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Revision of the Spatial Strata in the Activity Data

Sector LULUCF of the Swiss Greenhouse Gas Inventory

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1 Introduction and Aims

The activity data (AD) of the Sector LULUCF¹ in the Swiss Greenhouse Gas Inventory under the UNFCCC² are stratified by means of three site criteria: soil type (mineral or organic), altitude and forest production region (FOEN 2013, Chapter 7.2.3.1).

The five forest production regions are defined in the National Forest Inventory (NFI). They form the spatial reference for many statistical evaluations. Since 2005 the NFI regions are also used for LULUCF reporting. The borders of the regions were delineated on the basis of the sample grid with a resolution of 1 by 1 km used in NFI1 (EAFV/BFL 1988). Meantime, a more precise spatial definition of the NFI region borders is available. It consists of a vector dataset based on the borders of the municipalities in Switzerland. The LULUCF group decided to implement that dataset also in the LULUCF workflow.

Since 2005, the definition of the three altitude belts (<601 m a.s.l., 601–1200 m a.s.l., and >1200 m a.s.l.) was based on a digital terrain model (DTM) with an original resolution of 250 by 250 m. The LULUCF group decided to redefine the altitudinal strata based on a more precise DTM with a resolution of 25 by 25 m supplied by swisstopo³ (DHM25).

These two updates of the spatial strata definition are made to achieve optimal consistency between LULUCF data processing and the input data supplied by the NFI (e.g. Thürig & Herold 2013) or by other data suppliers such as Agroscope Reckenholz-Tänikon Research Station (ART, Zürich) for cropland, grassland and wetlands.

¹ Land Use, Land-use Change and Forestry

² <http://www.bafu.admin.ch/climatereporting/00545/index.html?lang=en>

³ <http://www.swisstopo.admin.ch/internet/swisstopo/en/home/products/height/dhm25.html>

2 Workflow

The following steps were carried out. The GIS-related work was done with the software ArcGIS⁴.

1. The vector-based NFI region borders were ordered at the Swiss Federal Research Institute WSL and a contract determining the use of the data was signed. The status of the dataset is 19.08.2011. The matrix-model (raster) of DHM25 was licensed at swisstopo.
2. The polygons of the regions were rasterised with a resolution of 100 m.
3. The altitude values of DHM25 were classified according to the three altitude belts.
4. An export file was written containing for all 4'128'476 hectares in Switzerland the new NFI-region number, the new altitude class and the (unchanged) soil type codes (mineral or organic soil).
5. The file was transferred to Sigmaplan, where it is implemented in the process of interpolation and projection of the activity data for future submissions.

⁴ ArcGIS® is a registered trademark of Esri Inc., Redlands, USA.

3 Results

Figure 1 shows the difference between the previous and revised NFI regions on a map. The differences are visible but quite small ($< 1\%$ as shown in Table 1). The differences between the previous and revised altitude belts are also very small in average (Table 1).

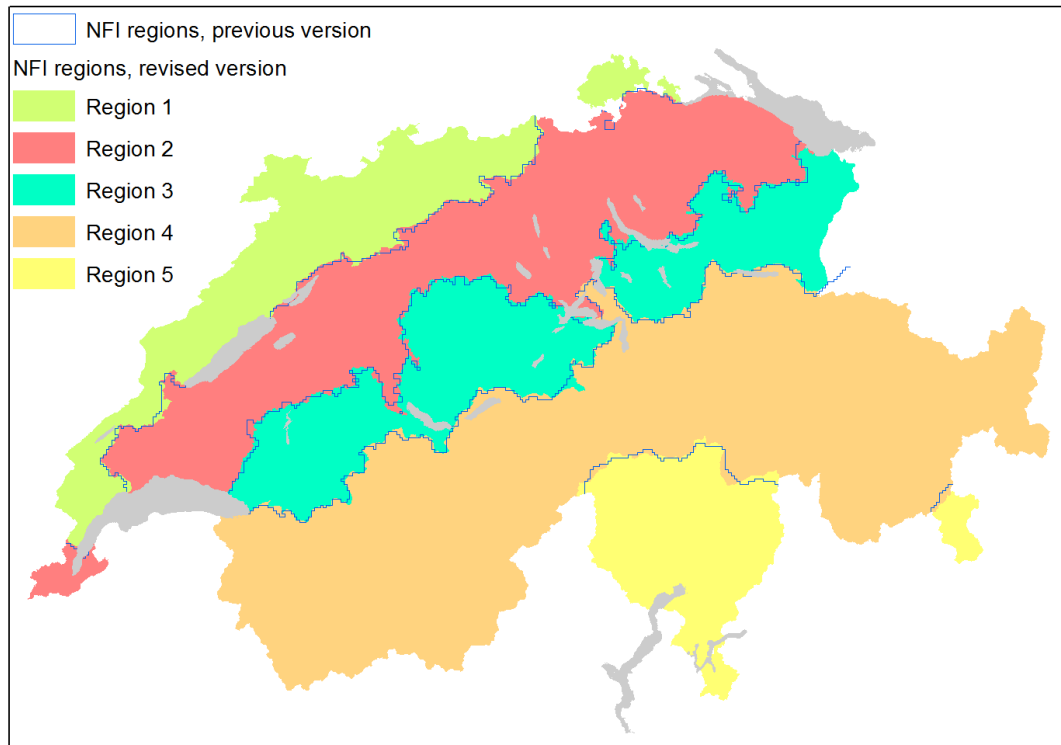


Figure 1: Comparison of previous and revised borders of the five NFI regions.

Table 1: Size of previous and revised NFI regions and altitude belts in ha and differences in percent.

	previous value	revised value	difference %
NFI region			
1	494'907	495'141	0.047%
2	944'144	941'820	-0.246%
3	661'457	660'744	-0.108%
4	1'673'124	1'676'940	0.228%
5	354'844	353'831	-0.285%
Total	4'128'476	4'128'476	
Altitude belt			
1	1'079'603	1'079'603	0.000%
2	1'154'332	1'154'338	0.001%
3	1'894'492	1'894'535	0.002%
Total	4'128'427	4'128'476	

The extent of the previous DHM was somewhat smaller (4'128'427 ha) than the revised version (4'128'476 ha).

4 References

- EAFV (Eidg. Anstalt für das forstliche Versuchswesen) / BFL (Bundesamt für Forstwesen und Landschaftsschutz) (eds.) 1988: Schweizerisches Landesforstinventar. Ergebnisse der Erstaufnahme 1982-1986. [Results of the first Swiss national forest inventory 1982-1986]. Ber. Eidgenöss. Forsch.anst. Wald Schnee Landsch. 305.
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- FOEN 2013: Switzerland's Greenhouse Gas Inventory 1990–2011: National Inventory Report, CRF tables, Kyoto Protocol LULUCF tables 2008-2011, SEF and SIAR tables from the National Registry. Submission of April 2013 under the United Nations Framework Convention on Climate Change and under the Kyoto Protocol. Federal Office for the Environment, Bern.
<http://www.bafu.admin.ch/climatereporting/00545/12558/index.html?lang=en>
- Thürig, E., Herold, A. 2013: Recalculation of emission factors in Swiss forests for the Swiss GHGI. Internal documentation of technical adjustments of data delivery and more recent data. Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Birmensdorf.
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