



## **Long-term water extent mapping of lakes in the Lakes Region, Turkey, using multiple satellites**

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Lakes are among the most important natural resources undergoing change in time and space as a consequence of seasonality and climate, climatic change and anthropogenic impacts such as landcover/landuse change. Thus, timely monitoring of lake water dynamics is essential for sustainable water resources management. Satellite remote sensing is among the most widely used sources of information in analyzing spatio-temporal changes in surface water bodies. This study presents a satellite-based monitoring of the water extents of sixteen lakes in the Lakes Region, Turkey in an effort to investigate possible trends with links to the meteorological variables and anthropogenic influences. Lakes Region is situated in the Mediterranean region which is identified as one of the hot-spots of climate change and undergoing rapid increase in population, thus long term observation records of these water bodies is critical. We utilized Landsat suite of satellites (5 TM, 7 ETM+, 8 OLI) together with Sentinel-2 to construct water extent time series of the study lakes covering the period 1984-present. The analysis was performed in Google Earth Engine<sup>®</sup> platform using Normalized Difference Water Index (NDWI) and a thresholding technique. Seasonal variations and long term trends in water extent of the study lakes were successfully constructed. Long term decreasing trends were identified for a number of lakes in the region. Spatio-temporal variations in water extents were further linked to the lake levels, bathymetry (where available) and the meteorological variables to understand possible causes of these variations.