Presentation title: A comprehensive system for monitoring the quality of surface waters using the hyperspectral cameras

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Presentation type: (Poster presentation)

Abstract: The research project will develop a comprehensive surface water quality monitoring system using unmanned aerial vehicles (UAVs) and underwater vehicles (UUVs) equipped with innovative data collection and continuous measurement methods. The use of variable reflection, emission and scattering properties of electromagnetic radiation is the basis of remote sensing research. The expected impacts of the innovative monitoring solutions will be discussed, including:

- The measurement of water quality parameters, which affect the spectral properties of water. These parameters include phytoplankton composition, turbidity, specific conductivity, chlorides, sulphates, nitrogen compounds, phosphorus compounds, COD, and organic carbon. The floating platform will be fitted with sensors to measure water temperature, reservoir depth, and substrate type, in addition to the capability of collecting water samples.
- The developed technology has a key advantage: it continually obtains data, simplifying the monitoring and analysis of physical and chemical water parameters. Furthermore, the system allows for rapid data generation at local and global levels, while maintaining an acceptable degree of observation repeatability. This makes it easier to monitor seasonal changes in water quality.
- The implementation of the project's results in a water monitoring system has high potential for information. Measurement data can generate dependable models of water quality degradation phenomena as well as risk assessment. The identification of water pollution, such as in a drinking water source, enables the determination of the pollutant type, degree of risk assessment and source identification.
- The wide-spectrum scanning of bodies of water will prove to be a valuable technique in the management of point sources of pollution that enter water. The detection of possible pollutants will enable the swift identification and localisation of their source. This approach will undoubtedly facilitate more effective intervention against environmental degradation.

Biography: Sylwia Myszograj has been employed at the University of Zielona Góra, Poland since 1997, and since 2019 has served as Director of the UZ Institute of Environmental Engineering and Chair of the Discipline of Environmental Engineering, Mining and Energy. Her scientific specialisation includes environmental biotechnology, micropollutants in the aquatic environment, monitoring and determination of microplastics, optimisation of wastewater treatment and methane fermentation processes and product carbon footprint determination. She has published 215 scientific articles and developed 50 implementation papers and technology concepts.

HYDROSTRATEG1/001/T/2022 (acronym HIPER). Co-financed by NCBiR within the framework of the 1st Government Strategic Program HYDROSTRATEG, POLAND, 1.10.2023 – 30.09.2026