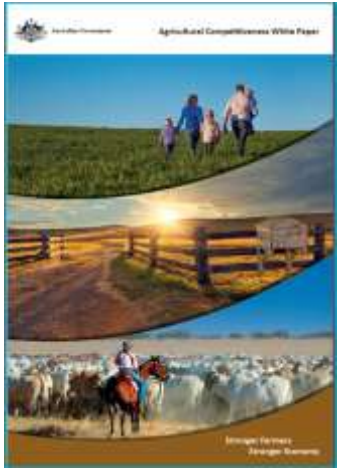
Northern Australian Water Resource Assessments: science to help inform policy, regulatory and investment decisions

Chris Chilcott| 3rd March 2020

Outline

1. What we did
2. The headline findings
3. More information
4. Products and links

Why



NBN'S MULTI-BILLION-DOLLAR VISION OF A FOOD BOWL TO FEED ASIA

Six dams planned for north

'Malcolm-close' Nats leader wants tap-rates removed

EXCLUSIVE 'It could create up to 2845 jobs around Darwin'

OUR WATER JOBS BOOM

ASHLEY MANCKANS

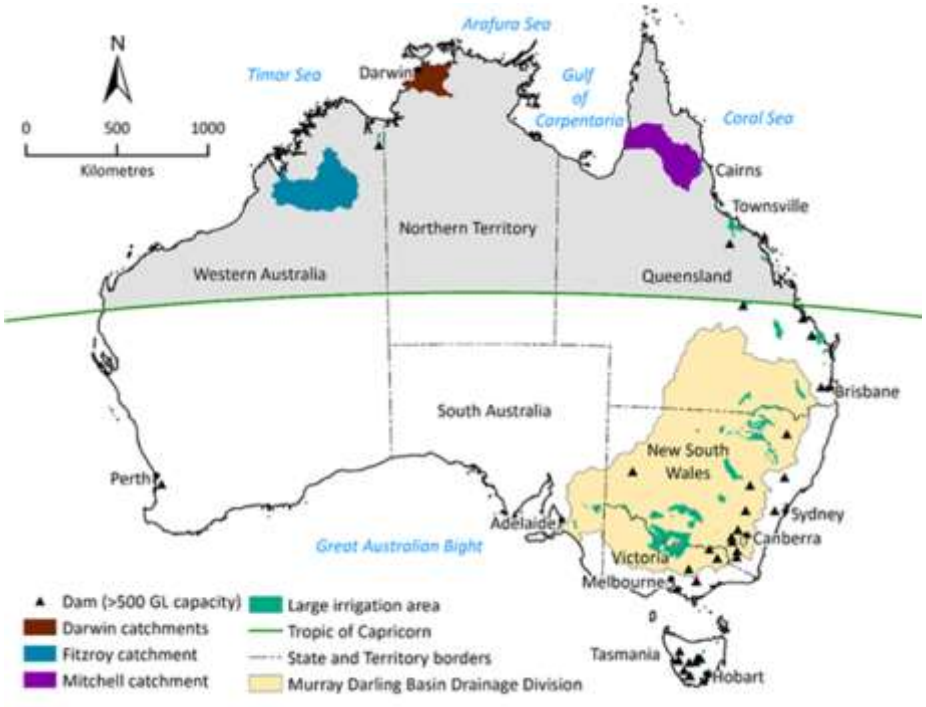
THOUSANDS of new jobs could be created around greater Darwin, injecting billions into the Territory economy, on the back of a new water study to be released today.

Deputy Prime Minister Michael McCormack will release the Northern Australia Water Resource Assessment conducted by CSIRO, Australia's science agency. The work reflects the potential for 30 (0.0) hectares of crops such as cotton, and sugar cane which could potentially generate more than 15,000 jobs and $5.5 billion in Northern Australia.

▶ P5: FULL STORY

The North Australia Water Resource Assessment

1. Evaluate the soil and water resources
2. Identify and evaluate water capture and storage options
3. Identify and test the commercial viability of irrigated agricultural, aquaculture and other opportunities
4. Assess potential environmental, social and economic impacts and risks of water resource and irrigation development.



What the assessments do not do!

- Do not advocate irrigation development, nor **recommend** one development over another.
- Do not assume any particular development pathway.
- Did not undertake small scale analyses required for specific developments
- Will not replace or change planning and approvals processes.

Why now?

- Annual streamflow under natural conditions

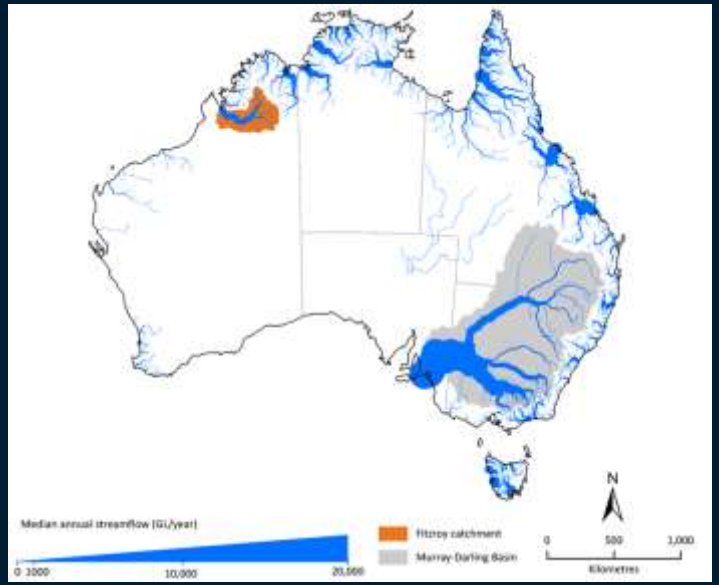
For example

Fitzroy – 9.4 M ha

700 km long

9th Largest river in the north

6600GL ~ 13.2 SH



The results

The headlines- Darwin

- Major dams, offstream storages and groundwater could support up to 90,000 ha of dry season horticulture and mango trees.

- Groundwater based development is possible and would support up to 7800 ha of trickle irrigated vegetable production.

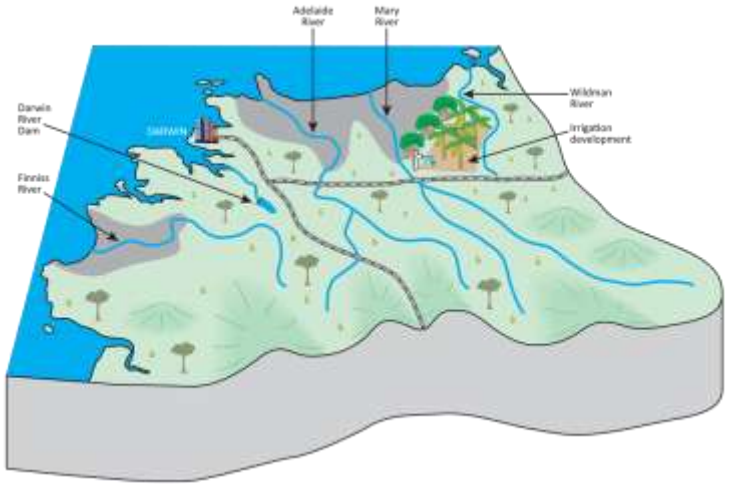
- Upper Adelaide River Dam, is most cost effective dam close to soil suitable for irrigated agriculture. Could provide high security water to Darwin (15 to 30 GL) and enable dry season rice production between 6000 to 9000 ha.

Possible development options

- Development based on extracting 35GL groundwater is possible and would support up to 7800 ha of trickle irrigated vegetable production.

Banana Case Study

- 500 ha banana farm
- $29,700/ha development costs
- Produce 3400 carton per ha, 1.7 M cartons
- IRR of >20% on average price
- Sensitive to transport costs and wholesale markets



The headlines- Fitzroy

- Water harvesting (water pumped into farm dams) could support 160,000 ha of irrigation in 85% of years.
- Independent of surface water, groundwater could support up to 30,000 ha of hay production (<0.5% of catchment).
- Development based on groundwater is the mostly likely initial development pathway (lowest risk, low cost)
- There is considerable opportunity for extracting water (flood harvesting) but carries higher risk and complexity (ie flooding of irrigation infrastructure and paddocks).

Findings

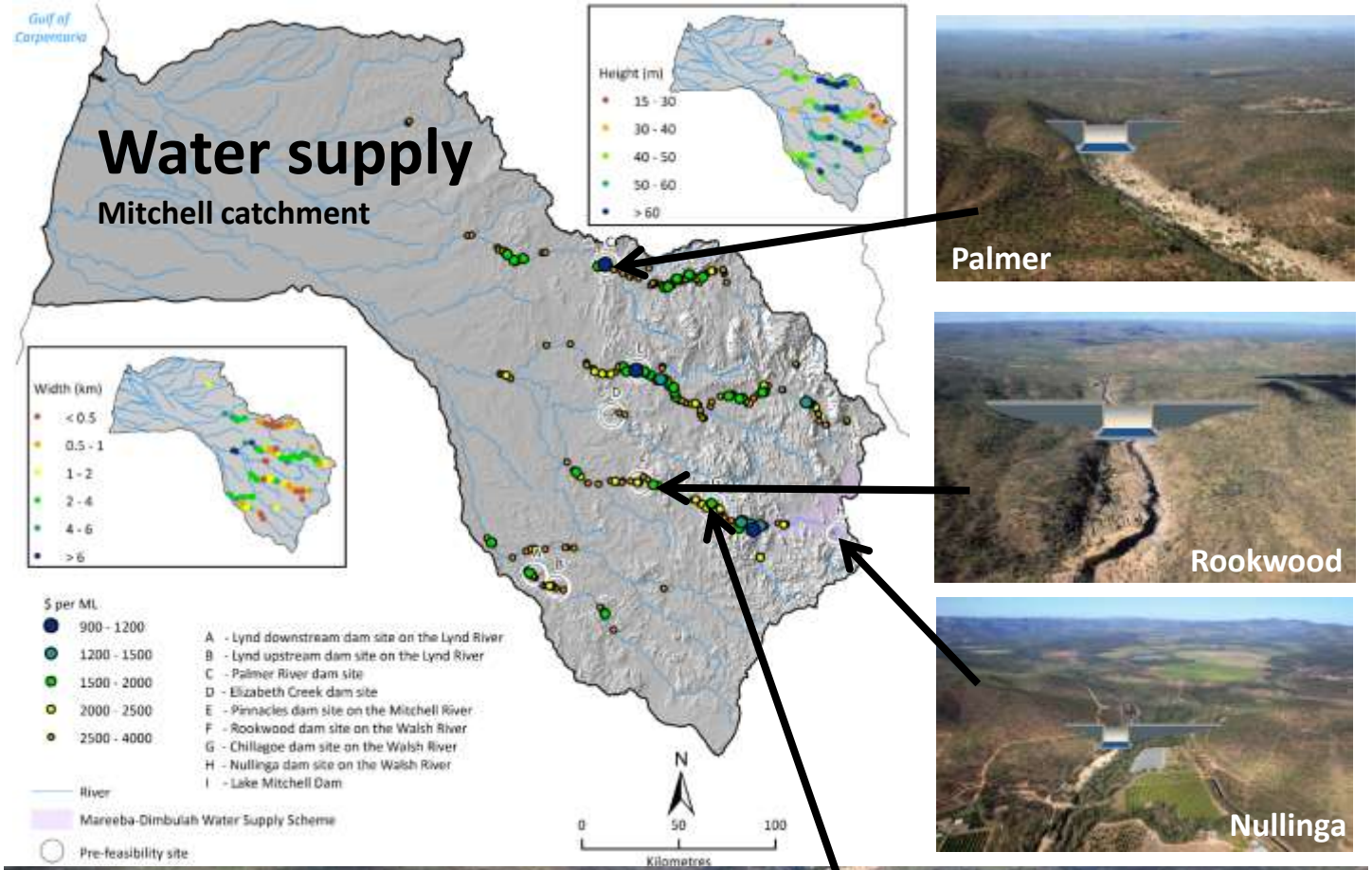
If all opportunities were fully developed, they would occupy less than 3% of the Assessment area.

"There is no single 'best' water solution- Combination of surface and groundwater …. which balances competing demands and is cost effective"

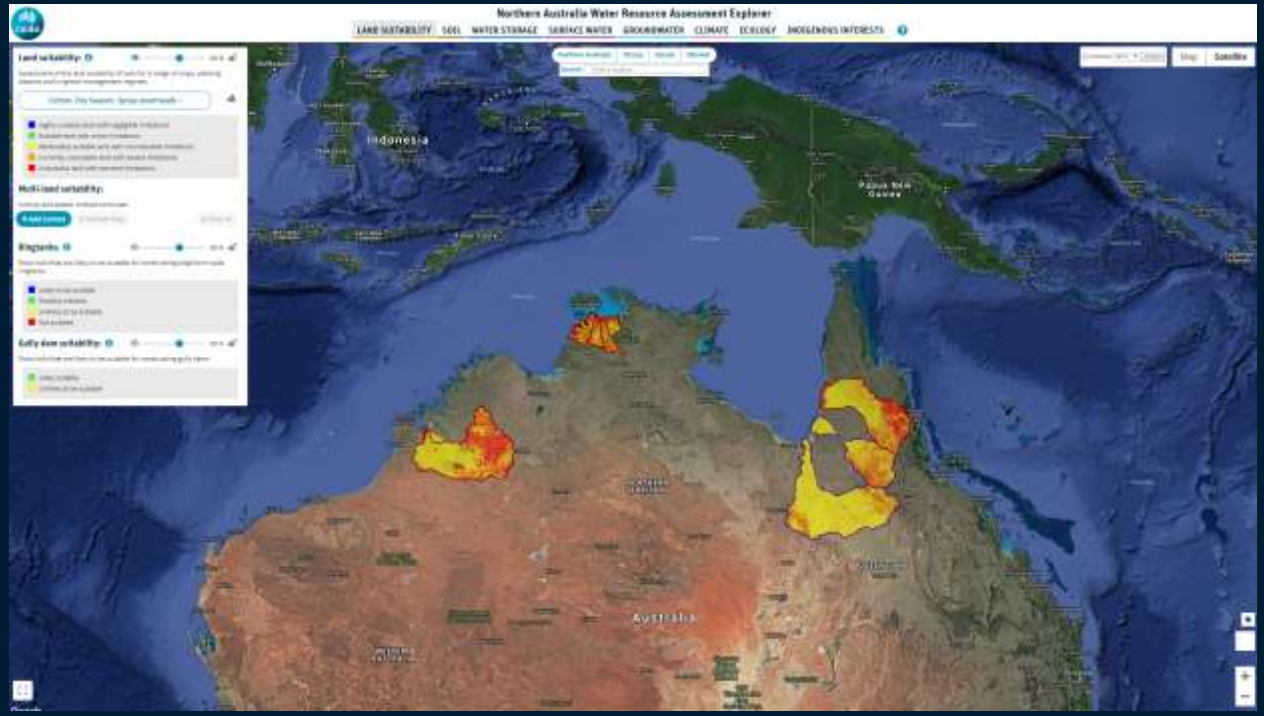
Indigenous people want to be owners, partners and investors in any future development. This reflects their status as the longest-term residents with deep intergenerational ties to the catchments.

Water supply

Mitchell catchment

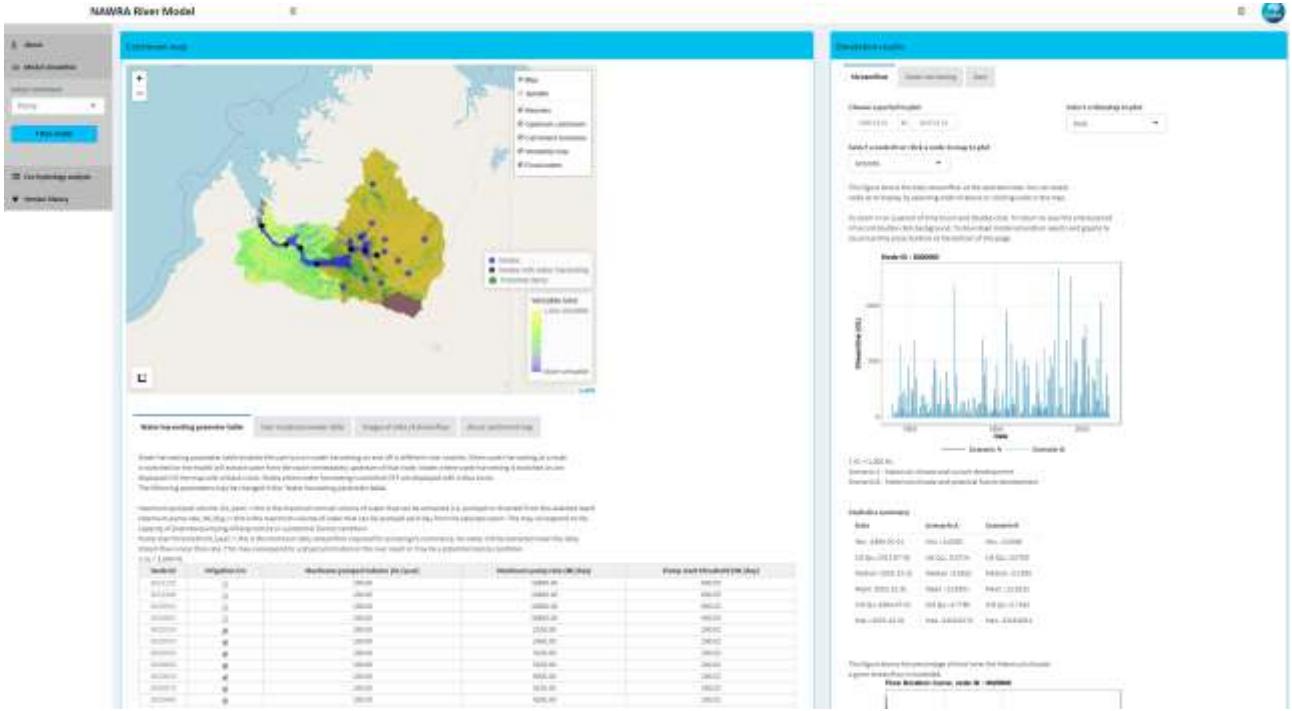


NAWRAexplorer



https://nawra-exp.appspot.com/

NAWRAriver https://nawra-river.shinyapps.io/river/



NAWRA Climate

- https://shiny.csiro.au/nawra-climate-reports/

Northern Australia Water Resource Assessment

Finniss, Adelaide, Mary and Wildman Catchments Cropping Calendar

Surface Water Storage

Major dams at Word Bennet on the Finniss River and upper Adelaide River have potential to enable irrigation at scale in the Darwin catchments. The majority of streamflow in the Darwin catchments cannot be readily captured or stored offstream. Although, it is possible to physically extract 200 GL and 400 GL of water in 85% of years along the Margaret and Mary rivers, respectively, land suitable for the construction of offstream storages is limited.

Water Flow

Widespread flooding occurs on the coastal plains of the Darwin catchments. These floods are slow moving and connect offstream wetlands with the main river channel. Here, water flow is shown using a blue line where thickness is indicative of the volume of flow and flood inundation based on MODIS satellite data.

The Finniss, Adelaide, Mary and Wildman catchments near Darwin in the Northern Territory cover approximately 30,000 km² and flow through extensive coastal and marine flood plains. The catchments have land suitable for trickle-irrigated crops such as mangoes and Asian vegetables as well as smaller areas of land suitable for flood-irrigated crops such as rice.

The agronomic information shown in this cropping calendar is general information only. Few of these crops have been extensively trialled in the catchments and growers should seek their own specialist advice.

Soil Generic Groups

Soil generic groups are a way of regrouping soils with broadly similar properties and management considerations, to be a descriptive communication tool, to be relatable to agricultural potential, and to align to the Australian Soil Classification. The red, brown and yellow loamy soils are highly suited to irrigated agriculture and horticulture. Inland low lying, seasonally wet alluvial plains of the upper Adelaide and Mary rivers are suited to dry-season irrigated agriculture.

Agricultural Versatility

The suitability of 14 selected land management options combining various irrigation methods, crops and season is used to illustrate more versatile land suited to a larger range of enterprises. The most versatile land is the red loamy soils on the elevated plains. Moderately versatile land includes the clayey and seasonally wet soils. Other moderately versatile land includes brown and yellow loamy soils found throughout.

Australia's national science agency, CSIRO, has conducted the most extensive, integrated assessment of northern Australia's agricultural potential.
It's part of the Australian Government's Agricultural Competitiveness White Paper, where more than 100 scientists assessed three priority areas:
The Fitzroy catchment in Western Australia; the Finniss, Adelaide, Mary and Wildman catchments in the Northern Territory; and the Mitchell catchment in Queensland.

To find out more, go to:
www.csiro.au/NAWRA

Thank you

Land And Water
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Australian Government
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Queensland Government

Australia's National Science Agency