

EUREF ACTIVITIES AND INITIATIVES TO IMPROVE THE EUROPEAN SPATIAL REFERENCE SYSTEMS



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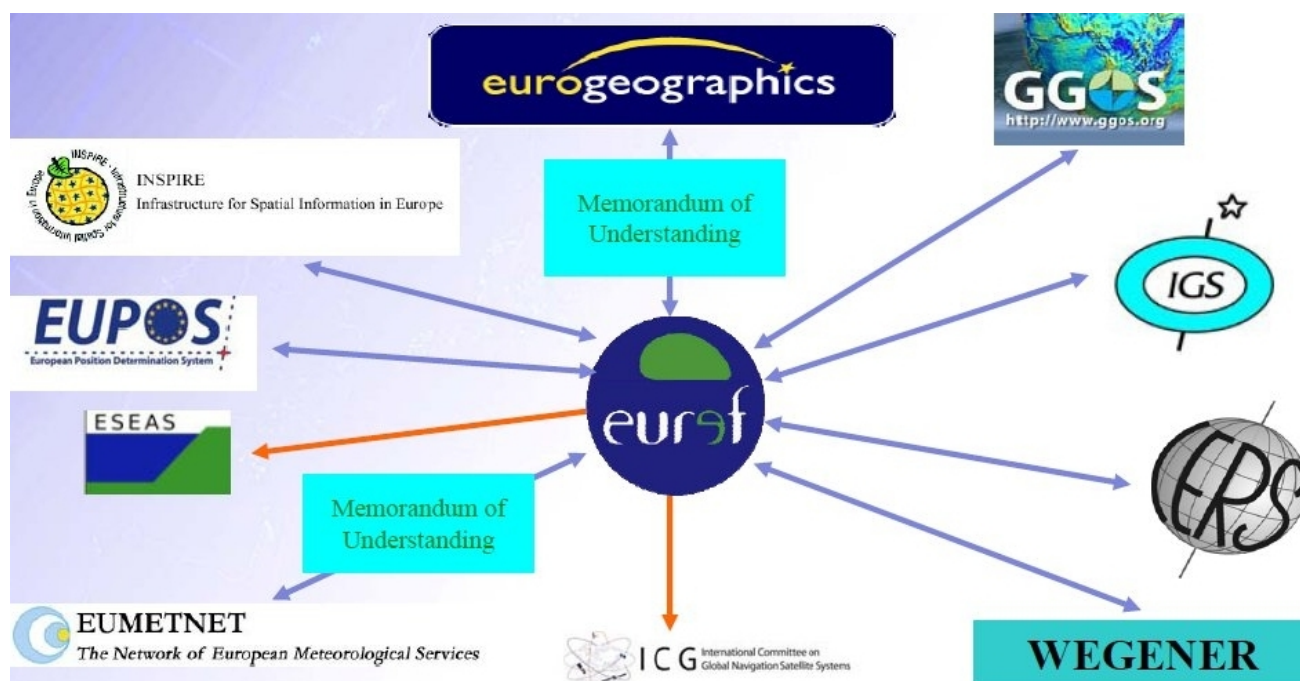
EUREF



the KEY for the European geodetic infrastructure

- EUREF & EuroGeoGraphics / INSPIRE
NMCAs and IAG Commission 1 on Reference Frames
- Definition, realization and maintenance of the European Reference Systems/Frames
 - ETRS89 / ETRFyy → EUREF Permanent Network
 - EVRS / EVRF2007 → UELN
- Products on the “best effort basis”, free of charge
- Technical Working Group
 - Dedicated working groups, projects
 - symposium resolutions

EUREF COOPERATION NETWORK

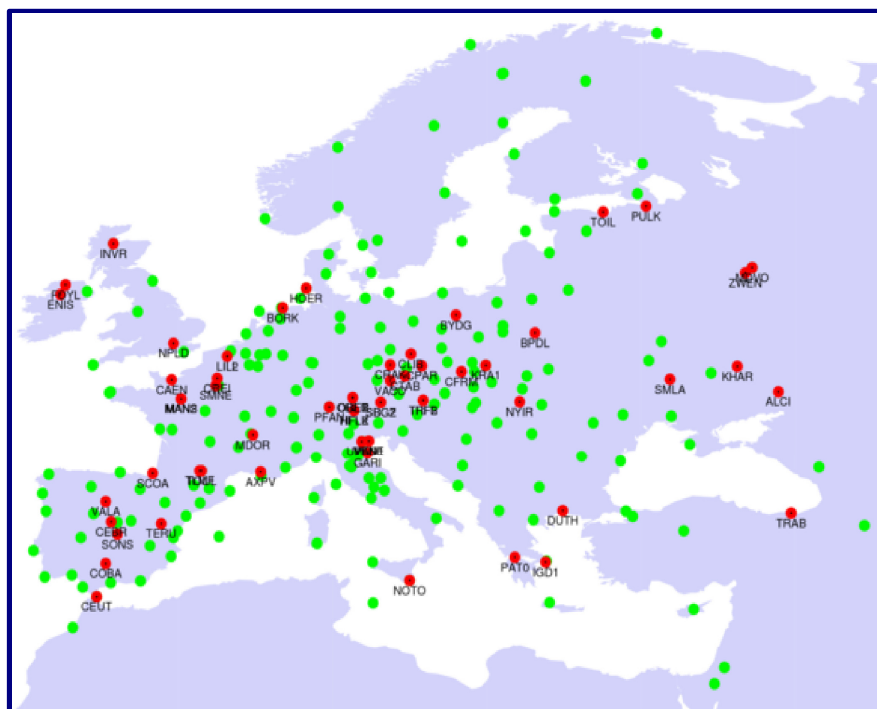


ETRS89 FACTS

- **ALIGNED TO THE ACTUAL ITRS REALIZATION AT EPOCH 1989 (ITRF_{yy} → ETRF_{yy})**
- **OFFICIAL EUROPEAN SPATIAL REFERENCE SYSTEM SINCE 2003**
- **IMPLEMENTATION ACCORDING TO THE INSPIRE DIRECTIVE IS OBLIGATORY**
- **MODIFIED ETRS89 DEFINITION IN 2009: ETRF2000 AS CONVENTIONAL REFERENCE FRAME SOLUTION → NEW GUIDELINES**

<http://etrs89.ensg.ign.fr/memo-V7.pdf>

ETRS89 / EPN



- Free rinex and real-time data service
- Maintains ETRS89
- Site coordinate and velocity updates in each 15 weeks
- Site categorization: selection of reliable EPN stations
- Guidelines

[ftp://epncb.oma.be/pub/general/Guidelines for EUREF Densifications.pdf](http://epncb.oma.be/pub/general/Guidelines%20for%20EUREF%20Densifications.pdf)

EVRS2007 / UELN

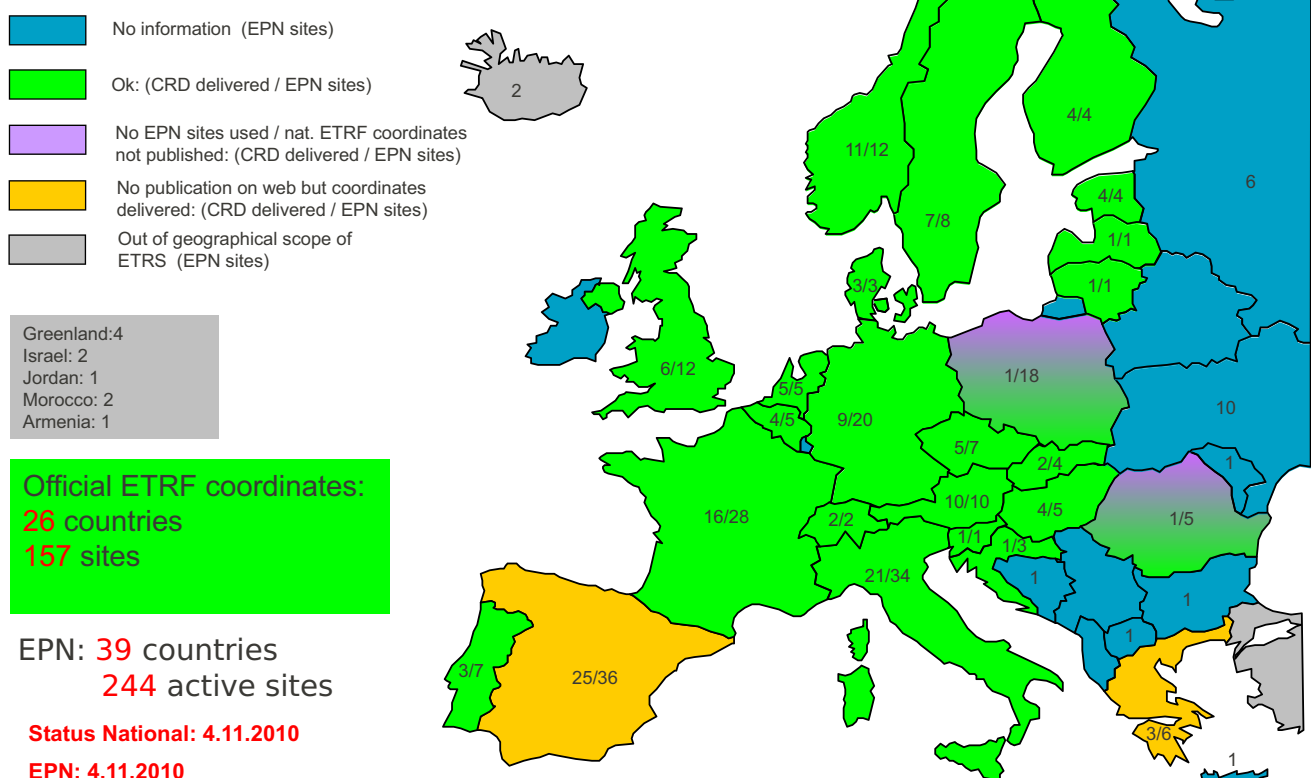


- 13 datum points
- Zero tidal system (consistent handling the permanent tidal part)
- Geopotential is known at the nodal points
- Confidential data
- Official vertical datum within EU for international cooperation, but
- Not obligatory to replace the existing national height system (transformation should be provided)

EUREF INITIATIVES

- **COORDINATE MONITORING**
 - ETRS89 national realization at EPN sites
 - Should be done on national level for the permanent sites (routine daily scientific GNSS data analysis)
- **EUVN_DA: European GPS/levelling network**
 - Target: European Height Reference Surface
- **DENSE VELOCITY FIELD (towards 4D geodesy)**
 - EUREF2010 resolution: create and provide weekly SINEX solutions (In agreement with the EUPOS Combination Centre initiative)
 - Operate high quality GNSS analysis facility
- ECGN, EUREF-IP . . .

MONITORING OF NATIONAL ETRS89 REALIZATIONS AT EPN SITES

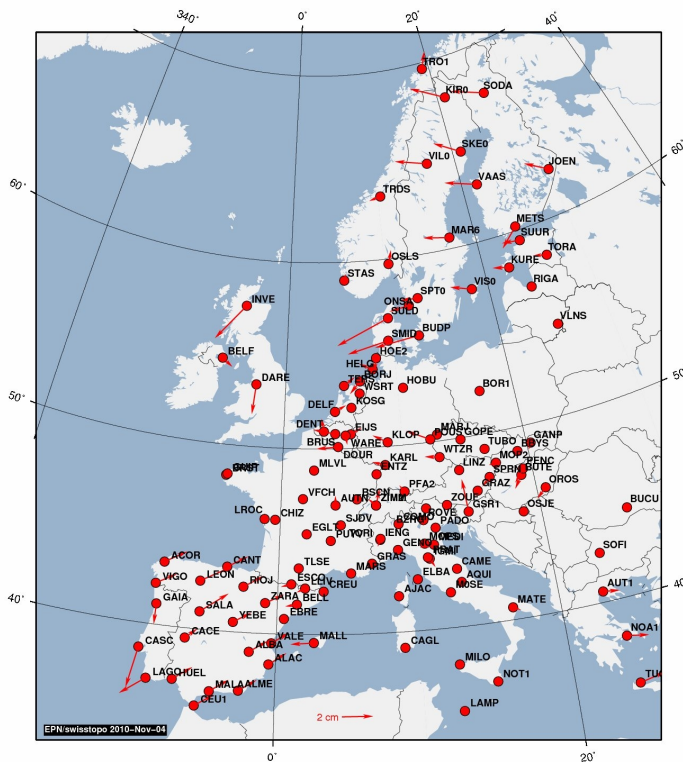


Comparison with EPN reference solution

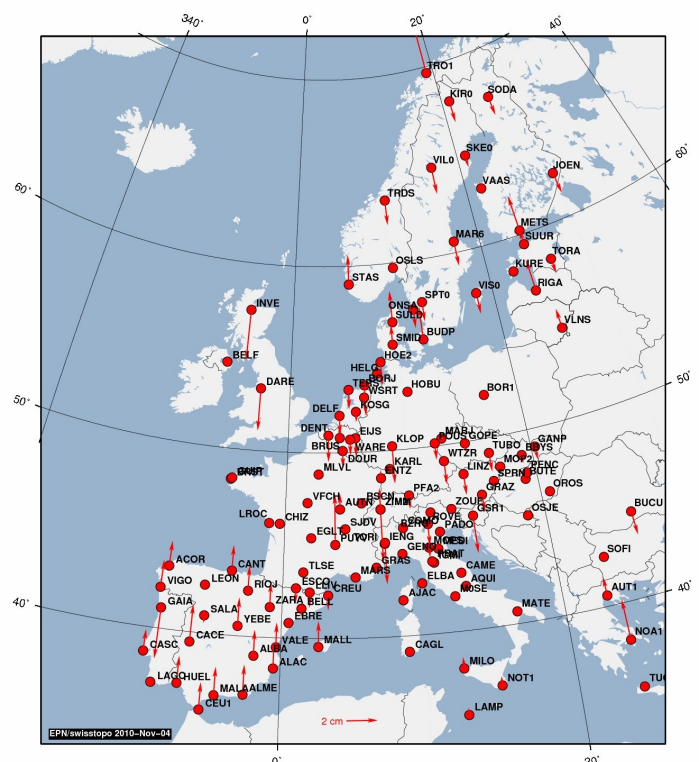
157 stations / 26 countries

at country specified epoch

horizontal



vertical

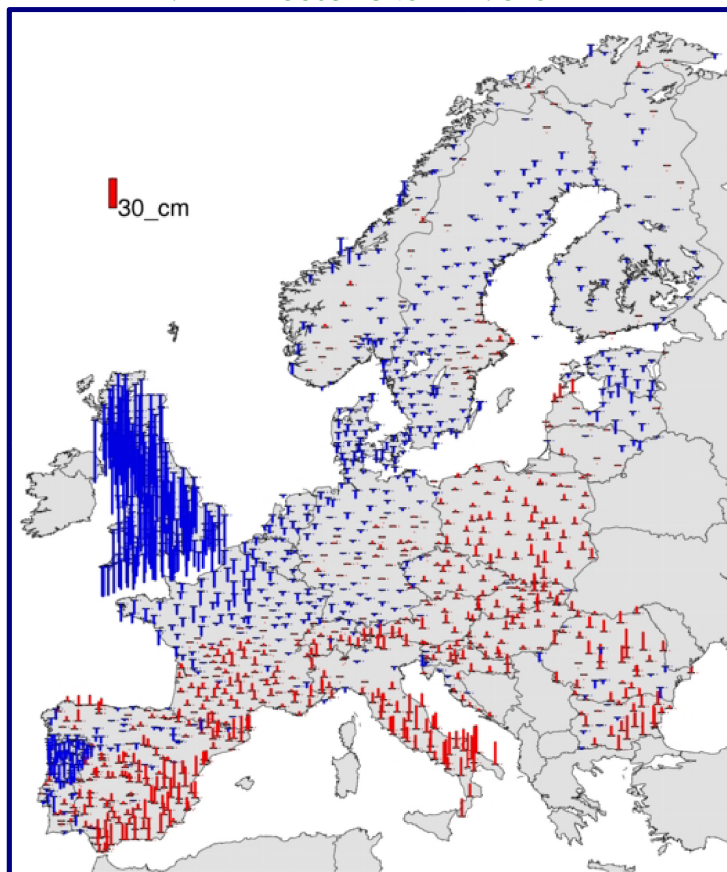


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EUVN_DA

DIFFERENCES OF THE GPS/LEVELLING DATA
AND THE EGG08 EUROPEAN GEOID

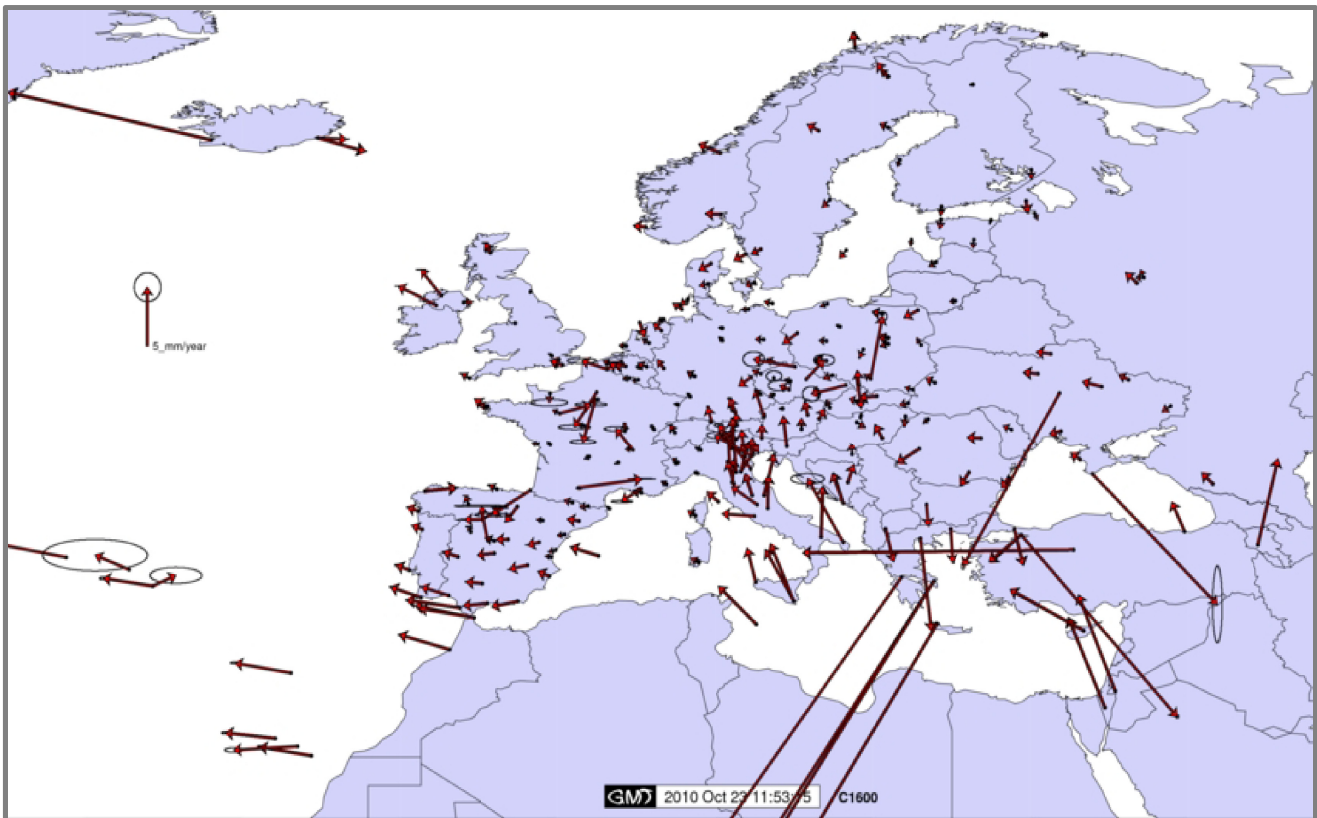


- COLLECTION OF HOMOGENEOUS, PRECISE GPS AND LEVELLING HEIGHT REFERENCE DATA
- TARGET: CM-ACCURACY HEIGHT REFERENCE SURFACE (“GEOID”), CONSISTENT WITH ETRS89 AND EVRS2007
- SUPPORT PRECISE GPS-HEIGHTING
- SHOULD BE FURTHER DENSIFIED ON NATIONAL LEVEL

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DENSE VELOCITY FIELD



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