

NATIONAL REPORT OF POLAND TO EUREF 2011

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Symposium of the IAG Subcommittee for Europe
European Reference Frame – **EUREF 2011**
Chişinău, Moldova, 25 - 28 May 2011

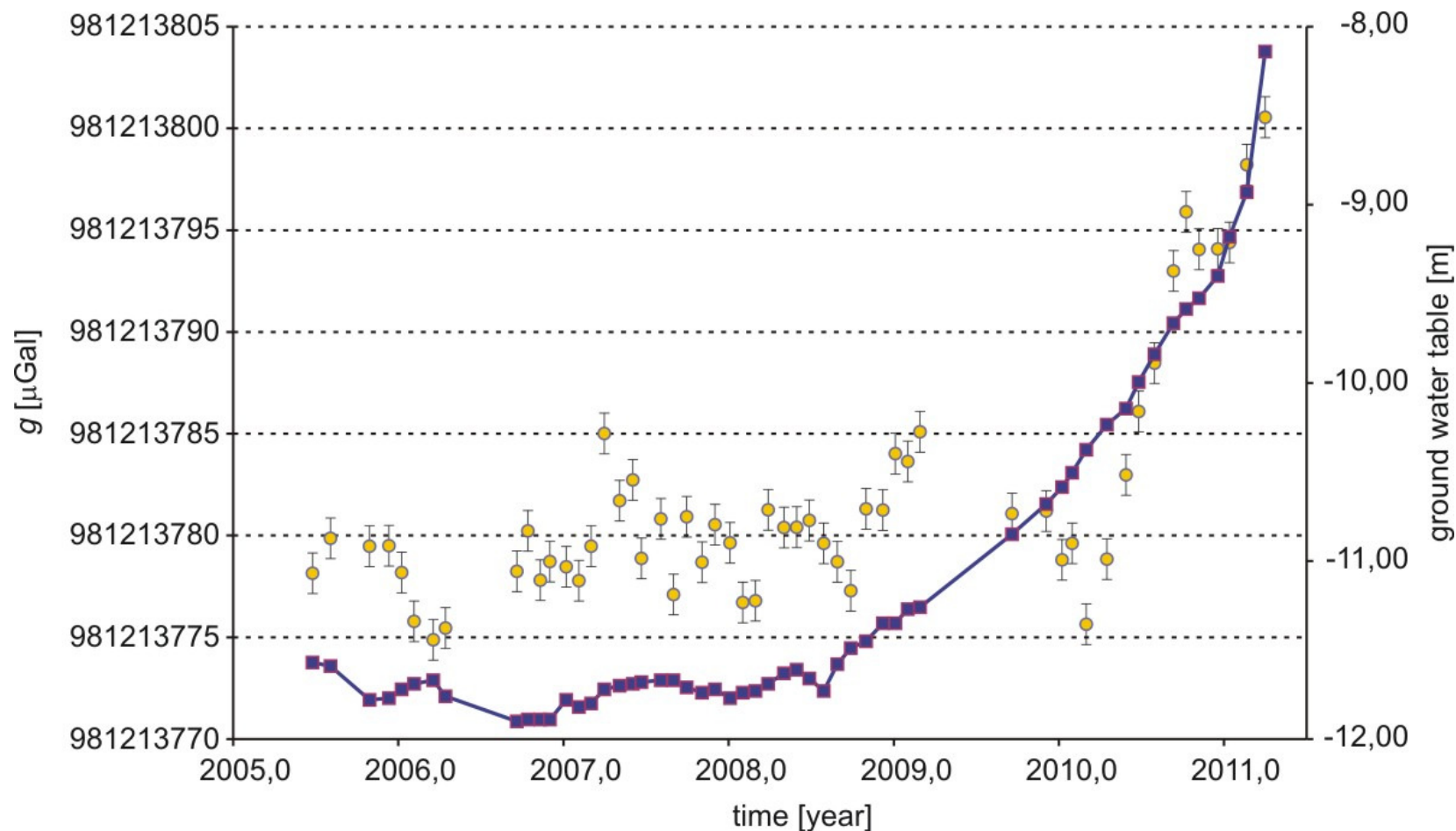


Main geodetic activities at the national level in Poland since 2009

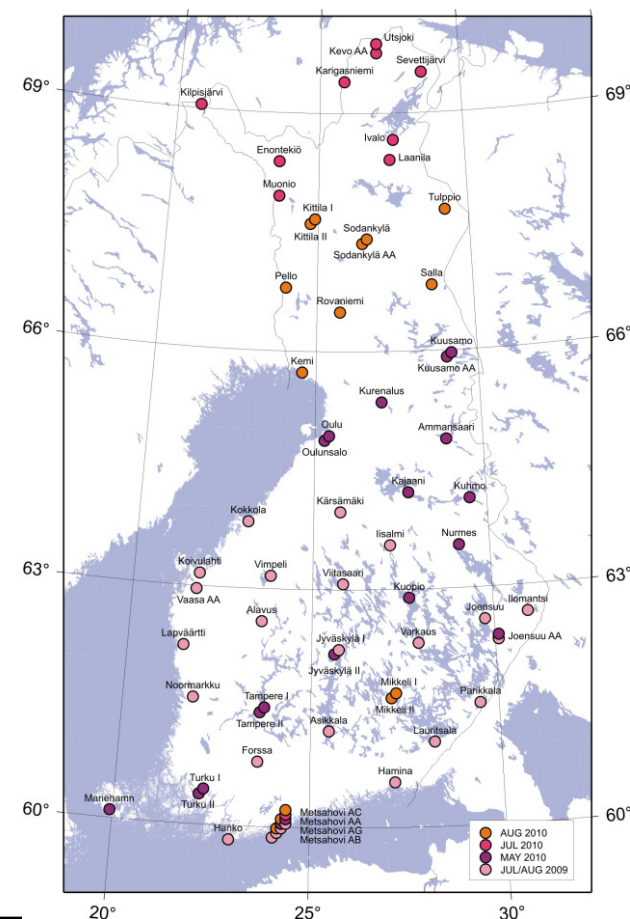
- maintenance of the **gravity control**
- operational work of **permanent EPN/IGS stations**
- data processing at **Local Analysis Centres at WUT and MUT**
- GNSS for **meteorology**
- monitoring of **ionosphere**
- status of the **ASG-EUPOS** network in Poland
- the use of data from **satellite gravity missions**
- **Galileo** project
- **Earth tides** monitoring
- activity in **SLR**
- **geodynamics**

Jozefoslaw Astrogeodetic Observatory of WUT

1. quasi-permanent absolute gravity measurements with FG5-230



1. quasi-permanent absolute gravity measurements with A10-020



2. re-survey of the Finnish gravity network with A10-020 of IGeK

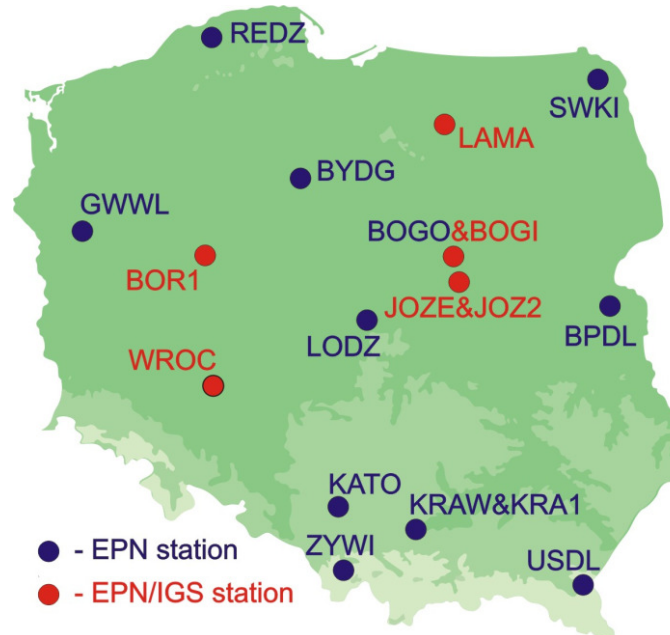
Operational work of permanent IGS/EUREF stations

EPN stations in Poland

- Biała Podlaska (BPDŁ)
- Borowa Góra (BOGI)
- Borowa Góra (BOGO)
- Borowiec (BOR1)
- Bydgoszcz (BYDG)
- Gorzów Wielkopolski (GWWL)
- Józefosław (JOZE)
- Józefosław (JOZ2)
- Katowice (KATO)
- Kraków (KRAW)
- Kraków (KRA1)
- Łamkowo (LAMA)
- Łódź (ŁODZ)
- Redzikowo (REDZ)
- Suwałki (SWKI)
- Ustrzyki Dolne (USDŁ)
- Wrocław (WROC)
- Żywiec (ZYWI)

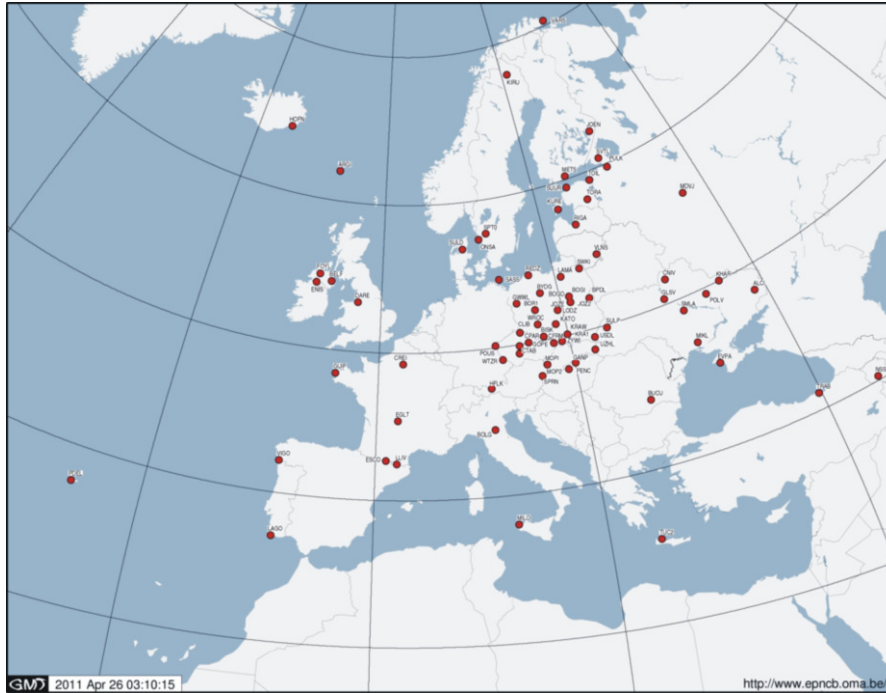
EPN Stations participating in **EUREF-IP**

- ♥ BOGI
- ♥ BOR1
- ♥ JOZ2
- ♥ KRA1
- ♥ KRAW
- ♥ LAMA
- ♥ WROC



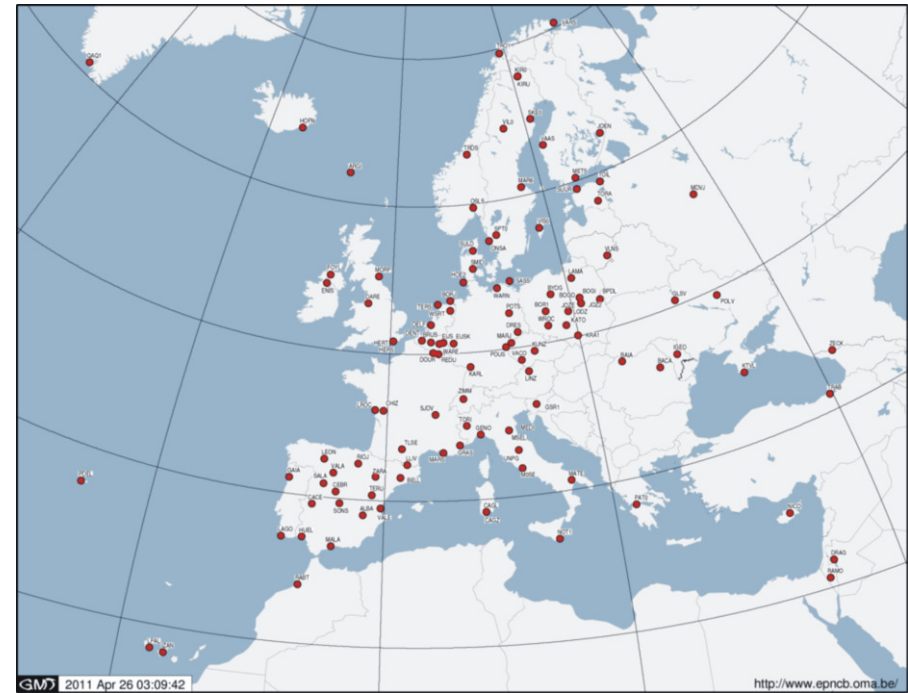
WUT

data from **80 EPN** stations routinely processed



MUT

data from **114 EPN** stations routinely processed



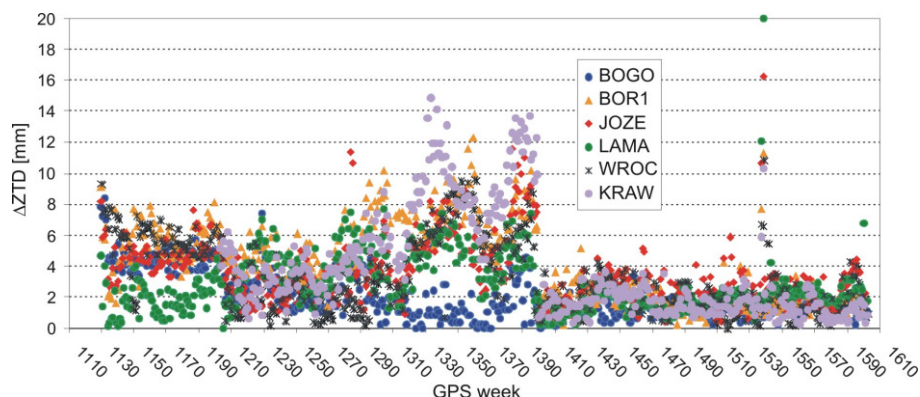
Reprocessing of EPN data

WUT and MUT: **EPN Reprocessing Project**

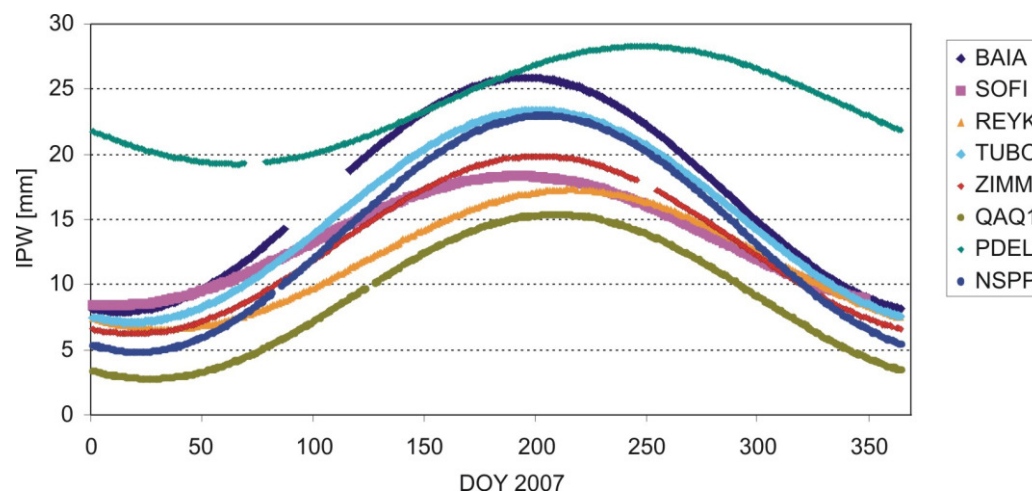
MUT + Royal Observatory of Belgium: **test reprocessing of the whole EPN data**

WUT

Decrease of **ZTD** differences between WUT LAC solutions and EPN combination after 2007



Simple model of daily **IPW** values series (sinusoid + constant) EPN ZTD combination in 2007 for 8 EPN stations representing diversity of European climates



Wroclaw Univ. of Envir. & Life Sciences

Near Real-Time application of the tomographic model for calculation of the tropospheric delay

University of Warmia and Mazury, Olsztyn

1. **Study the ionosphere** and its changes with the use of GNSS signals

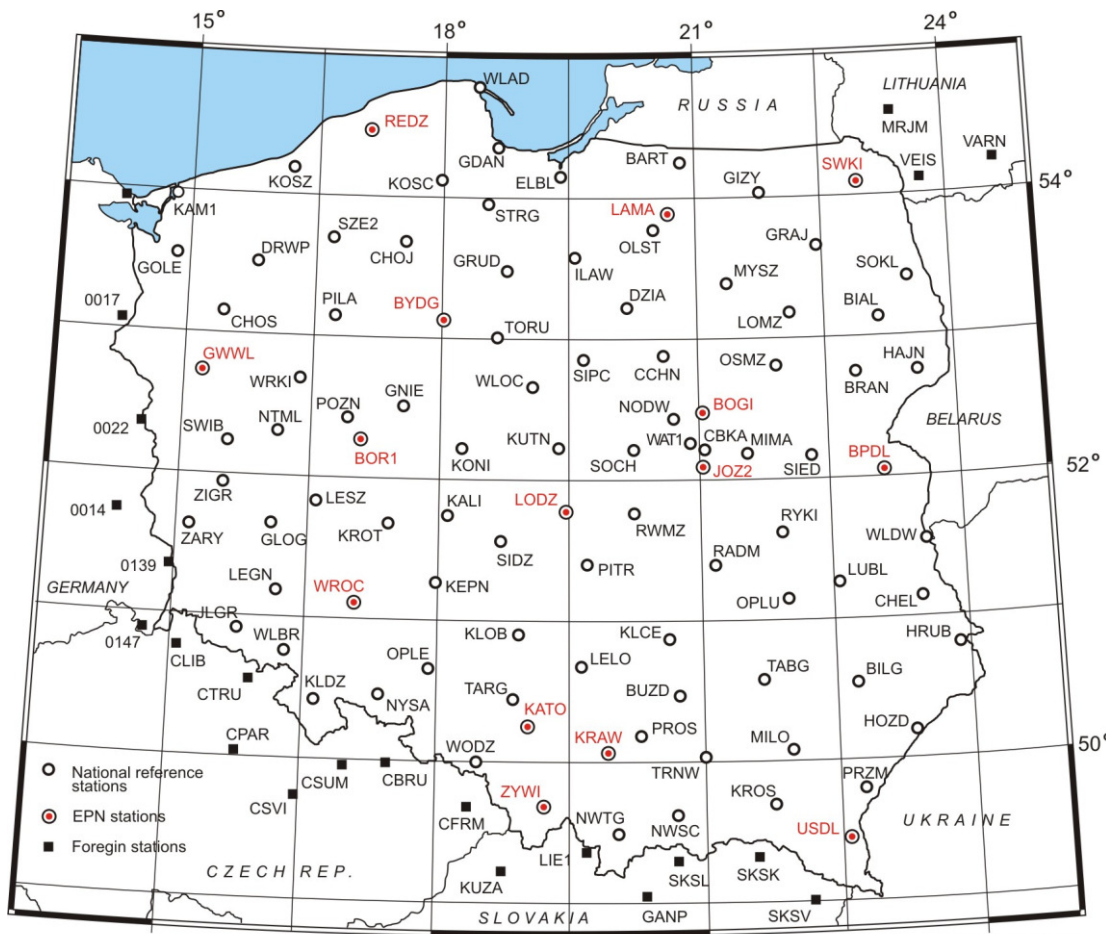
→ a new mechanism for explaining unusual wave-like disturbances of a period of 4–6h with amplitudes increasing from high to low latitudes, observed frequently in TEC observations was proposed

2. Running the **IGS Ionosphere Combination Centre**

- ionospheric products in IONEX format (spatial resolution of $5.0^\circ \times 2.5^\circ$, and temporal resolution of 2 hours)
- latency of the final and rapid GIMs: 10 days and 1 day, respectively

Reference stations of ASG-EUPOS network

- 98 of the **Polish part**
- 22 foreign



Source: ASG-EUPOS 2009

ASG-EUPOS network
contains **19 EPN stations**

At 14 EPN stations
modern meteo sensors
are installed

Services of ASG-EUPOS
are realized in **ETRS89**

Stability of the ASG-EUPOS
stations investigated at MUT

Institute of Geodesy and Cartography, Warsaw

- analysis of **geopotential models** developed from GRACE data at different computation centres, i.e. CSR, GFZ, JPL, GRGS
- investigation of the effect of **filtering method** on the calculated results
- analysis of the usefulness of the available **hydrological models**

Galileo Project

Space Research Centre PAS

Completed Harrison Project (6th Framework Program)
on **application of Galileo for precise time and frequency**,
as well as legal applications of Galileo Time

Earth tides monitoring

Jozefoslaw Astrogeodetic Observatory of WUT

- gravity record using LCR ET-26 gravimeter since January 2002
 - analysis of tidal record

Geodynamic Laboratory of Space Research Centre PAS in Ksiaz

- non-tidal signal observed by long water-tube tiltmeter is confirmed to reflect geodynamic phenomenon
- gravity record using LCR G gravimeter since 2007

Borowa Gora Geodetic-Geophysical Observatory of IGiK

- gravity record using LCR G gravimeter since January 2010
 - analysis of tidal record

Satellite Laser Ranging

SRC PAS Borowiec station operates within ILRS and EURULAS

2007-2010

- **600 000 observed raw points** tracking **1476 successful passes of 27 satellites** with the normal point precision of 3 mm and accuracy of 25 mm
- data of the Borowiec SLR station
 - supported **research programs**
 - was used for **orbit calculations**
 - was used the determination of **geodynamic parameters**

Geodynamics

WUT

continuation of monitoring geodynamic processes
in the **Pieniny Klippen Belt**

Wroclaw Univ. of Envir. & Life Sciences

continuation of monitoring of active tectonic structures
of **Sudeten Mountains and Fore-Sudetic Block**

MUT

investigation of the **suitability of the ASG-EUPOS system for geodynamics**

SRC PAS

study of the **second degree Love and Shida numbers h_2 and l_2**
using SLR data