8th ICA Mountain Cartography Workshop 1 – 5 September 2012 , New Zeland

Mountain Mapping

DESIGNING PHOTO-REALISTIC AND ABSTRACT MOUNTAIN MAPS FOR A 3D MAPPING STUDY

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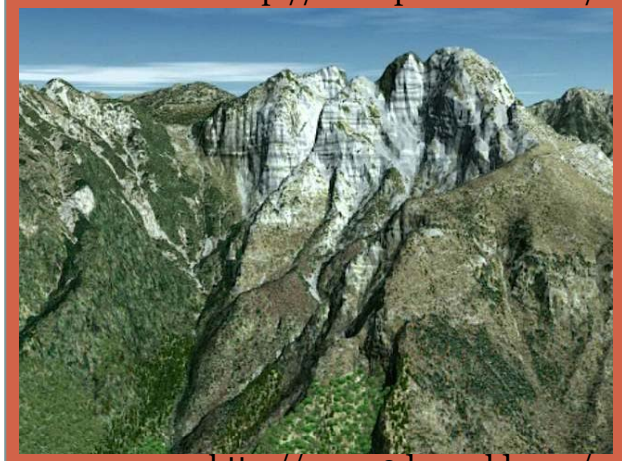
http://www.princeton.edu/



http://www.3dnworld.com/

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Main tasks (on mountain maps) are to estimate:

- the difficulty level of mountain paths,
- approximate length of the path,
- height differences and
- the time needed to complete the path.

Mountain 3D maps:

- **Perfect for less skilled users.**
- Enable **direct perception of the vertical character** of the depicted area

Trends in 3D map design

OR

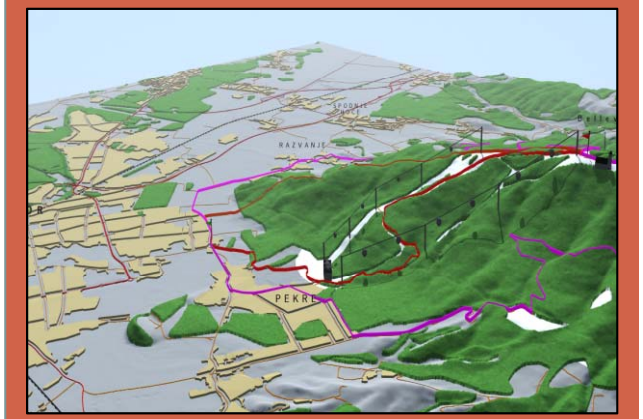


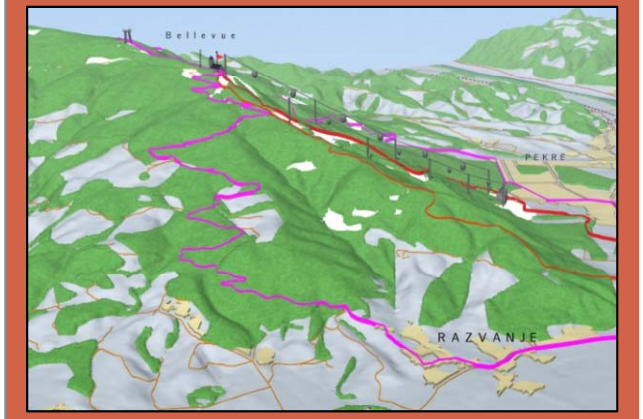
Photo-realistic 3D map

- Led by theory of computer graphics.
- **Suitable for unskilled and younger users**

Abstract 3D map

- Lack of cartographic principles /cartographic language (Häberling in 2003 and Petrovič in 2001 set guidelines)
- **Effective cartographic communication**

OR



Key features

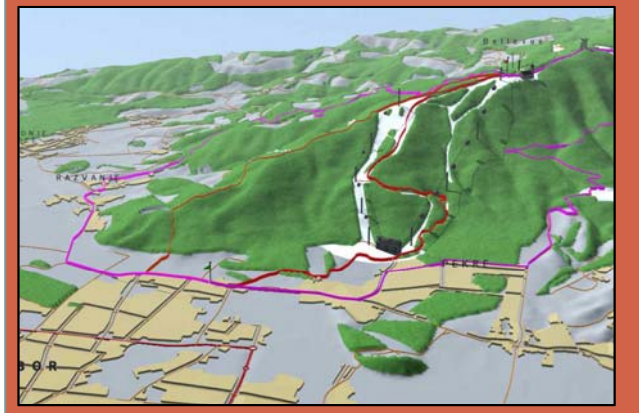
Photo-realistic 3D map

- Demands large number of details in terms of shape and color.
- High geometrical and graphical details.
- Very realistic appearance.

Abstract 3D map

- Employs cartographic generalization and
- cartographic abstraction.
- Expressive, clear and aesthetic 3D map

OR

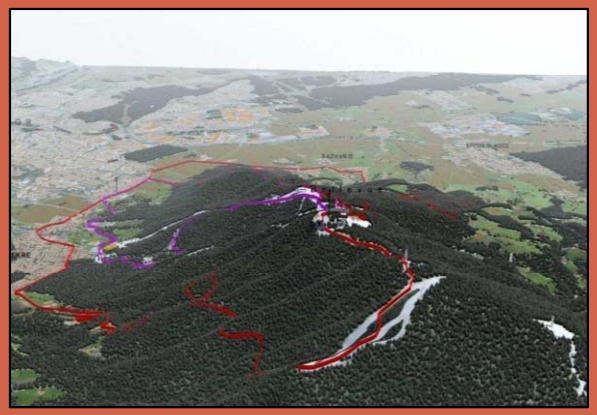


User study on 3D map design

The aim is to evaluate the influence of different levels of abstraction in 3D representations for cartographic communication.

Hypothesis:

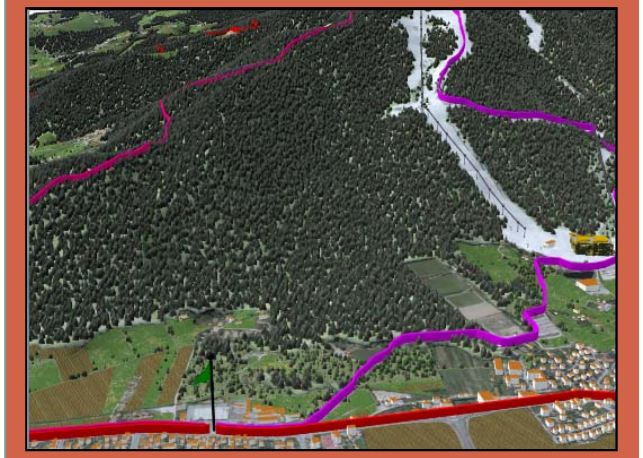
Abstract 3D geovisualizations are more effective for cartographic communication for mountainous purposes than photo-realistic 3D geovisualizations.



The test area

Pohorje highlands

- Above Maribor, the second biggest town
- Ski center (world cup women)
- Hiking trails
- Bicycle riding (downhill, mountain bicycling)
- Adrenaline park
- Very popular area, a lot of visitors



Design issues on a test 3D maps

Photo-realistic 3D map

- Similar to the real appearance of the presented objects and phenomena
- Require more time and technical skill in order to achieve a high level of realism

Design issues on a test 3D maps

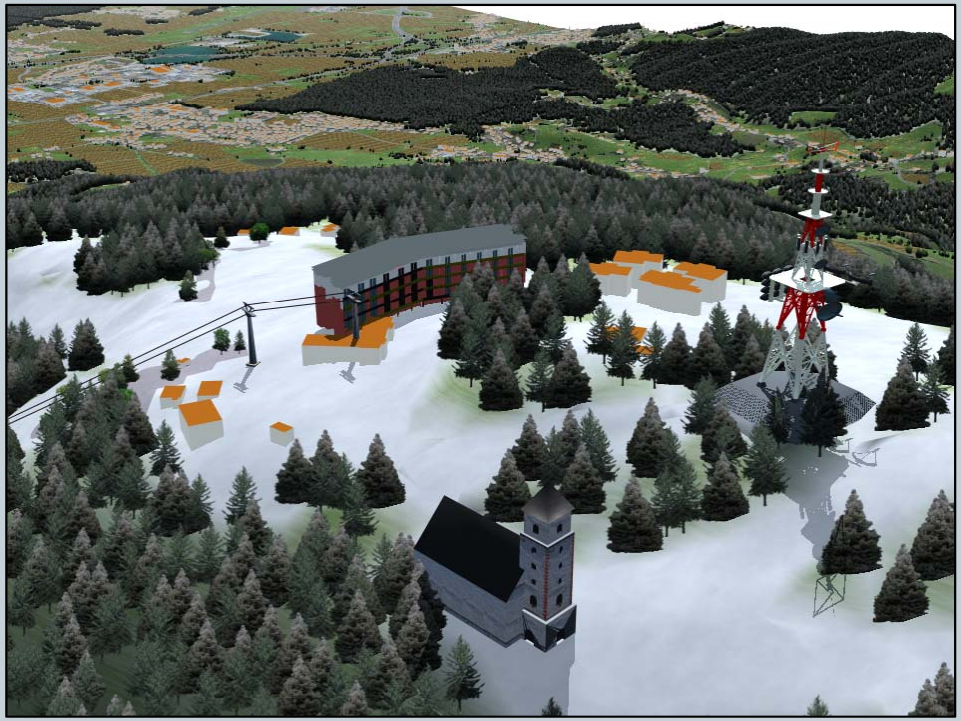
Abstract 3D map

To create an expressive, clear and aesthetic 3D map we followed various cartographic theories:

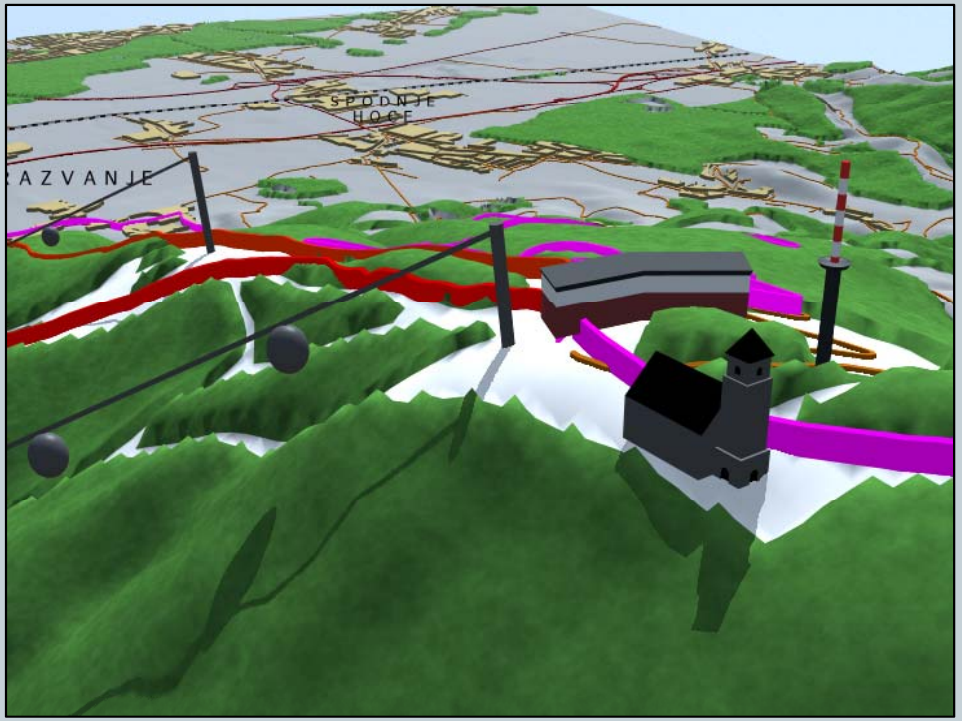
- Häberling (2008) – Proposed Cartographic Design Principles for 3D Maps
- Petrovič (2003) - Cartographic Design in 3D maps
- Glander's and Döllner's (2007) techniques for:
  - Generalization of 3D building groups,
  - Vegetation block model with coarse edge-line and coarse surface,
  - Cut-out of cell polygons

Comparison

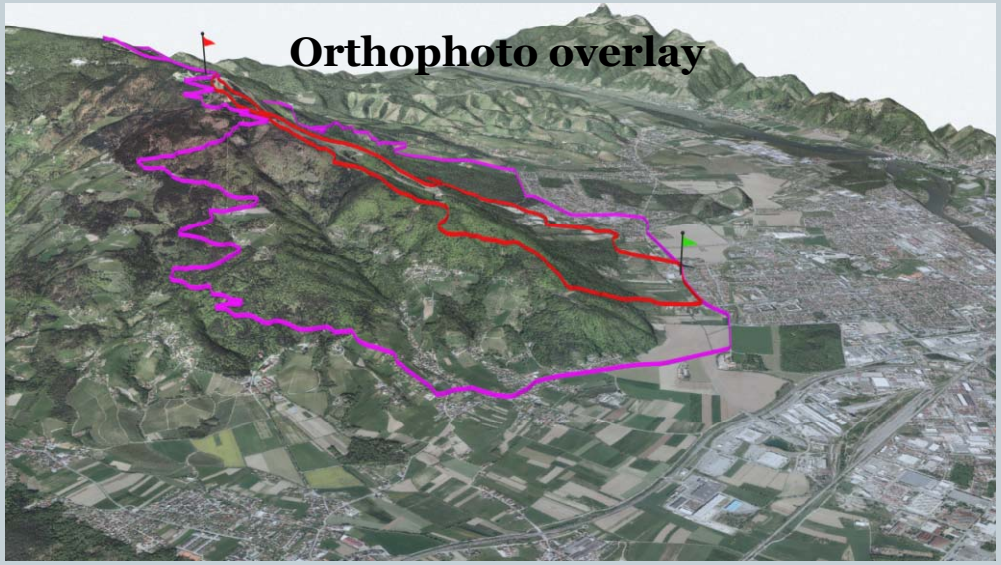
Photo-realistic 3D map

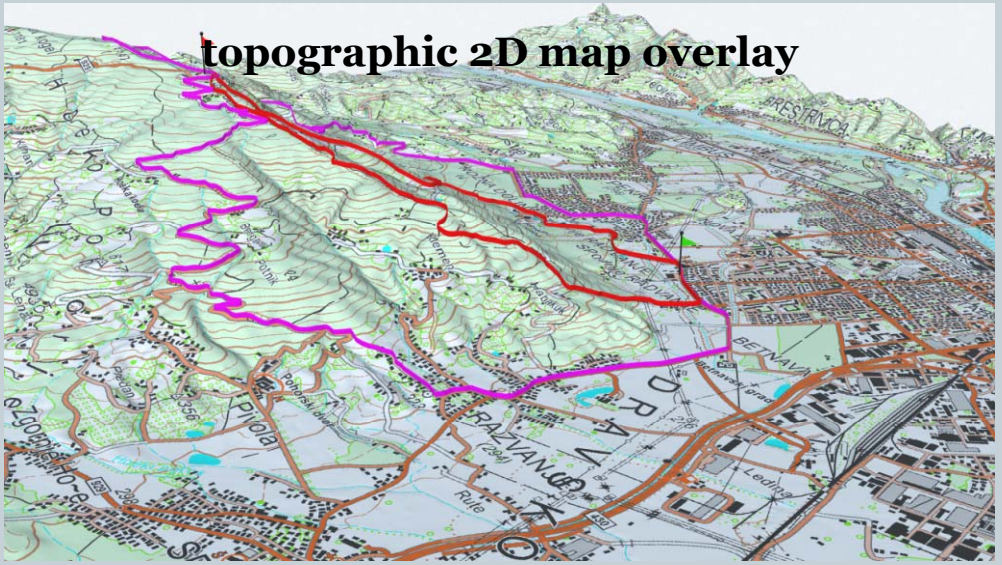


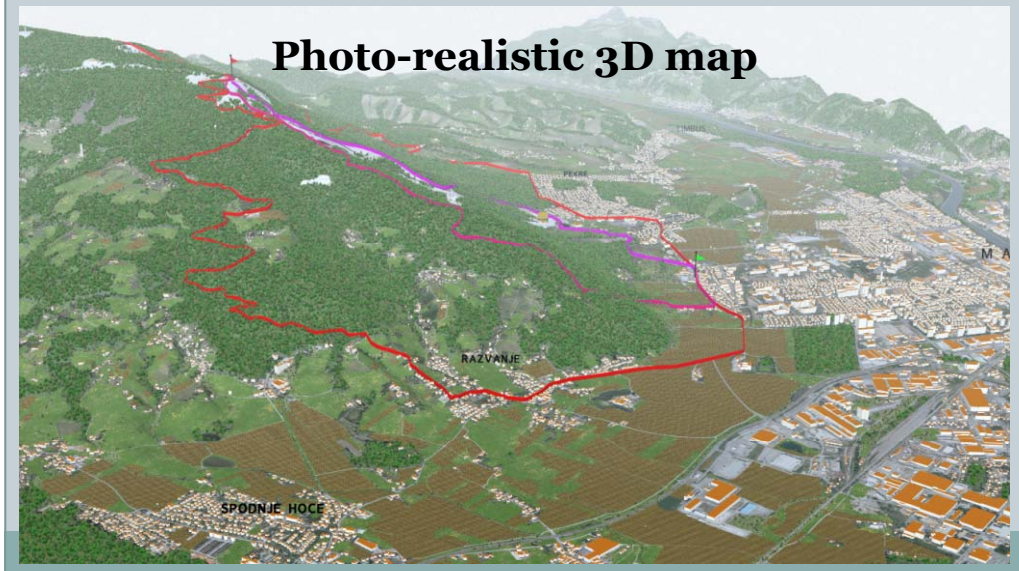
Abstract 3D map

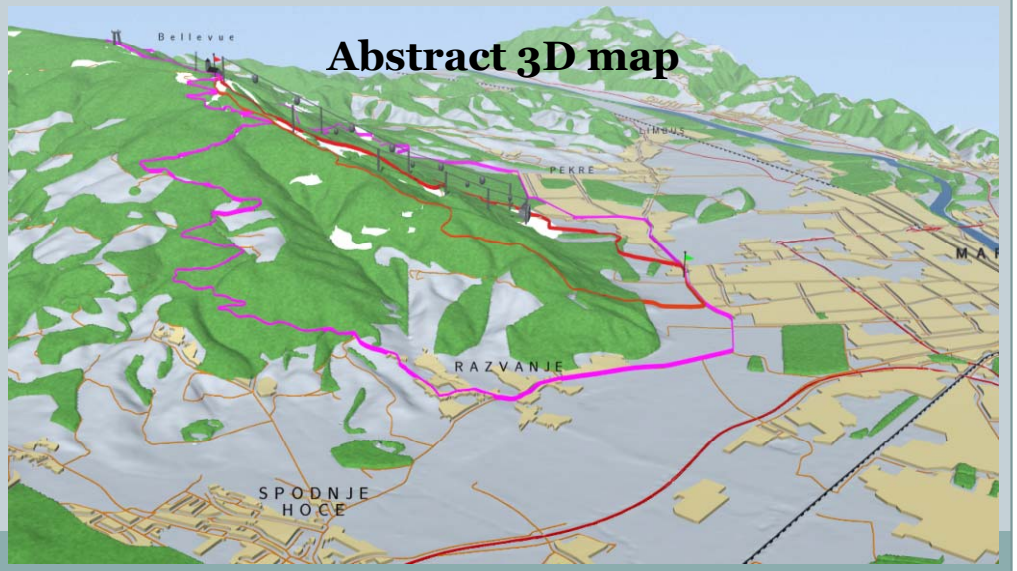


Types of 3D maps for mapping study

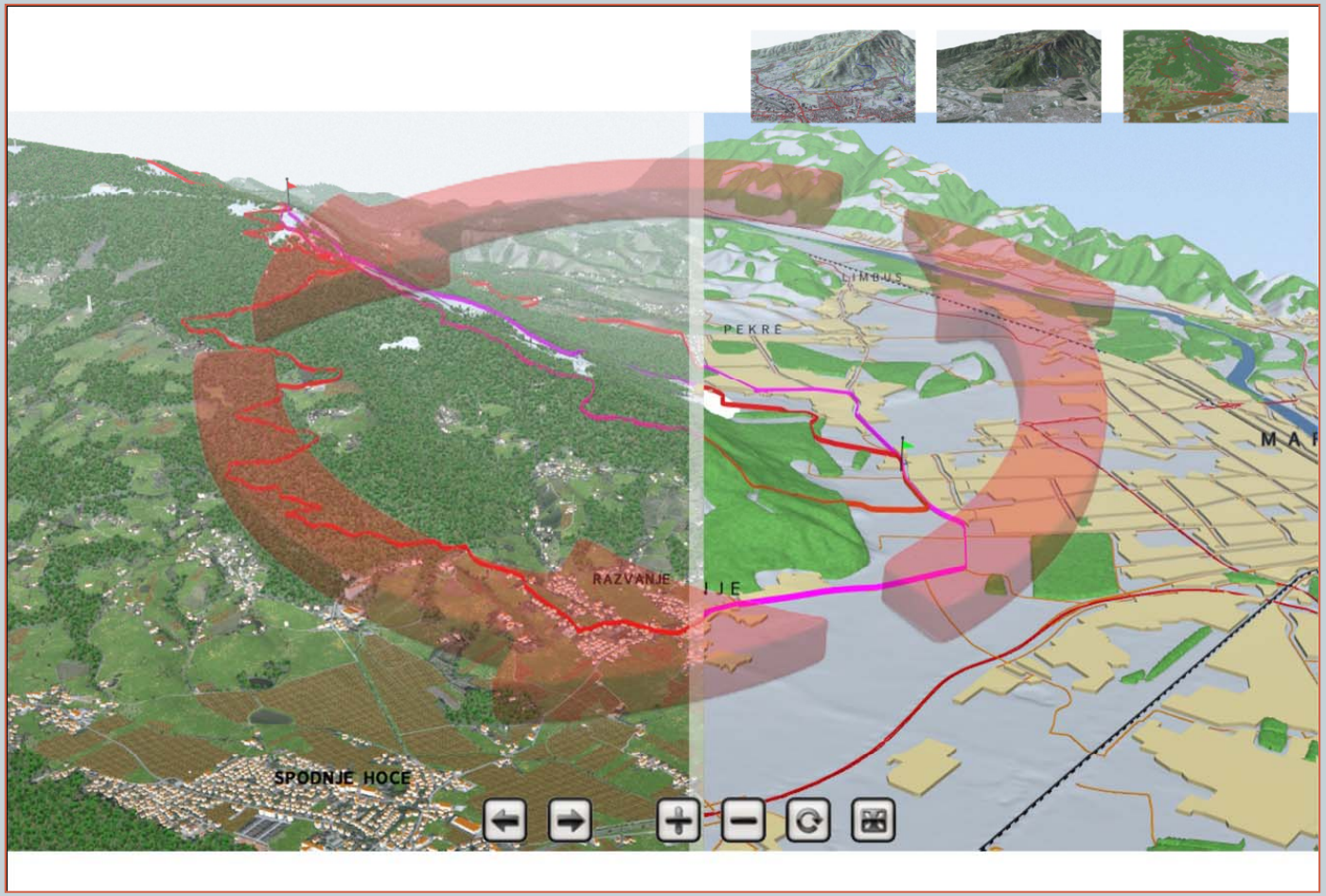








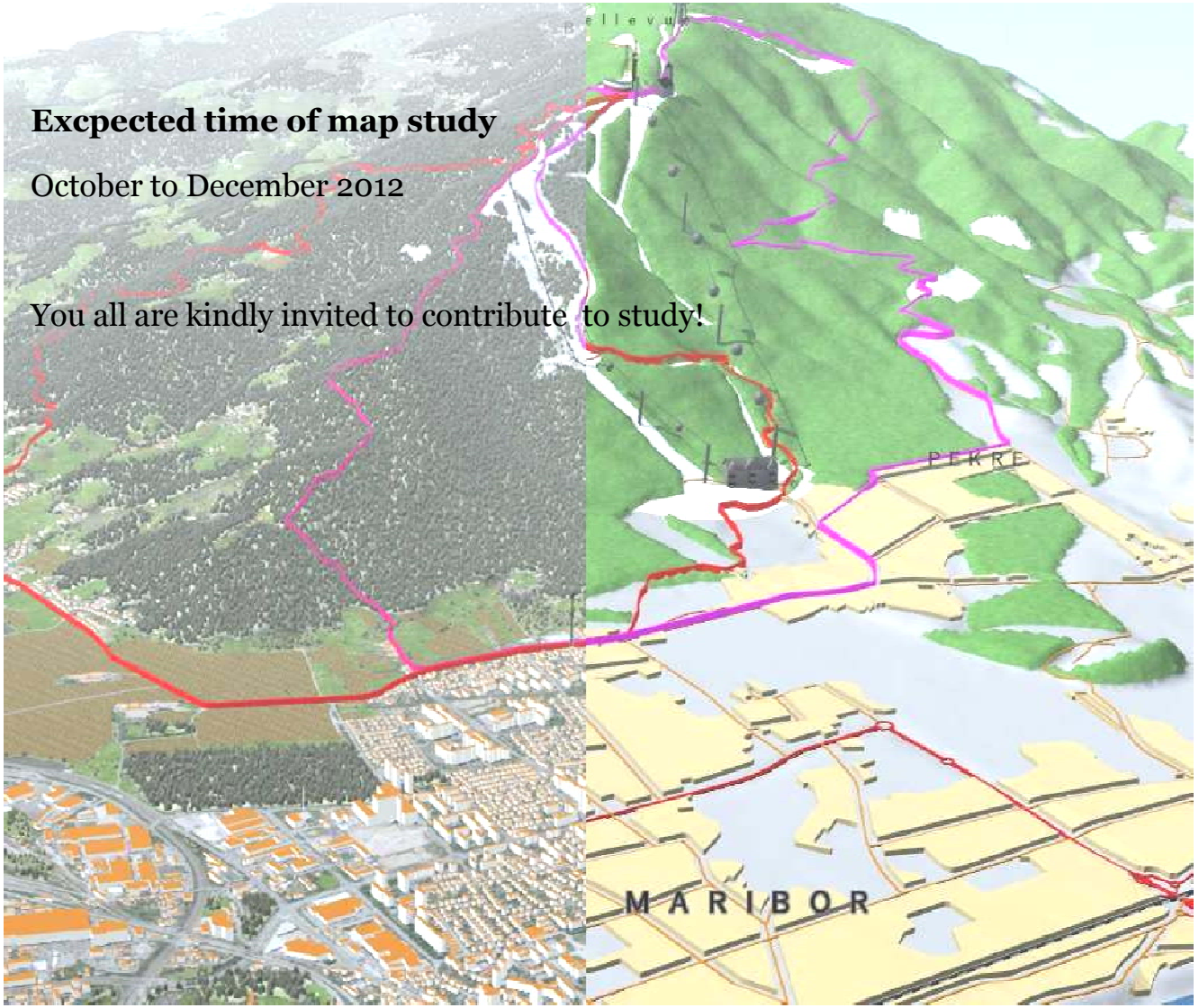
Study



http://kartografi.si/mountainCartography/anketa_VR.html

Conclusions

Excpected time of map study

October to December 2012

You all are kindly invited to contribute to study!