Climate Smart Forestry

Presentation of project results

Metsähallitus, PRESENTATOR | DATE 2018 PLACE

METSÄHALLITUS

FINLAND

338,424 km²

OF WHICH FORESTS

71%

OF WHICH ADMINISTRATED BY METSÄHALLITUS

33%

Metsähallitus

1/3 Metsähallitus manages a third of Finland's land and water areas.

- Metsähallitus manages, operates and develops state-owned areas responsibly, in a way that maximises their benefits to society as a whole.
- The reconciliation of various functions and ecological, financial, social and cultural sustainability lies at the core of our mission.

MULTIPLE-USE FORESTS

32%

In forestry use

Limited forestry 4%

MULTIPLE-USE FORESTS

24%

No forestry

PROTECTED & WILDERNESS AREAS

40%

No forestry

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).

The role of forestry in climate change mitigation

- 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.

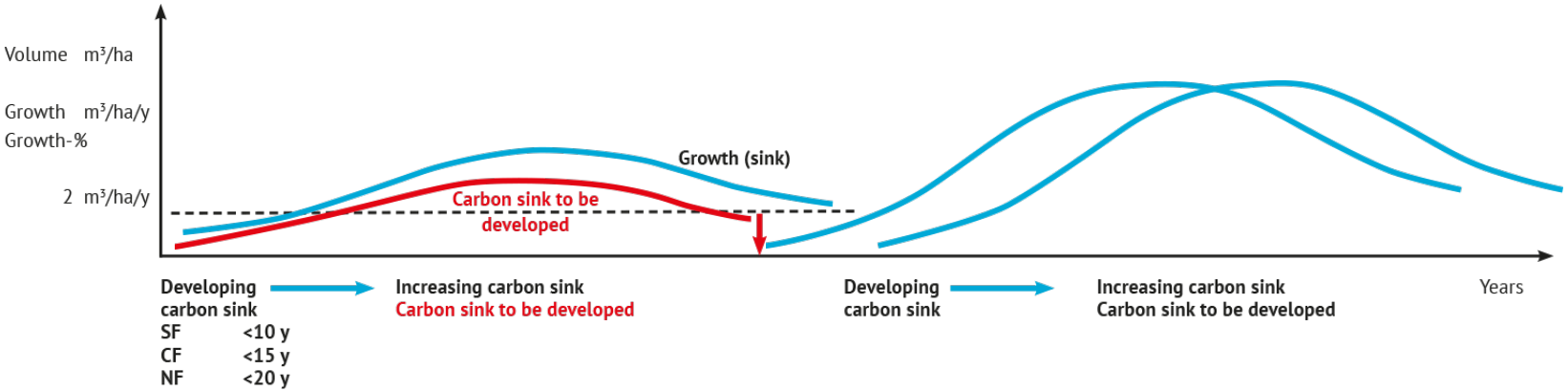
Carbon classification in forests

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 SINK SITES



Carbon classification in forests

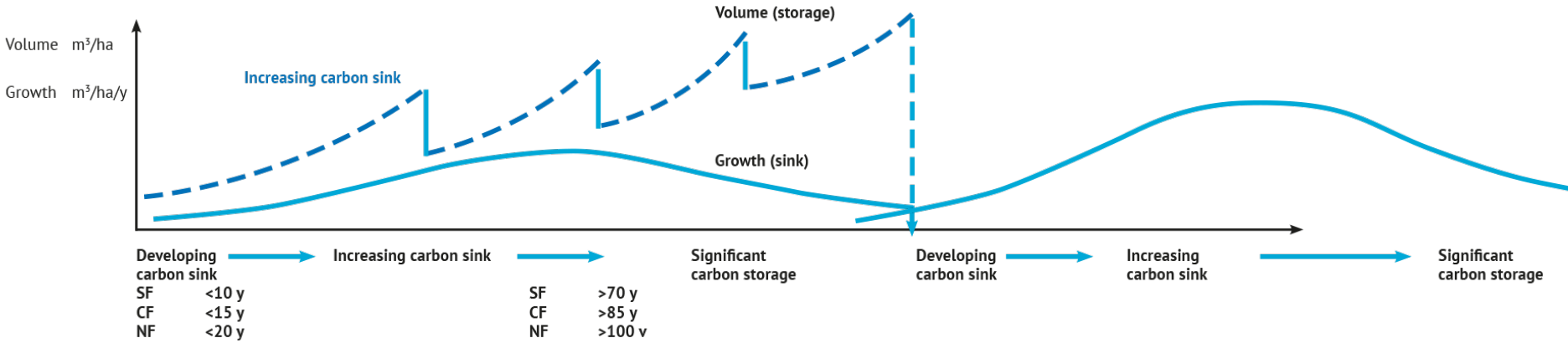
Carbon storages

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 STORAGE SITES

- periodic silviculture



Carbon classification in forests

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:
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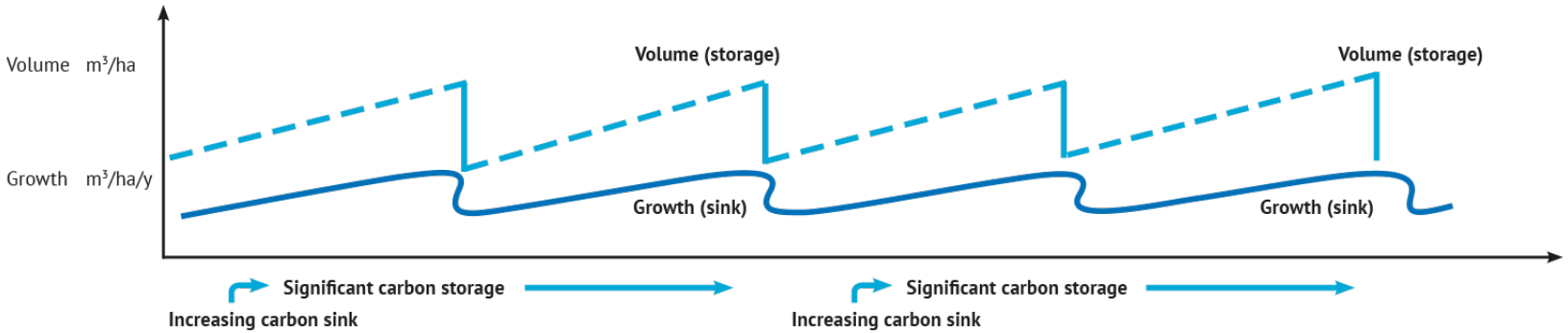
CARBON STORAGE SITES

- Continuous cover silviculture



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 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 trees. 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 and their ability to sequester more 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.

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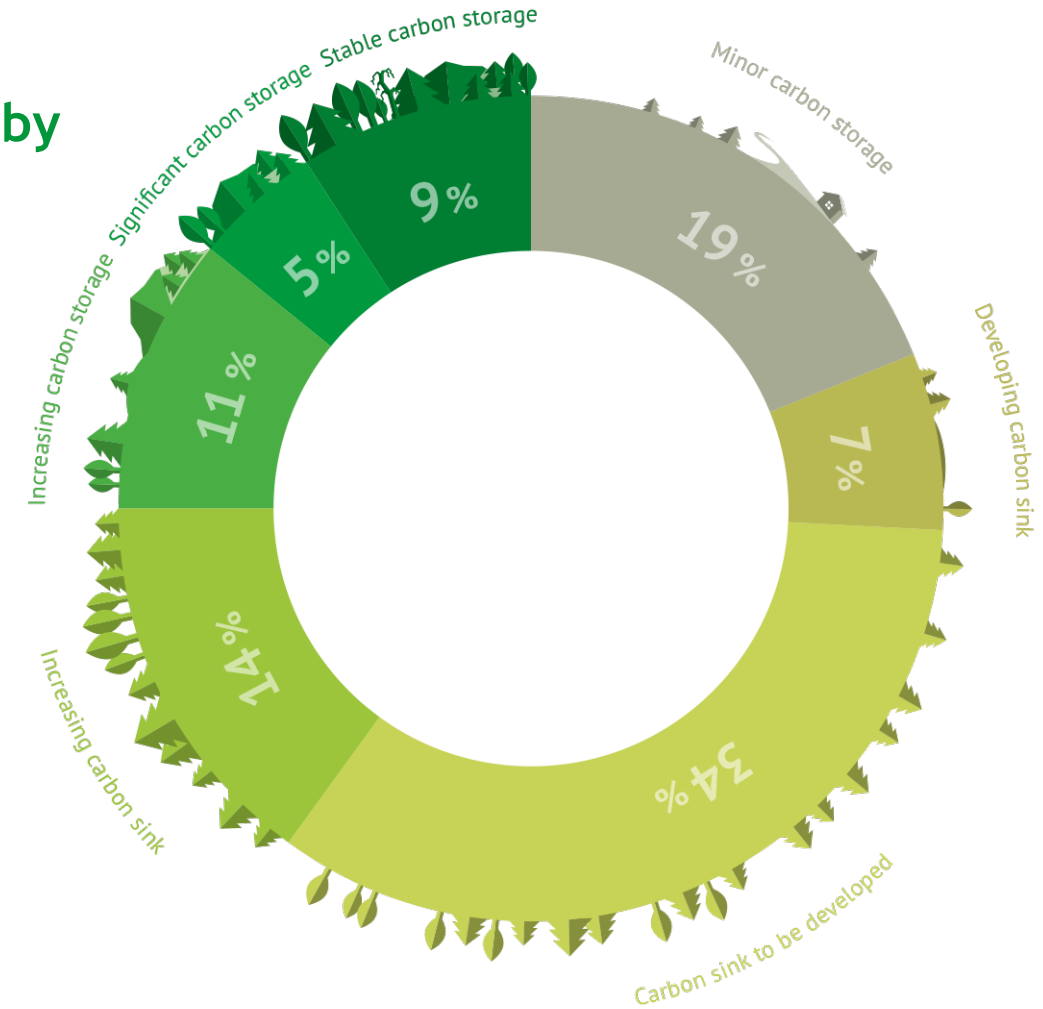
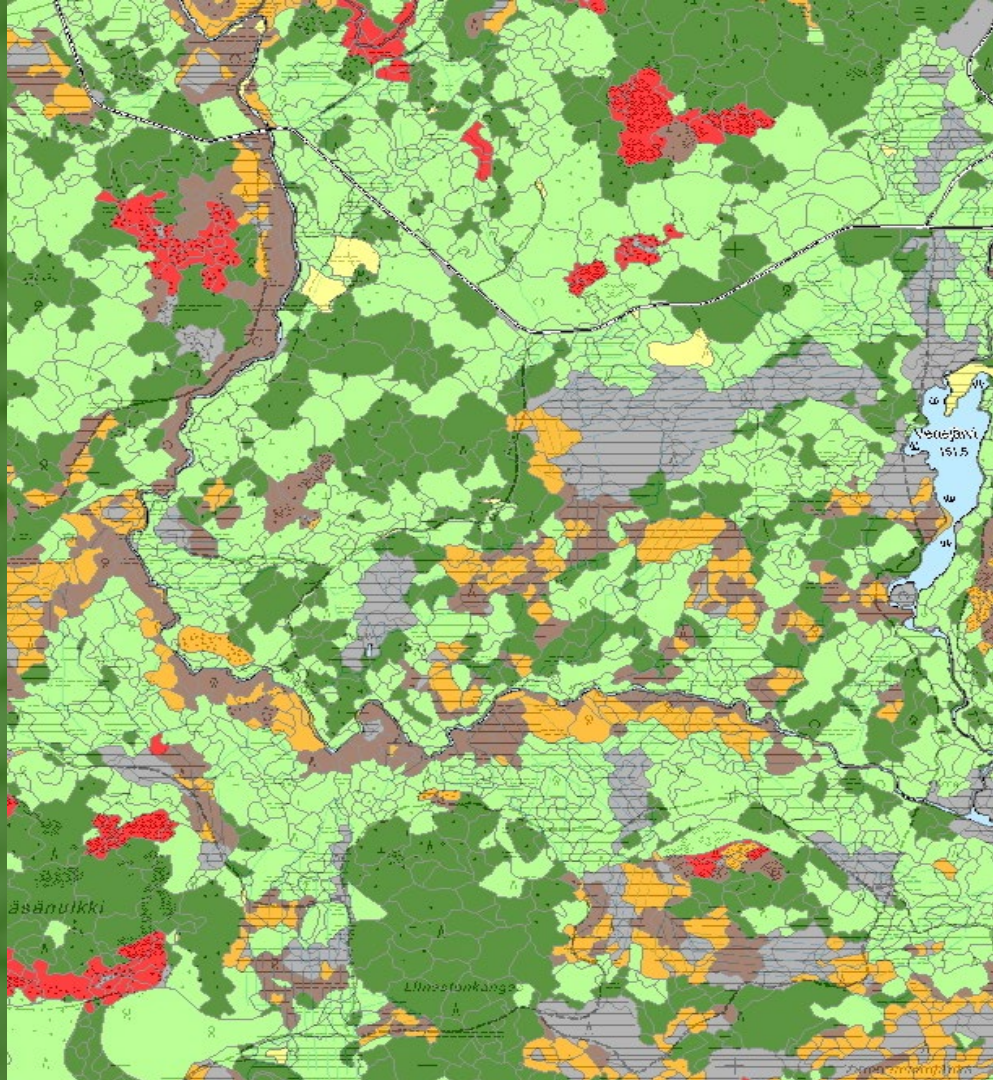
Number of forestry areas by category

- 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



METSÄHALLITUS

Climate Smart Forestry - Examining carbon sinks and storages

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.

Summary of calculations

Prolonging the rotation period requires sacrifices:

- Metsähallitus' financial result will decrease for a long time.
- Regional economy impact, less employment.
- Carbon sequestration in trees will increase clearly to begin with, but decrease later. Soil carbon accumulation will drop.

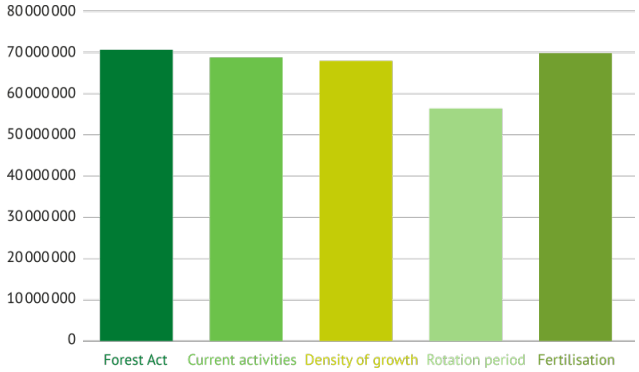
Increasing forest density decreases financial return:

- Carbon storage in the trees will increase.
- Soil carbon accumulation and the amount of sawwood will decrease, especially over the next decades.

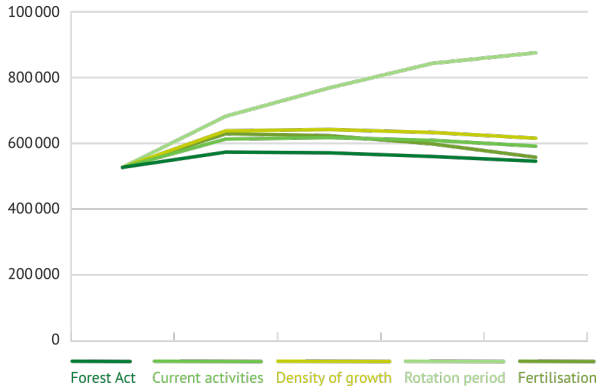
Fertilisation increases the amount of possible felling and the amount of sawwood

- Soil carbon accumulation will be greater.
- No change in carbon in the trees.

Southern Finland, yield value (net present value) 4%



Southern Finland, total carbon, tons



Summary of calculations

Fertilisation

- Good utilisation opportunities
- No negative impacts on the regional economy

Forest density & rotation period

- Additions in carbon sequestration and storing → economic sacrifices over the next decades

Climate Smart Forestry
- Targets for forest management and use by carbon category

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
- Careful implementation of the forest management instructions will improve the result

The forest management instructions emphasise the quick repair of damage

- Carbon classification emphasises the importance of preventing and repairing damage
- Damage can weaken carbon sequestration and storing

There are separate instructions for Finnish Defence Forces areas and the Natural Resources Institute Finland's research forests.

- Jointly agreed procedures will continue
- The targets of carbon classification will not applied in these areas

Targets for forest management and use

Developing carbon sink:

The target is the fastest possible development into the next category

- Selectively bred seeds and seedlings
- Unnecessary breaking of the ground avoided in soil preparation
- Tree species selection according to habitat recommendations
- Timely seedling stand management and inventory
- Density of forests according to forest management instructions
- Supplementary cultivation if necessary
- “Hot chain” in regeneration actions

Targets for forest management and use

Carbon sink to be developed and increasing carbon sink

The target is to maintain a good carbon sink and wood production level

- When forests remain under the reference density, the reason will be investigated
  - If the soil has good growth potential, the required measures to correct the situation will be performed
  - Poorly growing forests will be regenerated if necessary
- The growth situation and forest quality must be considered in the regeneration phase
  - Good quality forests that are growing well will be allowed to mature
- Examination of areas with drainage
  - Will be restored if necessary
  - Care must be exercised in site selection
  - Avoid lowering the groundwater level unnecessarily

Targets for forest management and use

Increasing and significant carbon storage:

The target is to increase the carbon storage with consideration to the special character of areas

- The target is dense forests and landscape cover
  - Prolonging the rotation period
  - Less dense forest can be the aim for special reasons (landscape, reindeer husbandry, ecological management)
  - More retention trees are left standing in forest management
  - Natural regeneration is used where the conditions for it exist
- The forest's ability to sequester carbon is maintained
  - Seedling stand management and intermediate felling leaves a sufficient number of trees.
  - In difficult regeneration conditions, use of fellings aimed at achieving a forest structure with trees of different ages
- Examination of mires
  - Mire restoration, no restoration drainage in sites with poor growth (so-called passive sites)

Targets for forest management and use

Minor carbon storage

The target is development via natural processes

- Restoration of mire areas with drainage in conjunction with other work sites
- Afforestation when the area recovers from other use (peatlands, gravel extraction, areas removed from cultivation use, former electricity lines)

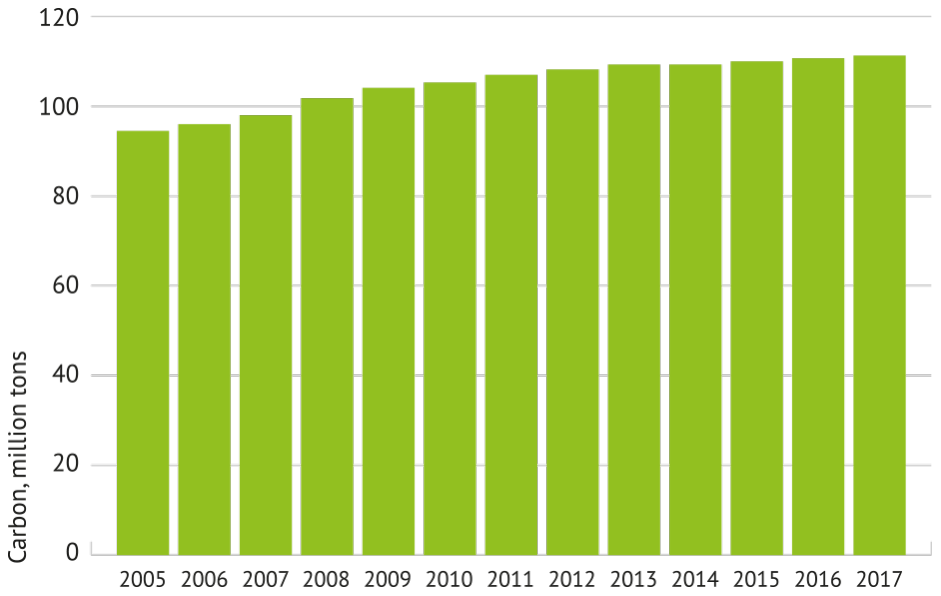
Climate Smart Forestry - Conclusions

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

- Forestry operations in line with the current Metsähallitus forest management instructions already takes carbon sequestration and storing into account in an outstanding manner.
- 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 a good forest 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 information 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.

METSÄHALLITUS

www.metsa.fi

CLIMATE SMART FORESTRY PROJECT

#ilmastoviisas #climatesmart

#metsäteko #forestaction

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