

## SPATIOTEMPORAL CHANGE ANALYSIS OF THE PROTECTED AREAS: A CASE STUDY-IGNEADA FLOODPLAIN FORESTS

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**Abstract:** Protected areas are important with land or water body ecosystems that have biodiversity, flora and fauna species. In Turkey, National Parks are one of the protected areas managed according to the National Parks Law No. 2873. Among them, the İğneada Floodplain Forests National Park has an importance being a rare ecosystem, which consists of wetland, swamp, lakes and coastal sand dunes. Planning of Protected Areas can be done in a variety of ways, taking into account the balance of conservation / use and should comply with policies and guidelines. For sustainability and good management of forest ecosystems, it is essential to use remote sensing technology to assess and monitor ecosystem health at different temporal and spatial scales in large areas. İğneada Floodplain Forests National Park is located in İğneada town in the province of Kırklareli, Turkey. The National Park area, which has two parts, has a wide variety of flora and fauna, including floodplain forests, deciduous mixed forests, wetlands, coast dunes, lakes. This area contains various plants of international importance and priority in the European scale. The National Park, which has a rich variety of fauna, is located on important bird migration routes.

İğneada floodplain forests has been declared as a national park in 2007. In this study, for the years 1987 to 2007, the potential temporal changes in the National Park has been analyzed with Landsat satellite image time series quinquennially. After it was declared as a national park in 2007, Landsat images taken every two years until 2017 were used in the analysis.

Two different methods were used for time series analysis to detect possible changes in the study area. First method used was the Landtrendr algorithm (Landsat-based Detection of Trends in Disturbance and Recovery) developed for multitemporal satellite data. Landtrendr is a tool for time series analysis, which uses pixel values as input data and analysis them by using regression models to capture, label and map the changes.

Second method used for spatiotemporal changes was done using Google Earth Engine (GEE) platform with multi-temporal Landsat images. The Google Earth Engine (GEE) is a cloud-based platform that facilitates access to high-performance computing resources to process large long-term data sets to analyze the impact of land cover changes.

Finally, the efficiency of these 2 methods for the planning of Protected Areas is outlined. Results showed that the area was exposed to various pressures (i.e. illegal tree cutting, pollution etc.) in the period until it was declared as a National park. Although it is seen that there is a general improvement and recovery after the declaration as a National Park in the ecosystem, it can be stated that the precise dynamics of the area cannot be sufficiently protected.

**Keywords:** Protected Areas, Landsat TM time series, Google Earth Engine, Spatiotemporal Changes, Landtrendr analysis.