

Title of the project: Impact of skiing on high mountain catchment morphodynamic. An example from Kasprowy Wierch region, Polish Tatras

Permanent growth in popularity of skiing contributes to establish new ski resorts and the development of existing ones. Ski slopes are built primarily in mountain areas, where due to severe climatic conditions, the natural environment is more vulnerable to changes than in other areas. One of the main elements of the environment transformed as a result of the development of ski resorts is the surface relief. It is subject to various changes e.g., development of new forms associated with erosion on the ski slopes, degradation of the plant cover, ripping of bedrock or disruption of the natural functioning of geomorphological processes. The problem of the influence of skiing on environmental changes in literature is not new, however, topic of changes in the relief is not often raised. The most frequently published works concern the description of newly created forms, there are few papers that refer the problem of changes in the natural functioning of processes. The greatest lack of knowledge concerns areas located in the high mountains above the alpine tree line, which should be given more attention due to the greatest susceptibility to disturbance of natural cycles, e.g. climate changes.

The aim of the project is to present the impact of skiing on high mountain catchment morphodynamic (the impact of skiing on the changes in functioning of relief processes and landforms in the high mountains). The research will be conducted in the Tatras, in the Kasprowy Wierch region, which distinguished from the areas previously described in literature with the longest impact of skiing on the relief (ski lifts since the 1960s, cable car since 1936). It is worth emphasizing that this area is located in a protected area with the highest protection regime, which is a national park.

The aim of the project will be carried out using a different research methods. The basis will be field mapping in the area of ski runs and in valleys without ski runs. This mapping is based on measuring the size of relief forms. The acquired data will be later used in statistical analyses that show and confirm the changes in relationships between the elements of the relief in the research area. Terrestrial Laser Scanning (TLS) and analysis in GIS software will also be conducted, which will show how skiing affects the relief in short-time (between the period before and after the ski season). The result of the project will be preparation a model of functioning of relief processes that will prove that this type of human activity can determine the direction of natural relief processes in the high mountains area located above the alpine tree line. In the world literature, these studies will be a new voice indicating how human activity can completely modify the natural direction of development of such a theoretical stable element of the natural environment as land relief. The results may also contribute to a better understanding of nature cycles and how to protect them in this part of the Tatra National Park.