

Marine litter assessment using remote sensing techniques – a review

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Marine litter, resulting from mismanaged waste disposed of in aquatic environments, is a widespread issue in marine pollution, posing significant environmental threats. Recent advancements in remote sensing technology are pivotal in marine litter studies, enabling large-scale detection and monitoring, which are reviewed in this article. Satellites equipped with infrared sensors aid in detecting marine litter, and the versatility of drones in gathering data on marine litter is a viable approach for quantifying litter. Furthermore, integrating remote sensing and GIS with AI technologies enhances the accuracy and efficiency of marine litter classification, supporting decision-makers.

Keywords: Artificial intelligence, drone, marine litter, remote sensing, satellites.

and vegetation influencing litter retention and deposition, thus making riverbanks and river mouths vulnerable to litter pollution^{7,8}. This dynamic nature complicates manual monitoring, emphasising the need for technology. Conventional monitoring methods are often limited by inconsistencies and the challenges of surveying large areas, leading to data underestimation⁹. Remote sensing technology offers a solution by providing large-scale, historical data that improves understanding of litter behaviour and supports the development of algorithms for better monitoring and management⁹. The present review article explores various remote sensing techniques for studying marine and beach litter, highlighting their potential to enhance environmental management efforts.

Methodology

Initially, a comprehensive keyword-based literature search was conducted using the keywords 'Marine litter', 'remote sensing', 'artificial intelligence', 'drone', 'GIS', and 'AI'.