

EVALUATION OF VEGETATION CONDITIONS IN DIFFERENT TYPES OF LAND USE USING SATELLITE MEASURED DATA

Laurynas Klimavičius

Institute of GeoSciences, Vilnius University, Vilnius, Lithuania
laurynas.klimavicius@gf.stud.vu.lt

At the end of 20th century advanced remote sensing system, which is based on satellite measured data, has allowed to use new methods for vegetation conditions researches. Satellite measured data nowadays is not only more accurate, but, unlike older methods, shows vegetation conditions in a particular area, not a specific place and covers the whole Earth [1].

In this study, a sufficiently long data sequence (from 1982 till 2015) was analyzed, so the results can be used to determine the connection between meteorological factors and vegetation conditions as well as to assess impact of climate change. The research area covers a rather large area from 53° N to 59° N. The distance from the Baltic Sea and the terrain in this area is quite diverse, so different landscapes and different types of land use are covered in the study. Also, an impact of meteorological conditions on vegetation using remote sensing data in the eastern part of Baltic Sea region is little studied [2].

The main objectives of this study are to assess:

- monthly NDVI changes from 1982 till 2015 in the eastern part of Baltic Sea region.
- air temperature and precipitation impact on vegetation conditions in the whole study area (2622 cells) and in five different types of land use (pastures, wetlands, broad leaved forests, coniferous forests and arable land) (322 cells)
- impact of extreme meteorological conditions on vegetation.

In order to do that, monthly Normalized Vegetation Difference Index (NDVI) values were used. This index is calculated using near infrared (NIR) and visible (VIS) light Eq. (1) [3]

$$NDVI = (NIR - VIS) / (NIR + VIS) \quad (1)$$

NDVI is an appropriate index for this research as it has strong connection with air temperature, especially at the beginning and the end of vegetation period [4]. Precipitation has an impact on NDVI as well and it depends on the type of vegetation and the growth phase [5].

In this study, monthly NDVI data (cell size 0.144×0.144°) were obtained from NOAA STAR – NESDIS system. Different types of land use were distinguished using CORINE land cover data. Monthly precipitation and air temperature data were obtained from CRU TS v. 4.01 database (cell size 0.5×0.5°).

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