

## Sending water south not a simple proposition

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**Southern Australia is struggling with increasing uncertainty, and rising costs, of water supply. While the idea of capturing water from the annually flooded north and sending it south has gained much traction recently, competing environmental and other uses complicate the issue.**



Credit: Peter Thorburn. CSIRO

Between October and April each year an average of about 1 million GL (gigalitres) of water falls on the northern Australia landscape. That is enough to cover Tasmania with 15 m of water or to fill a bucket the size of the MCG to a height of 40 000 km – one-tenth the distance to the moon. The annual deluge of ‘the wet’ makes the north’s rivers bulge and many lowland areas become completely inundated by floodwaters. To many eyes the water sits there doing nothing, and is eventually wasted by just running out to sea. This makes the prospect of sending the water to an increasingly parched south an attractive proposition.

But a closer look shows that the north’s waters are already supporting a wide range of uses in northern Australia. Access to water is critical to the vibrant mining, tourism, fishing, agricultural and cultural economies that collectively contribute more than \$15 billion to the regional economy. Water is also critical to the maintenance of many of the north’s iconic landscape features and habitats, which support about half the nation’s animal species and its inhabitants’ primary recreational activity – fishing.



Credit: Willem van Aken. CSIRO

Removing water from the northern landscape, or consuming it differently in northern Australia, will impact on these existing uses and users of water. Understanding how water contributes to existing uses is critical to assessing the opportunity for alternative uses of water, and development prospects in northern Australia.

With this in mind, the Australian Government convened the Northern Australia Land and Water Taskforce to examine ‘new opportunities for economic development in the north based on water availability and sustainability ... [and to report on] ... the potential impact of new development on water balance and quality, the environment, existing water users and the broader community.’

To help inform the Taskforce’s deliberations and recommendations, CSIRO coordinated a comprehensive scientific review, bringing together more than 70 scientific experts from over 20 institutions, as well as conducting extensive consultation across northern Australia. In addition to productivity and cost factors, the review also addressed equity in decision making, the health of land, river and sea environments, Indigenous livelihoods, water security, infrastructure and social wellbeing.

For the first time, the amount and timing of water inputs and outputs for both surface and groundwater across all of northern Australia was assessed. This has provided a clear picture of not only how much water is there, but how much is used (and for what purposes) and how much might be available for alternative uses.

A separate analysis of soil and water resources was conducted and then the soil and water analyses were brought together to explore agricultural development potential. The question of whether soil or water is the most limiting factor in agricultural development was explored. It turns out that water is far more limiting than first thought and that, if more water were available, large areas of soil (more than 16 million ha) may be able to support agriculture.

Key findings documented in the resulting report, the Northern Australia Land and Water Science Review, include:

1. of the 1 million gigalitres falling in the northern catchments each year, about 65 per cent evaporates or transpires from soils, plants and water bodies. Evapotranspiration plays a vital role in the water cycle; it enables plants to grow and it maintains the north’s humid climate. Evapotranspiration is driven by the sun, and there aren’t practicable options for stopping it. We have to accept that at least 65 per cent of the north’s water is not available for alternative uses.
2. only about 20 per cent of the north’s water flows through streams to the ocean. These flows ‘do work’ both in rivers, where they provide sites for tourism, recreation and habitat, and in estuaries and oceans, where they provide the conditions for fish to breed and grow. Reducing stream flow may reduce the amenity and habitat value of rivers and is known to reduce the value of the commercial fishery catch.
3. about 15 per cent of the north’s annual water budget becomes groundwater. This water keeps landscapes, people and industries alive and operating in the dry season, which lasts for six months or more each year. Groundwater sustains many rivers and waterholes, and remote communities in the north draw most of their drinking water from this vital resource. Groundwater use needs to be planned to ensure that the broader consequences of

extraction are clearly understood.

The Science Review estimated that there may be about 600 GL of groundwater across northern Australia that could support new consumptive use. This groundwater occurs in aquifers that ‘fill and spill’ on an annual cycle, which makes it simpler to manage the impacts of extraction much more easily than for ‘slow’ regional aquifers.

If made available for consumptive use, this volume could irrigate between 60 000–120 000 ha of new intensive agriculture, double to quadruple the current area. While this would not make the north the nation’s salad bowl, it would make it capable of producing a side-salad to go with the mixed grill provided by its nine million head cattle industry.



Credit: CSIRO

Unlocking the potential of irrigated agriculture would boost the north’s economy. If the industry realised its potential to double in size, it could create an additional 1400 jobs and would add about \$180 million to the economy. The impact on the beef industry may be even greater.

While the Science Review was able to identify opportunities of this type, its most important role was to outline a framework to help communities and industries balance competing demands for water. The proposed framework is designed to ensure that water use by one sector does not unduly limit the potential of other water uses, including industry use, and maintenance of healthy habitats, cultures and communities.

The chance for a cooperative approach across all the jurisdictions has been boosted by an agreement between the Federal Government and all three northern state and territory governments to prepare a joint response to the Taskforce recommendations, and to use the proposed Taskforce framework for this response. It is welcome recognition that the region’s future will be best served by a collaboration across all the jurisdictions.

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