6. SUMMARY

ANALYSIS OF SURFACE WATER WITH SPECTRAL PROPERTIES OF LIGHT

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The goal of the current study is to investigate the feasibility of estimating water composition from the optical characteristics of the water surface using a conventional digital camera as a low-cost alternative method and to find out how communities react to smartphone water quality assessment applications in terms of their efficacy, usefulness, and contentment compared to conventional instruments. The advanced computing power and feasibility of use in various applications make smartphones a potential tool for surfacewater quality monitoring. In winter 2022/2023, field measurements were carried out on number Four fish Pond, Gödöllő-Állami telepek, Hungary. The absolute or relative reflectance between channels can be used to estimate both nitrate and phosphate substances detected with the Nix Quality Control (NIX QC) color sensor and smartphone camera method. In addition, a series of three-band pictures had been taken using a smartphone digital camera, and according to the results of the color analyser mobile application, the red, green, and blue bands of the water-leaving reflectance were calculated from these pictures. On this basis, the water nitrate and phosphate parameters were successfully estimated by comparing the calculated values of the color results obtained from the NIX QC and Smartphone with the analytical results obtained from the eXact iDip photometer. This study established that there exists a statistically significant correlation between the phosphate water quality variable and the green channel (PO_4/G). Besides, there was a strong power relation between nitrate and blue channel (NO_3/B). With an appropriate method of linear regression algorithms, the retrieval of the NO_3 and PO_4 content was validated. With the help of accurate traditional monitoring, this degree of accuracy was suitable for the practical implementation of regular assessment and early alarming for the security of the surface water.