

Measuring water level in lakes and rivers

The national network of water level monitoring consists of some 310 stations, of which about 240 are operated by the Finnish Environment Institute or by a regional Centre for economic development, transport and the environment. Hydropower companies, water supply organizations and the navigation administration are also important producers of water level data. In total, there are water level observations from approximately 1500 different sites in the hydrological database. The oldest records began in 1847.



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Water levels are observed as distances in centimeters from the gauge zero, and in this specific level of the gauge the water level values are also given in the database. When a gauge is established, its gauge datum, i.e. its elevation above the sea level, is determined by levelling from a bench-mark of the national network. If needed, the water levels can be given according to one of these standard levels. There are four level standards: NN, N43, LN and N60. A new level standard, N2000, will be introduced in the coming years. In such documents as licenses given by a water rights court, the water levels are usually stated referring to one of the standard levels.

Water level is observed daily, and a major part of the stations have continuous automatic registration. At some stations, water level is registered using limnigraphs. Limnigraph is a mechanical recorder which draws the curve of water level fluctuations on a paper by registering the movements of a flute floating in a well, connected with a

water system. The papers of limnigraphs are changed every 1-4 weeks and the daily mean values of the water level can be computed from them. At some of the stations, daily water level observations are still made manually, by either reading the gauge or by measuring the level by a funnel-top measuring stick placed on the bottom pole.

At the water level stations operated by the Finnish Environment Institute and the regional Centres for economic development, transport and the environment, the following devices and techniques are used:

- manual water level gauge used at approximately 40 stations (about 15 of the stations data are transferred daily by telephone)
- a limnigraph at approximately 20 stations
- digital recording devices (logger, no realtime data transfer) at approximately 5 stations
- automatic gauge at approximately 175 stations (measurement frequency is 15min-2h and data transfer daily, or more frequently)