

UTILIZING A GEOGRAPHIC
INFORMATION SYSTEM (ARC/INFO)
TO INTEGRATE REMOTE SENSED AND
IN-SITU-DATA IN AN ANALYSIS OF
THE AIR POLLUTION EFFECTS ON
TERRESTRIAL ECOSYSTEMS IN THE
BORDER AREAS BETWEEN NORWAY
AND RUSSIA

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Abstract

Over the last decade satellite data has been used to demonstrate that the transboundary air pollution from the industries in Nikel, Zapolyarnij, and Monchegorsk has caused severe damage to the vegetation cover in Norway and Finland. The work presented in this paper focuses on the use of Arc/Info GIS as a remote sensing tool. In-situ air pollution data from 1990/92 and remote sensing data from 1973 and 1988 were used. A method for integration of air pollution and contamination data with remote sensing based vegetation cover maps into a GIS-system has been developed and documented. Methods for verification and correlation of the remote sensing based maps with the air pollution data were developed and applied. The total area of lichen dominated vegetation cover types had decreased from 2783 km² in 1973 to 538 km² in 1988, while bare rock, eroded heath, and contaminated (damaged) areas increased from 297 km² in 1973 to 1577 km² in 1988. A correlation between the degradation and the sulphur dioxide concentration in the air has also been documented. The most damaged or affected vegetation cover types were those with the largest concentrations of nickel and Sulphur in lichens (*Cladina stellaris*), while the classes with minor vegetation damage had rather low concentrations in the lichens.