

## Measuring ice thickness

Finnish Environment Institute measures ice thickness at about 50 stations, most located in lakes. Measurements are made three times a month, on the 10th, 20th and 30th. The longest data series date back from the 1910s. The present standard of measurements was introduced as late as in the 1970s. Most of the stations transfer the total ice thickness by telephone to the data base, so that the data is available on the internet almost in real time. The hydrological database contains ice thickness data from 160 sites.

Ice thickness observations are important for research purposes, but they can also be used by anyone who moves on the ice. It should, however, be remembered that the official ice thickness value is not intended to give a false idea of safety. Ice thickness is not the same in all parts of a lake, and the sites of official measurements are selected with respect to their representativeness. Accordingly, they are not located in straits or places with strong current where the ice is thin.



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The ice thickness measurement site is located at least 50 m from the shore. The measuring devices are a cm-divided measurement rod and, at most stations, three snow ice staffs. For each measurement time, three new drill holes are made at undisturbed places. The variables measured are:

- ice (the total thickness of ice, including the blue ice, the snow ice and the water layers between ice layers)
- water (the water level measured from the lower surface of the ice)
- snow ice (the thickness of snow ice)
- snow (the thickness of the snow layer on the ice)
- staff (the thickness of snow ice read at the snow ice staffs)

## Freezing and break-up dates

Both freezing and break-up are observed at four stages, depending on the extent of the ice cover in the horizon of the observation site. The four stages of freezing are "freezing of the shores", "freezing of the bays", "freezing of the lake within sight" and "freezing of the whole lake".

Only a few observation sites display a clear succession of these four stages. Sometimes severe cold causes all the four stages to occur during the same night. At some sites it is not possible to make difference between the stages. "Within sight" at a small lake is often the whole lake. On the other hand, an observer is hardly able to get information about the freezing of all parts of a large and complex lake area.

The four stages of break-up are "thawing of the shores", "thaw areas out of the shore", "ice in movement" and "no ice within sight".

The longest ice break-up series, from river Tornionjoki, started in spring 1693. From three lakes – Kallavesi, Näsijärvi and Oulujärvi – there are freezing and break-up records at least since the mid-19th century.