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Use of soil inventories to detect hot spots

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The aim with this presentation is to show possibilities and limitations of SOC (Soil Organic Carbon) inventories for identification of sites with high SOC changes over time. Hot spots are here defined as sites expected to respond strongly to environmental or management changes in a manner that is likely to turn these ecosystems into sources of GHGs. The data used originate from the Swedish National Survey of Forest Soils and Vegetation. This survey is based on about 23 500 permanent sample plots in a stratified national grid system that were sampled 1983-1987 and resampled 1993-2002, and 2003-2012, and hence provides suitable conditions for evaluation of SOC changes over time, and their relation to selected site factors. In addition also the Biosoil project provides such possibilities, though with much fewer resampled sites. The analyses are restricted to upland mineral soils (naturally drained), mainly Podzols. Predominating trees are conifers. The soil organic C stock for the O horizon is in average about 70% higher in the southern part of the country than in the northern, and 50 % higher for slightly moist sites than for dry sites. The selected site conditions are 1) current SOC content, 2) soil moisture (dry-slightly moist) and 3) stand age. The survey used does not monitor changes in mineral soil bulk density over time. Furthermore, estimates of stone content are associated with big uncertainties. For these reasons the change in SOC content was not expressed as a stock for the entire soil, but as 1) change in O horizon SOC stock and 2) change in B horizon SOC concentration. It is suggested that these two parameters are satisfactory for hot spot identification.