

RECEIVER OPERATING CHARACTERISTIC TECHNIQUE FOR INDICATING CUT OFF VALUES OF LAKE TROPHIC STATE

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ABSTRACT

The research aimed at using a new technique (Receiver Operating Characteristic) to find cut off values for the transition between the adjacent trophic states for different parameters. Besides, a comparison among them is made according to their accuracy for the first time in environmental management of water resources. The data of 158 cases for 100 world lakes in the world were collected from the literature. The data included: chlorophyll a, Secchi depth transparency, total phosphorus, pH, total suspended solids, temperature and electrical conductivity for surface water; ammonia, NO₃/NO₂, hardness, alkalinity, silica and total phosphorus for water column, in addition to trophic state of the lake. Cut off values were found between the adjacent trophic status according to Receiver Operating Characteristic technique which include the area under the curve, sensitivity, specificity and accuracy. The results showed high sensitivity to indicate the trophic state approaching 98.5% with significance for chlorophyll a, total phosphorus, Secchi depth transparency for surface water and silica, total phosphorus and ammonia for total water column. The study concluded that Receiver Operating Characteristic had efficient ability to analyze trophic status of lakes and reservoirs.

KEYWORDS: Cut off Point, Eutrophication, Lakes, Reservoirs, ROC, Trophic State