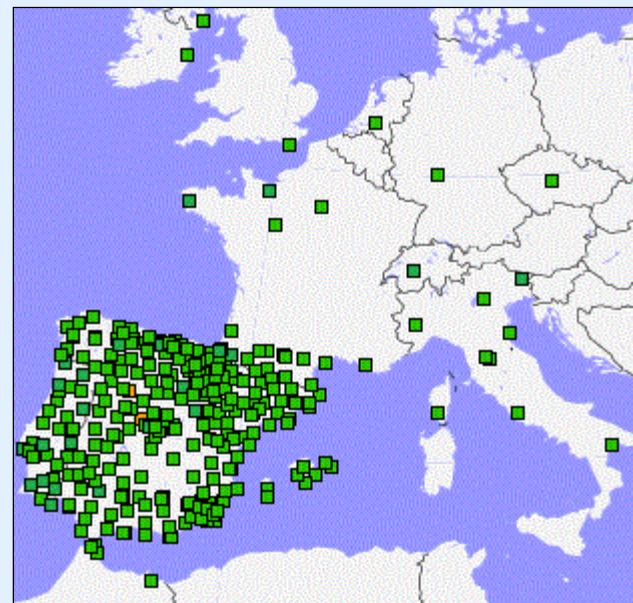
Contribution to Dense Velocity Field project

- Bernese 5.0
- 370 EPN + non-EPN stations.
- EPN + IGN + 12 regional networks + Portugal (IGP)...
- Iberian area.
- Current status: submitted until Wk 1890 (updated).
- Planned Repro BSW 5.2:
 - GPS+GLONASS.
 - VMF a priori trop.
 -



E-GVAP processing

- Previous PP process ~ 350 stations.
 - 72 IGS or EPN stations.
 - 10 E-GVAP “supersites”.
 - 19 IGB08 for Datum fixing.
 - > 350 stations in the area:
 - Spain
 - Public (regional networks).
 - Private.
 - Portugal and France (south).
 - Public stations (IGP & IGN)
 - From 22 different regional networks.
- BSW 5.2.
- Hourly NRT processing
(using coord. from IBERRED process).
 - Objective → ZTD

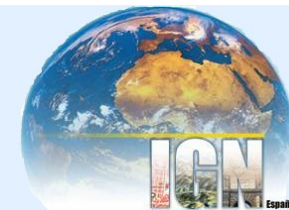
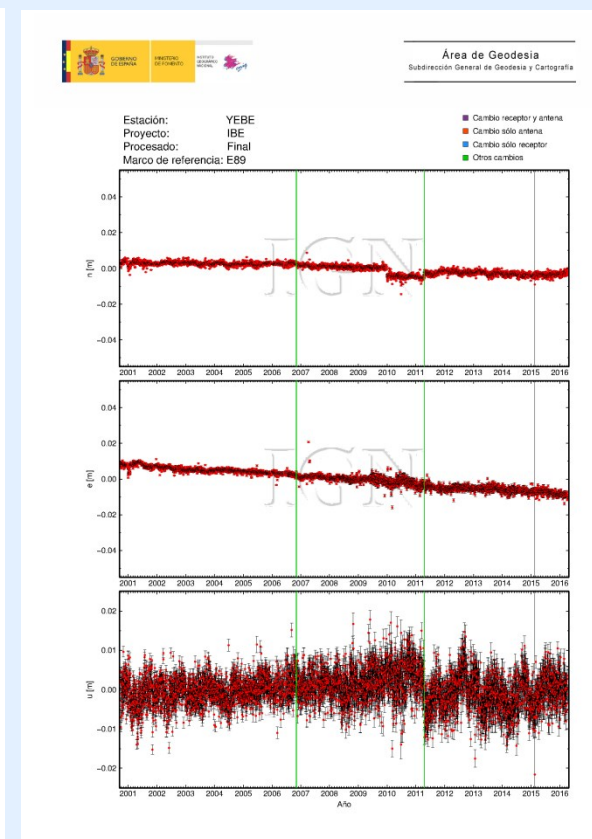
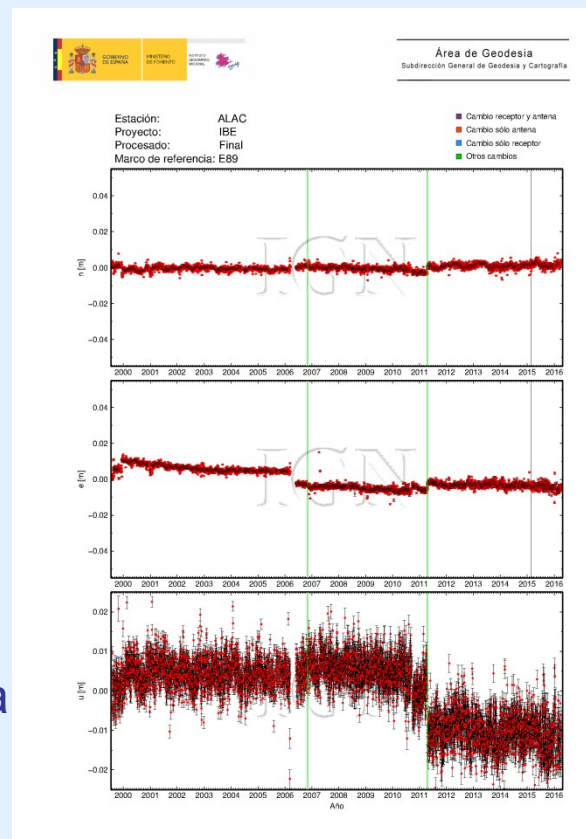


From: E-GVAP web (egvap.dmi.dk)



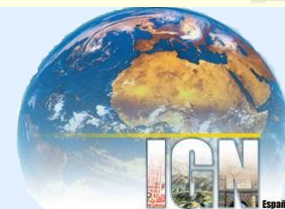
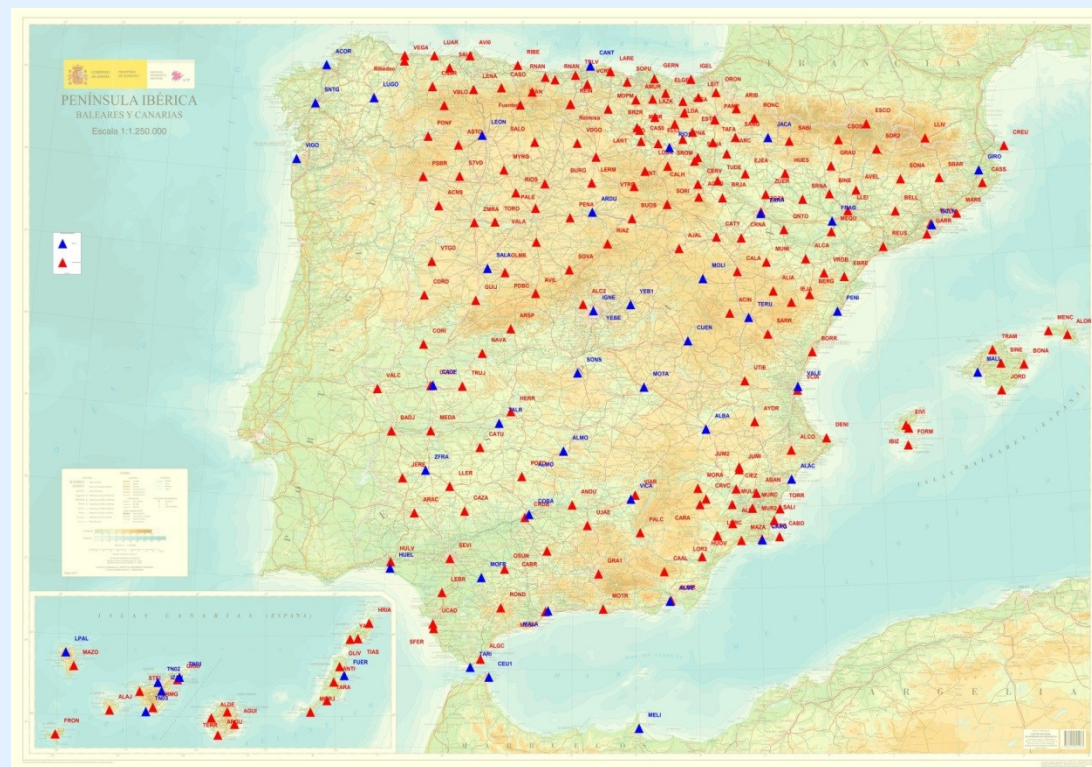
IBERRED

- Bernese 5.0.
- About 370 stations.
- Objectives →
 - Positions requested by GNSS active networks.
 - Coordinates to EGVAP hourly processing.
 - Monitoring of reference systems.
 - Atmosphere products.
 - Time series.
- Time series and velocity maps in Iberian Peninsula (ETRF2000).



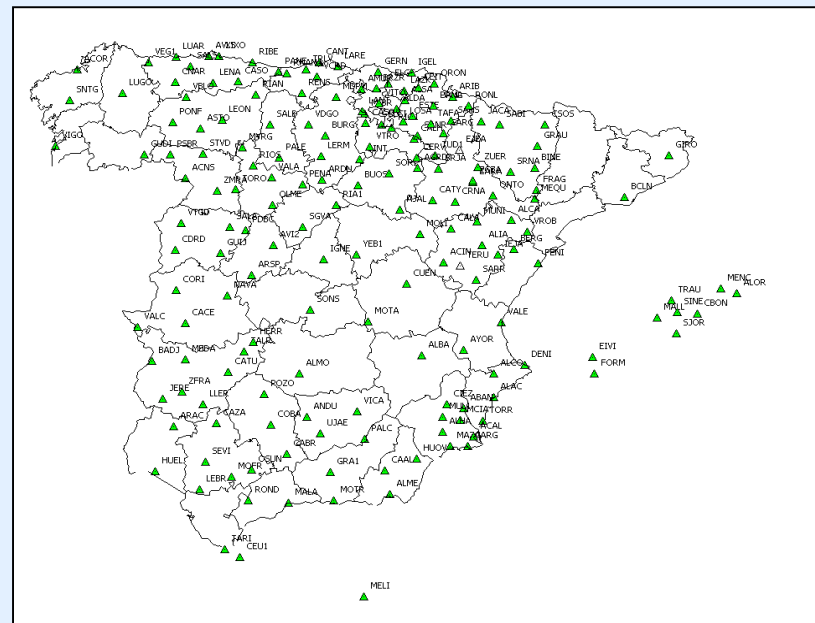
National coordinates

- Collaborative project with Autonomous Region networks.
- Objective:
 - Provide National Coordinates in an homogeneous frame to all regional networks and IGN in ETRF00.
- Several institutions involved (BSW5.2 & GAMIT): ICGC, IGN, ITACYL...
- About 240 stations from public regional networks.
- Period: 2011 – 2015.



Real Time Services

- Single-point RTK:
 - EUREF-IP Caster (from 2003).
<http://ergnss-ip.ign.es>
- New RTK service (working since 2015 in experimental mode):
<http://ergnss-tr.ign.es>
 - In collaboration with Autonomous Regions GNSS networks.
 - GNSMART (GEO++).
 - Current status: testing the service and finishing agreements with Aut. Regions.
 - Comparison between the RTK and post-processing positioning.
 - FKP, VRS, MAC.
 - GPS & GPS+GLONASS solutions.
 - Discrepancies better than 3 cm.



Our thanks to those institutions that provide data for these projects:

- Instituto Cartográfico de Cataluña (ICC) – CatNet.
- Gobierno de Aragón – ARAGEA.
- Gobierno de Navarra – Red Geodésica Activa de Navarra (RGAN).
- Instituto Cartográfico de Valencia (ICV) – Red Geodésica Activa en Tiempo Real.
- Gobierno de Euskadi – Red de Estaciones de Referencia GNSS de Euskadi.
- Gobierno de La Rioja – Red de estaciones permanentes GNSS.
- Gobierno de Cantabria, Universidad de Cantabria – Red Geodésica Activa.
- Región de Murcia – REGAM y Meristemum.
- Instituto Geográfico Portugués (IGP) – Rede Nacional de Estações Permanentes (RENEP).
- Instituto Geográfico Nacional de Francia (IGN) – Reseau GNSS Permanent (RGP).
- Leica Geosystems – IBEREF.
- Instituto Tecnológico Agrario de Castilla-León (ITACYL) – Red GNSS Castilla y León.
- Junta de Extremadura – Red Extremeña de Posicionamiento (REP).
- Instituto de Estadística y Cartografía de Andalucía – Red Andaluza de Posicionamiento (RAP).
- SITIBSA – Xarxa de Geodesia Activa de les Illes Balears (XGAIB).
- GRAFCAN de Canarias – Red de Estaciones Permanentes (REP) de Canarias.
- Lógica S.A. – Red de Galicia.
- Principado de Asturias – RGAPA.



Thank you for your attention



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