



Norwegian forest research in brief ➔

A rural country

In the two previous issues of News and Views, forest research in Iceland and Finland have been portrayed. The subject of this issue's portrait is Norway: a narrow, hilly country, with a long coastline, where fishery and the oil industry may be the commercial sectors that first come to the outsider's mind. However, Norway is also a forested country, with a productive forest area of 7 million hectares and a forest industry that employs 30.000 people. Furthermore, it is a country

where many people live outside the larger cities, and often come into contact with small-scale forestry and farming enterprises. Thus, it is not surprising that forest research plays a relatively large role in the country.

Funding

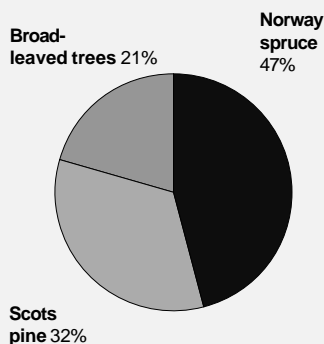
The Forest Research Council of Norway coordinates much of the national research funding. Through its forestry program, 11 million NOK per year is devoted to research. The wood program has a budget of 42 million

NOK per year. Most of this sum is dedicated to product development and innovation. An important research fund is administered by the forest owners association, which supplies 10 million NOK per year for research that improves the profitability of Norwegian forestry. New money is added to the fund through a fee of 0.50 NOK per m³ harvested timber.

www.forskningsradet.no

Norwegian forests in figures

- Productive forest land: 7.5 million hectares
- 79% of the productive forest area is owned by some 120,000 private forest owners. Companies own 6%, State 9% and other owners 6%.
- Average size of property: 57 hectares
- Growing stock: 650 million m³ today (300 million in 1920)
- Annual increment: 22 million m³
- Annual harvest: 8.4 million m³
- Annual wood imports: 13 million m³



Forest industry

- Sawnwood production 2–2.5 million m³
- Total turnover: NOK 12 billion (1.6% of GDP for mainland Norway)
- Employees in the forest industry sector: 33,000 (1.8 % of employees in mainland Norway)
- Exports: NOK 13–15 billion (10 % of total exports from mainland Norway)

Source: *www.skoginfo.no*, *www.nijos.no*

The Agricultural University of Norway

Through its *Department of Forest Science*, the Agricultural University of Norway is the only academic institution in Norway that studies and offers courses in forestry at the university level.

The department has around 50 employees, 40 of whom are researchers or teachers. In September 2003, it will be merged with the *Department of Biology and Nature Conservation* to form the *Department of Ecology and Natural Research Management*, which will be a large unit with 110 employees.

The research is presently organized into three units: silviculture, forest technology, and resource economics and planning. High priority is given to the following research areas:

- Environmentally sound methods of wood production

- Conservation of biological diversity
- Balancing the production of commercial and non-commercial forest goods.
- Wood utilization, particularly saw milling, use of hardwoods, small-scale technology and special products.
- Contribution of the forest sector to business and rural development.

The department closely cooperates with the Norwegian Forest Research Institute. It is located on the same campus in Ås, outside Oslo, and uses publications from the Institute to disseminate its research results.

The budget of the Department is 21 million NOK. Two thirds comes directly from central government, and the rest from the Research Council of Norway or other sources.

Graduate studies

Each year, 25 students start the 5-year program in forestry at the Agricultural University of Norway. In addition, another 20 students who have completed a 3-year-program at regional colleges continue by taking a 2-year program at the university.

The students specialize in forest ecology, technology or economics.

Recent dissertations from the Agricultural University of Norway

- Janne Kjønnaas, Carbon storage in the boreal region and strategies to counteract increases in greenhouse gases in the atmosphere.
- Ståle Størdal, The economics of timber sales – studies of the Norwegian roundwood market.

Further info: www.nlh.no

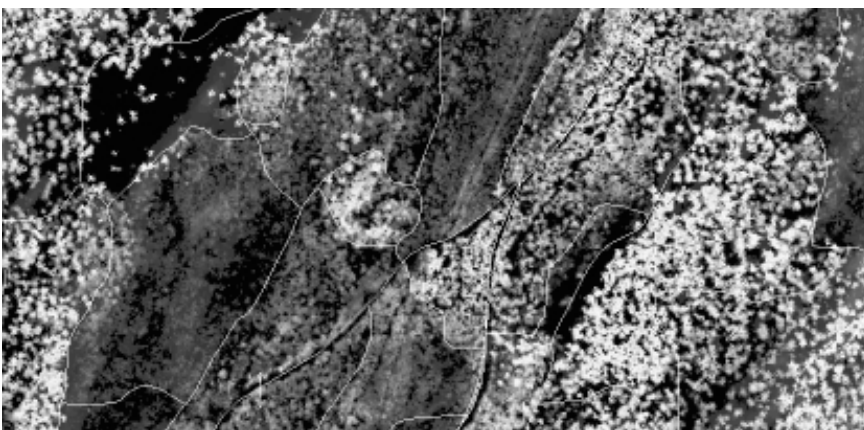
Examples of ongoing forest research at the University

Laser scanning

The Department of Forest Sciences has a broad research portfolio, in which remote sensing and other methods of inventory are strongly represented. Laser scanning is a relatively new technique that has great potential in the forestry sector. By scanning the terrain quickly and with high precision from an aircraft, much more detailed information can be obtained than is possible from satellite

images. The laser equipment “reads” “swathes” of earth by generating (and monitoring) 10,000 laser pulses per second, while the aircraft flies at normal speed. With the aid of GPS in the aircraft, the position of each of the pulses is known with a precision of 30–40 cm.

For further information, contact erik.naesset@isf.nlh.no.



Responses to climate change

A new program has been set up at the Agricultural University with the aim of learning more about the capacity of trees to survive and adapt to climate change. The total budget of 22 million NOK over five years is being shared by several research partners, both within and outside the Agricultural University. The research is focusing on the fundamental processes controlled by photoperiod and temperature, down to the gene level.

The contact person at the Department of Forest Science is Aksel Granhus aksel.granhus@isf.nlh.no

A forest map based on areal laser scanning. The lighter the colour is, the higher is the forest. The white lines are borders between stands.

The Norwegian Forest Research Institute – Skogforsk

The Norwegian Forest Research Institute (Skogforsk) is an independent institute that is accountable to the Ministry of Agriculture. Skogforsk was established in 1917 and has about 120 employees, most of whom work at the headquarter in Ås, outside Oslo, but there is also a research station in Bergen. The mission of the institute is to be a leading provider of information for government, industry and the general public, working towards sustainable management of forest resources. The research is divided

between two units, each covering a wide variety of research topics. Biodiversity, climate change, forest damage, genetics and physiology are important subjects in the Department of Forest Ecology and Environment. Meanwhile, the Department of Production, Techniques and Processing covers subjects such as silviculture, forest operations, logistics and economy, bioenergy and Christmas tree production.

www.skogforsk.no

Example of ongoing research at Skogforsk

Effects of climate change on spruce bark beetle dynamics

An example of the wide variety of projects currently being pursued at Skogforsk is the research related to spruce bark beetles. A general temperature increase may lead to a northward expansion of the areas in which the spruce bark beetle can complete two generations per year. This could increase the damage they do to trees. Observations from 23

years of monitoring in southern Norway are used to model the response of the beetle to climate.

Contact: bjorn.okland@skogforsk.no



The Norwegian Institute of Wood Technology (NTI)

NTI is an independent research institute, established in 1949. It serves 160 member companies representing the Norwegian sawmill and timber industries. As well as undertaking research, the NTI performs various quality control and laboratory tests. Its laboratories are accredited for testing mechanical and chemical properties of wood-based products, and it is heavily involved in quality assurance procedures related to the timber trade. The Institute has an annual turnover of NOK 27 million, and 37 employees. www.treteknisk.no

Norwegian Institute for Land Inventory (NIJOS)

NIJOS is the major supplier of data on soil, forest, outfield and landscape resources in Norway. Through national forest inventory and forest health monitoring programs it provides data used for planning in the forest industry and the development of environmental policies.

www.nijos.no



Clippings from Norwegian forest research

Timber imports introduce pest risks

Timber from Russia and the Baltic countries contains many species of beetles and fungi. This was a finding in a study of five boat-loads imported to Norway. Most of the species were previously known from Norway, but five of them were new.

One of the new species is known to cause damage in Finnish forests, and the researchers recommend further controls on timber imports.

Source: Aktuelt fra skogforskningen 4/03.

Trees have an effective immune defence

Conifers have a twofold defence system towards blue-stain fungi introduced by bark beetles:

- a) "a standing force" consisting of thick layers of cork and lignin in the outer bark, together with terpenes, phenols and tannins in the wood.
- b) an inducible system, activated when the tree is under attack. Phenols and tannins are then directed to the affected wood. Mechanical barriers containing cork are also rapidly constructed.

Source: Glimt fra skogforskningen 5/2003

Forestry affects the capercaillie population

The capercaillie (great wood grouse, *Tetrao urugallus*) is a quite common bird in the Norwegian forests. The population is estimated to amount to some 200,000 birds in the spring, though it varies substantially between years. Predators, such as fox and marten, are the major regulating factors, though harsh weather conditions may affect the mortality of the chicks considerably in some years.

Harvesting and other silvicultural activities affect the capercaillie population, but mainly indirectly through their influence on the predator populations.

Source: Glimt fra skogforskningen 3/2002