

RECONSTRUCTION OF THE MOST TRAGIC AVALANCHE IN SLOVAKIA AND ESTIMATION OF POSSIBILITY ITS OCCURRENCE AT PRESENT CONDITIONS

Forum of Young Geoinformaticians 2014

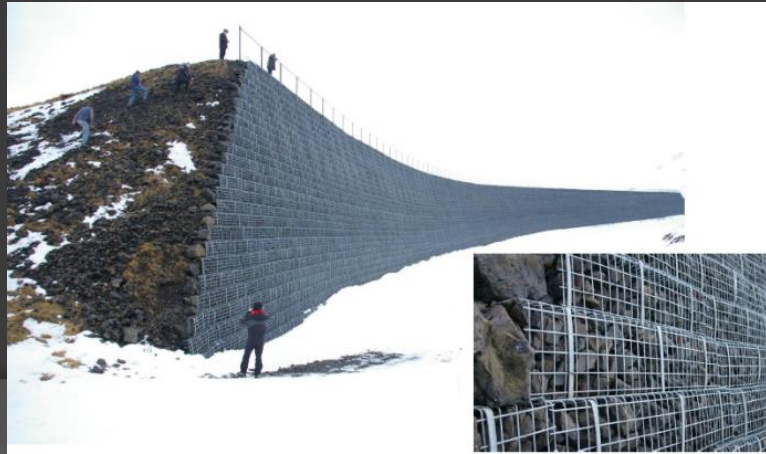
Martin Bartík

**5. - 6. June 2014
Zvolen**



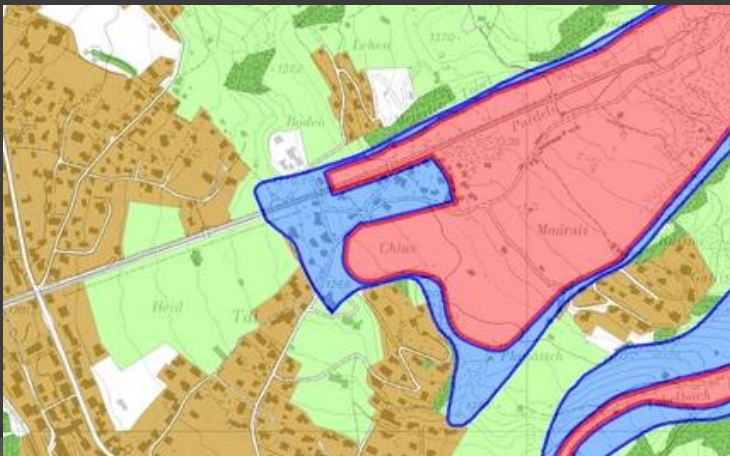
Avalanche protection

- Prevention- closures (road, ski run), evacuation, applications of explosives
- Technical- racks, snow bridges, terraces, dams, avalanche galleries or tunnels
- Biological- afforestation



Software applications

- Avalanche simulations
- Results : length, velocity, pressure
- Utilization: dimensioning avalanche structure, land-use restrictions, planning of hazard-zone
- RAMMS, Samos AT, ELBA+, AVAL 1D



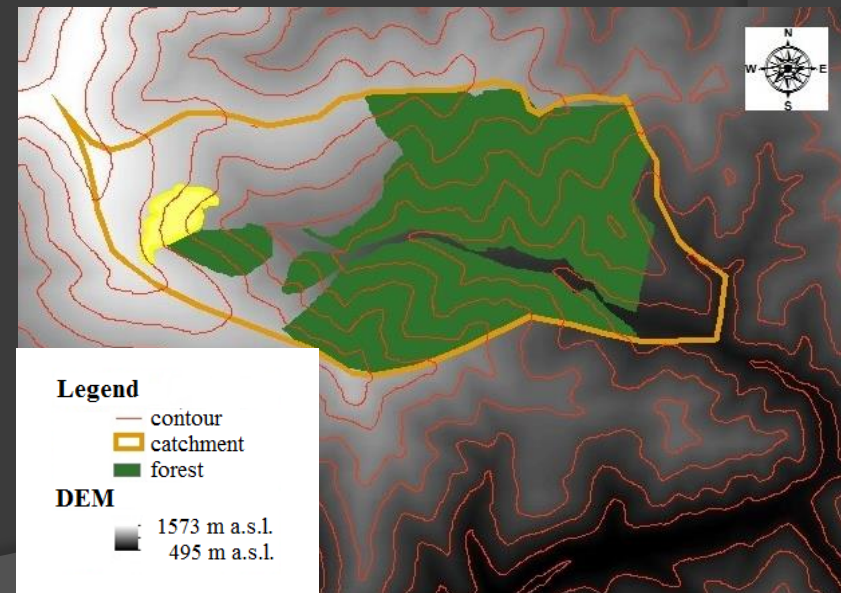
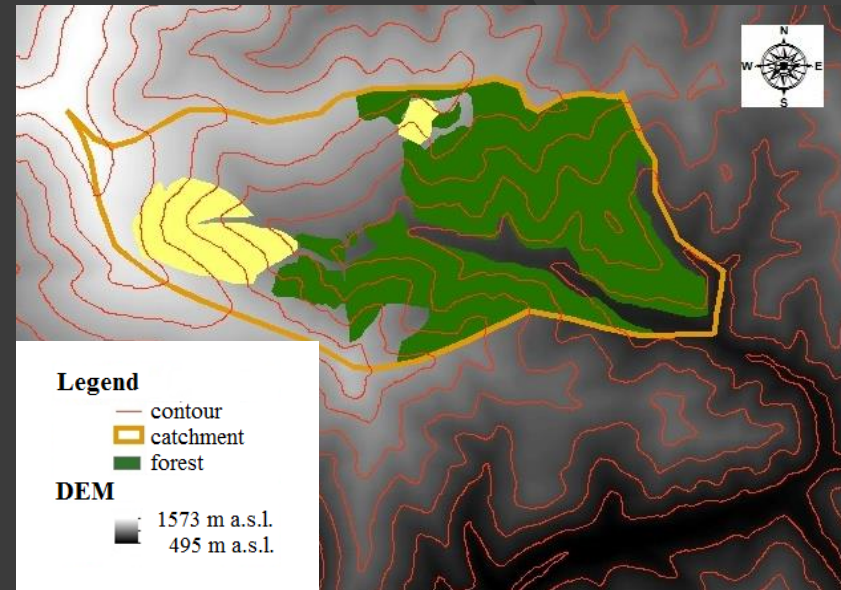
ELBA +

Input data:

- release zone
- catchment
- DEM
- forest area
- profiles
- snow cover characteristic

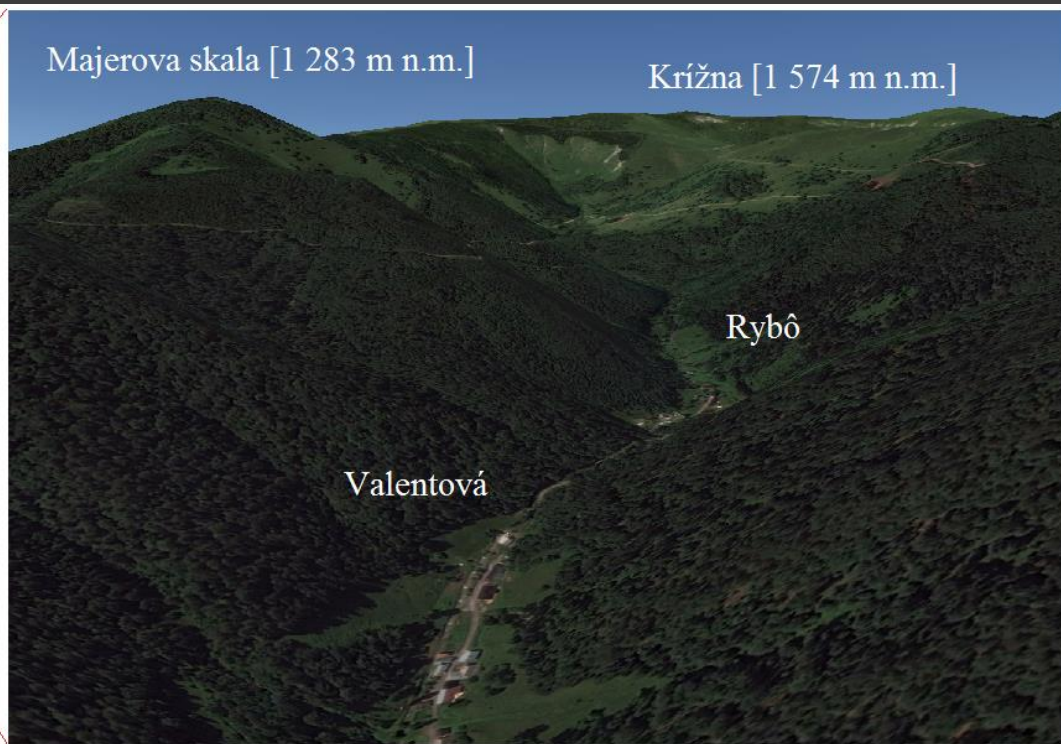
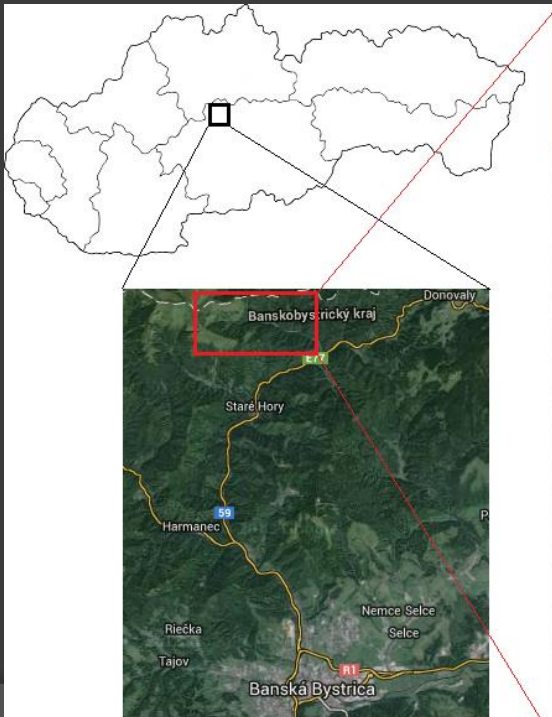
Results:

- avalanche length
- velocity
- maximal pressure
- maximal flow height
- deposit



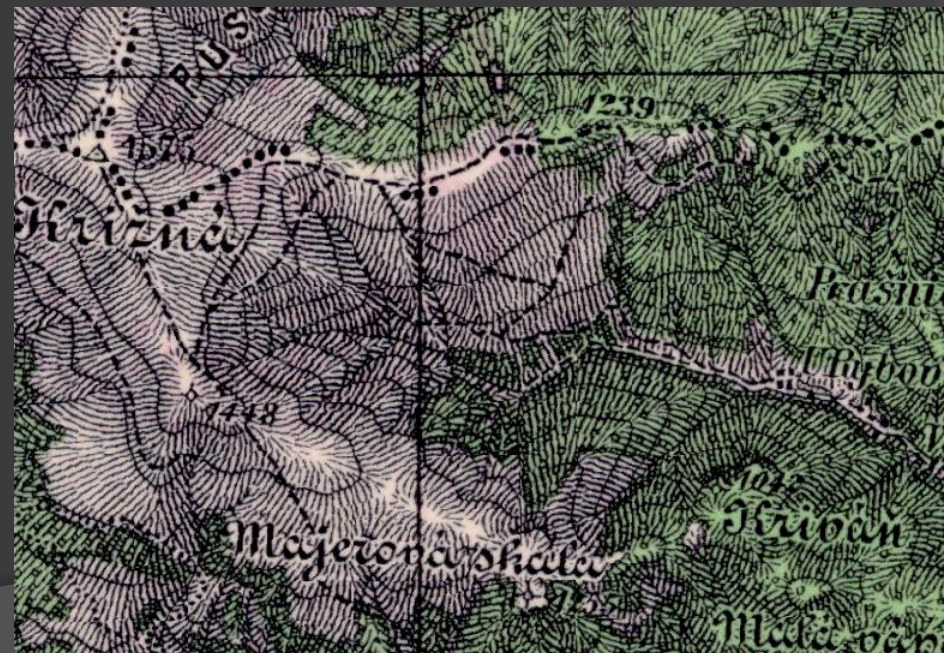
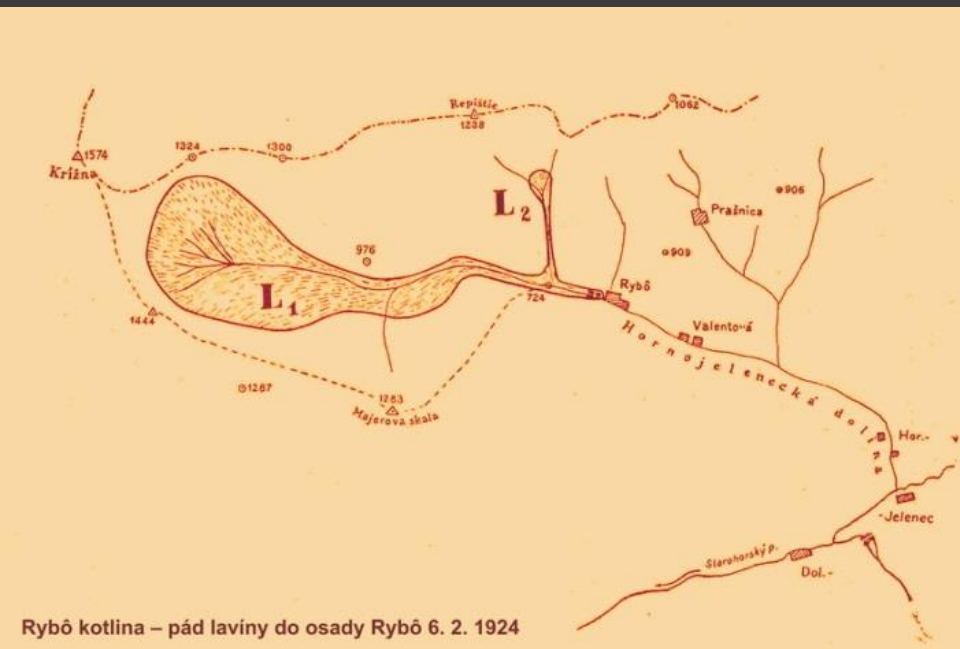
Rybô

- 6th February 1924 10:00 PM
- 18 victims
- 3 houses destroyed and 2 damaged
- Avalanche length 2,5 km
- Avalanche front height 35 m



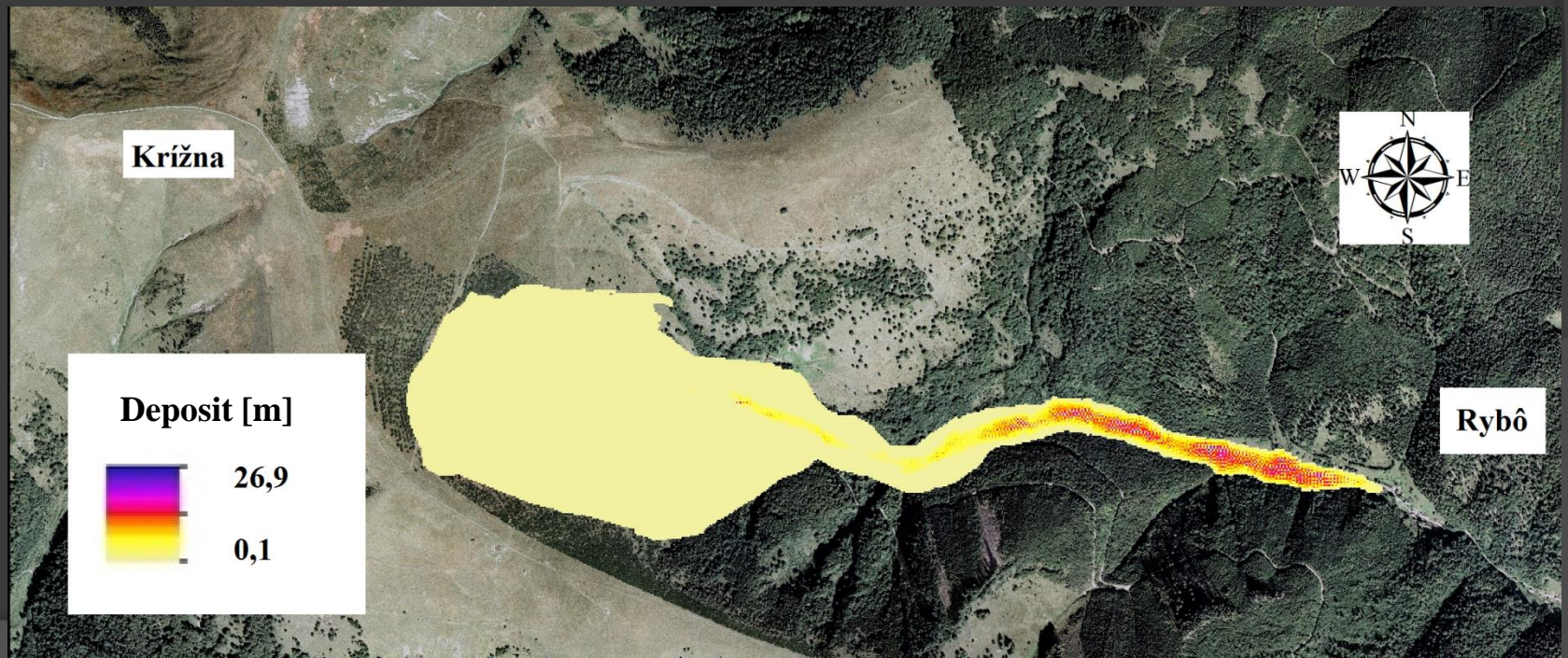
Material and Methods

- Reconstruction of historical avalanche from year 1924
- Simulation of avalanche without retarding effect of other avalanche, which fell a few days before from site slope „Rizničky“
- Avalanche simulation in present conditions

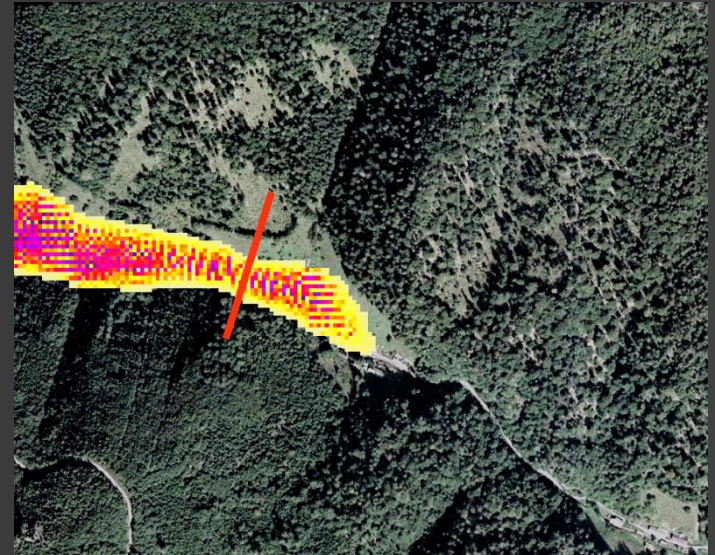


Results

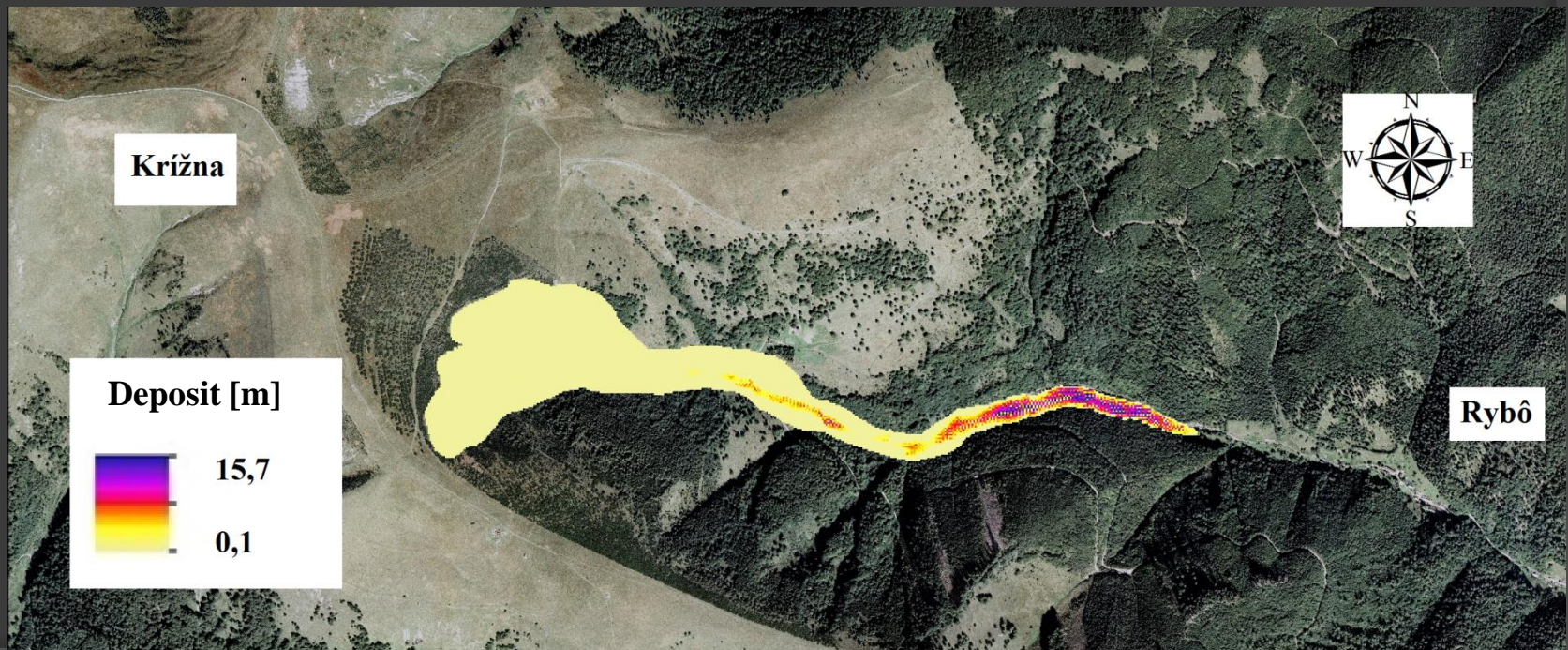
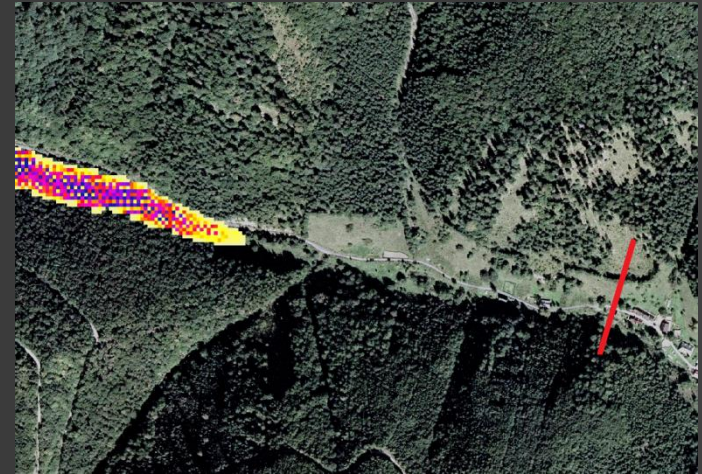
- Avalanche reconstruction



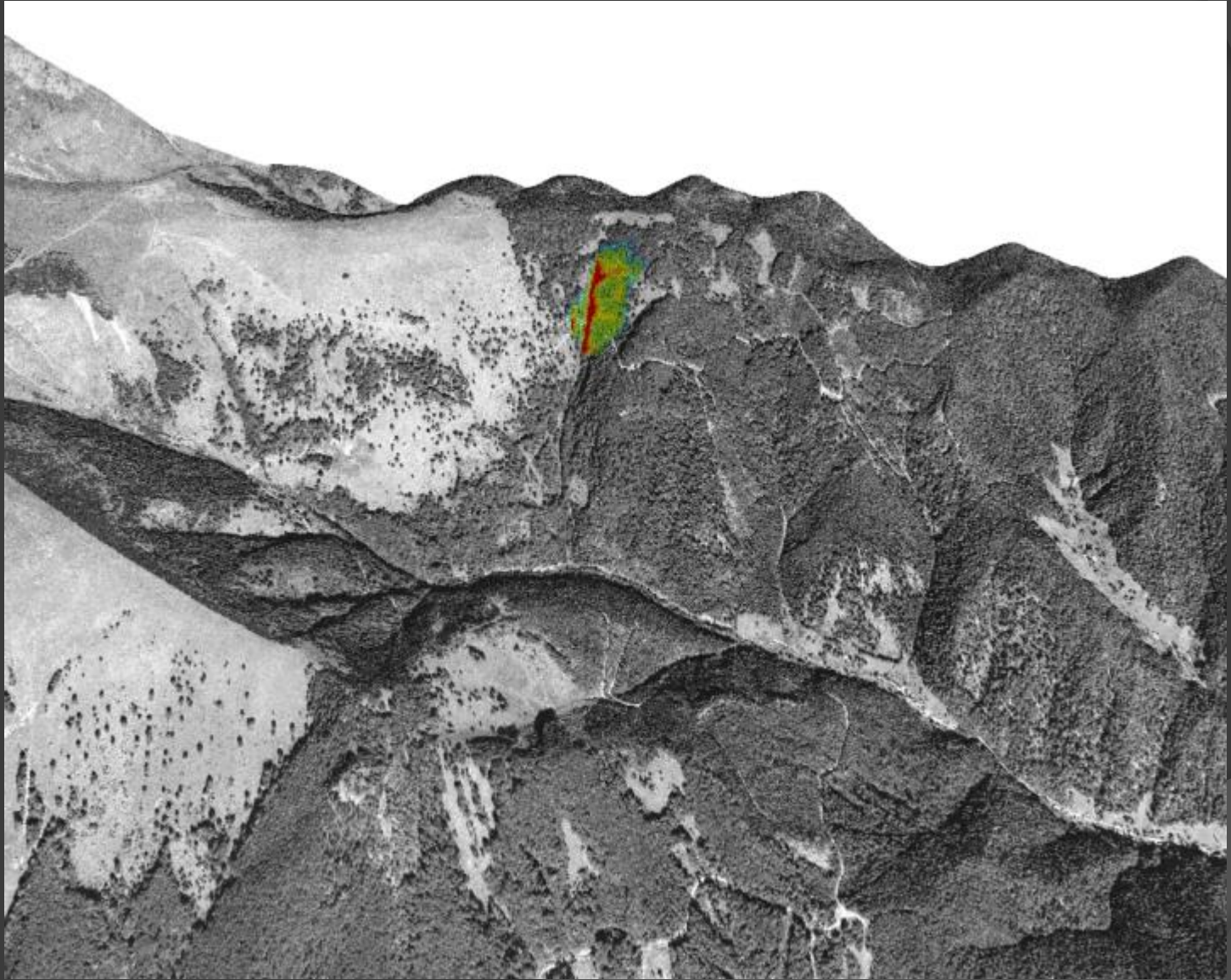
- Avalanche simulation without retarding effect of other avalanche



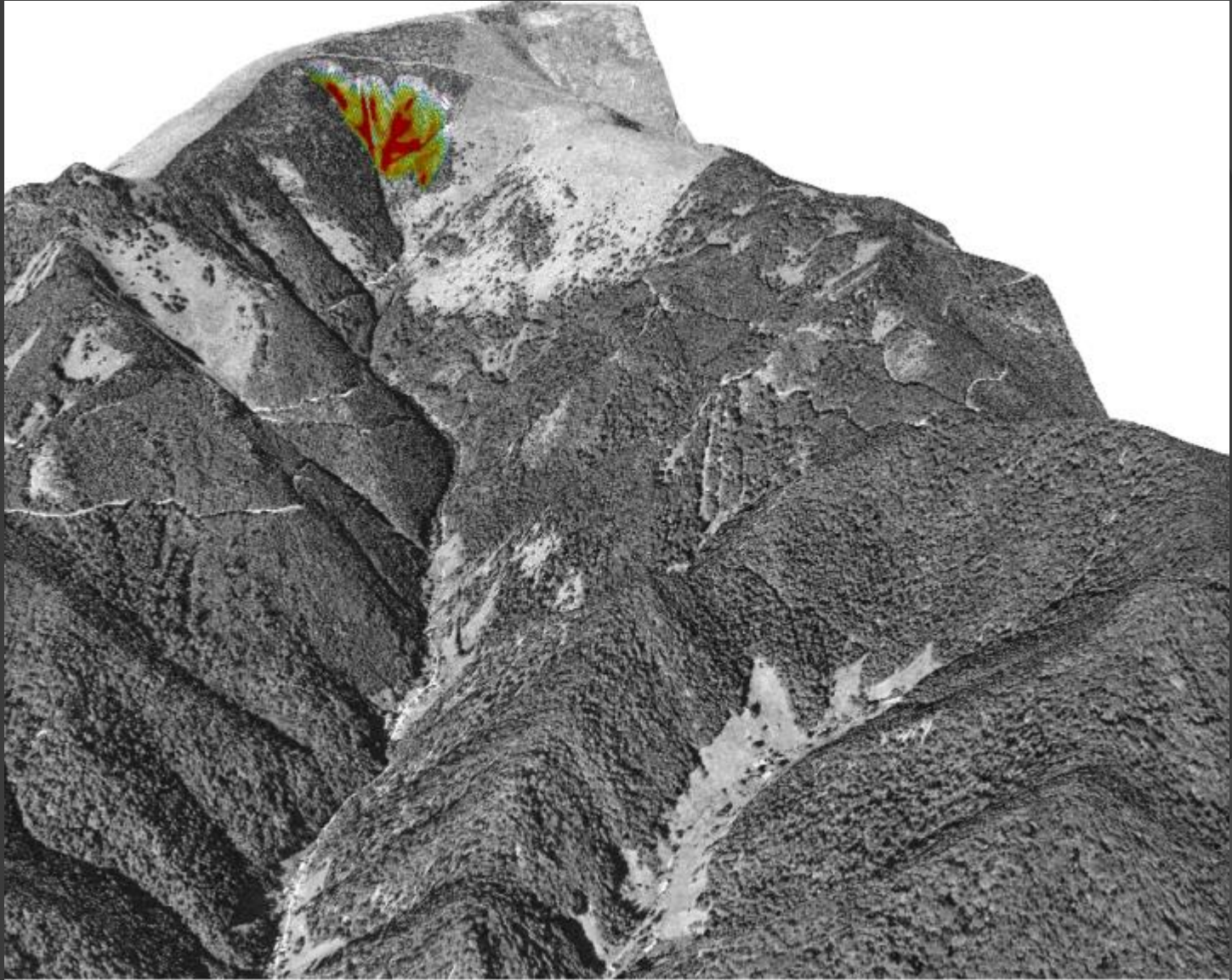
- Avalanche simulation in present state of release zones



Reconstruction of historical avalanche



Avalanche simulation at present



Conclusions

- Evaluation of reconstruction accuracy is in this case very complicated because we feel the lack of exact data (schematic sketch, snow cover characteristics, size release zone)
- Differences between our results and really data are not significantly: avalanche path 2,5 km (our result 2,55 km), deposit height 35 m (27 m) and deposit volume 580 00 m³ (800 000 m³)
- Avalanche simulation without retarding effect shows extensive damage and settlement would be destroyed from major part.
- Avalanche simulation at present conditions in release zones assumes, that reduction of release zone from 51 ha to potential 15 ha, should be avalanche length ca. 500 m shorter
- Finally we remind, that ELBA + is only model, which accordance with reality depend on input data quality

Thank you for your attention

