



REPUBLIKA HRVATSKA  
Državna geodetska uprava



# NATIONAL REPORT OF CROATIA

Martina Ciprijan, dipl. ing. geod.

Dr. sc. Marijan Marjanović, dipl. ing. geod.

# CROPOS – Croatian positioning system

- 33 Croatian reference stations, 18 stations of neighbouring countries

1

## EU Project (ERDF):

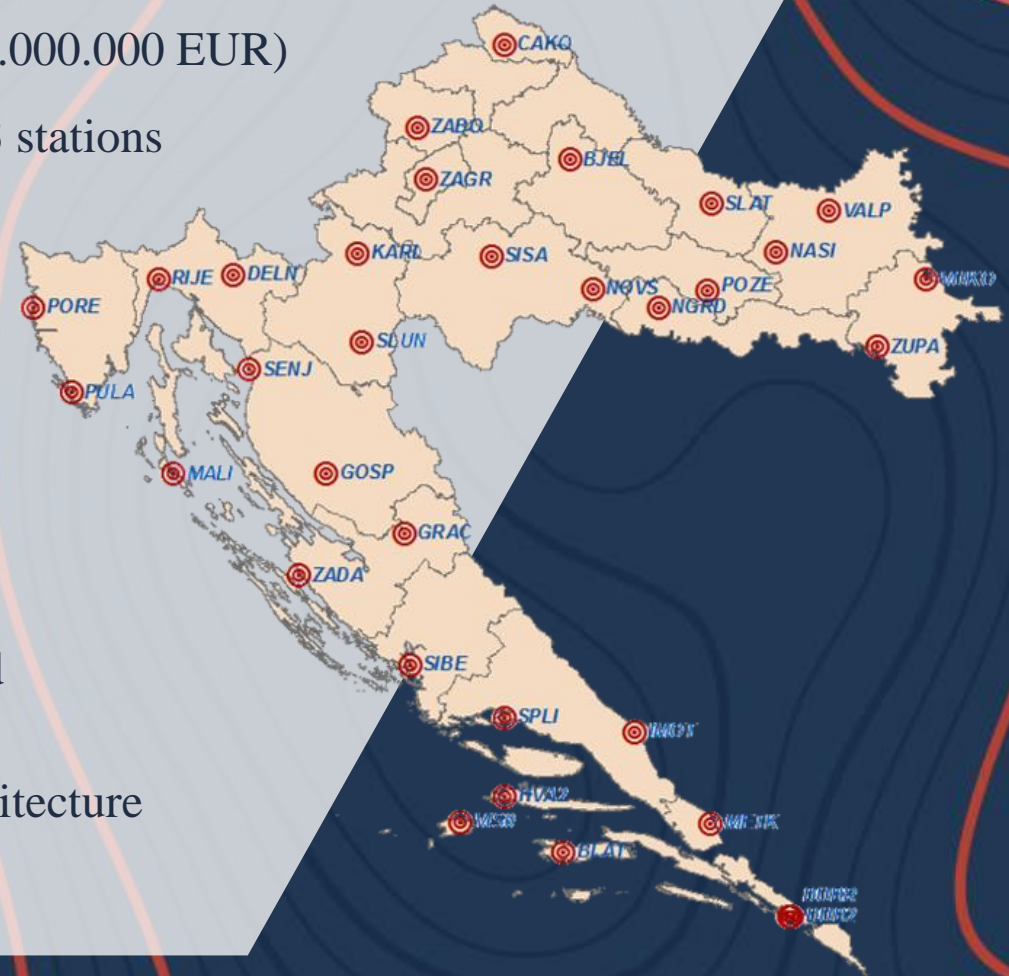
### Improvement of the CROPOS by connecting to Galileo (1.000.000 EUR)

- GNSS receivers and antennas have been changed at all 33 stations
- upgrade of the Control Center

2

## Densification – 5 new reference stations:

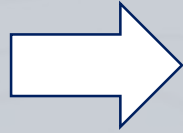
1. Glina
2. Pazin
3. Jastrebarsko
4. Zagreb – agreement with Faculty of Mining, Geology and Petroleum Engineering of the University of Zagreb
5. Split - agreement with Faculty of Civil Engineering, Architecture and Geodesy of the University of Split





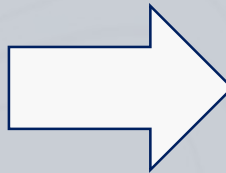
# Trigonometric points – 1st order

- 1 Project of renewing 1st order trigonometric points - since 2006.



- goal is to preserve stability and quality of 78 points that are foundation for Croatian Terrestrial Reference System – HTRS96

- 2 Trigonometric point – Hrastovačka gora was damaged in the earthquake and had to be removed





# Many activities were performed in the area severely damaged by the earthquake

- State Geodetic Administration performed precise GNSS measurements in the field of the earthquake area on 84 points already measured in previous epochs (Glina, Petrinja, Sisak)

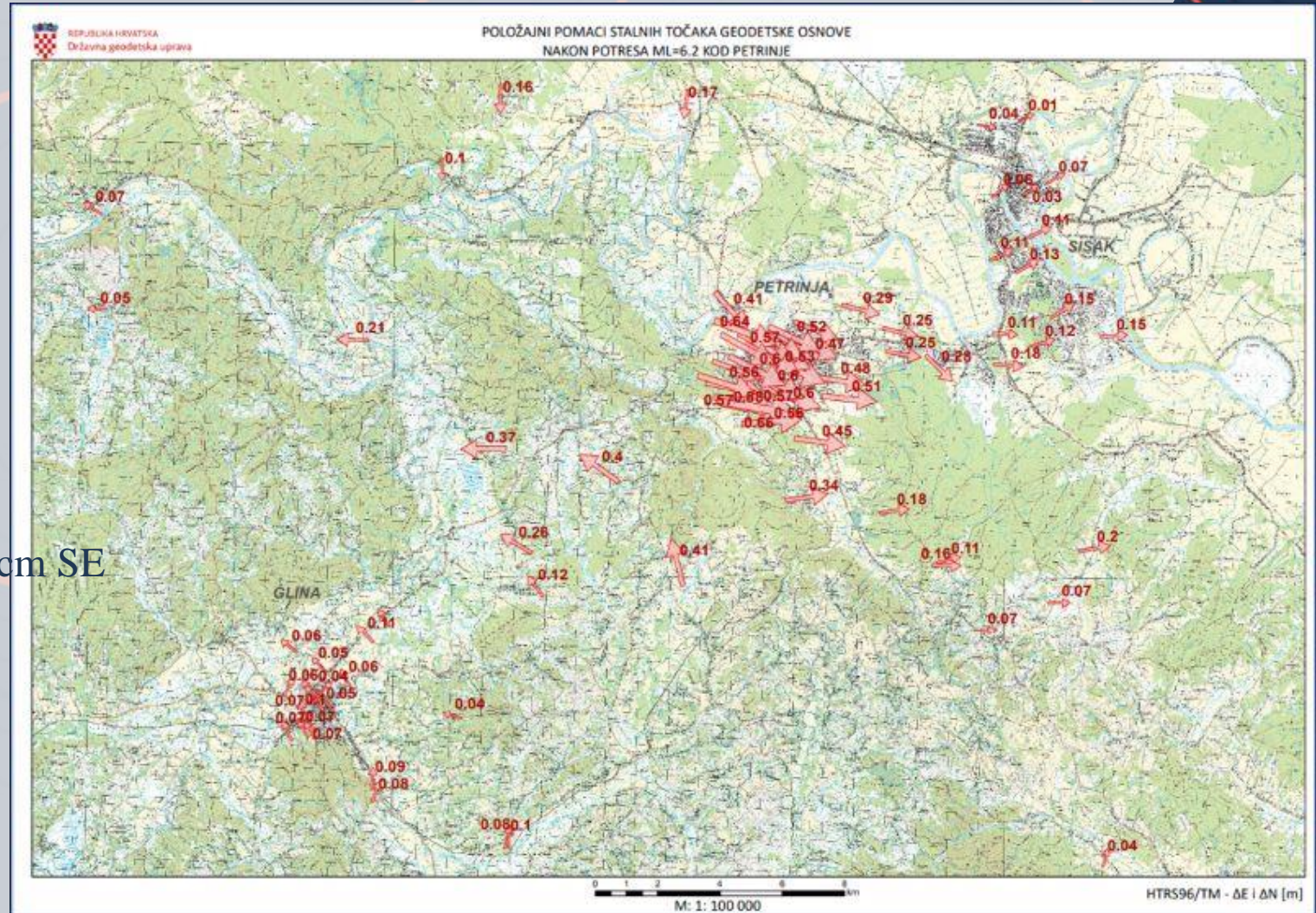
- Analysis of the movements of geodetic points showed:

- 1) the biggest movement was in Petrinja – 45 cm SE

- 2) Sisak – 10 cm E

- 3) Glina – 10 cm NW

- height 10 cm (downlift)





## Data collection with UAV in the earthquake areas



Field data measured by GNSS are complemented by different spatial data in order to detect damage and to create conditions for renewing and revitalization of that area:

3D mash (<https://geoportal.dgu.hr>), classified point cloud, DOP 1:500, DEM (with 10 cm accuracy)...



# EU Project: Multisensory aerial surveying of the Republic of Croatia for disaster risk reduction evaluation

- ERDF (European Regional Development Fund)
- 18.000.000 EUR (85% EU, 15% State budget)
- Main goals:
  - to produce DTM and DSM based on LiDAR data
  - to produce spatial data for more efficient risk management
  - to develop a methodology for earthquake risk management (Zagreb pilot area) that will be applicable to all big cities in Croatia
- LiDAR scanning of the whole territory of the Republic of Croatia
- Aerial photogrammetric capturing of the whole territory of the Republic of Croatia with GSD of 15 cm
- Line LiDAR scanning of the river banks with high density (floods)
- 30% of the territory of the Republic of Croatia is captured
- Primary area – Zagreb – project activity: Earthquake risk of the city of Zagreb



# Geomagnetic network of Croatia

- joint project with Ministry of Defence

Basic Geomagnetic Network:

10 locations – Geomagnetic Repeat Station Network

88 locations – Geomagnetic Network for Field Mapping

*Official models of geomagnetic information*

*GI2009.5 (accuracy of  $\pm 2,7'$ )*

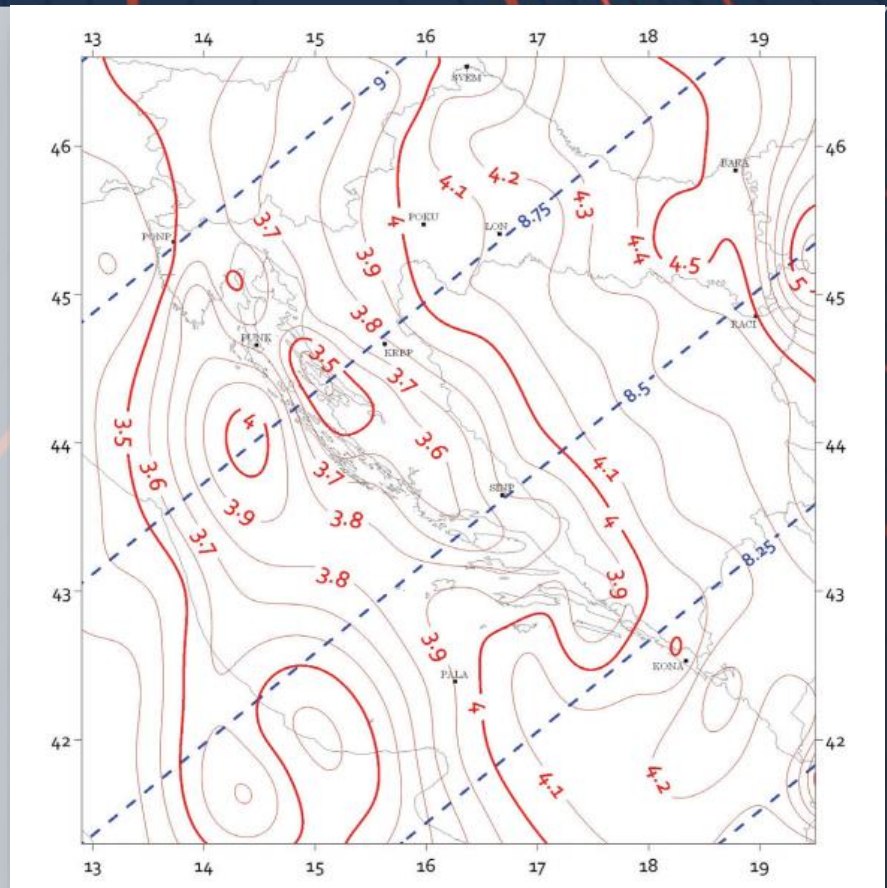
*GI 2012 (accuracy of  $\pm 6'$ )*

*GI2015v1.2 (accuracy of  $\pm 2,8'$ )*

*GI 2018v2 (accuracy of  $\pm 3,3'$ )*

For the purpose of renewal of geomagnetic information on topographic and navigation maps, in year 2017 SGA started with realization of the **five year activity plan - II. cycle of reconstruction of geomagnetic information of the Republic of Croatia**

2021: measurement of 10 points of the Basic Geomagnetic Network (**Repeat Locations**): Pokupsko, Sveti Martin na Muri, Baranja, Račinovci, Ponte Porton, Punta Križa, Krbavsko polje, Sinjsko polje, Palagruža and Konavle.







REPUBLIKA HRVATSKA  
Državna geodetska uprava



# Thank you

[martina.ciprijan@dgu.hr](mailto:martina.ciprijan@dgu.hr)