HYDROGEOLOGY OF AUSTRALIA

1987

Scale 1 : 5 000 000

0 200 400 600

KILOMETRES

Simple Conic Projection with Standard Parallels 18°S and 36°S

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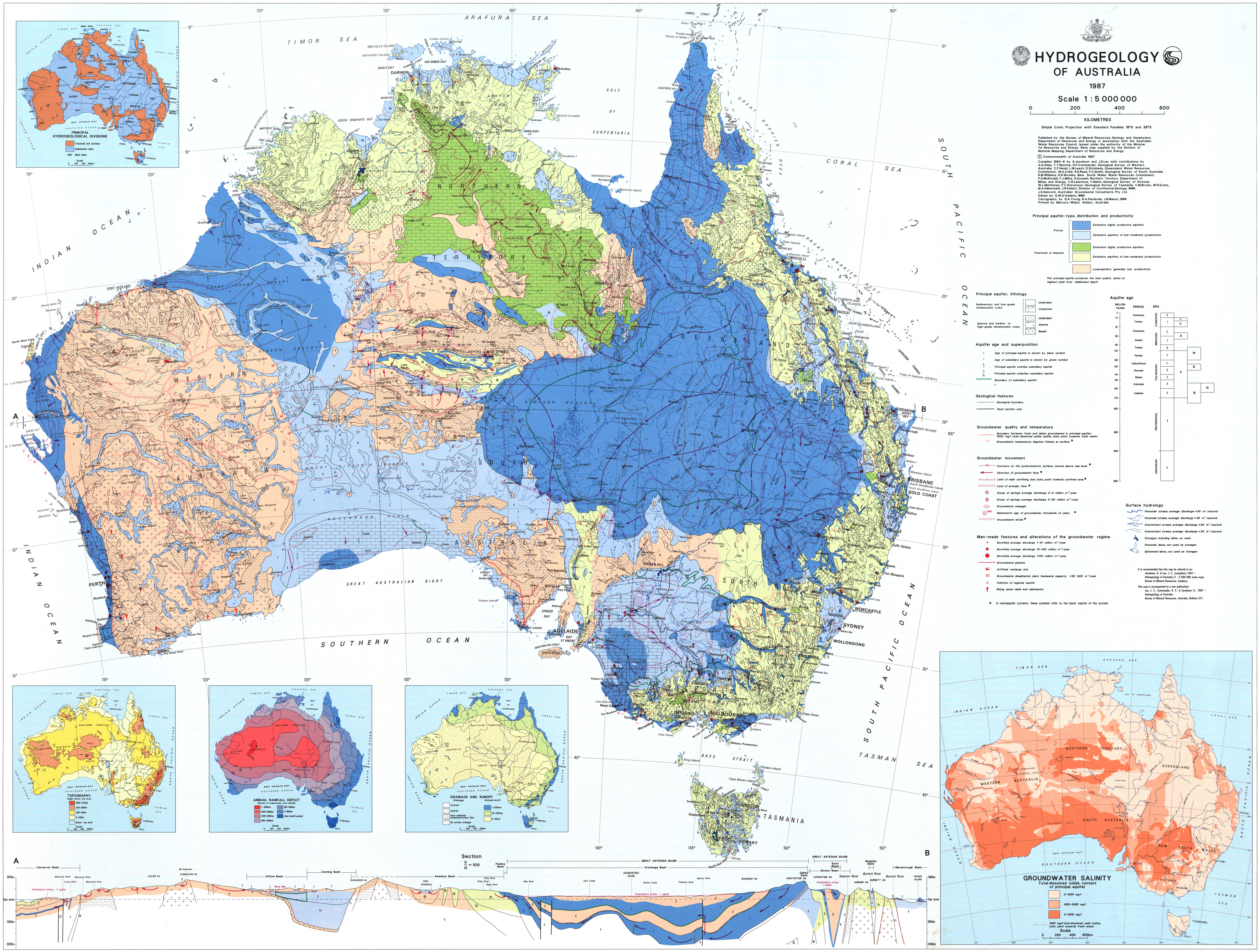
AUSTRALIA
ARAFURA SEA
TIMOR SEA
CORAL SEA
SOUTH PACIFIC OCEAN
INDIAN OCEAN
SOUTHERN OCEAN
TASMAN SEA
GULF OF CARPENTARIA
GREAT AUSTRALIAN BIGHT
GREAT BARRIER REEF
TORRES STRAIT
BASS STRAIT
NORTHERN TERRITORY
QUEENSLAND
WESTERN AUSTRALIA
SOUTH AUSTRALIA
NEW SOUTH WALES
VICTORIA
TASMANIA
DARWIN
TOWNSVILLE
MACKAY
ROCKHAMPTON
BUNDABERG
BRISBANE
GOLD COAST
NEWCASTLE
SYDNEY
WOLLONGONG
CANBERRA
MELBOURNE
GEELONG
HOBART
ADELAIDE
BROKEN HILL
WHYALLA
PORT HEDLAND
PERTH
SIMPSON DESERT
GREAT SANDY DESERT
GIBSON DESERT
GREAT VICTORIA DESERT
NULLARBOR PLAIN
A
B
10°
15°
20°
25°
30°
35°
40°
115°
120°
125°
130°
135°
140°
145°
150°
155°

Principal aquifer; type, distribution and productivity

Porous
- 🟦 Extensive highly productive aquifers
- 🟦 Extensive aquifers of low–moderate productivity

Fractured or fissured
- 🟩 Extensive highly productive aquifers
- 🟨 Extensive aquifers of low–moderate productivity

- 🟧 Local aquifers, generally low productivity

The principal aquifer produces the best quality water at highest yield from shallowest depth

Principal aquifer; lithology

Sedimentary and low–grade metamorphic rocks
- Undivided
- Limestone

Igneous and medium to high–grade metamorphic rocks
- Undivided
- Granite
- Basalt

Aquifer age and superposition

T Age of principal aquifer is shown by black symbol
J Age of subsidiary aquifer is shown by green symbol
$\frac{T}{J}$ Principal aquifer overlies subsidiary aquifer
$\frac{Tl}{Te}$ Principal aquifer underlies subsidiary aquifer
Boundary of subsidiary aquifer

Geological features

Geological boundary
Fault, section only

Groundwater quality and temperature

Boundary between fresh and saline groundwater in principal aquifer; 1500 mg/l total dissolved solids isoline, ticks point towards fresh water
· 85 Groundwater temperature, degrees Celsius at surface *

Groundwater movement

400 Contours on the potentiometric surface, metres above sea level *
Direction of groundwater flow *
Limit of main confining bed, ticks point towards confined area *
Limit of artesian flow *
Group of springs, average discharge 0–3 million m³/year
Group of springs, average discharge 3–30 million m³/year
Groundwater seepage
640 Radiometric age of groundwater, thousands of years *
○○○○○○ Groundwater divide *

Man–made features and alterations of the groundwater regime

● Borefield, average discharge 1–10 million m³/year
● Borefield, average discharge 10–100 million m³/year
● Borefield, average discharge >100 million m³/year
Groundwater pipeline
Artificial recharge site
Groundwater desalination plant, feedwater capacity >50 000 m³/year
△ Pollution of regional aquifer
↑ Rising water table and salinisation

* In multiaquifer systems, these symbols refer to the basal aquifer of the system

Aquifer age

MILLION YEARS
PERIOD
ERA
0
1.8
65
136
195
235
300
345
410
435
500
570
1000
1880
2500
3600
Quaternary
Tertiary
Cretaceous
Jurassic
Triassic
Permian
Carboniferous
Devonian
Silurian
Ordovician
Cambrian
CAINOZOIC
MESOZOIC
PALAEOZOIC
PROTEROZOIC
ARCHAEAN
Q
T
Tl
Te
K
JK
J
R
P
PR
C
DC
D
Pz
S
O
Є
ꝐO
ЄO
Ꝑ
A

Surface hydrology

Perennial stream, average discharge >30 m³/second
Perennial stream, average discharge <30 m³/second
Intermittent stream, average discharge >30 m³/second
Intermittent stream, average discharge <30 m³/second
Storages, including lakes so used
Perennial lakes, not used as storages
Ephemeral lakes, not used as storages

It is recommended that this map be referred to as:
Jacobson, G. & Lau, J. E. (compilers) 1987 –
Hydrogeology of Australia (1 : 5 000 000 scale map).
Bureau of Mineral Resources, Canberra.

This map is accompanied by a text publication:
Lau, J. E., Commander, D. P., & Jacobson, G., 1987 –
Hydrogeology of Australia.
Bureau of Mineral Resources, Australia, Bulletin 227.

PRINCIPAL HYDROGEOLOGICAL DIVISIONS

- 🟧 Fractured rock province
- 🟦 Sedimentary basin
- WISO Basin name

Scale 0 200 400 600km

GREAT ARTESIAN BASIN
CANNING
OFFICER
EUCLA
AMADEUS
GEORGINA
CARPENTARIA
KARUMBA
BOWEN
SURAT
ERONANGA
MURRAY
OTWAY
GIPPSLAND
BASS
BONAPARTE
ARAFURA
WISO
PEDIRKA

TOPOGRAPHY

Height above sea level
- 1000–2228m
- 500–1000m
- 200–500m
- 0–200m
- Below sea level

Scale 0 200 400 600km

ANNUAL RAINFALL DEFICIT

(Excess of evaporation over rainfall)
- > 4000mm
- 3200–4000mm
- 2400–3200mm
- 1600–2400mm
- 800–1600mm
- 0–800mm
- 0mm (rainfall surplus)

Scale 0 200 400 600km

DRAINAGE AND RUNOFF

Drainage
- External
- Internal
- Unco-ordinated occasional surface flow
- No surface drainage

Annual runoff
- > 250mm
- 25–250mm
- 0–25mm

Scale 0 200 400 600km

Section

$\frac{V}{H} = 100$

A
B
Carnarvon Basin
Officer Basin
Canning Basin
Amadeus Basin
Pedirka Basin
GREAT ARTESIAN BASIN
Eromanga Basin
Galilee Basin
Bowen Basin
Surat Basin
Mulgildie Basin
Maryborough Basin
Gascoyne River
Lyons River
Mt Essendon
CARNARVON RA
COLLIER RA
RAWLINSON RA
Lake Amadeus
Finke River
Hugh River
Hale River
Eyre Creek
DIAMANTINA RIVER
Farrars Creek
Thomson River
Barcoo River
WARREGO RA
CHESTERTON RA
EXPEDITION RA
Dawson River
AUBURN RA
Burnett River
BURNETT RA
FRASER ISLAND
Potentiometric surface – K aquifer
Potentiometric surface – J aquifer
Water table
1000m
Sea level
1000m
2000m

GROUNDWATER SALINITY

Total dissolved solids content of principal aquifer
- 0–1500 mg/l
- 1500–5000 mg/l
- > 5000 mg/l

1500 mg/l total dissolved solid isoline, ticks point towards fresh water

Scale 0 200 400 600km