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Effect of Climate Change on Water Level and Surface Area of Lake Iznik (NW Türkiye)

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The aim of the study is to investigate the changes in the water level and surface area of Lake Iznik in Northwestern Anatolia, Türkiye, between 2014 and 2024. In this context, High-Resolution Satellite images provided by European Space Agency (ESA)'s Sentinel-2 are used to determine the lake surface area, and satellite altimetry data provided by Copernicus Land Service is utilized to determine the lake water level. Additionally, temperature and precipitation data from a meteorological station near the lake are obtained from the Turkish State Meteorological Service due to their significant impact on the lake's water level and surface area changes.

The estimated trend for the change in the water level from 2014 to 2024 is -23 ± 1.9 cm/yr, and the change in the surface area trend is estimated as -1.2 ± 0.2 km²/yr. The results indicate a decrease in both the lake's water level and surface area. Furthermore, Standardized Precipitation Index (SPI) and Standardized Precipitation-Evapotranspiration Index (SPIE) are calculated from precipitation and temperature data obtained from meteorological stations near the lake. These indices reveal a decrease in precipitation and an increase in temperatures in the Lake Iznik basin over the past 10 years.

Consequently, it is observed that the changes in the water level and surface of Lake Iznik are influenced by climate change, and hence, necessary measures need to be taken for the conservation and sustainable use of the lake.