Vegetation Mapping of northern Fennoscandia, including the Kola Peninsula, using Landsat TM/ETM+ Data

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Northern parts of Fennoscandia, which also includes the Russian Kola Peninsula, represent a transition area between humid, oceanic parts in the west and drier, more flat, continental areas towards the east. It also includes a transition from boreal forest in the south to treeless Arctic tundra in the north, interrupted by several large, treeless mountains. The major bioclimatic zones have been agreed upon within the Nordic countries, but different criteria for defining them have been used within Russia and the former Soviet Union, which is easily seen when comparing these two territories in the European Vegetation Map. More detailed vegetation maps have been produced for both Kola Peninsula and northern parts of the Nordic countries. However, the lack of correspondence with respect to mapping methods and differences in primary data sources have made it difficult to create a consistent vegetation map covering the whole region.

The overall aim of the performed mapping has been to generate a generalized, consistent, and seamless vegetation map for the considerably large study area. Several Landsat TM/ETM+ images have been processed during six operational stages: (1) spectral classification, (2) spectral similarity analysis, (3) generation of classified image mosaics, (4) ancillary data analysis, (5) contextual correction, and (6) standardization of the final map products. Analysis performed on the spectral-only data is often denoted the pre-classification process, whereas the post-classification process involves the integration of ancillary data.

The map products created in this project portray the study area at different levels. The seamless pre-classified map is created with a ground resolution of 30 m. This map serves as base line for a subsequent contextual image correction using different types of ancillary data. The quality of the ancillary data sets highly affects the quality of the final vegetation map. For Norway high-quality ancillary data are available and vegetation maps with a ground resolution of 30 m have been produced. For areas within Sweden and Finland 100 m products are created, while the whole area is portrayed with a ground resolution near 1 km. The most detailed map is differentiated into 32 vegetation classes followed by detailed vegetation descriptions. In addition, the map is used to outline phytogeographical zones and sections within the area.

The vegetation map produced here will in future studies serve as a reference for a wide range of studies where spatial information is needed - such as reindeer range studies, climate impact studies, land degradation and pollution impact studies. The produced

maps will hopefully also serve as an important source of information when new types of satellite data are to be evaluated and validated for this part of Europe.