PYHÄJÄRVI INSTITUUTTI

Northern inland fishery and crayfishery will be challenged by climate change –case Lake Säkylän Pyhäjärvi (SW Finland)

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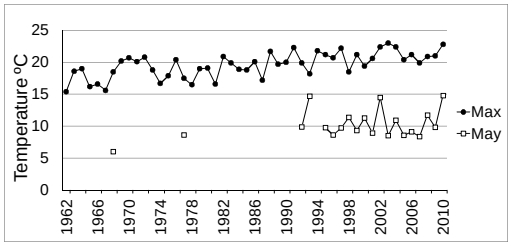
Säkylän Pyhäjärvi (SW Finland, North Europe) is large and shallow lake, which has vital commercial fishery, with 22 fishermen. The most important commercial catch species are vendace (*Coregonus albula*) and perch (*Perca fluviatilis*). The total value of the fish catch is approximately 2 million euros annually. The majority of the vendace and perch catches are taken in winter, using seine-netting from below the ice. Catches of vendace have clearly decreased recently and this may be linked with increased water temperature (Fig 1).

In addition to this commercial fishery, Pyhäjärvi restoration project has subsidized the harvest of commercially unwanted fish species (roach, ruffe, smelt) since 1995, aiming to improve water quality (Fig 2).

The lake is normally ice-covered for 141 days in average. Ice-out has shifted to an earlier date, and the duration of ice-cover is decreasing quite dramatically in the 2000s. As the commercial fishery in Pyhäjärvi is mainly based on winter seining through the ice, it is currently seriously challenged by climatic variation.



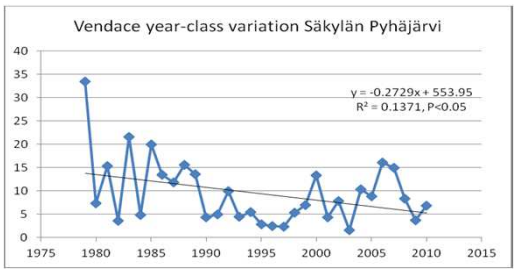


Fig 1. Jeppesen et al. 2012.

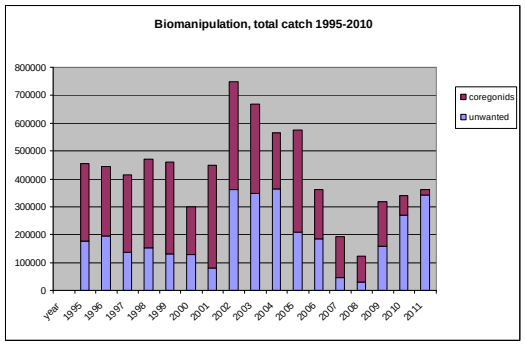


Fig 2. Biomanipulation catch

The lake has strong artificially introduced population of signal crayfish. The economical value of the crayfish catch is in many years higher than the total value of the fish catch (Fig. 3). Signal crayfish abundance may also be affected by changing climate.

The ecological role of signal crayfish in this lake is not known, but it will be clarified in current project 'SATAKUNTA – Innovation and research network in changing climate – case crayfish'. Also different ecological climate change scenarios of the fish stock will be valued economically.

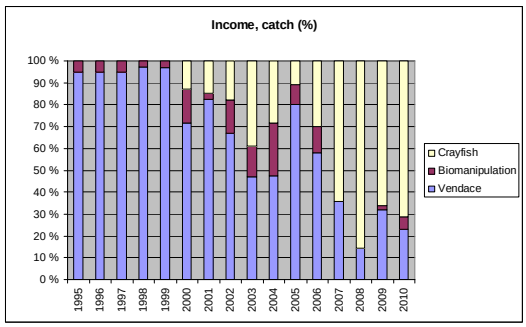
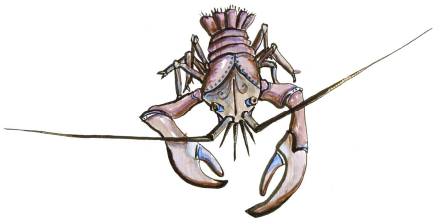


Fig 3. The income distribution of fishery

Basic information of Pyhäjärvi and fishery.

Lake area, km^2	155
Mean depth, m	5.5
Maximum depth, m	26
Fishery	
Professional	22
Crayfishery	
Professional	30
Recreational	240



European Union
European Regional Development Fund
European Social Fund

References:

- Jeppesen et al. 2012. Impacts of climate warming on the long-term dynamics of key fish species in 24 European lakes. Hydrobiology, in print.
- Ventelä et al. 2011. Climate related challenges in long-term management of Säkylän Pyhäjärvi. Hydrobiology 660:49-58.