

Cross section of a glacier

INSTRUCTION

The task is to draw a morphological cross section of the Hansbreen, a glacier located in the southern part of Spitsbergen Island on the Svalbard Archipelago. This glacier is under continuous observation made by glaciologists from the Institute of Geophysics, Polish Academy of Sciences. There are eleven ablation stakes drilled into the glacier surface. The altitude of each ablation stake can be read from the level map. On this map contour lines (isolines) join points of equal value of altitude in metres above sea level (m a.s.l.).

Examine the contour lines (isolines), which mark the of the Hansbreen glacier surface. Calculate the interval between isolines (how many meters are levelled).

Read the altitude of each ablation stake from the level map and type the values in the table below.

Ablation stake	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Altitude [m a.s.l.]											

On the map draw the straight line to join points T1 and T2. Extend the line until you cross the glacier front line. This point is assumed to be the beginning of the X axis on the graph.

On the graph (worksheet 1) on the X axis, mark the position of the ablation stake T1. The distance of the T1 stake from the beginning of the graph is equal to the length of the drawn section between the T1 stake and the glacier front.

Add line segments by connecting next ablation stakes from T2 to T11 and move the length of these sections to the horizontal axis on the graph. Note that the horizontal scale of the map and cross section is the same. There is no need to convert and scale. You can move the distance using a paper strip, ruler, or a pair of compasses (drawing tool). On the horizontal axis mark the stakes with numbers: T1, T2,

Then from each point that marks ablation stake, draw segments perpendicular to the horizontal axis. Read the altitude of each ablation stake and in the appropriate place mark its altitude in scale of the graph. After placing all the altitudes of the ablation stakes, join the points with a line.

In this way you have drawn the morphological cross section of the glacier, using the altitude of ablation stakes.

In this part of the assignment we used all 11 ablation stakes placed on the Hansbreen glacier. It is also possible to draw a cross section taking into account ablation stakes forming logical lines, eg T1-T4-T5-T6-T9-T11. The task would be the same as described in the instruction above.