



CRC for
Water Sensitive Cities



Program B: Water Sensitive Urbanism | Project B1.2 | Project duration: July 2013 - July 2017

Catchment-scale landscape planning for water sensitive city-regions in an age of climate change

Overview

Cities are not isolated entities, they exist within, connect with and ultimately depend on landscapes which extend far beyond their actual built edge or boundary. A water sensitive city (WSC) needs to be understood in relation to its broader catchment, the different landscape types and the various local needs for water that occur within that catchment. The need for food production and industry such as resource extraction must be balanced with the needs of the natural environment, urbanisation and related activities such as outdoor recreation.

The future of these landscapes, recognising all of these values, needs to be planned in an integrated manner with a whole-of-catchment perspective to sustainably manage Australia's projected population growth and build resilient communities.

The project aims to develop an integrated approach to whole-of-catchment planning and management that is capable of linking the ecology and hydrology of cities to their region whilst accommodating urban and peri-urban growth adapted to a changing climate. It will explore alternative institutional arrangements for catchment planning and management from a landscape-scale perspective.

Key outcomes

This project will provide state, regional and local planning agencies, including Catchment Management Authorities (CMA) and natural resource management bodies (NRMB), with a comprehensive whole-of-catchment landscape planning process and methodology

which acknowledges the critical dependency that cities have on secure and high-quality water sources. It will deliver policy guidelines for state, regional and local planning agencies for the management of growth at the city-region or catchment level. The outcomes of the project will also inform CMA and NRMB in the preparation of their catchment action plans and investment strategies.

Ultimately, the growth scenarios developed for the city-region or catchment areas will assist decision-makers in dealing with the high degree of uncertainty and inconclusive science associated with climate change and population growth by providing insight into plausible futures and a "test bed" to assess their policies. These outcomes will create a more balanced and scientific approach to statutory and non-statutory land use planning and decision-making.

This project will also provide:

- a comparative assessment of the statutory and non-statutory planning systems for the case study regions
- a strategic assessment of the future of each case study region in terms of water security
- an account of the diverse sources, uses and functions of water in the city-region and an understanding of the trade-offs between them
- guidelines and training packages for statutory and non-statutory planners mainly in the land use, environmental, landscape and natural resource management fields.

Early insights into existing planning frameworks

To inform the development of a city-regional scale urban metabolism framework, a comparative document analysis of the case study regions of South East Queensland and the metropolitan areas of Melbourne and Perth was completed. It examined the institutional arrangements and regulatory frameworks for water management with specific reference to hydrological and environmental connections, resilience, future changes and uncertainties, planning, and institutional arrangements and governance.

Surface and groundwater hydrological and environmental connections were often identified, especially the impacts from urbanisation on water quality. The impact of climate change was widely acknowledged although there were very few specific references to climate change adaptation. However, the need for a resilient water sector was highlighted with specific reference to climate extremes of floods and droughts.

The analysis also showed that future uncertainties facing the water sector included the impacts of climate change, extreme weather events and population growth. The effective role of statutory planning mechanisms in securing water quality and improved stormwater management was recognised. However there were calls for better integration between water and urban planning to maximise the potential of land use planning in aiding the management of water resources.

Recognition of the need for water planning to consider broader regional and landscape scales was rare. More common was the acknowledgement of the role of open space in urban areas as an aid to stormwater management, water harvesting and flood mitigation and the provision of amenity and recreational opportunities.

The analysis highlighted the need for improved vertical and horizontal integration, and cooperation and adaptive management approaches to better manage and plan for water resources.



Project design

The initial phase of the project consists of a comparison of the different statutory and non-statutory planning systems that exist in South East Queensland and the Perth and Melbourne metropolitan areas. A second phase will determine essential components of an integrated greenspace framework that incorporates natural ecosystems and green infrastructure, and links cities to their regional catchments regarding their critical water-related connections.

The next phase will involve the development of a city-region/whole-of-catchment systems model that is capable of addressing the various landscape values at that scale. This will include a city-region metabolism framework that can be employed to evaluate regional water budgets across multiple landscape types aimed at ensuring regional water security. Following that, alternative urban growth scenarios for each case study region, incorporating climate science, will be developed. The last phase will see knowledge synthesis and the development of future scenarios for rapidly growing metropolitan regions that adopt a whole-of-landscape outlook that links cities ecologically and hydrologically to their regions.



Outlook

In three years, the project will have developed an urban metabolism framework capable of incorporation into a conceptual model of a city-region or whole-of-catchment system. This conceptual model will assist in evaluating regional water budgets and urban growth scenarios along with methods for incorporating ecological and water science into statutory planning processes.

The next steps are to determine the essential components of an integrated greenspace framework incorporating natural ecosystems and green infrastructure and linking the city with its region, which will form part of the conceptual model.



About the Cooperative Research Centre for Water Sensitive Cities

The Cooperative Research Centre for Water Sensitive Cities (CRCWSC) brings together interdisciplinary research expertise and thought-leadership from Australia and the world to address current urban water management challenges facing our cities and regions. In collaboration with over 80 research, government and industry partners, it develops and synthesises knowledge into powerful tools and influences key players aiming to achieve sustainable, resilient and liveable water sensitive cities.



Further information

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