INVESTIGATION OF ANNUAL LAKE WATER LEVELS AND WATER VOLUMES WITH SEN INNOVATION AND MANN-KENDALL RANK CORRELATION TREND TESTS: EXAMPLE OF LAKE EGIRDIR

Ali Yücel[1], Monika Markovic[2], Atilgan Atilgan[3], Roman Rolbiecki[4], Hasan Ertop[5], Ariel Łangowski[4]

[1] University of Osmaniye Korkut Ata, Osmaniye Vocational School, Construction Technoogy, Osmaniye, Turkey

[2] Department for plant production and Biotechnology, Faculty of Agrobiotechnical Sciences, University of Osijek, Osijek-Croatia

[3] Department of Biosystem Engineering, Faculty of Engineering, Alanya Alaaddin Keykubat University, Alanya/Antalya, Turkey

[4] Department of Plant Irrigation and Horticulture, Bydgoszcz University of Science and Technology, Poland

[5] Agricultural Structures and Irrigation, Faculty of Agriculture, Isparta University of Applied Science, Isparta, Turkey

In ecological balance, lakes have been one of the most important water resources of people. In recent years, it has been frequently mentioned that there has been a decrease in the water levels and volumes of some lakes in our country. We can say that these decreases are caused by reasons such as unplanned urbanization, excessive water consumption, industrialization, unconscious and excessive irrigation due to excessive population growth, as well as global climate change. Considering these effects, Lake Egirdir, located in the Western Mediterranean region, was chosen as the study area. Lake Egirdir, water level (LWL) and water volume (LWV) values measured between 1988 and 2019 were used. The dependencies in the annual LWL and LWV values were analyzed by autocorrelation analysis, regression analysis for trend changes, Mann-Kendall Rank Correlation Trend Test (MKRCTT) and Sen Innovation Trend Test (SITT). It has been determined that significant LWLS decreases have started in 2000, and LWVs in 1990, depending on climate change, and decreases of 1.272 to -3.514 m in LWL, and -72.980 to -1082.134 hm^3 in LWV in 32 years. With these and similar studies to be carried out, the extent of the decrease in water can be determined. Measures to be taken thanks to these determined values will help protect our water resources. As a result, correct irrigation practices, redetermination of plant patterns in areas with limited water, and studies on excessive water use can be listed as priority measures to be taken for the protection of water bodies.