

Community of Interest on Geodetic Reference Frames



UN-GGIM
EUROPE

UNITED NATIONS
COMMITTEE OF EXPERTS ON
GLOBAL GEOSPATIAL
INFORMATION MANAGEMENT

Jeffrey Verbeurgt

5th plenary meeting of the Subcommittee on Geodesy

12/03/2025



Outline

- Governance of the regional reference frame by EUREF
- Geodetic landscape in Europe
- Work delivered by GRF Europe since 4th Subcommittee on Geodesy Plenary
- Work planned by GRF Europe



EUREF



- Founded in 1987 (IUGG Vancouver)

“EUREF deals with the definition, realization and maintenance of the European Reference Frame - the geodetic infrastructure for multinational projects requiring precise geo-referencing (e.g. three-dimensional and time dependent positioning, geodynamics, precise navigation, geo-information)”



- 1987

- International Association of Geodesy (IAG) + CERCO (Comité Européen des Responsables de la Cartographie Officielle - now EuroGeographics)
- Need for a continent-wide modern reference “close to WGS84” + usable for multinational datasets
 - International Terrestrial Reference System (ITRS) most precise global reference
 - In ITRS, plate tectonics move European stations about 2.5 cm/year

- 1990 – EUREF Symposium Firenze (Italy) – EUREF Resolution 1

- *"The IAG Sub-commission for the European Reference Frame recommends that the system to be adopted by EUREF will be coincident with the ITRS at the epoch 1989.0 and fixed to the stable part of the Eurasian Plate and will be known as European Terrestrial Reference System 89 (ETRS89)"*



EURF – Active Working Groups

- European Unified Height Reference
- EPN Densification
- Deformation Models
- EPN Reprocessing



EUREF Permanent GNSS Network



- Voluntary federation of over 100 self-funding agencies, universities, and research institutions
- > 30 European countries
- Working together to maintain ETRS89
- Status 09/01/2025: 420 permanent GNSS tracking stations
- Central Bureau hosted by Royal Observatory of Belgium
- www.epncb.oma.be



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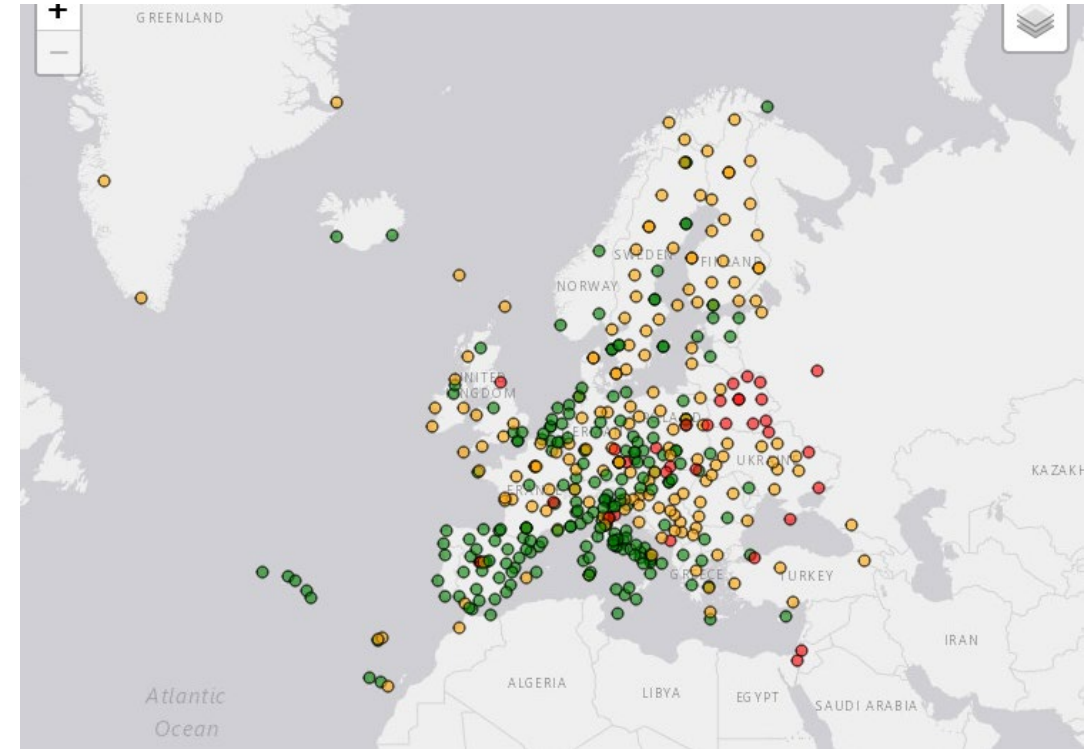
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EUREF Permanent GNSS Network



- 17 Analysis Centers (06/03/2025)
- + extra Dedicated Analysis Centers:
 - EPN-reproX
 - Densification
 - Real-time analysis
 - ...



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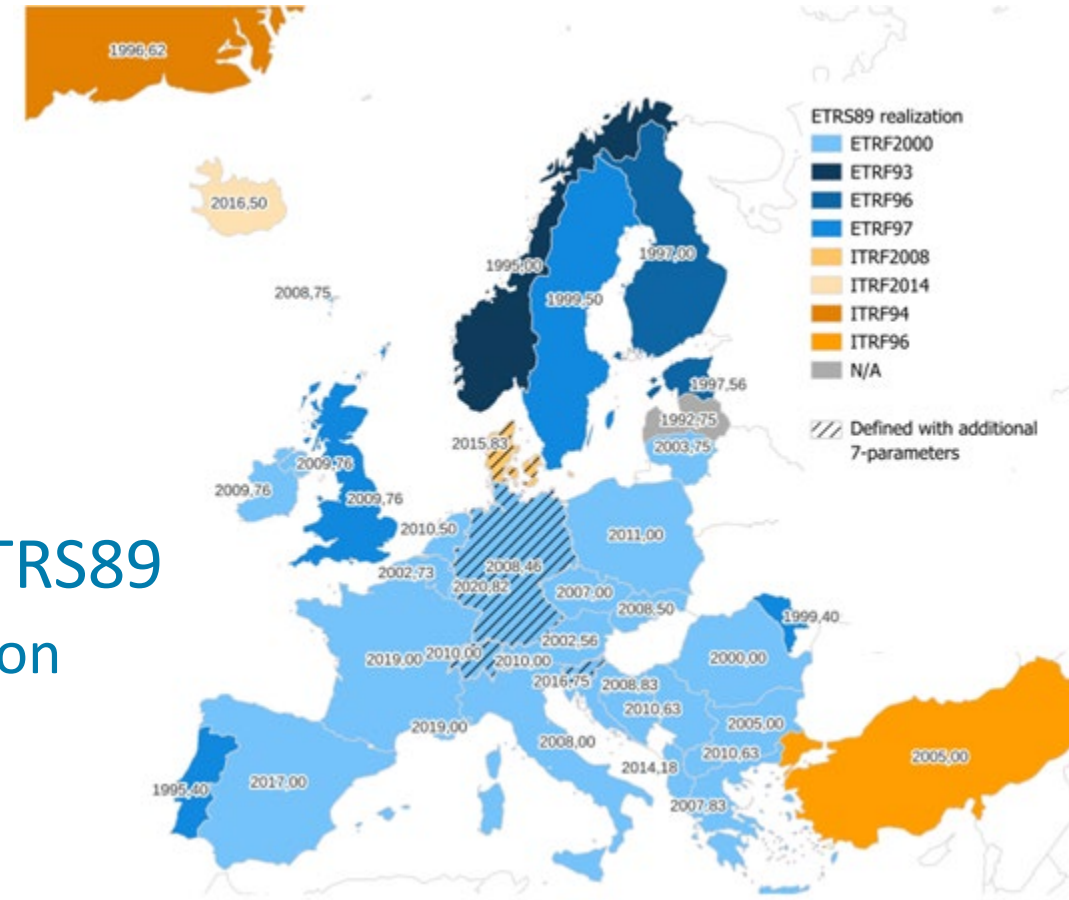
ETRS89 – Adopted by many

- Adopted by the European Commission (ref COGI action decision 2003 - F/GIS/69/EN)
- INSPIRE Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services established - among other requirements - that the ETRS89 shall be used for the referencing of spatial data sets in INSPIRE
- Note that the regulation is on the “system” – not on the realization (ETRFxx/yy/etc)
- ...and for the vertical the European Vertical Reference Frame (EVRS) is stated..



ETRS89 – Adopted by many

- Adoption shows success of ETRS89
- Differences between countries exist
- EUREF Study Group on alternatives to ETRS89
Scientific discussion & User needs discussion



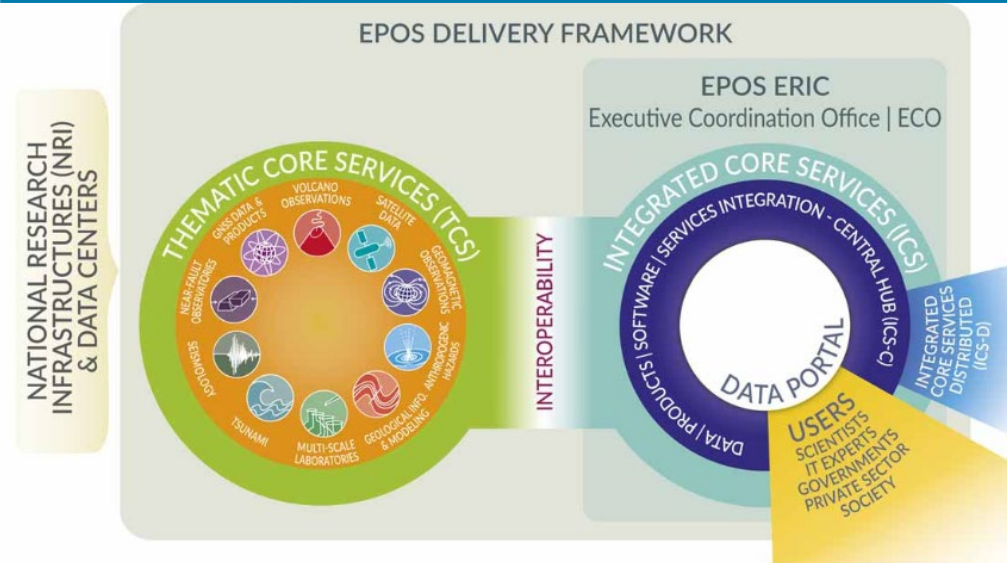
Credits: Xavier Collilieux, ENSG, France



Geodetic landscape in Europe

- EPOS - the European Plate Observing System

“EPOS is composed of a variety of Earth Science stakeholders that are together working towards integrating a set of diverse European Earth Science National Research Infrastructures into one single interoperable platform.”



494 Data and Service Providers
172 Research Organisations
26 European Countries
5 International Organizations



Geodetic landscape in Europe

- EPOS - the European Plate Observing System
 - European Research Infrastructure Consortium?
 - Full juridical person and a corporation under European Union law
 - membership of at least one European Union member state and two EU member or associated states
 - *“ERIC consortium is an interchange of knowledge and publications; a hub of the scientific results achieved; a scientific infrastructure shared across national states with resources and technology.”*



Geodetic landscape in Europe



Nordic Geodetic Commission
NKG



- EUPoS: European Position Determination System
 - Composed of public institutions providing GNSS augmentation services
- Regional geodetic commissions (e.g. Nordic Geodetic Commission)
- JIV-ERIC – the Joint Institute for VLBI ERIC
- EUROLAS – Consortium of European Satellite Laser Ranging Stations
- CRAF – Committee on Radio Astronomy Frequencies
 - Report ITU-R RA.2507-0 (published)
 - VGOS ITU-R recommendation (in preparation)



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Geodetic landscape in Europe



- EuroGeographics

“EuroGeographics is an independent international not-for-profit organisation representing Europe’s National Mapping, Cadastral and Land Registration Authorities.”

- EuroSDR – European Spatial Data Research

“EuroSDR is a not-for-profit organisation linking National Mapping and Cadastral Agencies with Research Institutes, Universities and Companies in Europe for the purpose of applied research in spatial data provision, management and delivery.”



Community of Interest on Geodetic Reference Frames: Europe

- One of the five lines of work of the regional committee UN-GGIM:Europe to implement its strategy

Integrated Geospatial Information Framework

- Provides support and input to European Members of the HLG-IGIF
- Contribute to the global tasks of HLG-IGIF making sure regional concerns are raised and addressed
- Understand issues and obstacles the Regional Members may face when looking to implement UN-IGIF

Geodetic Reference Frames

- Contribute to the activities of the Subcommittee of Geodesy and the UN-GGCE
- Act as a coordination body between technical and political level
- Focus on growing and sustaining the geodesy profession

Sustainable Development Goals

- Showcasing the added value of integrating geospatial data with other data to address SDG indicators
- Explore further requirements and practices on the use and integration of Earth Observation data

Data Strategy and Policy

- Contribute to the development of relevant policy and data strategies
- Understand the links between European policy and the UN-IGIF

Data Integration

- Maintain the active contribution on data methods and showcasing the value of integrating geospatial data with other data
- Explore ways to support activities promoting geospatial and statistical data integration



Community of Interest on Geodetic Reference Frames: Europe



2024 presentation: 4th Plenary Meeting of the Subcommittee on Geodesy



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Community of Interest on Geodetic Reference Frames: Europe

Key focus areas:

- Setting up a Point of Contact register (33 countries and counting)
- Providing the link between global and regional level (in support of UN-GGCE)

Recent activities:

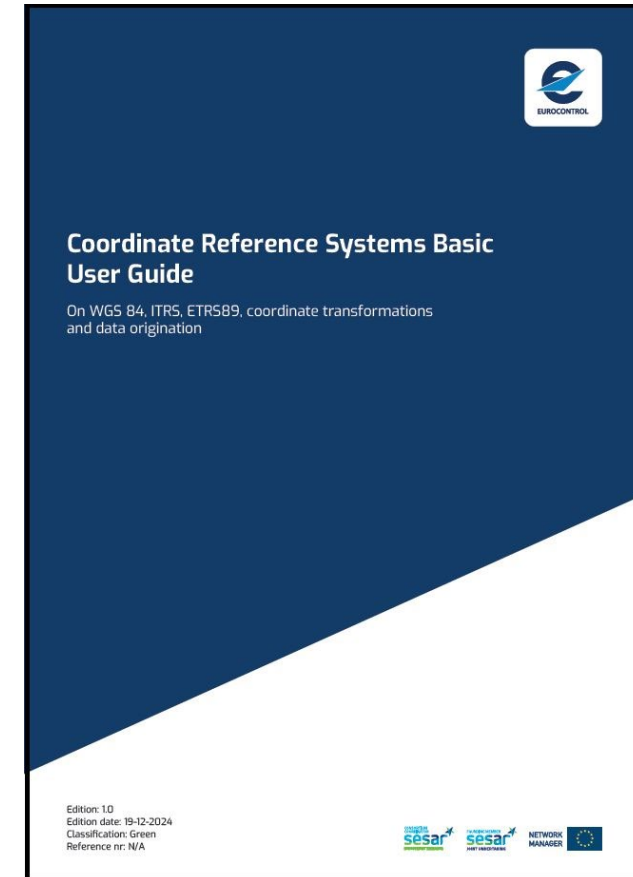
- EUREF Governing Board meeting (online)
- Joint EUREF and EuroSDR Workshop on How To Increase Use of Spatial Data & Sharing Data Across Borders - Relating to Reference Frames (Tromso, Norway)
- 10th EUPOS Council & Technical Meeting (Skopje, North Macedonia)
- Meeting with European geodetic observatories (SLR & VLBI)



Community of Interest on Geodetic Reference Frames: Europe

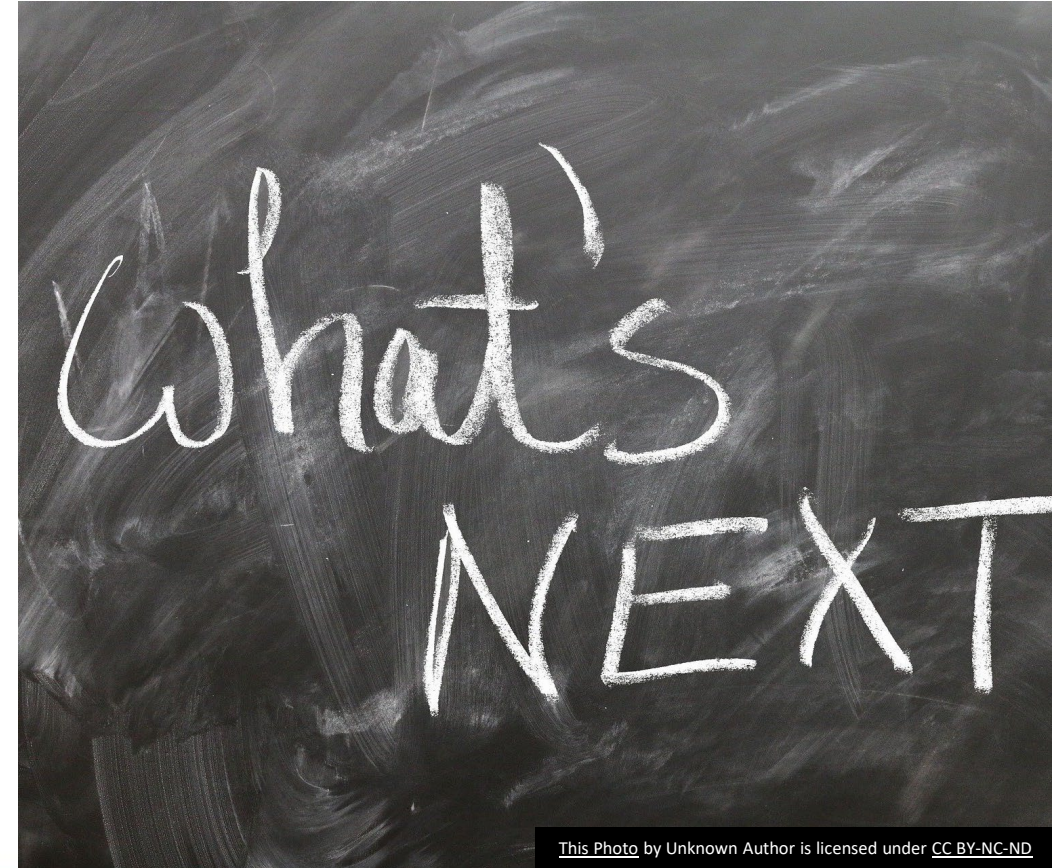
Recent outputs:

- Coordinate Reference Systems Basic User Guide
 - In support of request by EUROCONTROL, the pan-European, civil-military organisation supporting European aviation
- Webinar “Quo Vadis Geodesy”
 - Hidden Risk (UN-GGCE)
 - European MSc in Geodesy (TU Delft / IDEA League)
 - 229 registered participants



Community of Interest on Geodetic Reference Frames: Europe

- The road ahead
 - UN-GGIM: Europe's Strategy Update
 - Enhanced support to the UN-GGCE
 - Implementation of the 1st Joint Development Plan
 - Connecting European people and organisations with UN-GGCE
 - Work with CRAF on radio spectrum
 - How to tackle Education, Training and Capacity Building?



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