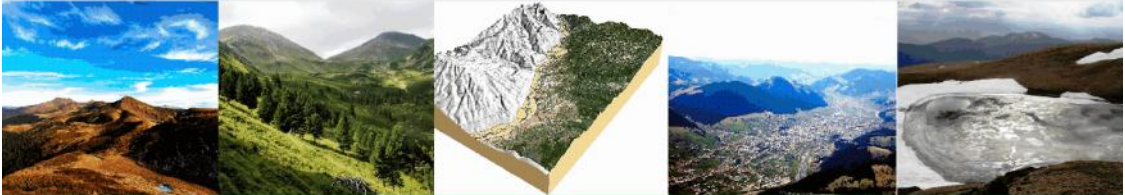




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## **Geomorphometry of the glacial lakes in the Romanian Carpathians**

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The aim of this study is to make an inventory and a database comprising of all glacial lakes in the Romanian Carpathians based on information provided by Gâștescu (1960), Pișota (1968, 1971), Decei (1981), Mindrescu (2006), and the data obtained in the field and laboratory by employing GIS techniques (ArcView, Global Mapper, Map Maker, Google Earth).

In order to identify all the glacial lakes within the mountainous area several datasets were used. These sources included maps of glacial cirques published by Pișota (1971), maps of each glacial cirque by Mindrescu (2006), a map of the glaciated areas in Rodna Mts by Sawicki (1911), individual studies on glacial lakes (Vespremeanu-Stroe et al., 2008), a study on the glacial and periglacial landscape in Romania (Vuia, 2005), as well as the topographic (1:25,000, 1986) and geological (1:200,000, 1968) maps and orthophotos (2005). By applying GIS techniques, each glacial lake was digitized, resulting in a geomorphometric dataset assigned to each glacial lake (coordinates, elevation, area and perimeter (1984 and 2005), aspect, etc.).

Subsequent to the data analysis, several maps were generated comprising all the glacial lakes in the Romanian Carpathians, but also for each mountain massif in part, displaying the altitudinal distribution of lakes, their catchments, geology and land cover.

The highest frequency of glacial lakes occurs between altitudes of 1800 m and 2000 m, which leads to the conclusion that this elevation range was the most intensely glaciated within the Romanian Carpathians. Regarding the depth of lakes, it is noteworthy that the majority of them are below 5 m in depth. By analyzing the data regarding the area of glacial lake catchments, it was determined that Retezat Mts host the largest catchments (e.g., Lia - 441 ha, Bucura - 201 ha, etc.). The analysis of geological data indicated that granitic substrates favored the formation of the highest number of lakes, which has also been documented in the Pyrenees (Garcia-Ruiz, et. Al., 2000).

To conclude, a total of 227 glacial lakes were inventorized in the Romanian Carpathians, of which 220 are cirque lakes (whereby 59 are silted) and 7 are valley lakes (Pojoarnei in Fagaraș, Latoriței, Zănoaga Stâni in Parâng, Tăul dintre Brazi, Lia, Ana and Soarbele in Godeanu). For comparison, Mindrescu (2006) counted 631 glacial cirques, which indicates that less than one third of all the cirques has a glacial lake.

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