

HEALTHY WATERWAYS-HEALTHY CATCHMENTS : AN INTEGRATED RESEARCH / MANAGEMENT PROGRAM TO UNDERSTAND AND REDUCE IMPACTS OF SEDIMENTS AND NUTRIENTS ON AUSTRALIAN WATERWAYS

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An interdisciplinary study of South East Queensland's waterways was initiated to address water quality issues which link point source and diffuse pollutant loadings with environmental degradation of Moreton Bay and its waterways. Moreton Bay (153°E; 27°S) is a shallow, subtropical embayment with abundant seagrasses, mangroves, sea turtles, and dugong, adjacent to a rapidly expanding population. Like many Australian estuaries, Moreton Bay is characterised by strong lateral gradients in water quality, with hyperautotrophic and oligotrophic waters within tens of kilometres. High sediment loads, especially during high flow events, together with resuspension of fine-grained sediments in the river estuaries and western Moreton Bay lead to high turbidity, reduced light penetration and subsequent seagrass loss. Sewage-derived nutrient enrichment, particularly nitrogen (N), has been linked to algal blooms. Nitrogen limitation of freshwater, estuarine and marine plant growth was inferred using bioassays and nutrient budgets (Dennison and Abal, 1999).

The riverine and estuarine environments of the South East Queensland (SEQ) catchment have been significantly altered. Land use changes and vegetation clearing have resulted in increased flows, erosion and delivery of both nutrients and sediments from the catchments to the waterways. Only 26% of the catchment's original vegetation remains. Channel (gully and streambank) erosion is the dominant form of erosion in the SEQ Catchment. Most of the sediment is generated from quite specific locations, with more than 60% of the sediment coming from less than 30% of the area. Given the episodic nature of rainfall in the catchment, protection of riparian areas, especially in the headwater (first and second-order) streams needs to be in place to prepare the catchment and waterways for extreme flow events. During smaller events or dry conditions, urban areas may have a significant contribution of sediment loads to our waterways. Best practices for stormwater management, will be useful in controlling sediment loads into the waterways.

The Moreton Bay Waterways and Catchments Partnership (MBWCP) has been established to coordinate the various initiatives required to achieve the 2020 Vision for waterways in the SEQ region. The MBWCP delivers integrated science, monitoring, planning and implementation programs supported by extensive government, industry and community involvement and targeted communication and education initiatives.

The Ecosystem Health Monitoring Program (EHMP) was developed and currently implemented to independently audit the effectiveness of investments in improved waterways management to restore and protect the rivers, estuaries and Moreton Bay. A key component of the EHMP and the MBWCP as a whole, is effective communication of scientific results to community, government and industry partners. Each year, a "Report Card of Ecosystem Health" is presented to evaluate improvements or declines in ecosystem health across the SEQ Region.

The MBWCP frameworks illustrate a unique integrated approach to water quality management whereby scientific research, community participation, and strategy development are done in parallel with each other. This collaborative effort has resulted in a water quality management strategy, which integrates the socio-economic and ecological values of the waterways, and has led to significant cost savings by providing a clear focus on initiatives required to achieve the Healthy Waterways vision.