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Water resource assessment for the Southern Gulf catchments

A report from the CSIRO Southern Gulf Water Resource
Assessment for the National Water Grid

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The Assessment was guided by two committees:

- i. The Governance Committee: CRC for Northern Australia/James Cook University; CSIRO; National Water Grid (Department of Climate Change, Energy, the Environment and Water); Northern Land Council; NT Department of Environment, Parks and Water Security; NT Department of Industry, Tourism and Trade; Office of Northern Australia; Queensland Department of Agriculture and Fisheries; Queensland Department of Regional Development, Manufacturing and Water
- ii. The Southern Gulf catchments Steering Committee: Amateur Fishermen's Association of the NT; Austral Fisheries; Burketown Shire; Carpentaria Land Council Aboriginal Corporation; Health and Wellbeing Queensland; National Water Grid (Department of Climate Change, Energy, the Environment and Water); Northern Prawn Fisheries; Queensland Department of Agriculture and Fisheries; NT Department of Environment, Parks and Water Security; NT Department of Industry, Tourism and Trade; Office of Northern Australia; Queensland Department of Regional Development, Manufacturing and Water; Southern Gulf NRM

Responsibility for the Assessment's content lies with CSIRO. The Assessment's committees did not have an opportunity to review the Assessment results or outputs prior to their release.

This report was reviewed by Mr Mike Grundy (Independent consultant). Individual chapters were reviewed by Dr Peter Wilson, CSIRO (Chapter 2); Dr Andrew Hoskins, CSIRO (Chapter 3); Dr Brendan Malone, CSIRO (Chapter 4); Dr James Bennett, CSIRO (Chapter 5); Dr Nikki Dumbrell, CSIRO (Chapter 6); Mr Darran King, CSIRO (Chapter 7). The material in this report draws largely from the companion technical reports, which were themselves internally and externally reviewed.

For further acknowledgements, see page xxviii.

Acknowledgement of Country

CSIRO acknowledges the Traditional Owners of the lands, seas and waters of the area that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present.

Photo

Saltwater Arm, a tributary of the Albert River. This view typifies the tidal rivers and estuaries along the southern coast of the Gulf of Carpentaria. Source: Shutterstock

Appendices



Lawn Hill Gorge on Lawn Hill Creek
is a popular tourist attraction

Photo: Manfred Gottschalk – Alamy stock photo

Appendix A

Assessment products

More information about the Southern Gulf Water Resource Assessment can be found at <https://www.csiro.au/southerngulf>. The website provides readers with a communications suite including factsheets, multimedia content, FAQs, reports and links to other related sites, particularly about other research in northern Australia.

In order to meet the requirements specified in the contracted 'Timetable for the Services', the Assessment provided the following key deliverables:

- Technical reports present scientific work at a level of detail sufficient for technical and scientific experts to reproduce the work. Each of the activities of the Assessment has at least one corresponding technical report.
- The catchment report (this report) synthesises key material from the technical reports, providing well-informed but non-scientific readers with the information required to make decisions about the opportunities, costs and benefits associated with water resource development.
- A summary report is provided for a general public audience.
- A factsheet provides key findings for a general public audience.

This appendix lists all such deliverables, plus those jointly delivered for the concurrent Victoria River Water Resource Assessment.

Please cite as they appear.

Methods report

CSIRO (2021) Proposed methods report for the Southern Gulf catchments. A report from the CSIRO Southern Gulf Water Resource Assessment for the National Water Grid Authority. CSIRO, Australia.

Technical reports

Devlin K (2023) Pump stations for flood harvesting or irrigation downstream of a storage dam. A technical report from the CSIRO Victoria and Southern Gulf Water Resource Assessments for the National Water Grid. CSIRO, Australia.

Devlin K (2024) Conceptual arrangements and costings of hypothetical irrigation developments in the Victoria and Southern Gulf catchments. A technical report from the CSIRO Victoria and Southern Gulf Water Resource Assessments for the National Water Grid. CSIRO, Australia.

Gibbs M, Hughes J and Yang A (2024) River model calibration for the Southern Gulf catchments. A technical report from the CSIRO Southern Gulf Water Resource Assessment for the National Water Grid. CSIRO, Australia.

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- Rider Levett Bucknall (2024) Water infrastructure-related costs for the Victoria and Southern Gulf catchments. A technical report from the CSIRO Victoria River and Southern Gulf Water Resource Assessments for the National Water Grid. CSIRO Australia

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Vanderbyl T (2021) Southern Gulf: Queensland water plans and settings. A technical report from the CSIRO Southern Gulf Water Resource Assessment for the National Water Grid. CSIRO, Australia.

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Catchment report

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Summary report

CSIRO (2024) The Southern Gulf Water Resource Assessment. A summary report from the CSIRO Southern Gulf Water Resource Assessment for the National Water Grid. CSIRO, Australia.

Factsheet on key findings

CSIRO (2024) The Southern Gulf Water Resource Assessment. Key messages of reports to the CSIRO Southern Gulf Water Resource Assessment for the National Water Grid. CSIRO, Australia.

Appendix B

Shortened forms

SHORT FORM	FULL FORM
ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum, Assessment and Reporting Authority
AE	adult equivalent
AEP	annual exceedance probability
AHD	Australian Height Datum
ALA	<i>Aboriginal Land Act 1991</i> (Qld)
ALRA	<i>Aboriginal Land Rights (Northern Territory) Act 1976</i> (Cth)
AMTD	adopted middle thread distance
ANZECC	Australian and New Zealand Environment and Conservation Council
APSIM	Agricultural Production Systems SIMulator
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ASC	Australian Soil Classification
AWC	available water capacity
AWRC	Australian Water Resources Council
BCR	benefit-to-cost ratio
BOM	Bureau of Meteorology
CBA	cost–benefit analysis
CBR	cost-to-benefit ratio
CLA	Cambrian Limestone Aquifer
CLCAC	Carpentaria Land Council Aboriginal Corporation
CMB	chloride mass balance
CMIP	Coupled Model Intercomparison Project
CV	coefficient of variation
DENR	Department of Environment and Natural Resources (NT)
DIDO	drive-in drive-out
DIWA	Directory of Important Wetlands in Australia
DN	Nominal Diameter
DNRME	Department of Natural Resources, Mines and Energy (Queensland)
DOGIT	deeds of grant in trust
EBITDA	earnings before interest, taxes, depreciation and amortisation
EGM96	Earth Gravitational Model 1996

SHORT FORM	FULL FORM
EIS	Environmental Impact Statement
ENSO	El Niño–Southern Oscillation
EOS	end of system
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
FIFO	fly-in fly-out
FSL	full supply level
FTE	full-time equivalent
GAB	Great Artesian Basin
GABORA	Great Artesian Basin and Other Regional Aquifers
GCM	global climate model
GCM-PS	global climate model – pattern scaled
GDE	groundwater-dependent ecosystem
GGNTAC	Gangalidda and Garawa Native Title Aboriginal Corporation
GM	gross margin
GRA	Gilbert River Aquifer
GRF	Gilbert River Formation
GVAP	gross value of agricultural production
GVIAP	gross value of irrigated agricultural production
HSD	health service district
IEO	Index of Education and Occupation
IER	Index of Economic Resources
ILUA	Indigenous Land Use Agreement
IPA	Indigenous Protected Area
IPCC	Intergovernmental Panel on Climate Change
IRR	internal rate of return
IRSD	Index of Relative Socio-Economic Disadvantage
IUCN	International Union for Conservation of Nature
JORC	Joint Ore Reserves Committee
LGA	local government area
MAR	managed aquifer recharge
MODIS	Moderate Resolution Imaging Spectroradiometer
NAWRA	Northern Australia Water Resource Assessment
n.d.	not dated
NEM	National Electricity Market
NGMA	Nicholson Groundwater Management Area
NPF	Northern Prawn Fishery
NPV	net present value

SHORT FORM	FULL FORM
NRM	Natural Resource Management
NT	Northern Territory
NWPS	North West Power System
O&M	annual operation and maintenance
PAW	plant available water
PAWC	plant available water capacity
PBC	Prescribed Body Corporate
PE	potential evaporation
PET	potential evapotranspiration
PHN	primary health network
QSNTS	Queensland South Native Title Services
RCC	roller compacted concrete
RNTBC	Registered Native Title Body Corporate
RoNA	rest of northern Australia
SA	South Australia
SA2	Statistical Area Level 2
SEIFA	Socio-Economic Indexes for Areas
SGG	soil generic group
SILO	Scientific Information for Land Owners
SOI	Southern Oscillation Index
SSP	Shared Socio-economic Pathway
SWAN	Surface Water Ambient Water Quality Network
SWL	standing water level
TDS	total dissolved solids
TraNSIT	Transport Network Strategic Investment Tool
UNESCO	United Nations Educational, Scientific and Cultural Organization
WA	Western Australia

Units

UNIT	DESCRIPTION
\$	dollars
%	per_cent
c	cents
cm	centimetre
d	day
dS	decisiemens
DS	dry season
GL	gigalitre
ha	hectare
kg	kilogram
km	kilometre
km ²	square kilometre
kPa	kilopascal
kV	kilovolt
kW	kilowatt
L	litre
m	metre
m ³	cubic metre
mASL	metres above sea level
mBGL	metres below ground level
mEGM86	metres (Earth Gravitational Model 1986)
mEGM96	metres (Earth Gravitational Model 1996)
mg	milligram
ML	megalitre
mm	millimetre
MWh	megawatt hour
s	second
t	metric tonne
y	year
°C	degrees Celsius

Appendix C

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