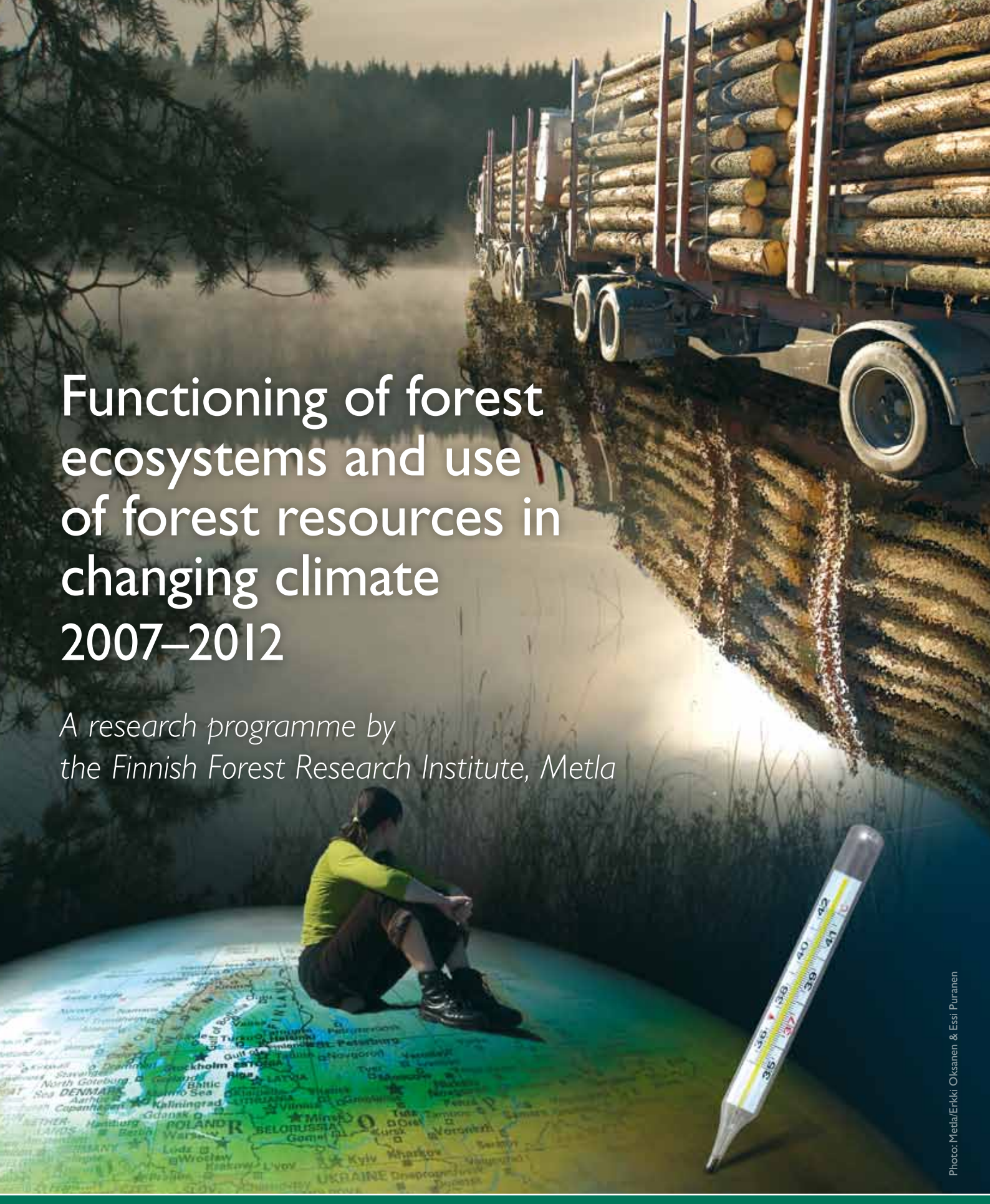

Functioning of forest ecosystems and use of forest resources in changing climate 2007–2012

A research programme by the Finnish Forest Research Institute, Metla

Photo: Metla/Erkki Oksanen & Essi Puranen

METLA forest · knowledge · know-how · well-being

Background and challenges

Climate change can have great impacts on growth, health and biodiversity of boreal forest ecosystems, and the positive and negative effects will have influences on the whole society. Therefore, apart the mitigation actions, it is important to take actions to adapt the forest sector to the anticipated changes. The mitigation and adaptation actions will reflect on the international policy and the course of the forest sector, with increasing needs in future to combine the forest policy decision making as part of climatic issues.

Aims of the programme

This research program aims at producing information of the impacts of climate change on forest ecosystems. Studies will be conducted to understand the forest and environmental policy actions and means that help in mitigating and adapting to climate change. The aim is that the knowledge produced in the program can be incorporated in the software developed in Metla to be used as practical forest planning tools by policy makers, foresters and forest owners. The research programme produces information in support of the greenhouse gas reporting dealing with forests, for Finland's National Strategy for Adaptation to Climate Change, IPCC and the National Forest Programme.

Research themes

The programme was started in the beginning of 2007. The program comprises of seven projects within the following three thematic areas:

Phenological studies – appearance of climate change in forests
The tasks of the studies include assessment of past growth variation in forests using long-term tree ring chronologies/needle trace chronologies from timber-line forests as well as data from the forest inventories.

Biological bases of forests and forest use in the changing climate
The tasks of the studies focus on examining the adaptability of tree species to future climate, and on assessment of risks for pest and pathogen outbreaks in future climate.

Forest economics and environmental economics in the changing climate
The tasks of the studies focus on climate policy tools that could be applied in forest sector related to carbon sequestration, and energy and material substitution.

The currently ongoing projects are:

- Causes and consequences of increasing growth of Finnish forests
- The use of the time series based on the Needle Trace Method, NTM, in environmental, forest health, ecosystem and climate change studies, and in visualization of tree development
- Forests 2050
- Adaptability of birches to global climate change
- The assessment and control of risks caused by forest pest insects in a changing environment
- Impact of climate change on forest damage by mammals
- Climate change and tree roots: Effects of soil frost and flooding on tree growth
- Impact of climate change on C and N transformations in organic soils
- The effects of climate change on the distribution ranges and the structure of forest vegetation in Finland,
- Adaptation to local climate and dispersion potential of some conifer pathogens in Europe
- Climate policies and the forest sector
- Carbon and nutrient dynamics in forest soil under environmental change
- Climate Change - Forests and terrestrial adaptation and mitigation in Europe
- Functioning of forest ecosystems and use of forest resources in changing climate
- Impact of Climate Fluctuations on Microbial Communities Responsible for Carbon and Nitrogen Cycling in Arctic Soils
- Management and harvesting of Norway spruce stands in changing climate
- Phenology and crop forecasts of forest plants in changing climate

Resources and collaboration

In 2007 the budget was approx. 1.5 M€ (incl. labor costs), with 29 researchers working in the programme (total of 155 months per year) and with altogether 200 months per year of technical staff. The programme is funded by Metla, EU, Ministry of Agriculture and Forestry, Academy of Finland and the Metsämiesten Säätiö Foundation.

The research projects of the program have collaboration with researchers from the Finnish Universities (U. of Helsinki, U. of Joensuu, U. of Jyväskylä, U. of Oulu) and research institutions (Finnish Meteorological Institute) and from abroad.

Please, contact:

Programme director: Dr. Elina Vapaavuori
E-mail: elina.vapaavuori@metla.fi
phone +358 29 532 4888

Metla/Erkki Oksanen

RVoi/2109/6-2009

Programme homepage: www.metla.fi/ohjelma/mil/index-en.htm
www.metla.fi