

National report of Slovakia 2022

Branislav Droščák, Karol Smolík, Martin Ferienc, et al. ¹⁾

Juraj Papčo, Richard Chzikhardt et al. ²⁾

Katarína Leitmannová ³⁾

Peter Vajda et al. ⁴⁾

1) Geodetic and Cartographic Institute Bratislava, Department of Geodetic control

2) Slovak University of Technology in Bratislava, Faculty of Civil Engineering, Department of Theoretical Geodesy

3) Geodesy, Cartography and Cadastre Authority of Slovak Republic, Department of Geodesy and Foreign affairs

4) Slovak Academy of Sciences, Earth study institute



EUREF 2022 SYMPOSIUM

Online from Zagreb 31 May – 3 June 2022



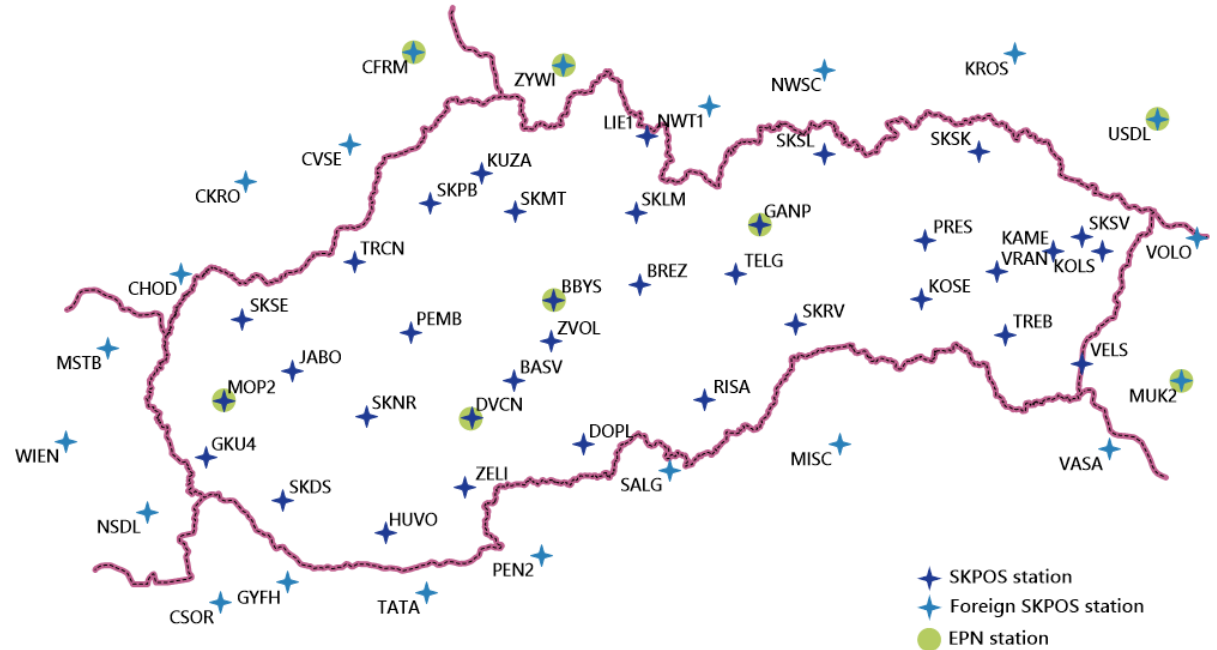
CORS infrastructure (status in May 2022)

■ 35 CORS from Slovakia

- ✓ 35/35 tracking GPS, GLO, GAL, BDS, QZS, SBS
- ✓ 20/35 individual antennas calibration
- ✓ 19/35 monumentations suitable for geokinematic research

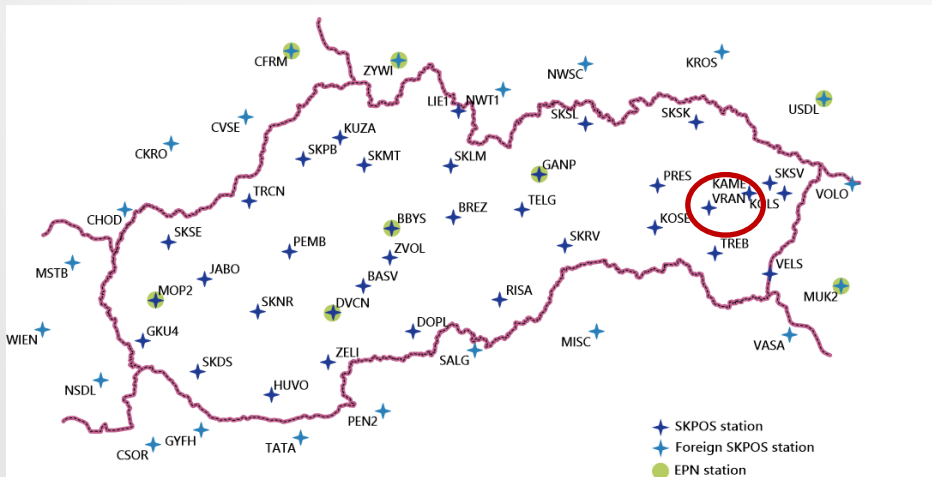
■ 21 CORS from neighborhood abroad

- ✓ AT: APOS (3)
- ✓ PL: ASG-EUPOS (5)
- ✓ HU: gnsnet.hu (7)
- ✓ CZ: CZEPOS (4)
- ✓ UA: ZAKPOS (2)



Relocation of station VRAN in 2021

- roof monumentation was changed to pillar monumentation + centric InSAR reflector
 - better stability
 - suitable for geokinematics
 - better reference frame benchmark



SKVT



VRAN

SKPOS®

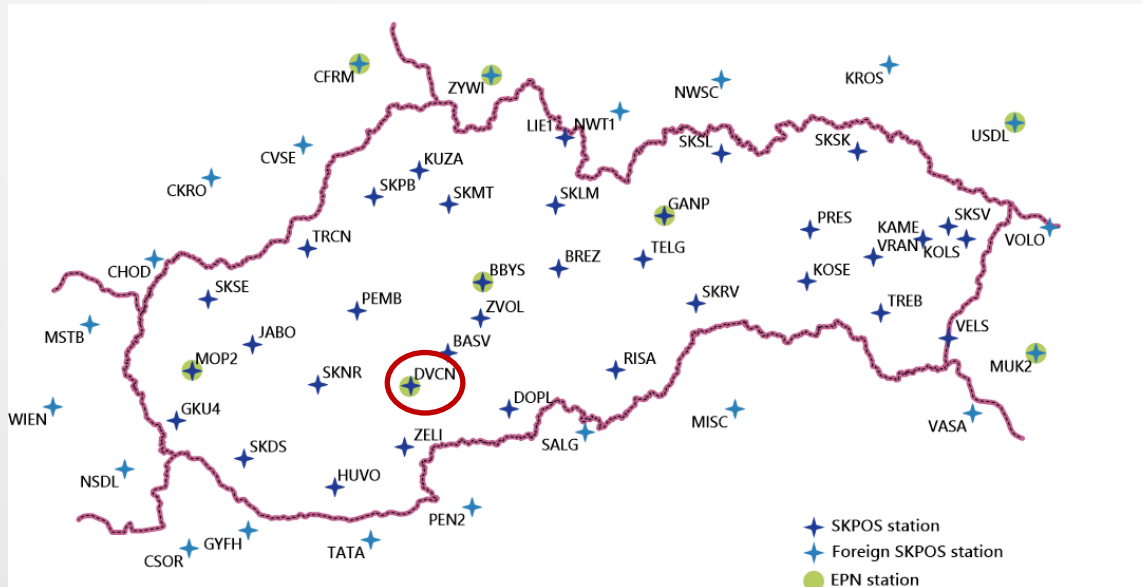
New station Devičany (DVCN)

■ SKPOS® station from: 25.03.2021

NEW

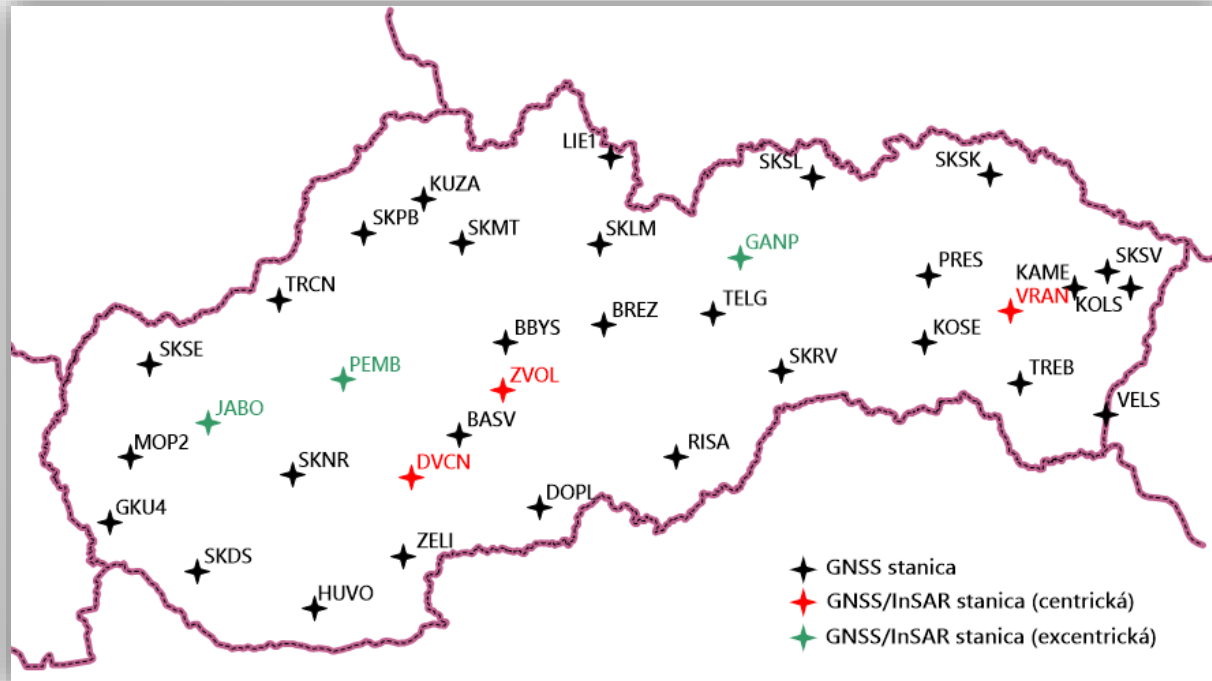
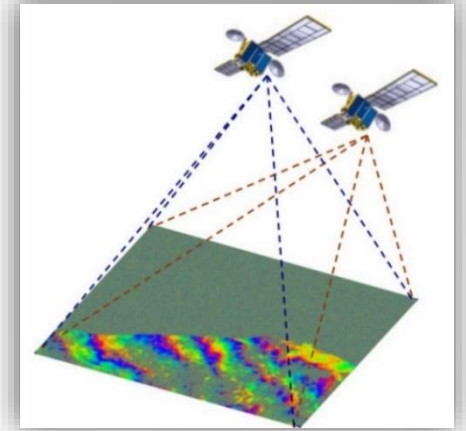
EPN station from: 20.02.2022

- pillar monumentation + InSAR reflector
- GPS+GLO+GAL+BDS+QZSS+SBAS

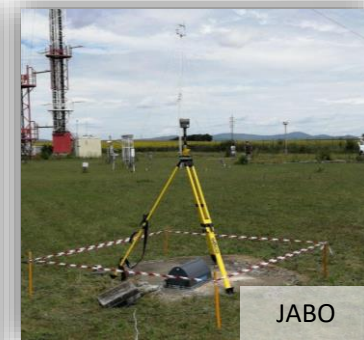


GNSS/InSAR collocated stations

- 3 centric stations & 3 excentric stations
- in cooperation with Slovak University of Technology
- Target: **establishment of the National reflector network for InSAR images referencing (to ETRS89)**



ZVOL



JABO



VRAN



GANP



PEM2



DVCN

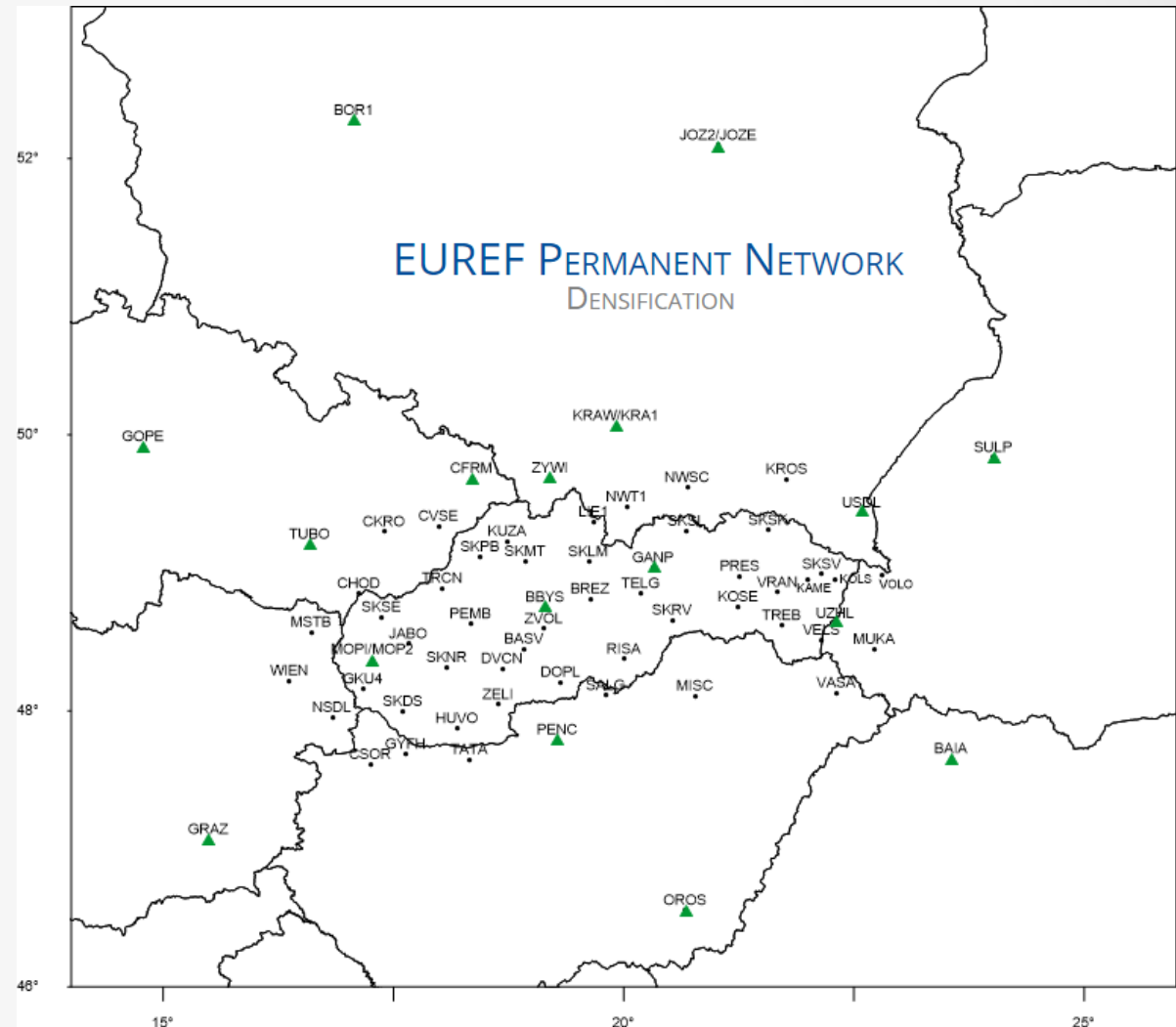
SKPOS[®] CORS reprocessing = new multiyear solution



Bernese GNSS Software 5.2

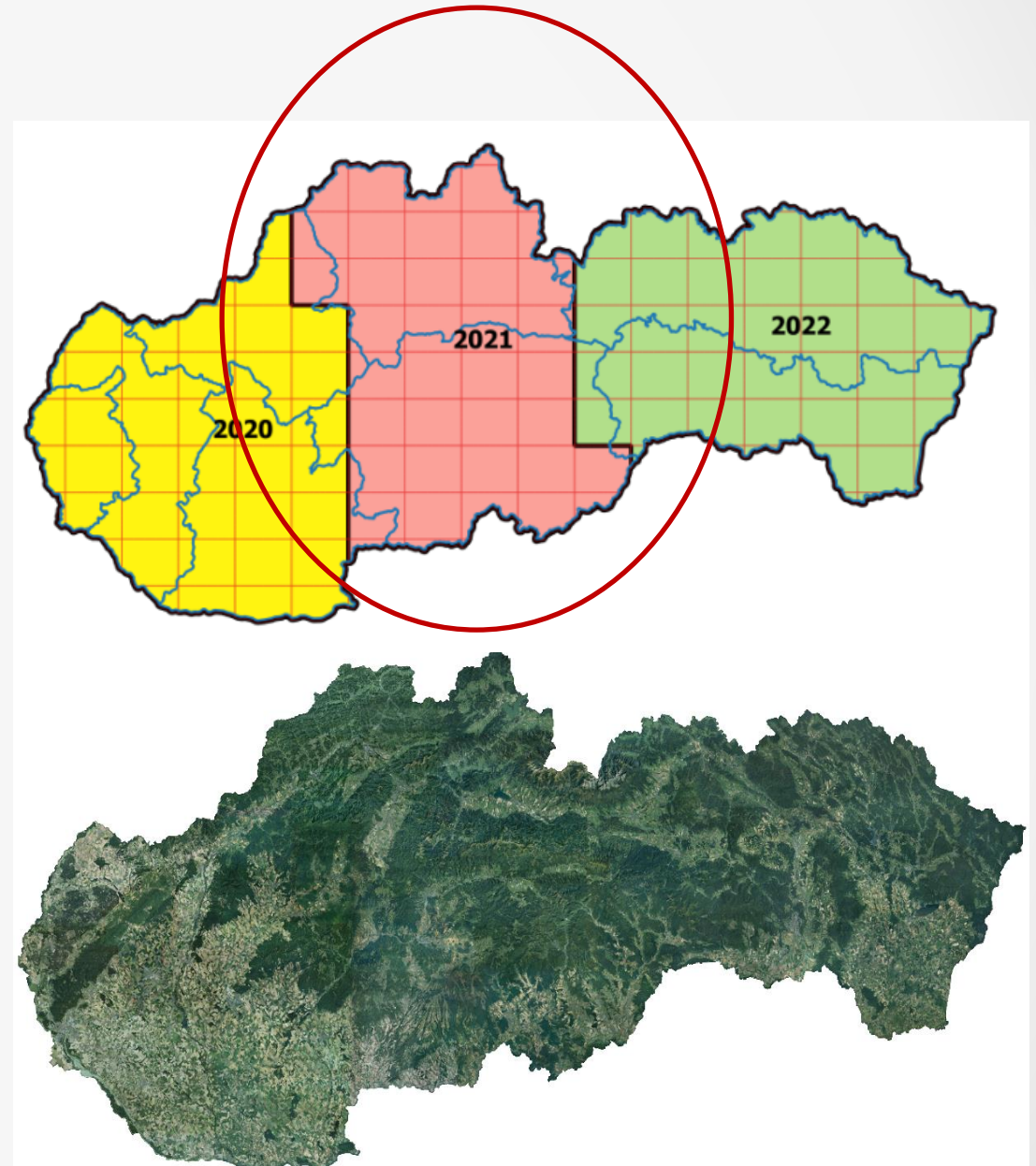
SKPOS CORS reprocessing

- ✓ work done by: GKU (EPN OC & AC)
- ✓ CORS data: from 01.01.2007 to 31.12.2020 (14 years)
- ✓ 65 stations
- ✓ strategy fulfils EPN guidelines
- ✓ new input files: CODE products, RINEX v3 files
- ✓ new EPN reference stations used
- ✓ new campaign settings (OBS-MAX, ...)
- ✓ multiGNSS: GPS+GLO+GAL
- ✓ solution validated by EUREF – detailed information in EUREF presentation provided by Martin Ferienc (GKU)

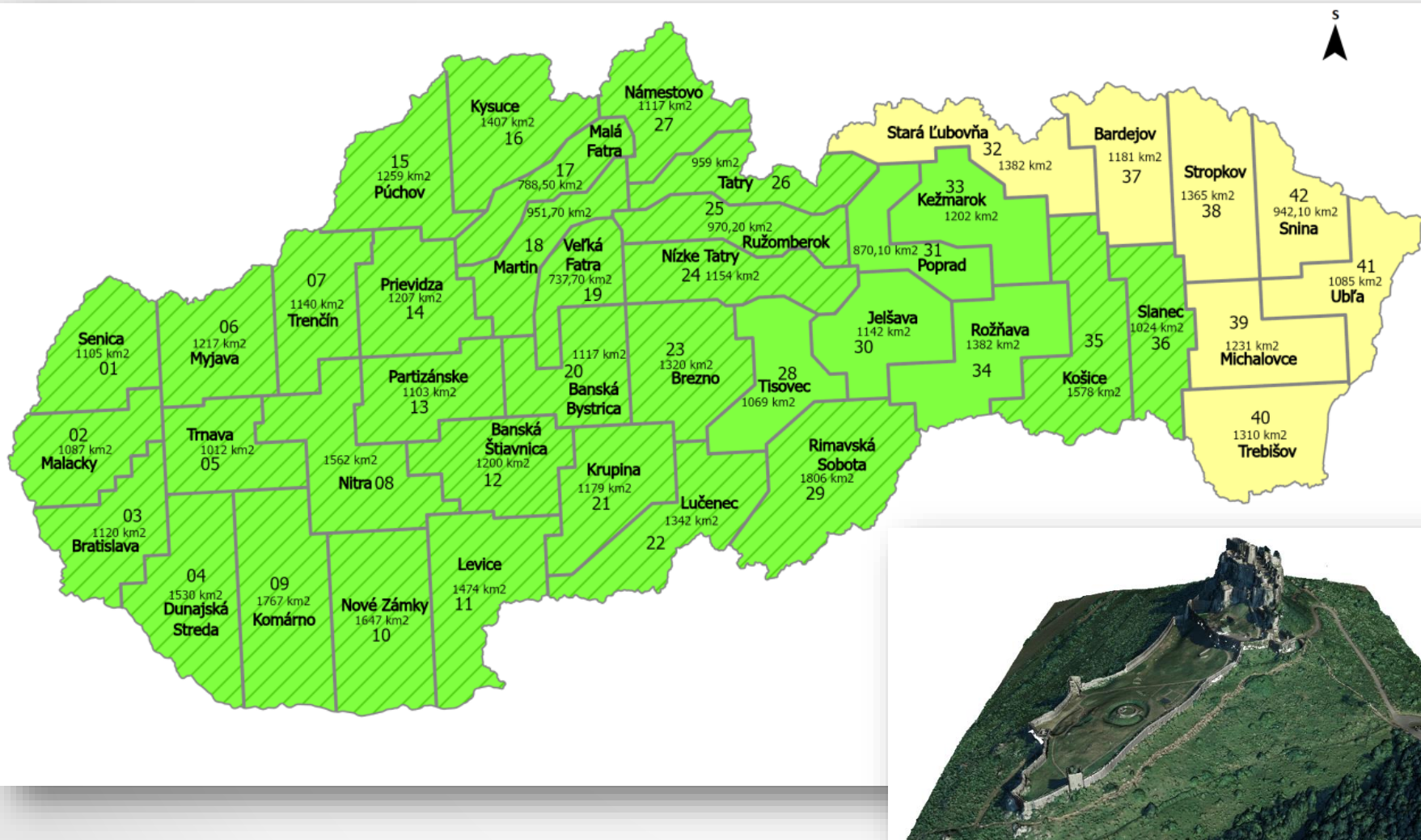


Orthophotos of Slovakia

- Cooperation between GCCA and Ministry of agriculture
- 1st cycle (2017-2019)
- 2nd cycle (2020-2022)
 - GSD: 0,20 m
 - TIFF + TFW
 - 4 (RGBN)
- Data are provided free of charge
 - raster data
 - wms 1.3.0
 - geoportal

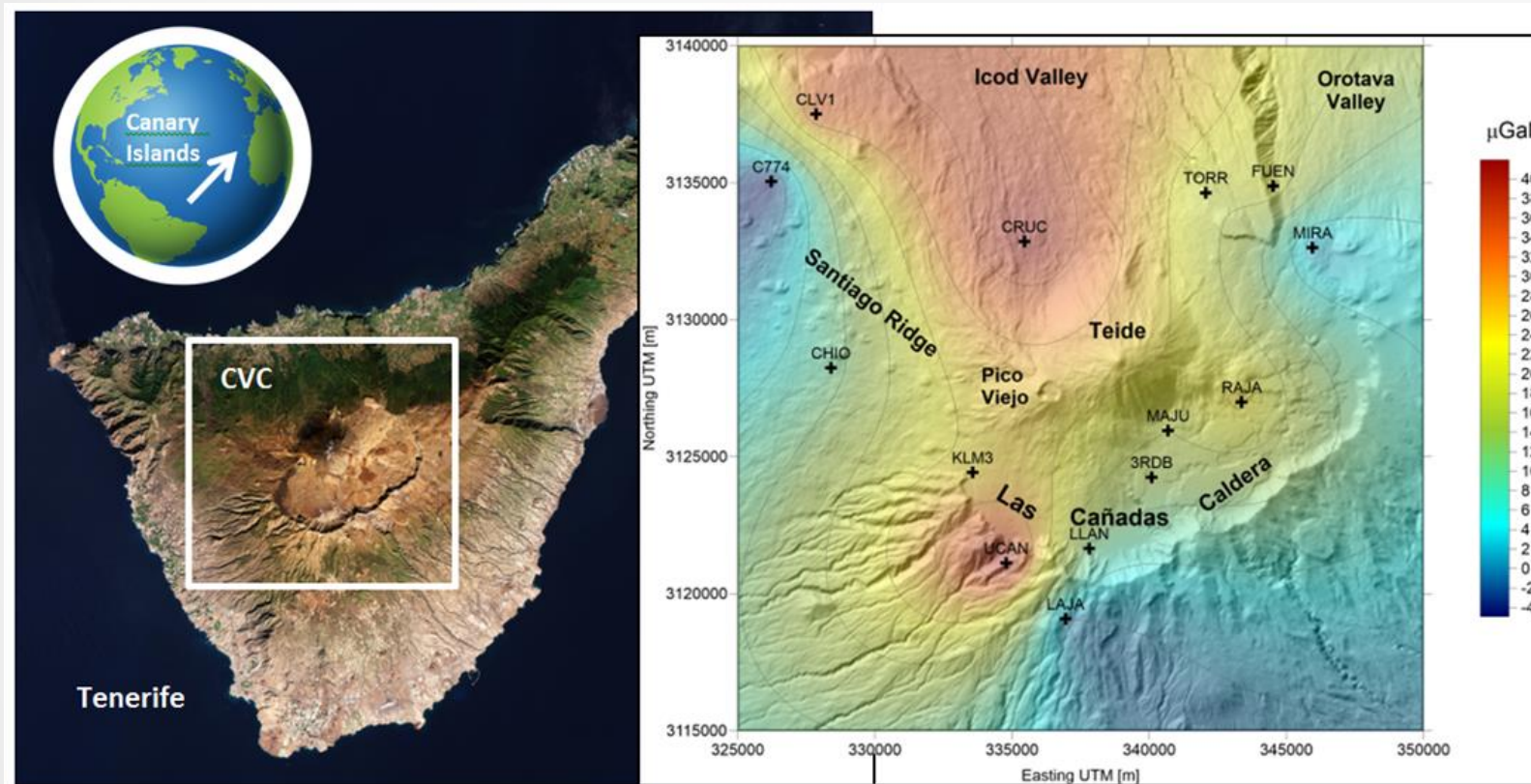


Digital elevation model (in progress, plan to finish in 2023)

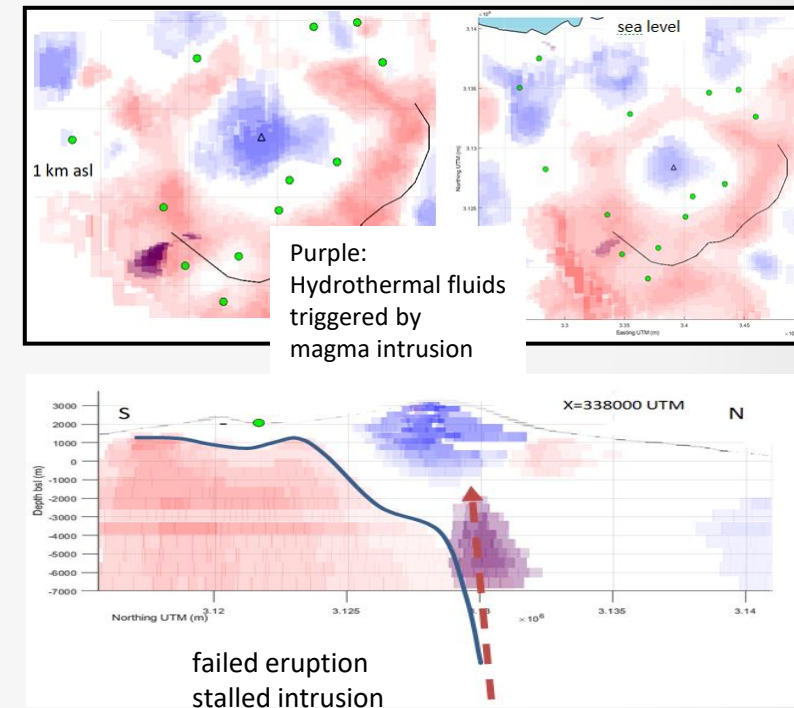


- airborne laser scanning
- density min.15 points/m²
- DEM 1 m resolution
- DEM and DSM provided free of charge

Interpretation of spatiotemporal gravity changes



Gravimetric picture of the 2004–2005 Tenerife unrest



- Vajda Peter, A.G. Camacho, J. Fernández (2022): *Benefits and limitations of the Growth inversion approach in volcano gravimetry demonstrated on the revisited Tenerife 2004–2005 unrest. Surveys in Geophysics* (2022), (under review, GEOP-D-22-00035) (Q1, $IF_{2020} = 6.673$)

Thank you for your attention