



Involvement of the Geological Survey of Slovenia in the field of natural hazard risk management

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WHAT IS THE GeoZS?

- Legal status: Public Research Institute
- Owned by The Republic of Slovenia
 - Ministry of Environment and Spatial Planning
 - Ministry of Science
 - Ministry of infrastructure

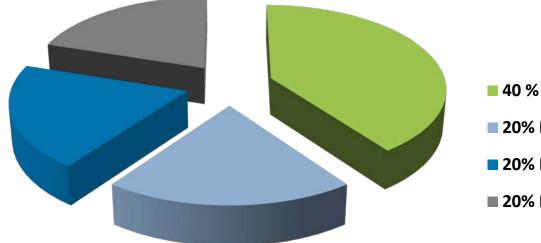


OUR HISTORY

- Funded: 1946 as the Geological Survey Ljubljana
- Reorganised into GeoZS: 1991



Funding structure



- 40 % Research
- 20% Public service
- 20% International
- 20% Market



Projects, connected to NHRM

ClimChAlp (PSInSAR methodology was applied to observe the movements of the displacement rates in the NW of Slovenia)

AdaptAlp (Impacts of climate change on slope mass movements' occurrences were examined through displacement rates of PS points and rainfall patterns).

Start-it-up (development of common "state-of-the-art" or "bestpractice" in the field of Natural Hazard Risk Management (NHRM) and Risk Governance (RG)).

SafeLand (risk management and innovative approaches to risk mapping on European level were studied)

I2GPS integrated two technologies InSAR and global navigation satellite system (GNSS).

RECALL focuses on smart, community based solutions supporting local authorities in better planning and implementing landslides and disaster prevention measures in their territories.



GeoZS + prevention measures

- Susceptibility assessment
- Database of past events
- A landslide forcast system



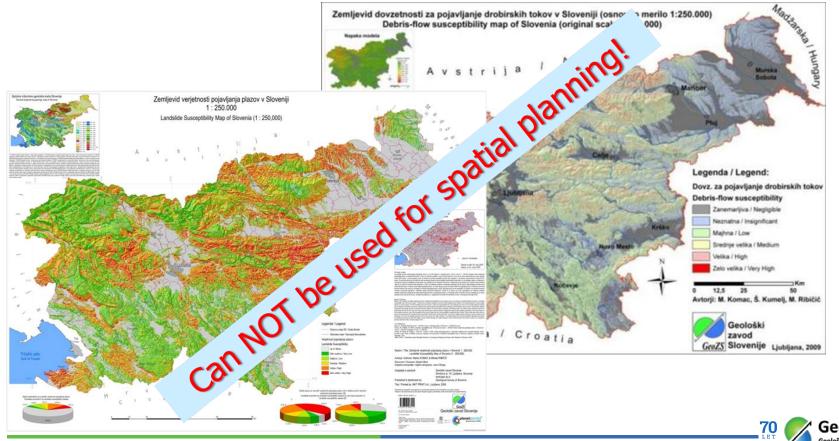
Different types of mass movement processes: landslide (left), debris-flow (middle), rock-fall (right)

(photos © M. Ribičič)



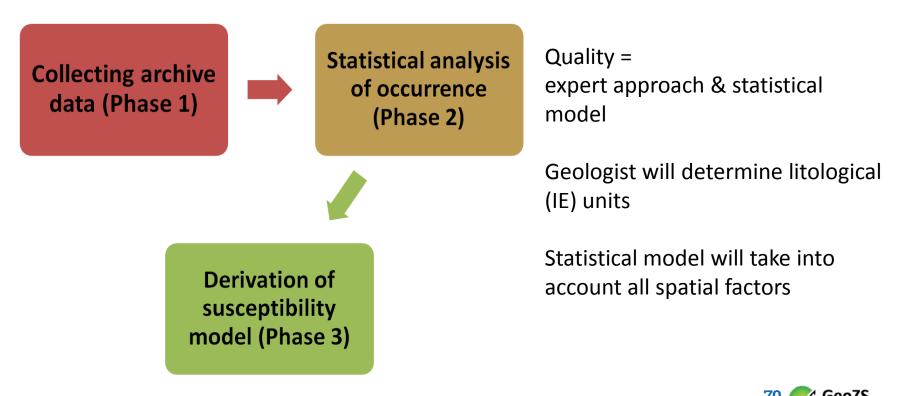
GeoZS approach to susceptibility assessment

 Landslide and debris flows susceptibility map, both in scale of 1:250,000 (Komac 2005 & 2009) have been developed.

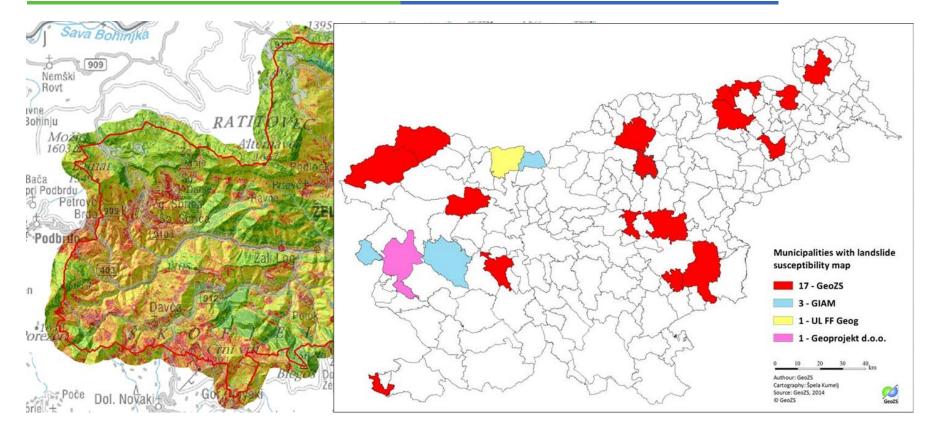


GeoZS approach to susceptibility assessment

 Methodology of susceptibility maps derivation is adapted to levels of precision depending on expected use of results (<u>Regional, Local and municipal (1:25,000), Detailed</u> (1:5,000 and 1:1,000)



GeoZS approach to susceptibility assessment

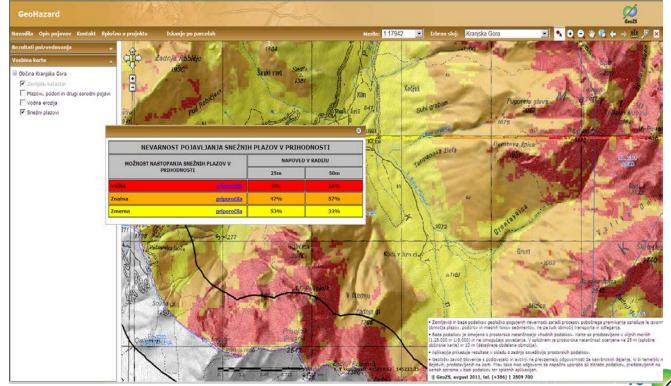


 Methodology can be also adopted to different environments. After retrieving of new data or new validation of results, system enables new recalculation and reclassification.

GeoZS

Interactive web application

- Results are available as datasets in standard GIS format, adapted to end users.
- <u>http://akvamarin.geo-zs.si/geohazard/</u> (The visualization of the results is limited by the spatial accuracy of input data)

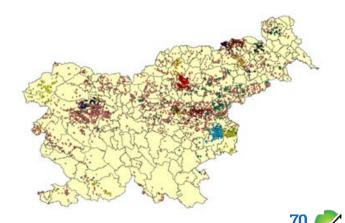




Uniform spatial DB of SMM events

- GeoZS collects event data since 1998 (7273 events; 6941 landslides with know location; 898 with known location + date of occurence)
- Uniform and central gathering is still inadequate.
- Status: kaotic

sources and purposes for collecting data are different, geographic positioning is not correct in 20% of the data, maintenance, traceability,...





Geographic location



Lesjak , Florjan pri Šoštanju (foto: podjetje RGP)



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Uniform spatial DB of SMM events

- Administration for civil protection and disaster relief, Ministry of Defence, has established the working group to prepare The Procedure for actions taken when landslides are triggered.
- Within this group a common inventory form to collect event data and to assure higher quality of collection was developed
- Minimum datasets to assure projects' quality demands (Date of occurence, Location, Type and description (dimenzion), Cause of event and damage (risk)- (SEF), Proposal of Actions to be taken(SEF), Documents and contacts)
- web application <u>e-Plaz</u>





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Tukaj si lahko preberete.

Kaj so masni tukovi?









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Spletna aplikacija e-Plaz



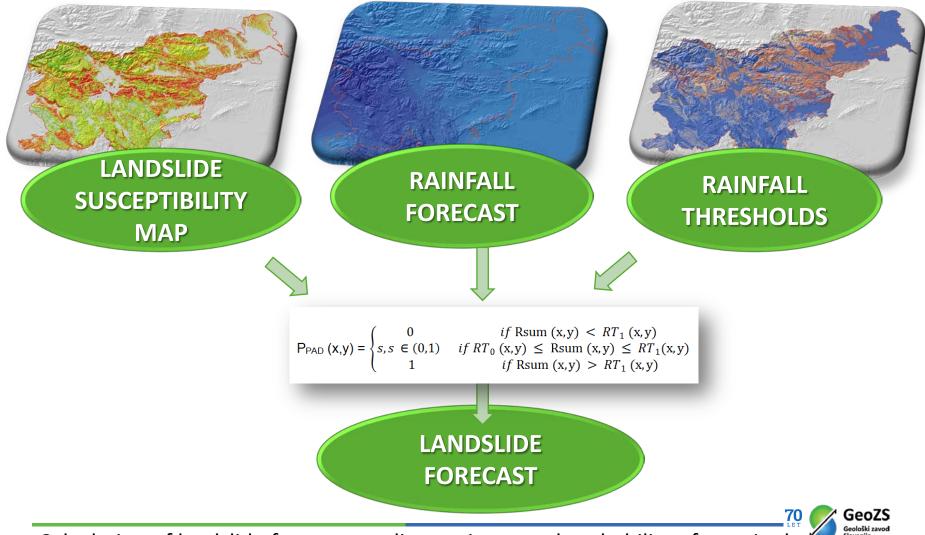


Project MASPREM / MASPREM 2

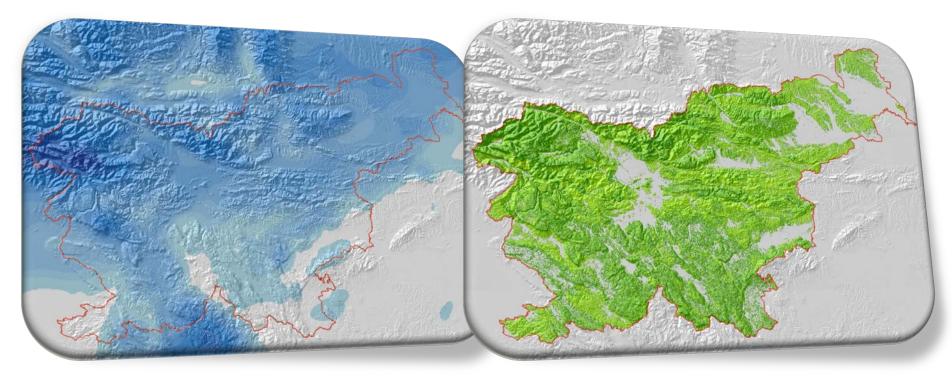
- To develop a landslide forecast system that will, through a web application, inform responsible authorities /warn inhabitants of an increased landslide hazard as a consequence of heavy precipitation that would exceed the threshold landslide triggering values.
- National project, funded by Administration for civil protection and disaster relief, Ministry of Defence



A landslide forecast system

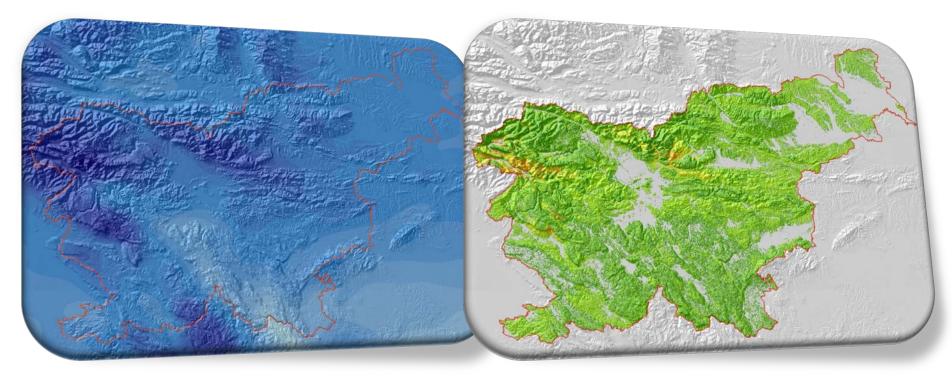


Calculation of landslide forecast predicts an increased probability of certain date.



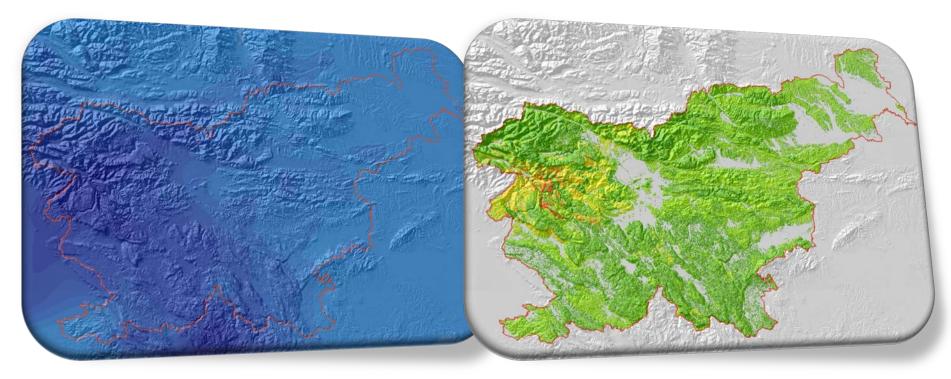
1st day, 24-hour forecast





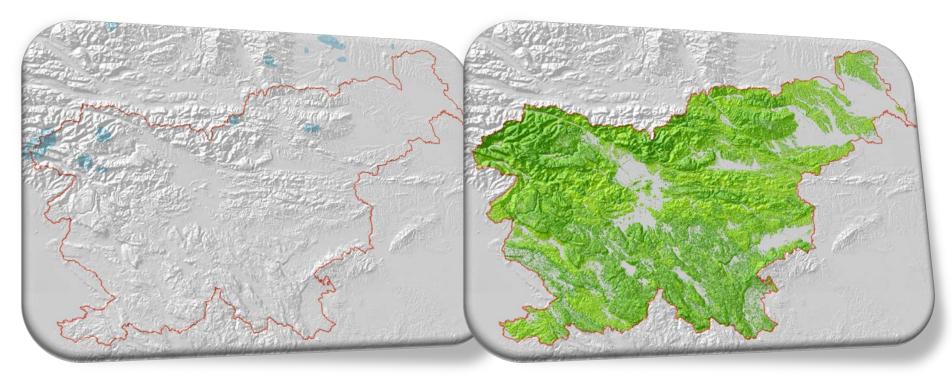
2nd day, 24-hour forecast





3rd day, 24-hour forecast



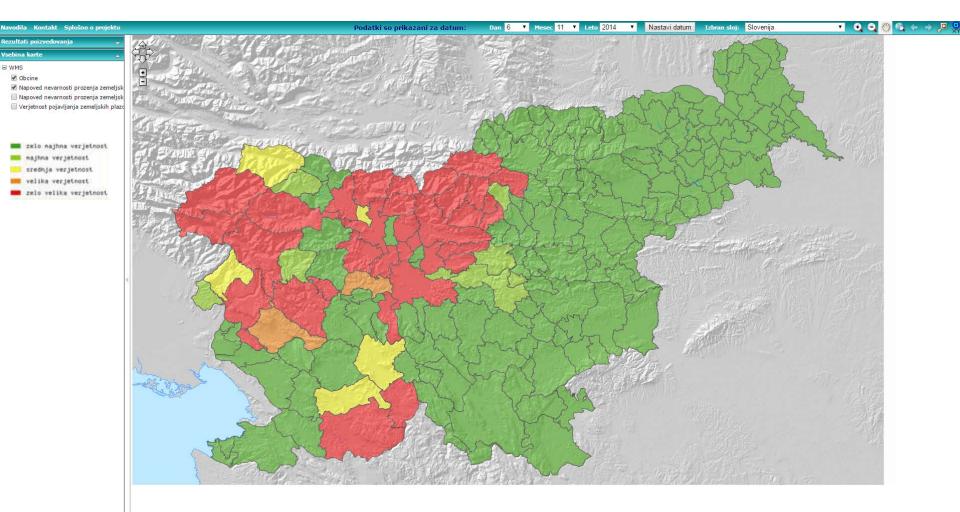


4th day, 24-hour forecast



Data export and distribution

WMS) – web application http://akvamarin.geo-zs.si/masprem/)



Topografska podlaga:

DPK230, TK25: Javne informacije Slovenije, Geodetska uprava Republike Slovenije: <u>http://www.au.aov.sl</u>
- senčen relief Vold-filed seames SRTM das VI. 2004. Interestional Centre for Tropical Agriculture (CIAT), available from the CGLAR-CSI SRTM 90m Database: http://strm.csi.cgiar.org
GeoCS. september 2013, EL (-336) 1 2809 700

MASPREM / MASPREM 2

 Existing landslide prediction system is intended to be upgraded to facilitate specific needs for the infrastructure protection policies and approaches.



Thank you for your attention

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