

REMOTE DETECTION AND RECLAMATION OF LAND DAMAGED BY AMBER MINING

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Abstract

The problem of illegal amber mining in the forest areas of Ukrainian Polissya has been in existence for more than 15 years. Primitive mining technologies are causing degradation of large areas of forest lands, destruction of the earth's surface and changes in the water-chemical balance of damaged territory. As a consequence, local communities losing significant forest areas triggering serious economic losses to landowners. Disturbed biotopes require a large-scale reclamation measures. However, local authorities do not have appropriate methods for assessing the losses incurred and suitable measures for planning the scale of remediation operations. The purpose of the study is developing a methodology for detecting measures of the land damage caused by amber mining and providing recommendations on remedial operations to local authorities. Sentinel-2 space images with atmospheric correction class 2A were used to determine the affected area. Numerical data processing was performed using SNAP and ArcGis programs. The proposed methodology is based on the applied vegetation index GEMI, the water index NDWI2 and the composite of short-wave infrared radiation (SWIR2), close infrared (NIR) and green (GREEN) channels. Recommendations for the planning of restoration activities are provided on the basis of research on forest land reclamation methods and existing peer review reports.

Keywords: Amber mining, Land damage (degradation), GIS methodology, Space images, Atmospheric correction, SNAP and ArcGis programs, Land reclamation