Australian Government

Australia's National Programme of Action for the Protection of the Marine Environment from Land-Based Activities

October 2006

case study 17: townsville - thuringowa creek to coral program

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executive summary

Over the past 10 years, Townsville City Council has introduced a total water cycle management and ecosystem-based approach to its management of water quality and water utilities. The introduction reflects a whole-of-Council approach involving engineering (water, wastewater, & drainage) and environmental departments. The program addresses the reduction of pollution reaching the marine environment as well as economic objectives in water supply and wastewater treatment and management of stormwater. The multimillion dollar wastewater management and water recycling upgrade within Council is being managed via an innovative contract alliance known as *Water Matters*. This approach incorporates both community and environmental partnership. The management approach is driven internally through a partnership between Engineering Services and Environmental Management Services.

Externally the approach is consolidated through the *Creek to Coral* program, a high level strategic partnership, and co-funding with the Queensland Environment Protection Agency and the neighbouring Thuringowa City which shares the catchments that drain through Townsville waterways.

All partnerships are based on community involvement, consideration of the marine environment, efficient safe use of water and collaboration and coordination within and between government, community and private sector units involved in all aspects of the water cycle.

Environmental factors have been significant drivers in the move to total water cycle management because Townsville City is adjacent to the Great Barrier Reef Marine Park and includes the suburb of Magnetic Island, which is part of the Great Barrier Reef World Heritage Area. The development of the *Water Matters* and *Creek to Coral* programs involved local liaison with the Great Barrier Reef Marine Park Authority and a benchmark agreement on load based licensing.

Recently the Creek to Coral program received responsibility and Commonwealth funding of $1.3 million for administering and implementing a *Coastal Catchment Initiative* (CCI) Water Quality Improvement Program across Townsville and Thuringowa. This new element of *Creek to Coral* is targeted particularly at water quality and environment issues and complements the existing approach.

introduction

The Townsville Region has a spatial area of 3735.6 square kilometres. The City of Townsville comprises an area of 1868.7 square kilometres and the City of Thuringowa covers the remaining area of 1866.9 square kilometres (see Figure 1). The populations of Townsville and Thuringowa cities are approximately 96,000 and 55,000 respectively. The Townsville Region is part of the dry tropical region of North east Australia characterized by variable summer monsoon rains and long periods with little rainfall.

European settlement started in the mid 19th century when Ross Creek was selected as the site for a port to service the developing agricultural industry of north Queensland. The construction of rail links and mineral discoveries such as the inland goldfields of Ravenswood and Charters Towers provided the basis for continuing growth and consolidation of the city. Throughout the 20th century Townsville and the adjacent Thuringowa developed to become a major administrative, commercial, educational, military and research centre for north Queensland.

Pioneering development and growth of the city led to local pollution of the Ross Creek and River. The early water-related concerns related to adequate storage and supply of fresh water in dry periods and flooding of low lying areas in high rainfall periods. As was common until quite recently sewage processing was designed to address human health risks; while mangroves, wetlands and estuarine areas were seen as areas for land-fill and reclamation.

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Figure 1: Satellite Image of Townsville Region.

pollution issues

The major pollution issues of concern in the context of the Great Barrier Reef World Heritage Area and the consequent Federal/State Reef Water Quality Management Plan are nutrients and sediments. Other issues of interest include chemicals, heavy metals and hydrocarbons. Heavy wet season rains generate lowland saturation and run-off from soil and built surfaces that flush out high nutrient and sediment loads accumulated during dry seasons and sequences of years with low rainfall. These emerge as visible low salinity high sediment plumes. For large rivers such as the Burdekin, major flood plumes can extend across the Great Barrier Reef lagoon to reach the main reef chain of the Great Barrier Reef. The flood plume impacts of the Ross River are experienced mainly in the in-shore fringing coral reefs and marine habitats of Cleveland Bay.

management context

During and since the 1990s several changes have affected the water management approach of Townsville and the adjacent Thuringowa City Councils. At the national level, several inquiries addressed issues of sustainability of water supply, linkages of water quality to riverine and coastal ecosystems and the need for total water cycle management. At the local level this has been reflected in growing public awareness of the importance of water cycle management in terms of quality of life and environment. Research has demonstrated the impacts of land sourced pollution on the Great Barrier Reef World Heritage Area. National and Queensland policy and legislation have imposed requirements for higher water quality standards than had applied before or were generally required in areas that do not abut World Heritage properties.

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For Townsville City Council, responding to these requirements has involved developing an integrated approach to address water usage from harvest to advanced waste treatment as well as managing pollution and flood water flows from storm-water run-off from roads, urban areas, land use, and wetlands. In the classic organisational structure there was limited interaction with occasional sectoral differences between the business units responsible for water supply and waste treatment, engineering and works including roads, urban infrastructure and flood management, and environment.

The point source discharges are managed through licensed urban and industrial wastewater treatment plants.

The *Creek to Coral* program came through combination of Council's stormwater and wastewater (total water cycle) management and an ecological and water quality approach led by the Environment Management Services. The program is infrastructure-based and has substantial community involvement in education and volunteer programs. The program has developed further through co-funding of a high level strategic partnership between Townsville and Thuringowa with Queensland EPA for *Creek to Coral* and recently received $1.3 million funding under the Australian Government's *Coastal Catchments Initiative* to address marine environmental objectives through a Water Quality Improvement Program as part of the Reef Water Quality Protection Plan.

Key elements of the *Creek to Coral* Program that go beyond conventional local government practice are scientific monitoring and reporting of environmental indicators involving professional scientists and trained community volunteers; adoption of water sensitive urban design; GIS mapping and management planning for the catchment; and a code of practice for stormwater management.

The major issues addressed by the *Creek to Coral* program are polluted stormwater runoff into Ross River and Ross Creek from the cities of Townsville and Thuringowa; management of wetlands; and community education and involvement to build understanding and "ownership" of the management issues.

Key program elements include:

- Protecting and enhancing natural values, biodiversity and ecosystem services of the coastal catchments, flood plains and wetlands;
- Linking impact on the marine environment for land based activities;
- Ensuring sustainable management of stormwater and effluent by promoting and innovating beyond best practice techniques to manage catchments and waterways;
- Focussing on the benefits and opportunities of total water cycle management including conservation of the regional water resource from rainfall to outfall;
- Utilising skill, expertise and resources within the Townsville and Thuringowa catchments and encouraging local community ownership, assistance and support for its management; and
- Preparing coastal catchment and waterway health indicators for the production of a report card based on scientific research and monitoring.