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DETERMINATION THE DEGREE OF AEROSOL POLLUTION AND ANALYSIS OF FOREST
COVER IN THE TERRITORY OF LACHIN, GUBADLI AND ZANGELAN REGIONS OF
AZERBAIJAN

Abstract

Spectral vegetation Indices AFRI-1600 and AFRI-2100 are used to assess vegetation under conditions of smoke, anthropogenic pollution, or volcanic plumes. Unlike the well-known NDVI index, in order to calculate the index value, in addition to the near infrared range (NIR), data from the spectral short-wave infrared ranges (SWIR1 and SWIR2) are used. Under clear sky conditions, the AFRI and NDVI indices have close values. But the presence of smoke or sulphate contamination causes them to be markedly different. Multispectral images of satellites of the Landsat series were selected for the study. This is due to the presence of TM / ETM+ sensors on the satellites, which allow you to work in the specified SWIR1 and SWIR2 bands. The AFRI-1600 index was used to identify aerosol sites in forest vegetation. The initial data were images of the study area obtained from Landsat 5 and Landsat 8 satellites for 2000, 2009 and 2021. First, the images were radiometrically and atmospherically corrected using the ENVI program and the FLAASH module. Then, the values of the specified index were calculated and images were obtained reflecting the degree of aerosol pollution in the forest cover for different years. The aerosol composition of the forest cover of the study area was classified into four classes: high, medium, weak, and aerosol-free. For each class and for each year, the areas of the corresponding plots were calculated. This made it possible to determine the dynamics of change in all classes of each region of the study area. According to the results obtained, comparing the data of 2000 and 2021, there was an increase in areas with a high aerosol content in Gubadli and Zangilan regions, as well as an increase in areas with an average content of aerosols in Gubadli region. Weakly aerosol areas in the study region turned out to be the most unchanged and least decreasing areas. Thus, it was determined how the forest cover changed in the regions. The results obtained are presented in e-maps and in tabular form. Quantitative indicators are summarized in a general table. Based on tabular data, diagrams were constructed that reflect the results of the study. Thus, the presented method makes it possible to determine the areas of forest cover affected by fires, soil salinization, and many anthropogenic impacts.