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Utilizing Unmanned Aerial Systems in River Water Quality Variability Monitoring

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Traditional water quality monitoring in River Systems is both labor intensive and expensive. However, in order to better understand the different phenomena occurring in river systems, it is vital to have robust data available. Satellite observations have been successful in monitoring different environmental systems, but generally, current available spatial resolutions and cloud cover in inland waters limit the monitoring of rivers. Recent developments in the use of Unmanned Aerial Systems (UAS) highlighted the potential to address this gap in environmental monitoring.

In this study, UAS and image processing techniques were utilized to gather an overview of the water quality variability, specific to turbidity level and pollutant transport, along the Sarno River, which is the most polluted river in Europe, and the river pollution has long been subject to disputes between many sectors. Preliminary findings highlighted the potential of image processing and allowed to identify the variability in river water quality along the main river by adopting a sampling protocol in several points of the Sarno River. While there were few observations of plastic in river banks, organic transport was mostly observed and interestingly, there is a water quality spatial mixing in the river mouth, which is difficult to observe using traditional *in situ* point measurements. This study only covers the initial phase of the river monitoring activities.

Keywords: *UAS river monitoring, sediment transport, image processing, spectral indices, remote sensing, drones, water quality assessment*

References:

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