

MORPHOLOGICAL QUALITY INDEX OF SURFACE WATERBODIES IN WESTERN SICILY

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The assessment of the “morphological quality” of surface waterbodies represents a fundamental element for expressing their ecological status under the European Water Framework Directive (WFD). Italian legislation has adopted the IDRAIM methodology, including evaluation criteria based on the Morphological Quality Index (MQI), which is derived from the expert evaluation of indicators of geomorphological functionality (F), artificiality (A) and morphological variations (CA).

This contribution presents the results of the application of the IDRAIM methodology to 40 waterbodies in western Sicily, segmented into 335 reaches, developing analyses at multiple spatial scales. At the reach scale (the fundamental unit of the methodology), a sensitivity analysis of the MQI was carried out, aimed at evaluating the index response to variations in the assigned indicator classes. For each reach, the range of values, the frequency of morphological class changes and the thresholds for morphological class modifications were then calculated. The analysis was then extended at the whole surface waterbody scale through the study of the longitudinal continuity of the MQI, by evaluating morphological class changes from upstream to downstream and introducing a morphological quality fragmentation index (MQFI), calculated as the normalized frequency of class changes between consecutive sections. The results highlight 61 cases of morphological improvement, 80 cases of worsening and 193 cases with unchanged class. The fragmentation index distinguishes waterbodies characterized by poor longitudinal continuity, often associated with localized pressures, from waterbodies with good longitudinal continuity often associated with pressures extending throughout the waterbody (poor or very poor MQI).

The results suggest that the integration of reach-scale sensitivity analyses and waterbody-scale longitudinal continuity analyses could represent a useful contribution to a detailed interpretation of IDRAIM results and good support for the definition of monitoring and planning plans for river restoration measures.