

# Rodnei Mountains Tourist Map

## A Tourist Mapping Project in Romania

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### **Abstract**

*The paper presents the main results of a tourist mapping research project: Methods, techniques and experimental models for three-dimensional graphic representations of Rodnei Mountains, for tourism. It aims to increase the graphical quality of the published materials, solving two typical big problems for mountain tourist maps. The first objective is to build an orientation tool for the tourist, to transform the classical mountain map, with contours, into an easy to use tool. Secondly, the goal is to give the map the quality of an advertizing material, as the tourism activities are emerging in the area. Based on the newest visualization software and recent information, new types of representations will be obtained. The details will also concern a general view and aspects of unique geological structures and hydrological elements. Activities have been driven on in four main directions: realizing a synthesis on the latest methods and techniques of 3D representations of a mountain area, creating a database of digital information for Rodnei Mountains, experimenting methods and techniques in order to obtain suggestive representations and transforming the obtained models into formats to fit the most important ways of spreading the results of the research.*

### **1. The Tourist Mapping Project**

The present project continues a series of tourist mapping projects, dealt with as research work at Babes-Bolyai University in Cluj-Napoca, the Sighetu Marmatiei Extension. The series contains the following topics:

- Methods, techniques and experimental models for three dimensional graphic representations of Rodnei Mountains, for tourism CEEX ET/2006
- Printed and interactive Atlas of the Maramures Land CEEX ET/2006
- Methods, techniques and experimental models for three-dimensional graphic representations of Gutai-Ignis Mountains, for tourism CNCSIS AT/2006
- Conceiving, experimenting and producing tourist maps for children CNCSIS AT/2007
- Tourist resources of Sighetu Marmatiei, in the frame of crossborder relationships, Partnership with the Sighetu Marmatiei Local Council/2005

- Tibles Mountains. Tourist prospective research CNCSIS A/2003

Some of the study subjects are: potential of the relief, tourist prospecting, tourist arrangements, tourist cartography, tourist branding, thus being a valuable geodatabase.

The results will be used for different purposes:

- Tourist orientation tool,
- Didactic/educational tasks (for tourism/geography students),
- Branding for tourist purpose (research to identify the potential elements for a consolidation point of the tourist web-portal of Maramures Land),
- Tourist arrangements (local authorities and investors).

The study area is a former mining region. After the mines closed down, people have found three alternatives to earn their living: wood exploitation, temporary or final migration and tourism. The third option explains the need for cartographic materials for the process of tourism improvement. The town Borsa, located in the northern area of Rodnei Mountains, is a resort of regional interest, mostly for winter sports facilities, but also for hiking and for the mineral water sources. Due to the necessity of elaborating competitive investment projects there is also a need for visualizing materials in order to arouse the investors' interest.

According to the field of interest such as the overall configuration of the relief, areas of maximum interest and the presence of certain natural phenomena (glacial relief and lakes, karst, natural mineral waters), the following approaches for several areas of the Rodnei Mountains have been determined:

- Rodnei Mountains – general approach
- Northern Ridge - the most spectacular
- The area of Pietrosu Rodnei - the highest
- The area of Borsa – Complex (the most important from the tourist point of view)

The conclusion of the research will be available both digitally and in printed form, with the following products:

- 3D maps of different areas
- 3D Panorama
- 2.5 D or shaded
- 4D Animations

## 2. The Mountains

Rodnei Mountains are the highest and the most massive in the Eastern Carpathians. Their altitude reaches a maximum at 2303m above sea level. From the geomorphologic point of view they are a tilted horst with the short slope northwards, a higher northern area determining the highest altitudes, and a lower southern area. This leads to a steeper northern ridge with high peaks (over 1600–1800 m) and a milder southern slope. In the horizontal plane they have got a pentagon shape, imposed by the presence of the fracture lines, with the sides oriented towards W, N, NE, SE and S.



Fig. 1: Position of Rodnei Mountains

The northern and north-eastern sides are separated by a range linking Rodnei Mountains to Maramures Mountains, which is in fact the boundary between the basins of Tisa (by its affluent Viseu) and Siret (by its affluent Bistrita). On the northern slope, there are very wide basins in the superior course of the rivers (Dragos Stream, Repedea, Negoiescu) and it is very difficult to obtain a really clear visualization from north. The southern slope has longer hydrographic basins and it is easier to visualize from the perspective point in the south. The main peak looks like a circular bow, with the convex part towards the north, which does not allow a plane horizontal or quasi-horizontal visualization, with one perspective point, because most of the areas corresponding to the northern bassinets are not visible. (Fig. 1)

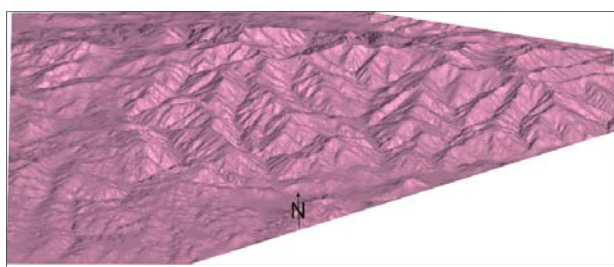


Fig. 2: Rodnei Mountains – rough view from North and South

## 3. Visualization

The 3D cartographic approach, for different reasons, has its advantages and disadvantages. The link between the overall configuration of Rodnei Mountains and the

methods used is obvious. Therefore, several points of perspective have been chosen: visualization from north, west and south. Due to its general shape, the visualization from east has been excluded.

### 3.1. Visualization from North and North-West

From this perspective, it is impossible to visualize the whole topographic area of the mountains, but there is a perfect image of the highest and most spectacular area. By setting the perspective point higher, the visualization area offers an angle to overcome the slope of the southern oriented sides. It is the most suitable representation for Maramures County (Borsa Area) because its corresponding area is in the foreground. Despite the fact that the glacial relief is visible only on the northern side, the overall visualization allows the sight of glacial circles only by using high resolutions and small scales.

### 3.2. Visualization from South

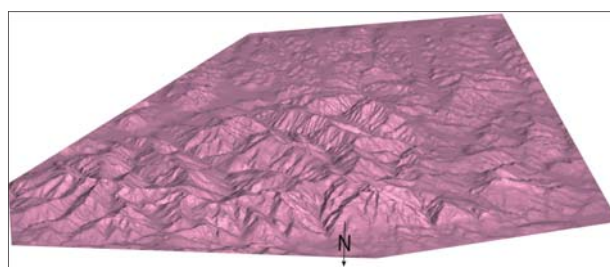
As the shapes of the relief maps are the most present in people's minds and the visualization from the south is the closest to such a result, it is a lot easier to use in orientation, especially for action of tourist branding. However, due to the tipped over horst configuration, the very steep northern frontage is very little represented, even if it is the most representative one. (Fig. 2)

### 3.3. Visualization from the West

Visualization from the west is less spectacular; however we could obtain some 3D images extremely useful from the didactic point of view and also for promoting the mountains as brand of the Maramures region.

In the first situation we can easily notice several aspects important for the didactic process, such as:

- The fracture line Dragos Voda, oriented towards East-West
- The tipped over horst shape
- The contact between the mountain and the Piedmont area.







#### 4.2. The area of Pietrosu Rodnei

This is the highest area in Rodnei Mountains, corresponding also to a natural reserve, and it is located near the town of Borsa. By its configuration, this area allows a great number of visualizations, even circular flights and animations, as it is flanked by two deep valleys on the eastern and western side and steep mountainsides. The highest area, with many bare cliffs, is easily visible even from downtown Borsa. This area has cirques and glacial lakes almost on all sides. One of the most suggestive visualizations is obtained by setting the perspective point in the north-west, at an altitude of 2000–2200 m, thus offering a better visibility of the northern and eastern mountainsides, and also of the highest peak of Oriental Carpathians (Pietrosu Rodnei 2303 m). In this area, there are many glacial lakes, such as Taurile Buhaescu and Iezer Lake, the later having a very similar shape to that of Romania. From this angle we can visualize the topographic area with an exact demarcation of the cirques and the glacial valleys (Fig. 4).

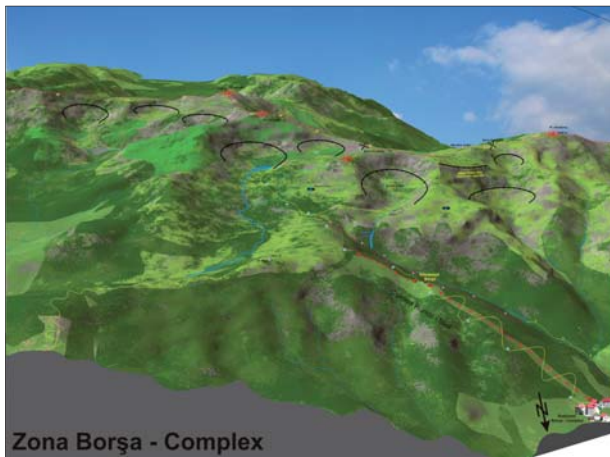


Fig. 5: The Borsa-Complex Area

#### 4.3. The area of Borsa -Complex

This is the most accessible area with the most developed tourist infrastructure in Rodnei Mountains, being a contact area of three counties and near the resort of regional interest Borsa – Complex. The products for this area must cover the 4 fields of action: orientation, improving, branding, and didactic. The most suitable solution for the four fields of action is obtained by the visualization from a point in

the north-east, at an altitude of approx. 2000 m. The topographic surface of interest is almost entirely visible (except for an area in a glacial cirque) thus the elements of interest were represented.

The relief depiction is similar to the real situation with a clear visualization of the effects of the glaciations, resulting in glacial cirques (8 visible) and glacial crests at the foot of the cirques (the ones at Cascada Cailor and Izvorul Bistritei Lake are visible). The entire hydrographic network, comprising the glacial lake Izovrul Bistritei and all the rivers are represented. Areas with forest vegetations (resinous essences), areas with vegetation of Juniper and Cade bushes, alpine grasslands and secondary ones were subject of texture work. Also the steep rocks, cliffs of the natural reserve Piatra Rea were drawn. The infrastructure for skiing, comprising ski-runs, cable transport devices and buildings for services includes the buildings, roads and paths with tourist trails. Mountain peaks with panoramic view over spectacular areas, the saddles on the main crest as points of bifurcation of the tourist itineraries, elements of karsts such as caves and swallow-holes were marked accordingly (Fig. 5).

#### 5. Conclusions

For each of the four fields of action we have obtained a series of products, consisting of:

- orientation materials, maps which are easy to use and very close to the real aspect,
- promotion materials for the whole area of interest, including the base for the future tourist web-based portal of Maramures Land [www.maramures-tourism.ro](http://www.maramures-tourism.ro),
- didactic materials with clear visualization of the relief, with structured representations,
- maps for tourist improvement, very useful in elaborating and on-going of projects, but also in attracting investments,
- Results will be available to be set on information and orientation boards, maps, printed out or in electronic format by different visualization styles.

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