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EUTROPHICATION, PRIMARY PRODUCTION AND NUTRIENTS IN THE SAPANCA LAKE, TURKEY

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Systematic measurements of optical properties of concentrations of major and minor chemicals and of primary production throughout 1989-1992 identify the oligotrophic state of Sapanca lake, located in the Marmara region of Turkey. The lake waters which have low concentrations of major anions and cations (total= 1.49µM) overturn every February-March, ventilating the bottom waters with bottom-nutrients. The surface water cool down to 6.5 °C in late winter and then warm steadily to 26.0 °C by late summer, whereas temperatures in the deep waters range mérely between 6.3-10.0 °C throughout year. When the seasonal thermocline develops, the dissolved oxygen (DO) profiles exhibit a subsurface maximum in the upper thermocline but, in the hypolimnion water, the concentration of DO varies seasonally from 11.5-12.0 ppm (380-400 µM) in March to 0.5-1.7 ppm (16.6-56.6 µM) in late autumn. The surface nitrate concentrations vary markedly with season, from < 0.15 µM in summer to 5.7 µM in early March. Whilst the bottom water concentrations range from 13.5-14.0 µM in late autumn to 5.7 µM after the winter overturn. Phosphate concentrations are always less than 0.1 µM throughout the entire water column. Coherent subsurface chlorophyll-a maxima (SCM) descend in late summer to depths of 20-25 m, where the light intensity decreases to less than 1.0 % of its surface value. Primary productivity (PP) is very low bellow depths of 10-15 m corresponding to the upper thermocline. The integrated values of PP varied between 35 and 93 mg-C m-2 day -1 during 1989-1991 , consistent with values in other oligotrophich lakes.

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