Special Issue

Monitoring Surface Water Dynamics and Quality Using Modern Remote Sensing

Message from the Guest Editors

Surface water bodies play a fundamental role in sustaining ecosystems, supporting human societies, and regulating the Earth's climate system. However, these environments face growing pressures from climate change, population growth, industrialization, and intensified land–sea interactions. Monitoring both the dynamics and quality of surface waters, across inland and marine environments, is therefore critical for water resource management, ecological health, disaster risk reduction, and sustainable development. Modern remote sensing technologies are revolutionizing how we observe surface waters at multiple scales. Satellite, airborne, and UAV-based platforms equipped with multispectral, hyperspectral, thermal, SAR, and LiDAR sensors now provide unprecedented capabilities to monitor spatial–temporal variability and water quality indicators such as turbidity, chlorophyll, harmful algal blooms, suspended sediments, salinity, temperature, and nutrients. Meanwhile, machine learning, artificial intelligence, and cloud computing enable more accurate retrievals, automated mapping, and near-real-time applications that bridge science and decision-making.

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