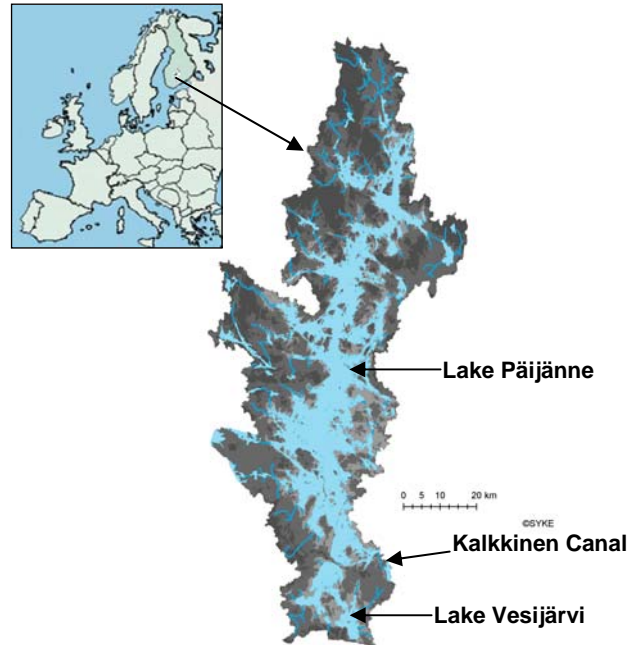


Suur-Päijänne river basin, Finland

Location

The Suur-Päijänne river basin is located in middle Finland. The catchment is characterized by the large Lake Päijänne (area 1116 km², mean depth 16.2 m). Päijänne is a 119 km long and 28 km wide lake between the major cities of Jyväskylä and Lahti. By volume Päijänne is the largest lake in Finland and it is also the deepest lake, maximum depth is 94 m. The proportion of the catchment covered by lakes is over 27 %. The river Kymijoki starts from the Kalkkinen Canal and it transports waters from Lake Päijänne to the Gulf of Finland.



Catchment description

The catchment area of Päijänne consists mainly on coniferous and mixed forests on mineral land. The elongated catchment is mainly unclassified forest management area (61 %) and regulated natural waters (22 %), where the deep and large lake Päijänne dominates the hilly scenery. The highest sites of the hills are in the altitude of 130 m above sea level and the lake surface level is 78.5 m above sea. The lake water level was artificially lowered in 1832-1837 and it has been regulated since 1964.

Lake Päijänne is very important area for recreational fishing and also for professional fishing. The lake has both high economic and social importance for a significant proportion of the Finnish population. Its water is used as tap water for more than 1 million people in Helsinki metropolitan area and hence can be considered to be the single most important lake in Finland. More built up areas can be found in the northern parts of the catchment, and agricultural areas in middle and southern parts of the catchment.



The lake is loaded with purified municipal waste waters by 300 000 inhabitants living around the lake. Päijänne district accommodates the important pulp and paper industry which both provide

Hydrological Observatory description

work to a large number of people. Purified industrial waste waters are lead to lake from the North and in the middle part of the lake. The lake has been heavily polluted but its condition has been improved significantly during the last decades. At present lake water is of very good quality but concerns rise due to the climatic change and increasing human activities around the lake and catchment. Lake Päijänne has been selected as a one of the national sites (www.environment.fi/syke/iter) for European LTER-network (www.lter-europe.ceh.ac.uk) and also for the International LTER-network (www.ilternet.edu/)

Key descriptors:

Catchment Area	26480 km ² including 9 sub basins (129-2715km ²)
Average annual rainfall	604 mm
Mean discharge(1970-2005)	232 m ³ s ⁻¹ at the outlet (Kalkkinen)
Highest peak flow and year	535 m ³ s ⁻¹ ,1975
Lowest mean flow and year	131 m ³ s ⁻¹ ,2003
Lowest flow and year	61 m ³ s ⁻¹ ,2003

Data availability

In Finland, Lake Päijänne has one of the longest research traditions.

Water level and discharge data are collected from several sites and archived in Finnish Environment Institute's (FEI) database (HERTTA). The earliest recordings date from 1911. Currently, there are two official water level recording sites; one in north Päijänne, Vaajakoski, and another in south, Kalkkinen. In addition, there are three public water level measurement sites.

Meteorological observations are monitored by the Finnish Meteorological Institute. There has been on line lake monitoring station on Lake Jyväsjärvi since 2003 (www.paijanne.org)

Water quality data are available from over 1200 sites. The earliest records are from 1960's. This data are also available from HERTTA-database.

There are 4 groundwater monitoring stations in the area and 94 ground water supply sites.

Supporting data e.g. vegetation cover, land use, point sources of pollution, water level regulation for hydropower, describing geology, soils and elevation are available.

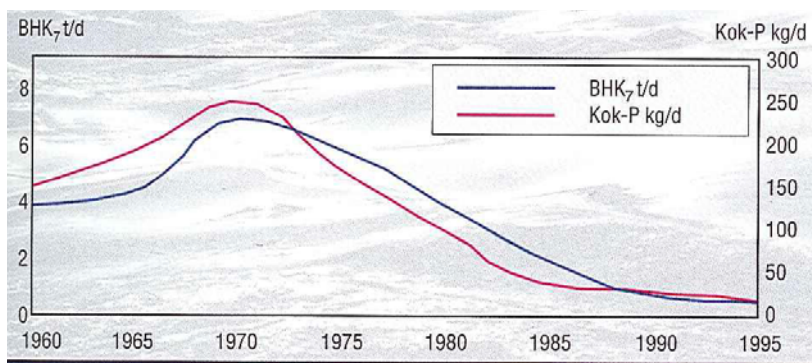


Figure. The development of loadings of the human effluents (BOD7 tons/d; left) and the total phosphorus (kg/d) during the years 1960-1995.

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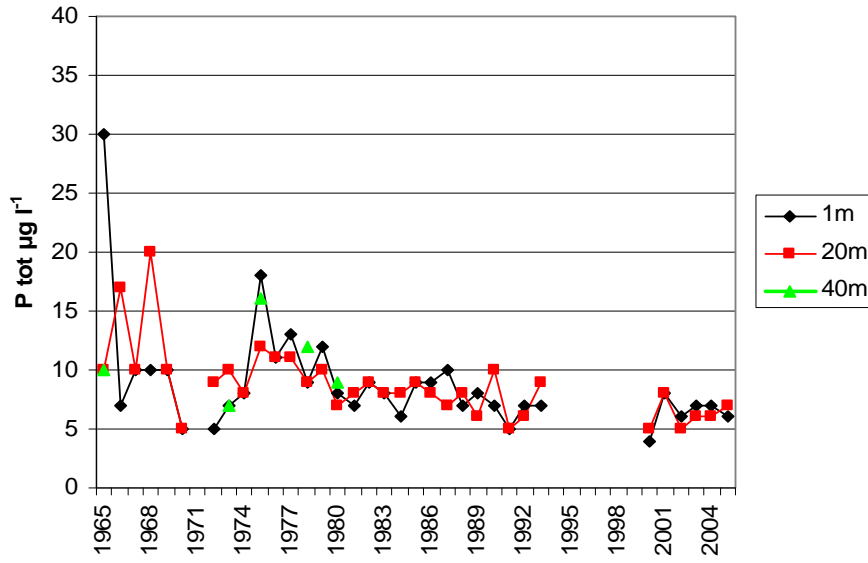


Figure. Total P in Southern Päijänne (Asikkalanselkä). *Source: FEI database*

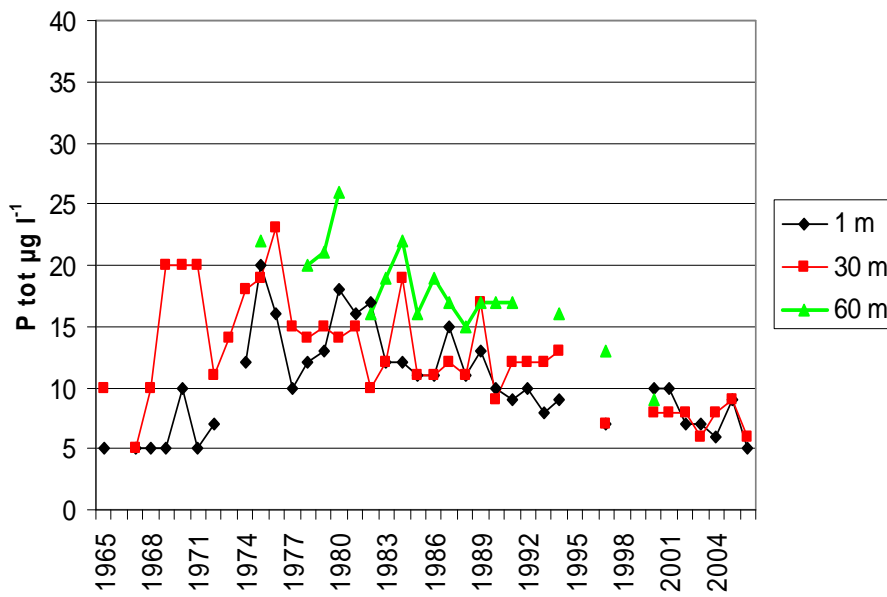


Figure. Total P in middle Päijänne (Saviselkä). *Source: FEI database*

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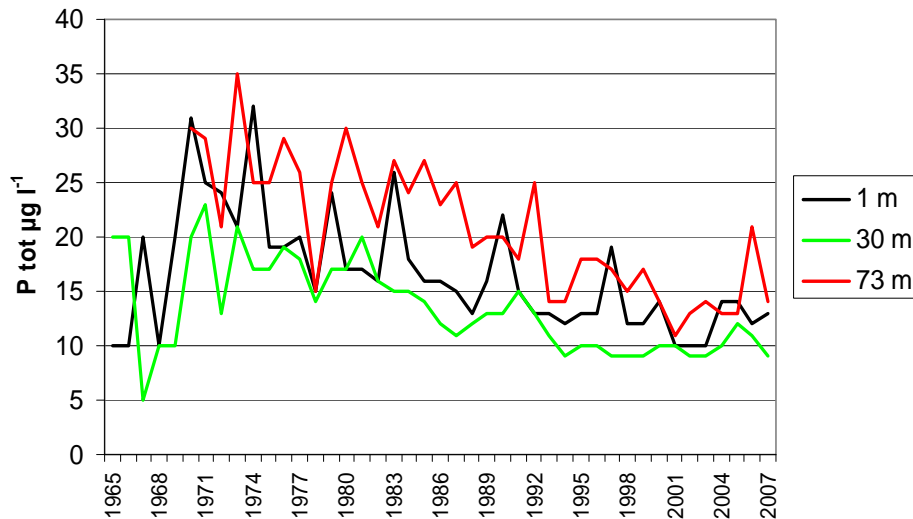


Figure. Total P in Northern Päijänne (Ristinselkä). *Source: FEI database*

Research Activity and Outputs

- Model area for sustainable use of lake ecosystem services, in particularly fisheries
- Climate change: The research connected to climate change has two main focuses in Lake Päijänne. First, the load from catchment area and changes in hydrology are investigated. Second important research area is the effect of climate change on fish production and fisheries.
- Recovery of the lake: Another line of climate change related research lies in the research of re-oligotrophication.
- Urban lake studies

Value to network

Lake Päijänne, with its catchment provides a Northern Boreal observatory site, which has long data sets and is under active national research.

The Suur-Päijänne Observatory provides data for hydrological conditions that are common in its region but which are quite different from those monitored by many other observatories in the network. Some distinguishing features of the Suur-Päijänne catchment in the European context are: its boreal climate, the mainly forested land cover, and the size of lake Päijänne and the large cover by other lakes in the Suur catchment.

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Links

FEI projects:

<http://www.paijanne.tkk.fi/index.htm>

<http://www.ymparisto.fi/download.asp?contentid=21564&lan=EN>

<http://www.ymparisto.fi/download.asp?contentid=55571&lan=EN>

Others:

www.paijanne.org

www.kalapaikka.net/1id_28369_iid_11554_l_s.asp

<http://paijannepurjehdus.fi>

<http://www.psv-hrv.fi/paijanne.phtml?lang=fi>

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