

Drained organic soils in forests

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1 Underlying data for the analysis

During the third field campaign of the Swiss national forest inventory (NFI; 2004-2006) 6944 forest sample plots were visited. On each sample plot the presence of an old or new drainage within a square of 50 m x 50 m was assessed (Keller, 2013). The relevant sample plot size for this criterion is a square of 50 m x 50 m. The presence of a drainage is assigned to the sample plot centre irrespective of the abundance of the drainage within the sample plot.

Wüst-Galley et al. (2015) produced a digital map showing estimates of the surface of organic soils in Switzerland. They classified the organic soil polygons into eight classes (I to VIII) based upon the attribute information of the information sources representing each polygon. Class I contains surfaces with the strongest evidence that there is organic soil; class VIII contains surfaces with the lowest support for organic soil at a site (they possibly once contained peat but without recent evidence). Up to date, the total area of organic soils in Switzerland is cautiously assumed to be 28 kha (0.8% of the total area covered by soils).

2 Analysis and Results

The coordinates of the NFI forest sample plots were intersected with all classes (I-VIII) polygons of the organic soil shapefile provided by Wüst-Galley et al. (2015) in a GIS software. This analysis led to the following results:

- 83 out of 6944 forest sample plots indicate a drainage (old or new);
- 67 out of 6944 forest sample plots are located within one of the organic soil polygons;
- out of these 67 sites 2 forest sample plots indicate a drainage located within a polygon of organic soil from the GIS shapefile.

3 Conclusions for the data interpretation

For reporting GHG emissions and removals from forests in the Swiss greenhouse gas inventory, it is deduced that 3% (2 plots from 67) of organic soils in forest land is or has been subject to drainage. Regarding this conclusion, however, the following considerations must be taken into account:

- Due to the small number of sample plots either with drainage or within organic soil polygons only a rough estimate of the amount of “organic soils with drainage” is possible, namely, that it’s infrequent. The standard error of such small samples only allows a rough estimation.
- The field measurement of the NFI is not designed to give an exact estimation of the forest area with a drainage. It provides an indicator on the occurrence of drainage “nearby” to a location in the forest. This criteria would allow to identify trends on drainage. However, the precise target variable of the NFI measurements would be “forest area with drainage in a range of 25 to 35 m from the sample plot centre”.
- Due to the fact that many cantons in Switzerland have few modern soil data sets available (if at all) certain regions lack reliable information on organic soils. This is also true for forest land. For a detailed discussion of the restrictions of the organic soil shapefile and further development see Wüst-Galley et al. (2015).

4 References

Keller, M. 2013: Schweizerisches Landesforstinventar, Feldaufnahme-Anleitung 2013. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft WSL. <http://www.lfi.ch/publikationen/publ/anleitungen.php>

Wüst-Galley, C., Grünig, A., Leifeld, J. 2015: Locating organic soils for the Swiss Greenhouse Gas Inventory. Agroscope Science No. 26, Zürich. <http://www.climatereporting.ch>