

Climate Smart Forestry

Presentation of project results

Metsähallitus, Kirsi-Marja Korhonen | May 23rd 2018 Kemi

Climate change mitigation

Forests can be utilised to mitigate climate change in three ways:

A carbon sink that sequesters carbon dioxide

Continued action as a carbon sink requires renewal of the tree stock (growing forest).

As a carbon storage that stores carbon

Carbon storages don't last forever - an ageing forest releases carbon slowly (trees, long-lasting wooden products and soil).

Using wood as a raw material

Replaces the use of fossil and high-emission materials (wooden products and bioeconomy products, bioenergy).

Project targets

- To identify the importance of forestry areas in carbon sequestration and storage as a whole.
- To examine how carbon sequestration and storage can be enhanced through forestry measures.
- To create a carbon-based classification method as a practical tool for planning forest use.
- › To improve Metsähallitus' ability to make climate-friendly decisions in its forestry activities.



Carbon classification in forests

Carbon classification in forests

- Includes all forest compartments in Metsähallitus' forestry areas (total 10.1 million).
- This is based on Metsähallitus' forest inventory, soil information, land use information and landscape-ecological data.
- Areas with a similar sink and storage emphasis are grouped together.
- Some generalisation was required in the classification, which is why the end result may not necessarily be completely correct for every compartment.
- The work resulted in seven forest categories.
- The main division into two groups is based on different types of forest use: *Carbon sinks and carbon storages*.
- Each group is important as a carbon sink and carbon storage, but the emphasis varies.

Carbon classification in forests

Carbon sinks

Carbon dioxide sequestration in forest growth

- Forestry operations are not restricted
- Continued action as a carbon sink requires renewal of the tree stock
- Carbon sink development can be enhanced with forestry measures

Carbon storages

Carbon storing in tree biomass and the soil

- Forestry is restricted for reasons related to some other form of use
- Greenhouse gases are released from a carbon storage:
 - › From soil, wooden products and trees

Carbon classification in forests



Minor carbon storage

Understocked, low-productivity land, non-productive land, built-up land and other areas.

- › The trees have no significance as carbon sinks or storages



Developing carbon sink

Young growing stands and open areas. Developing into a good carbon sink.

- › Small significance as a carbon sink and storage.



Carbon sink to be developed

Multiple-use forest where the number and/or condition of trees is not ideal.

- › Need for actions to develop carbon dioxide sequestration in the growing trees.



Increasing carbon sink

Multiple-use forest in good condition, a sufficient number of growing trees and timely forestry actions.

- › The best sites for effective carbon dioxide sequestration.



Increasing carbon storage

Areas with young forests where forestry use is restricted for landscape, recreation or game management reasons, such as wood grouse mating displays.

- › A good site for storing sequestered carbon in the tree stock. The trees in the area already contain a certain amount of carbon and their ability to sequester more is good in light of local conditions.



Significant carbon storage

Areas with mature forests where forestry use is restricted for landscape, recreation or game management reasons, such as wood grouse mating displays.

- › The best site for storing sequestered carbon in trees. The trees already contain a lot of carbon. Their ability to sequester more carbon has decreased.



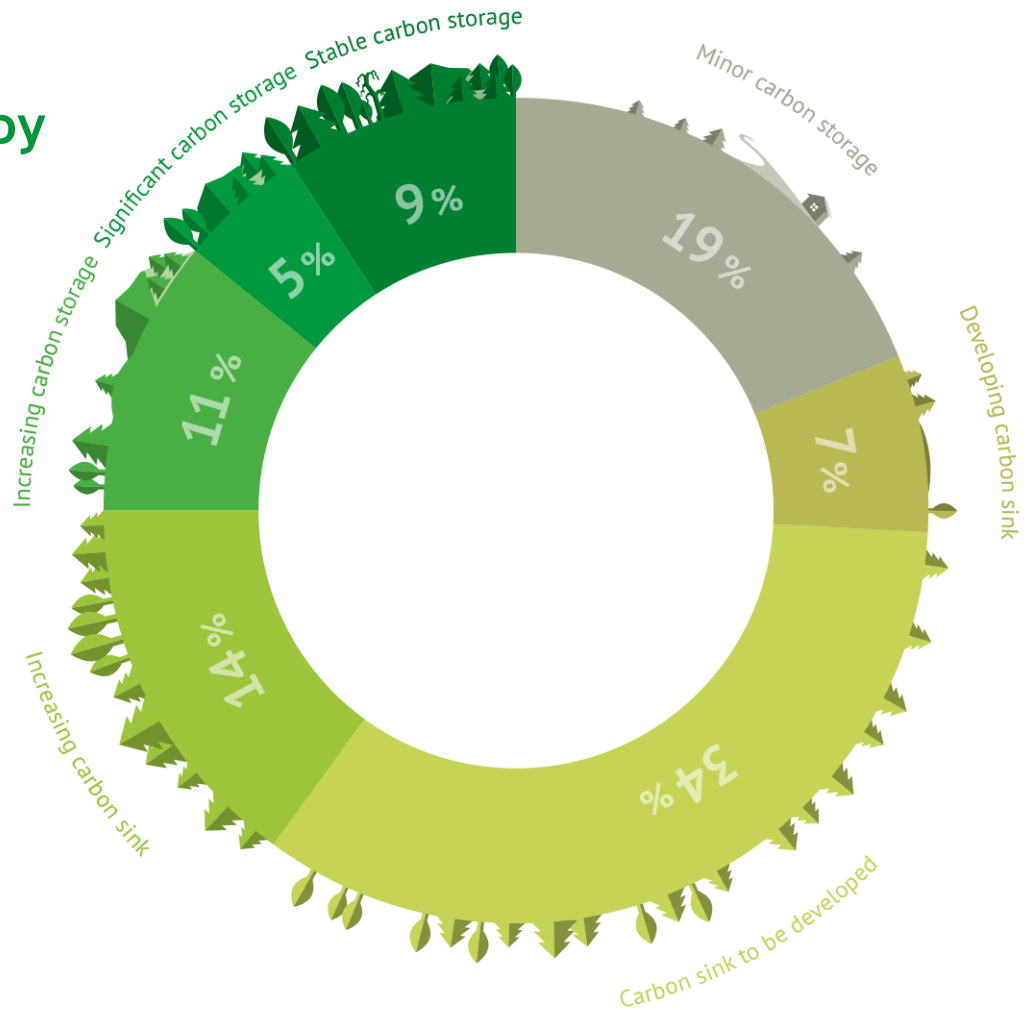
Stable carbon storage

Areas completely excluded from forestry operations. Mainly various nature sites and other areas outside the scope of forestry operations.

- › A carbon storage that develops via natural processes, storage may also decrease due to rot. No forestry measures.

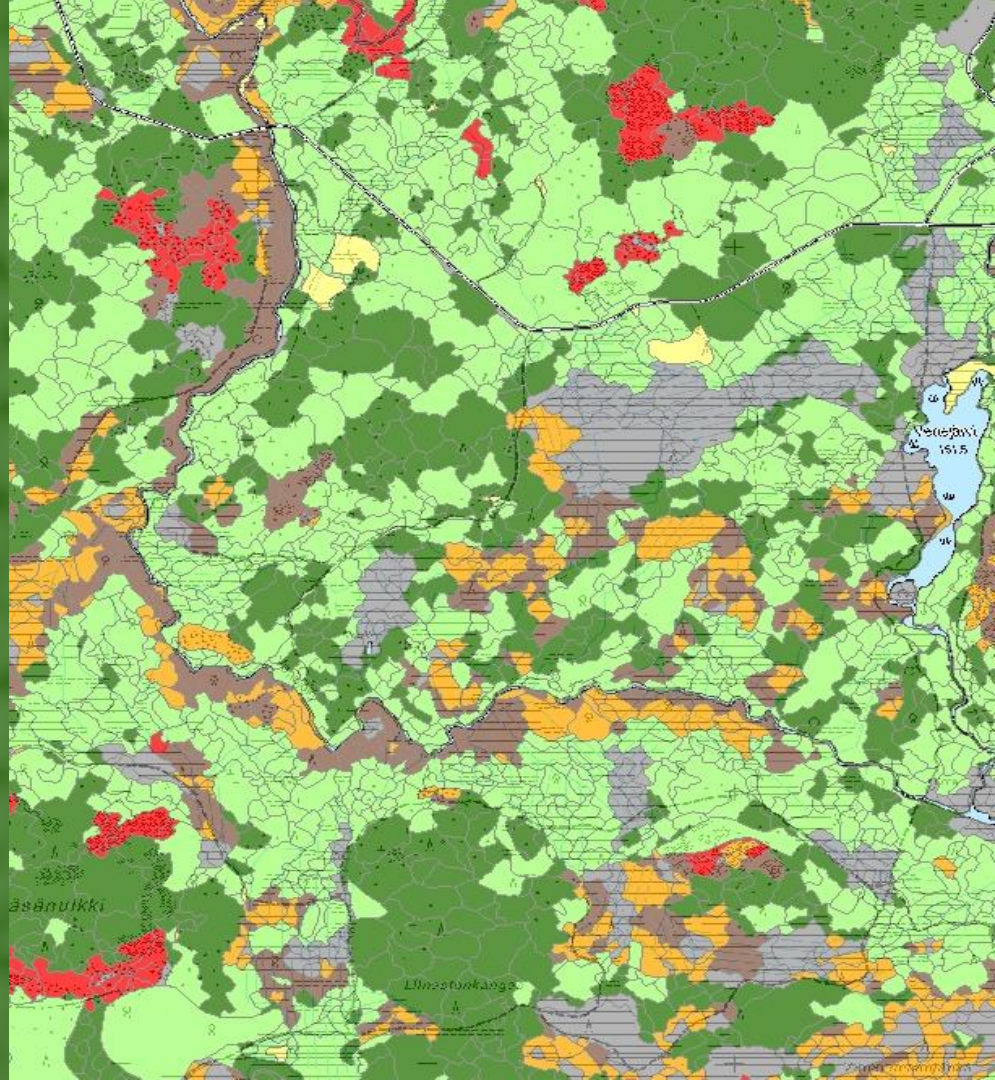
Number of forestry areas by category

- One third of Finland's land and water areas is administered by Metsähallitus.
- Forestry land, total 5.1 million ha.
- Includes forest land, low-productivity land, non-productive land, restricted forestry sites and nature sites.



Carbon classification by forest compartment

- Minor carbon storage
- Developing carbon sink
- Carbon sink to be developed
- Increasing carbon sink
- Increasing carbon storage
- Significant carbon storage
- Stable carbon storage



Range of methods

- In addition to carbon sequestration and storage, the significance and impacts of actions were examined for soil carbon, business, biodiversity, water protection, recreational use, game, and reindeer husbandry.
- The viability of measures was examined in the evaluation.
- A more detailed picture of the most important impacts of the measures was created using long-term felling calculations.



Recommended methods for each class

- Most effective for carbon sequestration:
 - › Fertilisation, ditching, regeneration using selectively bred seeds and seedlings, regeneration of underproductive forests, and afforestation.
- Most effective for carbon storage:
 - › Improving forest density, prolonging the rotation period, restricting forestry due to other forms of use, forest management to enhance coverage, and restoration of low-productivity mires with drainage systems.

Targets for forest management and use

Forest management instructions:

Metsähallitus' forest management instructions and Metsähallitus' environmental guidelines

- › Carbon classification brings new emphases to applying the guidelines
- › Each carbon class has its own special forest management targets
- › Careful implementation of the forest management instructions will improve the carbon balance even further
- › Carbon classification emphasises the importance of preventing and repairing various forest damage, such as insects, fungi, storms and fires
- › All forest damage weaken carbon sequestration and storing

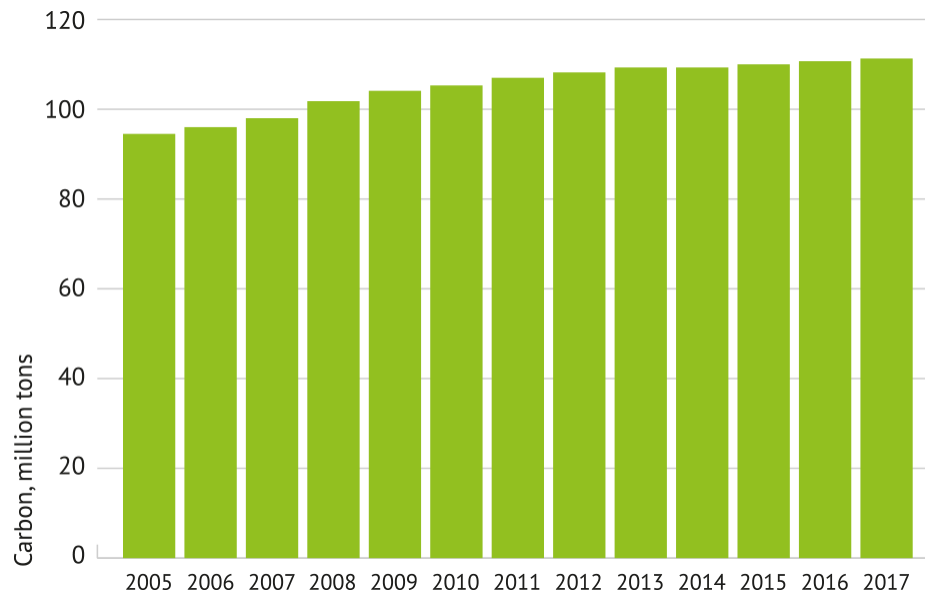


Carbon balance in forestry areas

Carbon storage in forests will
increase in
State-owned forests

- An increasing amount of wood raw material has also been harvested
- Carbon balance growth shows that Metsähallitus' forest management instructions support consideration of carbon sequestration and storing.
- At this time, we are enjoying the results of long-term forest management work.

Carbon in tree biomass (forest and low-productivity land)



Conclusions

- Current Metsähallitus forest management instructions already take carbon sequestration and storing into account. Effective forestry is effective sequestration.
- Development will be achieved by applying the forest management instructions with climate emphases and by further improving the level of forest management.
- Focusing on carbon sequestration does not conflict with economical result.
- A strong increase in carbon storing in multiple-use forests can reduce forestry revenue.
- Increasing carbon sequestration by means of fertilisation is a worthwhile option.
- More effort must be put into restoring low-productivity mires with drainage.



Further measures

- New research projects have begun - they will supplement the data collected in this project
 - › Progress and results will be monitored
 - › Participation in projects according to opportunities
- Development of carbon classification will continue
 - › Soil carbon will be taken into account - more research is needed
 - › In the future, classification could be based on compartment-specific carbon parameters that show the carbon storage and sink situation for each compartment
- Implementation of new methods
 - › Inventory methods for identifying understocked seedling stands
 - › Identification of understocked forests with remote sensing data

Metsähallitus as a pioneer

Metsähallitus Forestry Ltd's efforts to mitigate climate change does not involve one or several major changes.

It is good forest management and smaller changes and improvements that combine to form a significant entity.



PILKE- the wooden house and science center of Metsähallitus



Pilke biocampus - The new co-operation of Metsähallitus and LUKE Natural Resource center, Arctic centre of the University of Lapland and the City of Rovaniemi