

Is it possible to use SPOT-5 for the mapping of habitat types?

Comparison of methods- remote sensing/traditional vegetation mapping

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Over the last few years the Icelandic Institute of Natural history has been developing methods for classification of Icelandic habitat types. The sampling of vegetation, birds, land invertebrates and environmental factors was carried out in seven highland areas, resulting in 26 different habitat types.

The main objective of this research is to find out if remote sensing data (SPOT-5) can be used for mapping habitat types in the highlands of Iceland.

Maps have been made for the seven areas by analyzing vegetation communities from traditional vegetation maps and classifying each into the most likely habitat type, based on field data and description of habitat types. By using this method, maps of habitat types can only be made of those areas where vegetation maps already exist.

Accuracy assessment was made for both classifications (existing map and SPOT-5 map) with 130 test transects in 11 habitat types that were sampled in 2004. Also, the total area of each habitat type, classified by each method, was calculated and compared. A test area of 300 km² in Northeast of Iceland was chosen for this research. Based on the field data, 15 habitat types were classified, but then condensed to eight classes in order to be able to compare the classification of each method.

All four bands of the SPOT-5 image were used for both supervised and unsupervised classification. Correlations were made by using both slope and hydrology data. The correspondence of the unsupervised classification and the test data was higher than of the supervised classification of all the habitat type classes. A map of habitat types was based on that classification. Overall accuracy of the unsupervised classification in eight classes was 70%, but the accuracy of each class varied from 25-90%. Comparison of the SPOT-5 map and the map based on vegetation communities showed that there was a great variation between some habitat types using different methods. However, overall sparsely vegetated classes and wetland classes were nearly the same in area in both classifications.

At large the results give an overview of the habitat types in the study area. However communities that are insignificant or rare may not be recorded at all by this method. For a more detailed classification, more traditional mapping methods are required in addition to remote sensing methods.

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