In this issue

Glacial retreat from the Baspa Valley, HP, India

B. S. Deota *et al.* (**page 1555**) report on the role of remote sensing and GIS in the identification of geomorphic records and understanding of the local controls on the retreat of glaciers of the Baspa Valley, HP, India.

The records of glacial retreat are well preserved in the form of a number of deglaciated valleys, terminal moraines and lateral moraines, and can be easily extracted from satellite data as well as in the field. Terminal and lateral moraines are found to be the important glacial geomorphic indicators and the number of sets can be correlated with the stages of deglaciation. Apart from lateral and terminal moraines, many empty cirques, hanging valleys, horns and arêtes of different shapes and sizes are commonly observed in the Baspa Valley, indicating the presence of glaciers in the past which have now retreated. The critical analysis of these glaciers reveals that, other than global warming, the local factors, viz. size of the accumulation zone, ratio of the moraine covered to exposed ablation zone (Mcab/Exab), slope of ablation zone and orientation of the glaciers are closely interrelated and control the retreat of the glaciers. The authors report that the retreat of glaciers of the Baspa Valley is inversely proportional to the size of accumulation zone and Mcab/Exab ratio is directly proportional to the slope of ablation zone. They also report that the south-facing glaciers are retreating faster than the north-facing glaciers.

Using Ground Penetrating Radar to study snow depth and snow layers

Ground Penetrating Radar (GPR) is a non-destructive technique for snow depth and snowpack information. The technique has been used previously for estimating thickness of two glaciers in the Indian Himalayas, among other studies. Snowpacks are important because they are a source of water and can be used for forecasting avalanches.

Using GPR of antenna frequency of 1000 MHz, Singh *et al.* (**page 1532**) have carried out snow depth estimation and snow stratigraphic studies on Pir Panjal and Greater Himalayan range of the NW Himalayas. The GPR study was carried out near Patseo and Solang field research stations of the Snow and Avalanche Study Establishment. The study was conducted in late February in Solang and in March in Patseo field station.

To verify GPR data for snow depth, observations were taken manually as well. A good correlation between the two sets of values was found. Snowpack conditions were found to differ for Patseo and Solang observatories. An attempt to identify different layers of a snowpack was made in the study at Patseo. The antenna cannot differentiate the layers of snowpack with thickness less than the vertical resolution of the antenna. This study indicates the use of GPR at high frequency for fast sampling of snow depth and snowpack studies.

Halophiles, compatible solutes and applications

Halophiles are the microorganisms that thrive in habitats with high salt concentration. Their metabolism differs from other halophiles and their products (enzymes, pigments, solutes, etc.) find commercial applications. Halophilic bacteria can adapt to rapid changes in salt concentrations by producing compatible solutes, which are highly soluble, low molecular weight organic compounds. The solutes are named so because they are compatible with the intracellular machinery. These solutes could be amino acids, sugars or polyols. Besides osmoregulation, compatible solutes also have therapeutic use and properties against stress such as freezing, drying and heating. They can also be used in cosmetics, agriculture and as salt antagonists.

Pooja Shivanand and Gopal Mugeraya (**page 1516**) review the diversity of halophilic bacteria, application of such bacteria in biotechnology, compatible solutes and their production and purification. Compatible solutes such as ectoine, betaine, mannosylglycerate, trehalose and diglycerol phosphate have been dealt with individually, indicating their properties and applications.