# Summary

Sample plots (altogether 162) were established in randomly selected and surveyed 27 old-growth (age 122-146 years) birch stands in *Hylocomiosa, Oxalidosa* and *Myrtilloso- polytrichosa*. Data for assessment of carbon storage in living and dead tree biomass and soil were collected. Mean yield in the analysed stands reached 248,7 ± 57,3 m3ha-1, diameter: 36,5 ± 1,6 cm, height: 28,7 ± 1,1 m. Mean carbon storage per year in birch stands is increasing as the stand age increases from 21 to 80 years (NFI data), than decreasing rather rapidly and in old-growth stands was on average 2,4±0.26 t ha-1 y-1 in *Hylocomiosa, Oxalidosa* and 1.9±0.20 in *Myrtilloso- polytrichosa* (differences with figures in mature stands statistically significant).

Analysis of the carbon pool in Scots pine stands revealed that the total accumulated amount of carbon (living trees, dead wood, soil, litter) in pine stands (P 160 +) is 266.5 ± 19.4 and 290.0 ± 57.9 t ha-1 in *Hylocomiosa* and *Caricoso- phragmitosa*, respectively; it does not differ significantly between forest types (p = 0.32). The average annual accumulated carbon in pine stands is 1.51 ± 0.13 t ha-1and 1.61 ± 0.41 t ha-1 in in *Hylocomiosa* and *Caricoso- phragmitosa*, respectively. In *Hylocomiosa* old growth stands the average annual carbon stock is decreasing with increasing age.

Increment cores were collected form the trees in old-growth stands and data provided for growth modeling, significantly improving the accuracy of radial increment growth model for birch stands older than 80 years.

In the complex evaluation of data from National forest inventory (NFI) and this study, it is concluded that the amount of deadwood in pine stands and the amount of carbon stored in it is independent of the basal area and height of the trees. The pine stands in *Hylocomiosa* and *Caricoso- phragmitosa*, when combining data from NFI and this project, accurate modelling of amount of deadwood, based on the age of the dominant layer pines can be done.

Analaysis of scientific literature and potential use of the information revealed, that it is important to prepare and carry out the next stage of this research, obtaining novel (at European scale), scientifically sound data on carbon budget in old-growth stands, especially on peat soils, and impact of natural stand-replacement on carbon budget of unmanaged forests.

Results were presented in 3 conferences and summarised in publication in journal Forests.