

Water quality assessment with Simultaneous satellite imagery in Bin El Ouidane Dam (Morocco)

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Monitoring water quality in large dams is a necessity to protect stored water against various forms of pollution. Unfortunately it is difficult to achieve given the large surface area of the dams, and the quantity of chemicals product needed to analyze several samples in a monthly manner. In this purpose, our study aims to determine the relation between water quality parameters and Sentinel imagery reflectance. The in situ sampling were carried out in Bin El Ouidane Dam (Azilal province) followed by physicochemical parameters analyzes in laboratory. These measurement results were compared with the pixels reflectance in each sampling location to investigate the correlation that can exist between bands and laboratory results. The regression and correlation results were significant between chlorophyll A, water temperature, electrical conductivity, chlorine, nitrate, phosphate, bicarbonate and sentinel 1, 2, 3 bands. This obtained correlation has been developed and transformed into predictive models describing the correlated water quality parameters throughout Bin El Ouidane Dam. These parameters generally vary during the sampling month (May) in allowable values with an average of $0,4\mu\text{g/l}$ in chlorophyll A, $400\mu\text{s/cm}$ as electrical conductivity, $0,5\text{ mg/L}$ for nitrate, 75mg/L in Chlorine and $0,8\text{mg/L}$ for the phosphate. As a conclusion, this study constitutes the first made effort to use satellite imagery data to map water quality parameters in Moroccan dams and showed a great potential in term of prediction.

Keywords: Water Quality, Sentinel imagery, Predictive models, Cartography.