Remote Sensing and River Systems

Mapping of Riverscape and In-Stream Mesohabitats

A new, semi-automated method for mapping hydrogeomorphological data of rivers at a regional scale was developed by Luca Demarchi, Simone Bart, and Herve Freyag from the European Commission, Joint Research Centre. The new method that the group developed used a combination of spatial and geographic information with aerial, photogrammetric data. Different input features were tested at each level with Machine Learning classifiers for mapping the riverscape units and in-stream mesohabitats. The GEOBIA approach was used to analyze the river system at different levels of detail and to create the topographic data with the spatial data. The approach allowed the water channel, unregenerated sediment beds, riparian vegetated areas, and other mesohabitats to be delineated from each other with a high level of accuracy. This method allows for monitoring and characterizing the hydrogeomorphological status of the system continuously along the entire river system through time. Figures 1 and 2 show images from the method used.

Another study was performed by a research group on the effects of the dam on the rivers downstream of the dam. The group analyzed the effects that dams had on thermal pollution in the rivers downstream of the dam. The group found that the dams had a significant role in changing the spatial pattern of temperature in rivers and contribute to thermal pollution. By being able to understand the temporal and spatial variation of thermal pollution caused by dams helps mitigate the harmful effects. Thermal infrared remote sensing allows the assessment to be done over large sections of the river that may not have gauges set in the river. The group used spatial and temporal characteristics of thermal pollution from fifty-hour cloud free Landsat 7 images to analyze the surface temperatures. The affected area from the dams reached over 20 km below the dam.

The Effects of Dams on River Systems

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