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Climate from the 7520-year unbroken Scots pine tree-ring chronology for Finnish Lapland

See in detail: http://7thicd.ibcas.ac.cn/
Tracking past climate from tree-rings
Old tree remnants, megafossils, may preserve undecayed for thousands of years in ice-cold and muddy lakes.
Lake Luolajärvi is one source of subfossil wood. Many of the living pines on the hillside are more than 450 years old.
Grassy shores are good indicators in locating subfossil logs from lakes.
Underwater subfossil "forest"
This pine megafossil was extracted from deep mud. It lived over 5000 years ago.
• Scots pine spread to Finnish Lapland 9000 - 8000 years ago.

• Summer climate during the Atlantic period (7000 - 4500 BP) was 2-4 degrees warmer than today.

• Large pines grew beyond the present pine timberline in those times.

• The oldest megafossil found so far is 7638 years old.
Two ways of locating sub-aqua pine megafossils
A French-made winch, Tirfor T560, is strong enough to drag most logs from mud. It weighs 13 kg and uses a steel wire (7 kg).
Sampling examples from a 2700 years old megafossil.
Sampled megafossils, age over 4000 years.
A set of cross sections ready to be prepared and measured
Metla (Finnish Forest Research Institute) uses a modified Eklund-based tree-ring measurement system.
DATA, RESULTS and CONCLUSIONS
The Finnish supralong 7639-year pine chronology
The supralong pine chronology is built from 1087 samples, scattered on the both sides of the present pine timberline.
Pine timberline was at its highest during the Atlantic period.
Some statistics describing the Finnish 7639-year supralong timberline pine chronology
A subdata from Lake Kompsiojärvi. Similar data available from over 70 sites (lakes).
Another example, a subdata from Riekkovaara.
Tree-ring width variation of Scots pine in the supralong pine chronology
The supra-long Finnish timberline pine tree-ring chronology extends from the present time to 5633 B.C.

The long chronology presented as tree-ring indices.
THE SUPRALONG CHRONOLOGY Conclusions:

1. Good for dating
2. Limited for dendroclimatic analysis, because:
   • Data scattered and heterogenous
   • Not enough well replicated
3. Additional material needed
The problematic gap around 350-150 BC
The critical part of the Finnish pine chronology.
The graph shows how nicely Fil6201 and Kom6724 finally closed the gap around 350-150 BC. Note the correlation instability.
Correlation between timberline pine tree-ring index and June-July temperature of northern hemisphere 1856 - 2002 (Jones et al.)
WHAT ARE WE GOING TO DO NEXT?
We have to:

- improve our tree-ring data
- monitor climate and tree-growth on annual basis
- focus on more detailed studies with our data
- increase our international cooperation
Pleasant work: we need to continue our mud baths.
Reference:

Welcome to the LUSTIA Website. Visit the Lustia Net Lab and learn what’s up and hot in Finnish Tree-Ring Science. Click the links for further info.

More to read here. Thank you!