



Development of Finnish peatland area and carbon storage 1950-2000

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This study summarizes the present knowledge of Finnish peatland areas and carbon (C) storage in peat from 1950 to 2000. In 1950, approximately 8.8 million ha of the Finnish peatland area was still undisturbed and 1.4 million ha drained. Today, almost 55 % (5.7 million ha) of the peatland area in Finland has been drained for forestry, 38.4 % (4.0 million ha) is undrained, 0.8 % (85 000 ha) in agriculture, 0.6 % (60 000 ha) under water reservoirs, 0.3 % (35 000 ha) under roads and 0.6 % in peat harvesting or removed from the harvesting business (63 000 ha). The change in mire area is considered relatively reliable, whereas the net changes in the actual C sequestration and the actual C storage change from 1950 to 2000 involves much more uncertainty. The present total C storage of Finnish peatland ecosystems was estimated at 5960 Tg, which includes 5304 Tg as peat. Since 1950, the C sequestration of undrained and drained peatlands (peat, plant biomass) has basically compensated for the anthropogenic losses. The most important forms of anthropogenic C losses have occurred from agricultural peat soils, water reservoirs, harvested peat and DOC output from forestry drained peatlands. The total C storage of Finnish peatlands, which includes peat and living plant biomass, from 1950 to 2000 was estimated to have increased by 52 Tg because the intensive peatland drainage has significantly increased the total C storage of vegetation. The actual C storage in peat itself has decreased about 73 Tg. However, new results indicate that the old nutrient-rich forestry-drained peatlands act as significant C sources and their gas fluxes to the atmosphere may have been under-estimated. The new datasets are not very large and there is also a lack of soil respiration studies of drained and nutrient poor peatlands to verify the possible

error. Thus, it is possible that the C accumulation of both nutrient-rich and nutrient-poor drained peatlands is overestimated in this study and the actual decrease of peat C storage is significantly larger than the estimated 73 Tg.