

BOOK OF ABSTRACTS

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TOWARDS 2050



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Remote sensing for water quality monitoring: a reservoir case study

S1.4 Global water provision: Understanding the forest-soil-water nexus under forest management, climate change and increasing disturbances

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Abstract: Continuous monitoring of water resources is crucial for ensuring sustainable urban water supply. Remote sensing techniques have proven to be valuable in monitoring various water quality parameters with optical characteristics. The study focused on the Marateca reservoir located in central inland Portugal. The objectives were as follows: (1) to investigate the water quality parameters at different monitoring points within the Marateca reservoir that could explain certain events; (2) to validate optical water quality parameters using the data collected from the monitoring points; and (3) to model the water characteristics of the reservoir, including its depth, trophic state, and turbidity.

The parameters of total phosphorus, total nitrogen, and chlorophyll-a were utilized to calculate a trophic level index. Sentinel-2 imagery was employed to compute spectral indices and image ratios for different bands, obtain spectral signatures for the monitoring points, and model the water characteristics. The analysis revealed that the water parameters exceeded the recommended values at the entry point of the reservoir from the Ocreza river. The trophic level of the reservoir was classified as Hypereutrophic and Eutrophic. The spectral signatures confirmed a Hypereutrophic pattern at the entry point. The modeling of the Marateca reservoir's water characteristics predicted zones of contamination issues.

The developed methodology can be readily applied to other reservoirs and serves as a valuable decision-making tool for policymakers. This study was funded by CERNAS-IPCB [UIDB/00681/2020] funding from the Foundation for Science and Technology (Fundação para a Ciência e Tecnologia-FCT); and by ICT [UIDB/04683/2020] also funding from FCT.