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case study 7: south east queensland healthy waterways partnership

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introduction

South-east Queensland's marine systems support large populations of dugongs and turtles, migratory wading birds and major recreational and commercial fisheries. Stretching from the Queensland-New South Wales border, north to Noosa and west to the Great Dividing Range, the region occupies 22,672 square kilometres and includes 15 major river catchments (see [Figure 1](#)). More than 2.5 million people live within 50 kilometres of the coast.

Moreton Bay is a marine park and is listed as a wetland of international significance under the Ramsar Convention.

These natural systems have undergone profound modifications since European settlement. The river estuaries are now highly turbid and the lower Brisbane River does not currently meet national standards for primary contact activities such as swimming. The major river flows have been highly regulated through dams and weirs.

The agricultural districts contribute significantly to the economy and rely on good quality water supplies and soil protection to maintain viable yields.

pollution issues

In the early 1990s it became apparent that projected population increases over the next 30 years could seriously impact further on the waterways and catchments in South-east Queensland. Nutrients (particularly nitrogen), fine sediments and toxicants (pesticides and heavy metals) had already been identified as significant environmental problems.

The projected 1 million population increase will require an estimated 575,000 new dwellings by 2026. As population increases, the waste, sediment, nutrients and other pollutants entering waterways increase, natural waterway flows are modified or halted, and natural habitat decreases.

Even with the significant improvements in controlling point and diffuse source nutrient inputs over the last five years, the rapidly increasing population will lead to increasing pressures that will degrade many waterways. For example, it is predicted that nutrient loads are likely to increase by up to 46 percent by 2026. Initial work has identified a range of social and economic impacts resulting from factors such as increased health risks, loss of income, reduced recreation and tourism opportunities, and increased water treatment costs.

Figure 1: South East Queensland Region



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management context

Since the mid-1970s public concerns about declining water quality had been articulated. However, it was only in the 1990s that a coordinated approach to addressing this decline began. The Brisbane River Management Group started in 1993, extended to include all South East Queensland (SEQ) waterways with the development of the 2001 SEQ Regional Water Quality Management Strategy (SEQRWQMS) and resulted in the formation in 2002 of the Moreton Bay Waterways and Catchments Partnership, now called SEQ Healthy Waterways Partnership, to implement SEQRWQMS.

seq healthy waterways strategy

The SEQ Healthy Waterways Partnership is now preparing the SEQ Healthy Waterways Strategy (SEQ HWS) incorporating the Moreton Bay Water Quality Improvement Plan.

The Strategy builds upon SEQRWQMS 2001, which in turn, built on both the Brisbane River Management Plan (1997) and the Stage 2 work of the Brisbane River and Moreton Bay Wastewater Management Study (1998). SEQRWQMS 2001 was based on the National Water Quality Management Strategy (and embedded in the Queensland *Environmental Protection (Water) Policy 1997*), and provided a means for coordinating the development and implementation of management actions to deal with water quality and ecosystem health impacts on SEQ waterways.

SEQRWQMS 2001 detailed 72 management actions ranging from local to regional, with timeframes of up to ten years. At March 2005, 20 actions had been completed, 41 were in progress and 11 had either not commenced or were unable to be reported on. Some actions have been carried forward into the SEQ HWS; others have been modified in the light of new information.

The SEQ HWS covers the whole of South East Queensland. It deals with aquatic ecosystem health and water quality issues, and contains measures to avoid or ameliorate the impacts of human activities on aquatic ecosystems.

The SEQ HWS recognises the close link between water supply and water quality. It will depend on, and be closely linked with, the statutory water resource plans being developed for the Gold Coast, Logan-Albert and Moreton regions. Through collaboration and reciprocal representation on key bodies the SEQ HWS has been integrated with the SEQ Regional Water Supply Strategy. Overall, the SEQ HWS will complement natural resource management plans and provide a framework within which organisations such as local governments can develop and implement healthy waterways strategies.

The Partnership's Vision is:

"By 2020, our waterways and catchments will be healthy ecosystems supporting the livelihoods and lifestyles of people in South East Queensland, and will be managed through collaboration between community, government and industry."

The Partnership uses two decision support tools, a catchment routing model (the Environment Management Support System) and a receiving water quality model to predict future water quality scenarios for Moreton Bay in 2026. Based on these predictions management targets have been identified. Achievement of these targets would ensure maintenance of the ecosystem health of Moreton Bay in 2026.

The setting of targets (or quantifiable objectives) as a 'goal post' for management is critical in the development of water quality improvement plans and natural resource management plans. The approach to develop the SEQ HWS can be summarised in three steps:

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1. Examine environmental values, water quality issues and water quality objectives for Moreton Bay and the waterways of SEQ.
2. Estimate sustainable pollutant loads (via modelling) that will allow water quality objectives to be achieved and maintained.
3. Determine in consultation with stakeholders the management and support measures and control actions required to ensure agreed pollutant loads are met.

Experience from SEQRWQMS 2001 indicated that a more multi-dimensional approach to strategy development and management will be more effective.

For example:

- An *issue-based approach* is needed to deal with problems that are common across large parts of the region;
- An *area-based focus*, either across the whole of SEQ or in some "special case" sub-areas may be needed in some circumstances; and
- the success of issues-based and area-based actions needs to be "*enabled*" by development and operation of decision-support and monitoring systems, and communications, education and motivation.

point source issues

In 2001, a core strategy of the SEQRWQMS was to encourage stakeholders to upgrade treatment facilities at government-managed sewage treatment plants (STPs) as well as major industrial treatment plants in South East Queensland. Approximately \$300 million has been invested in upgrading treatment plants. By the end of 2006 the amount of nitrogen discharged from STPs will be 44 per cent of pre-2001 discharges.

The *Point Source Management Action Plan* aims to reduce the loads of key pollutants entering waterways from point sources, while taking opportunities where appropriate to reuse treated water. The target for 2020 is 100 per cent reuse of wastewater discharges and minimal levels of key pollutants, while increasing understanding of wastewater management.

diffuse source issues

There will be significant diffuse source pollution from the increased population. Modelling indicates that diffuse source pollution from roads, stormwater run-off and buildings will increase by 63 per cent for sediment, 55 per cent for nitrogen and 67 per cent for phosphorous over the next 20 years.

Currently, in excess of 315,000 tonnes of sediment are discharged to Moreton Bay each year, from gullies and channel erosion, with some from broadacre runoff. Predictive modelling shows the gross sediment load will grow to approximately 370,000 tonnes per year from all sources by 2026, with a five per cent increase in rural sediment projected. Other modelling studies indicate that a significant proportion of rural diffuse pollution originates in a few catchments and these and other studies have pinpointed the likely sources in those catchments. The SEQ HWS includes plans to address diffuse sources of pollution.

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water sensitive urban design (including stormwater management)

Water Sensitive Urban Design promotes the integration of stormwater, water supply and sewage management at the development scale to protect ecological processes and water quality, while minimizing sewage discharges and the demand for reticulated water.

For future urban and urban infill area development, the target is that by 2008 *achieve minimum performance standards or design objectives for WSUD for 100 per cent of all development in SEQ.*

The target for existing urban areas is that by 2011 *achieve minimum WSUD performance standards or design objectives across 100 per cent of existing urban areas.*

The objective is to reduce loads of Total Suspended Solids by a minimum of 80 per cent; Total Phosphorus by a minimum of 60 per cent; Total Nitrogen by a minimum of 45 per cent compared with untreated stormwater.

rural diffuse source pollution management

The SEQ HWS incorporates a range of approaches to addressing rural diffuse sources depending on whether the source is hill slope or gully, on-farm or in-stream, private or public land. Protection and conservation of waterways and catchments currently in good condition is a priority. The recommended management outcome for rural lands is a 50 per cent reduction in sediment loads by 2026.

monitoring, evaluation and reporting

Critical to the success of the investment in South East Queensland to date has been the development of a monitoring program, ongoing investment in science and decision support tools, and a commitment to communicate the results of these programs.

ecosystem health monitoring program

The Ecosystem Health Monitoring Program (EHMP) delivers a cost-effective and integrated regional assessment of ambient ecosystem health of SEQ waterways and Moreton Bay, under a "catchment to coast" approach. This is achieved by assessing water quality trends, using a suite of biological, physical and chemical indicators of ecosystem health. A total of 375 sites in freshwater and estuarine/marine environments are currently monitored regularly. The EHMP provides an understanding of the cause and effect of management actions, and provides the receiving water quality monitoring required by EPA licensing.

EHMP products include the annual *EHMP Report Card*, annual *Technical Report*, *EHMP newsletters*, EHMP website, monthly estuarine/marine data reports and a centralised EHMP database.

decision support tools

Environmental Management Support Systems (EMSS) have been developed for the region and for the majority of catchments in SEQ. The EMSS model daily runoff and pollutant export loads, flow through the river network, and the effects of major water storages. They are designed to evaluate the relative efficacy of various catchment management actions aimed at improving water quality.

Receiving Water Quality Models have been developed for the various river estuaries and Moreton Bay. This combination forms an integrated modelling framework supporting decision making.

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communication, education and motivation

Extensive and ongoing communication and education activity are required to ensure the stakeholders embrace the actions needed to reach the Healthy Waterways vision. The Healthy Waterways Campaign is a hallmark of the Partnership's activities.

Any change requires communication so stakeholders understand the need, support it and assist with its implementation. Barriers to changes need to be addressed, whilst simultaneously reinforcing the benefits of new procedures and behaviours, effectively cementing new norms.

The rapid population growth is continually bringing new stakeholders to the area, requiring repeat communications. Whilst some stakeholders will hear the communication, understand what they can do and be motivated to act, newly arrived stakeholders (whether individuals or businesses) will not have been exposed to the history and significance of waterways issues in the region. Communication, education, consultation are ongoing to reach the constant stream of new stakeholders.