



Government of **Western Australia**
Department of **Water**

New challenges for urban development

Water resource management in a changing climate



Outline of Presentation

- Management drivers – current state
- The demand
- Management options
- Solutions?



Management drivers – current state



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Drivers and challenges: *Climate*

**Northwest
- wetter**



**Southwest -
drier**



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Drivers and challenges: population



**Doubling of WA
population by
2058 to 4.3m
people**

Current population 2.36m





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Drivers and challenges: Mining



**7% increase in
2010**



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Drivers and challenges



**4% per year
growth in 2010**



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Drivers and challenges





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Drivers and challenges



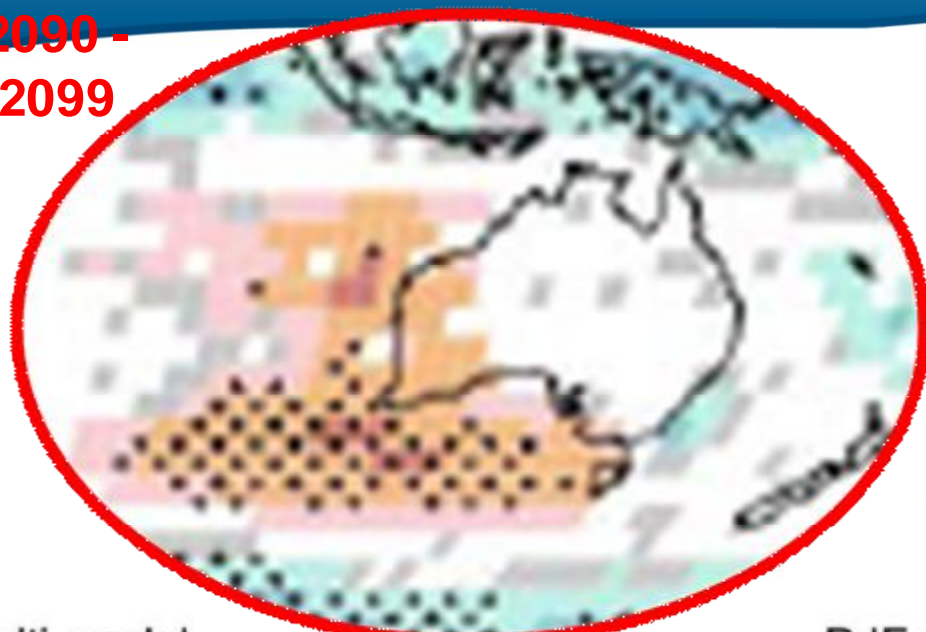
Environmental Management



Drivers and challenges



2090 -
2099



1980 -
1999



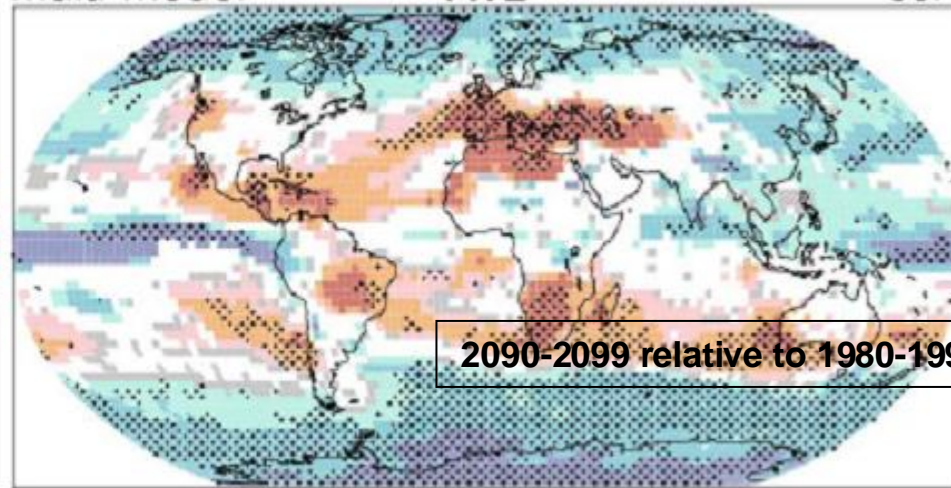
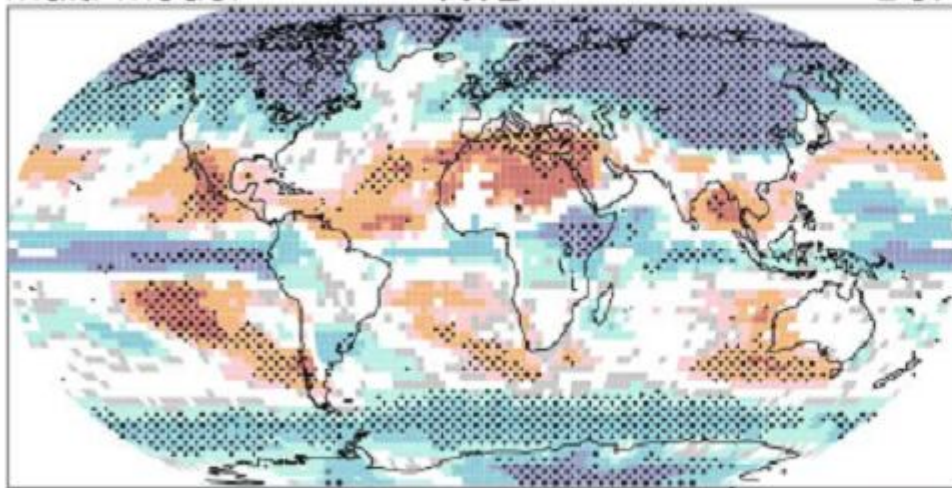
multi-model

ATB

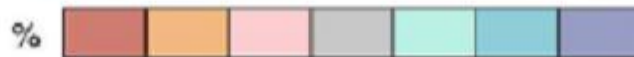
DJF multi-model

ATB

JJA



2090-2099 relative to 1980-1999



(white areas – less than 66% of models agree on the sign of change)
(stippled areas – more than 90% of models agree on the sign of change)



Rainfall deciles last 12 months

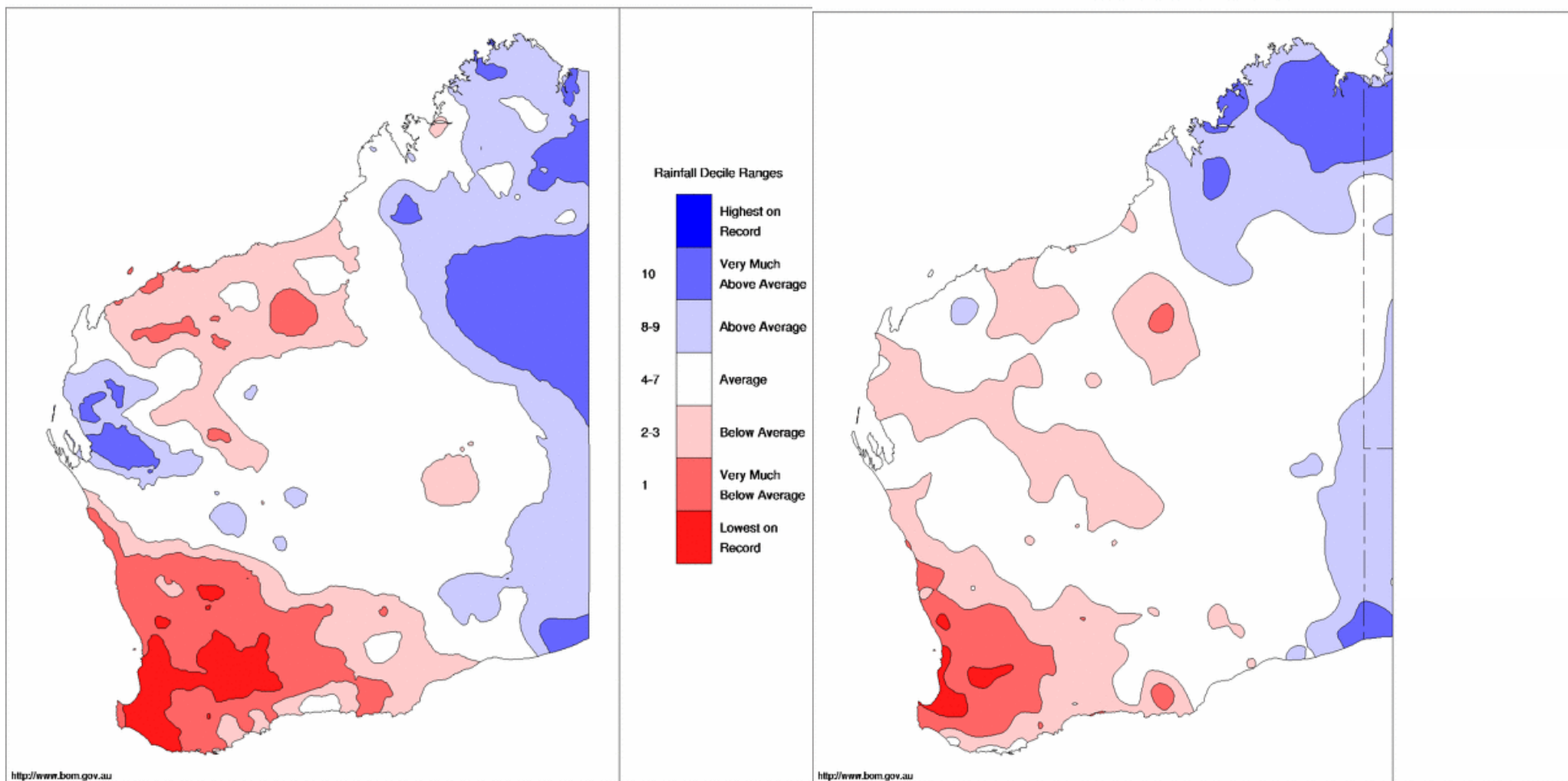
Western Australian Rainfall Deciles 1 January to 31 December 2010

Distribution Based on Gridded Data
Product of the National Climate Centre

Rainfall deciles last 36 months

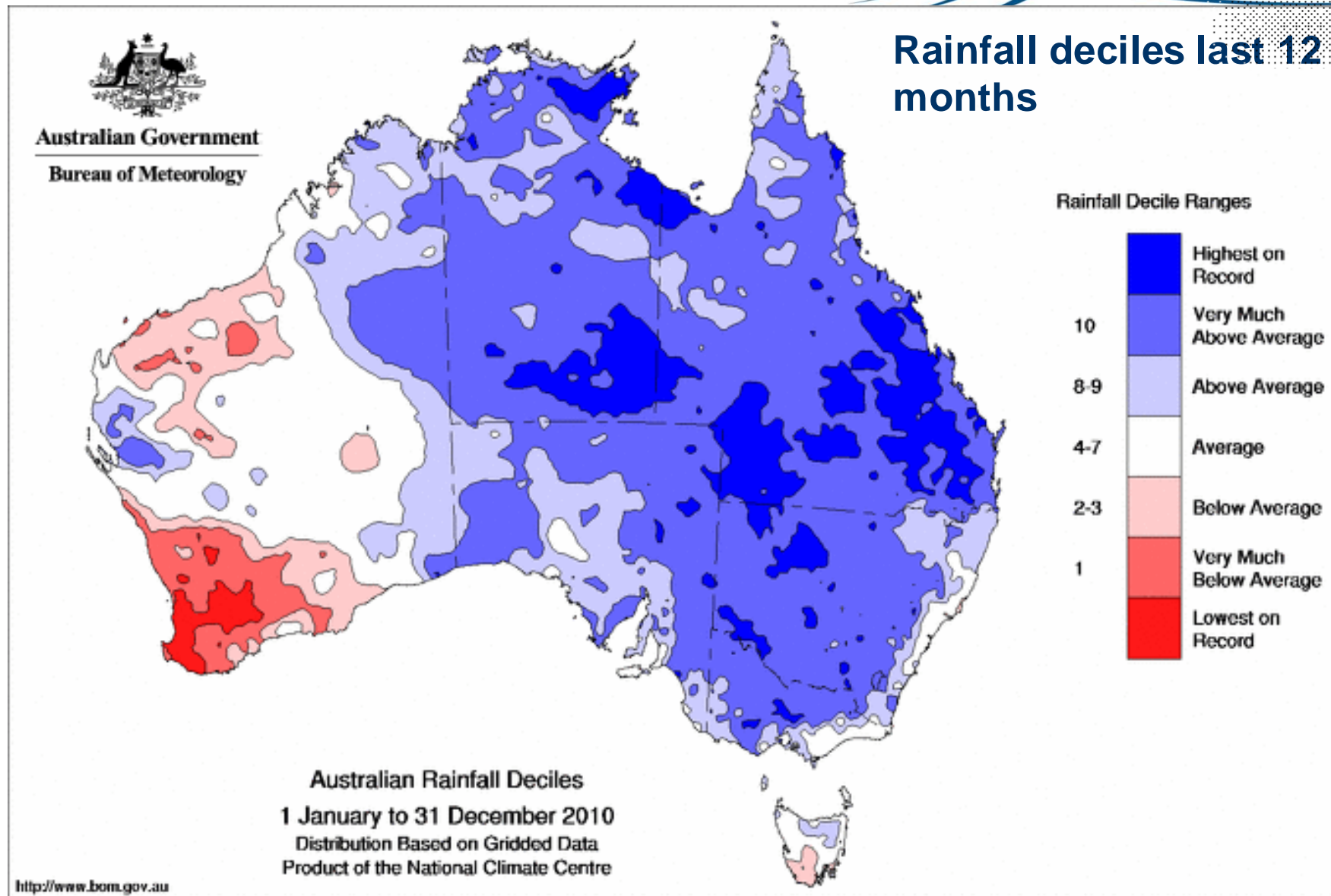
Western Australian Rainfall Deciles 1 November 2007 to 31 October 2010

Distribution Based on Gridded Data
Product of the National Climate Centre





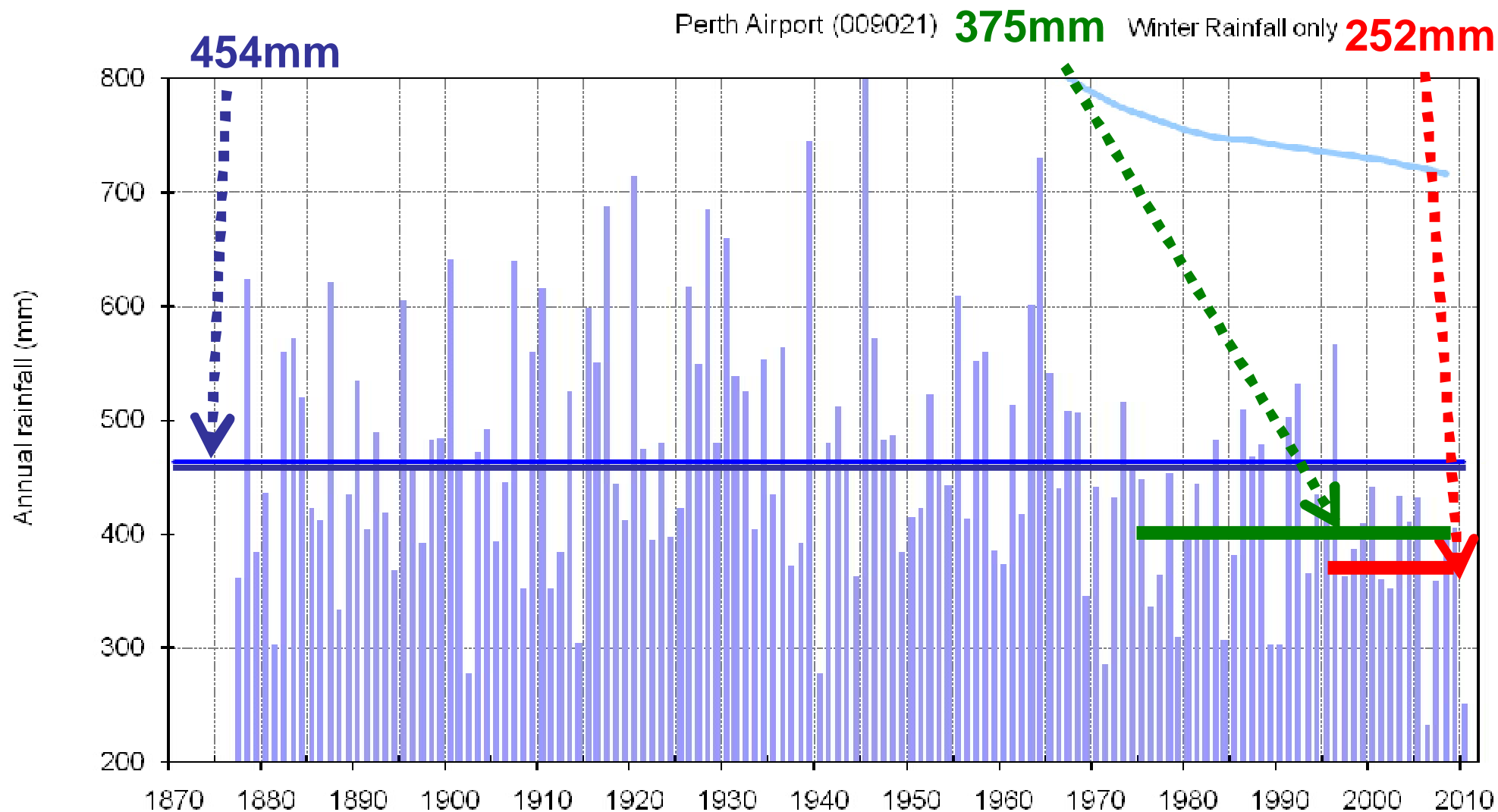
Australia current situation





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Drying Climate





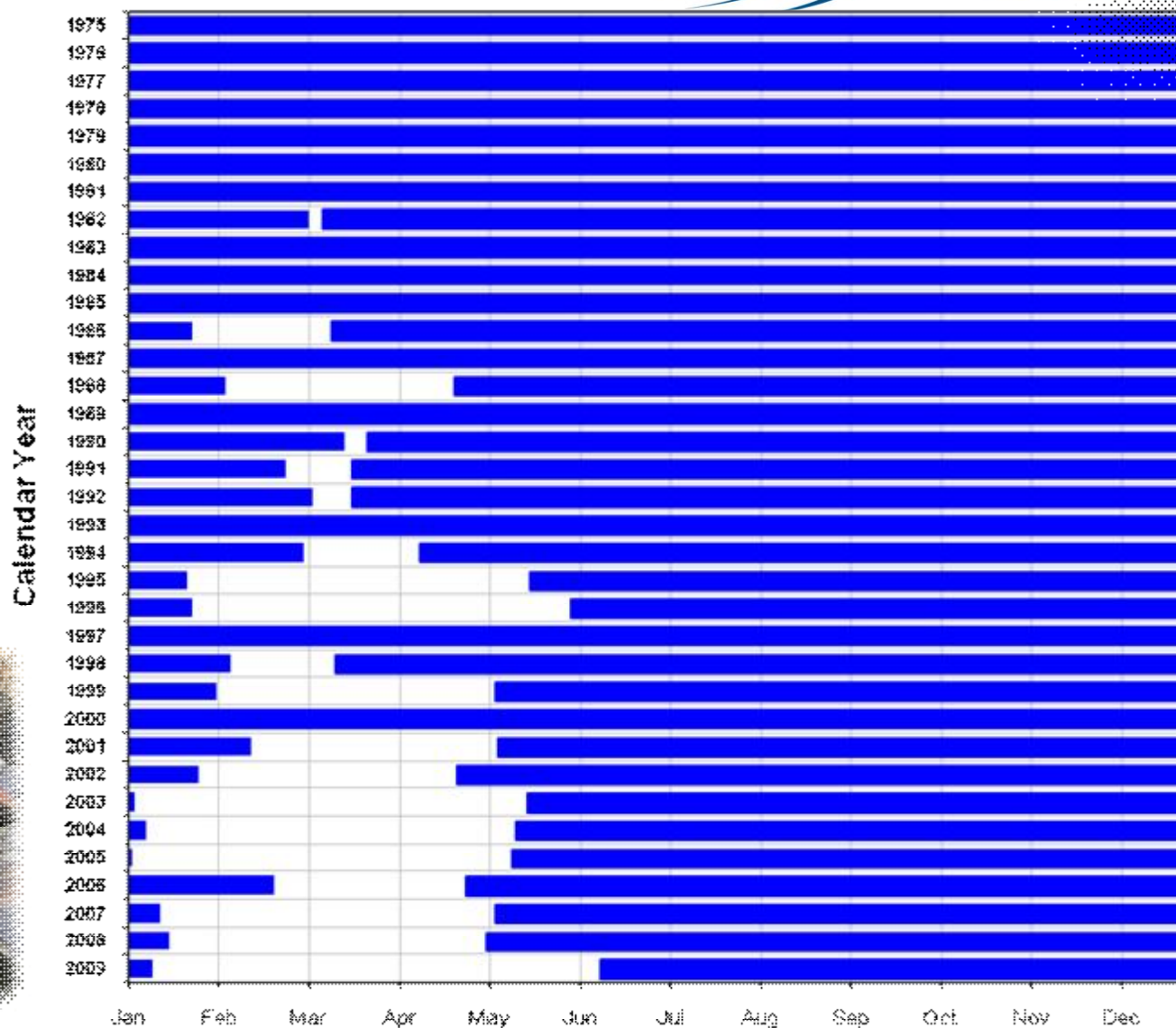
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Drying Climate



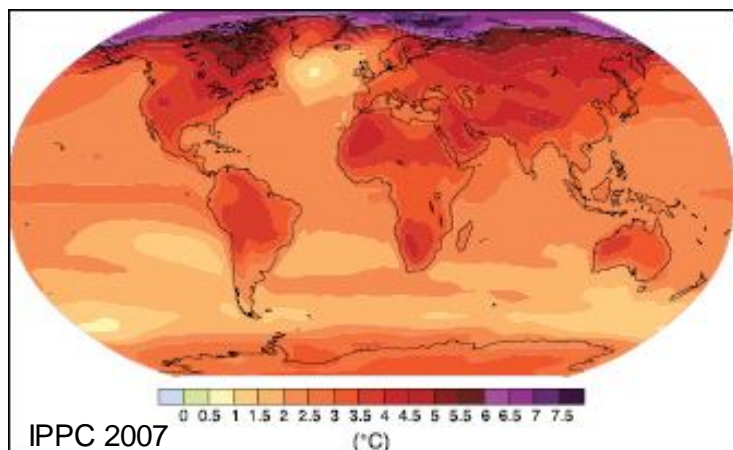
610001: Flow Duration

Margret River flow duration





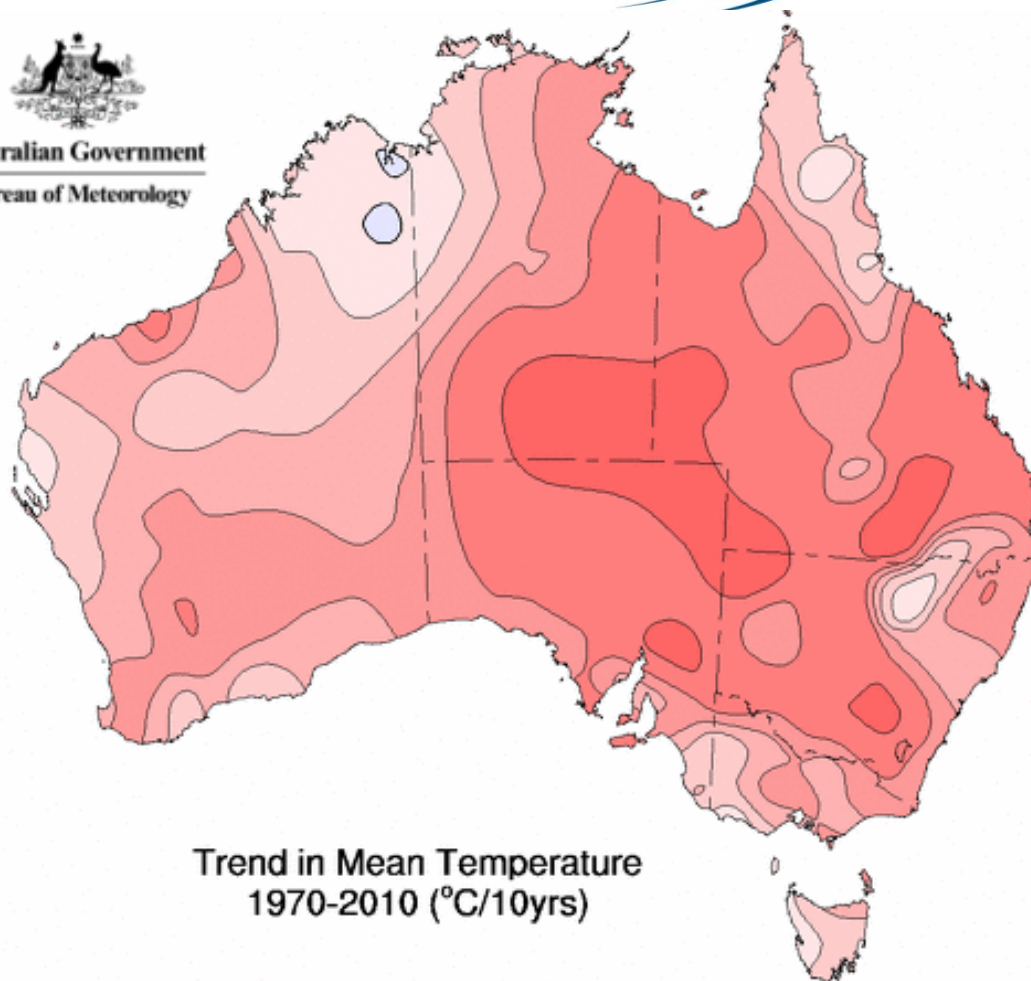
Temperature



IPPC 2007

(°C)

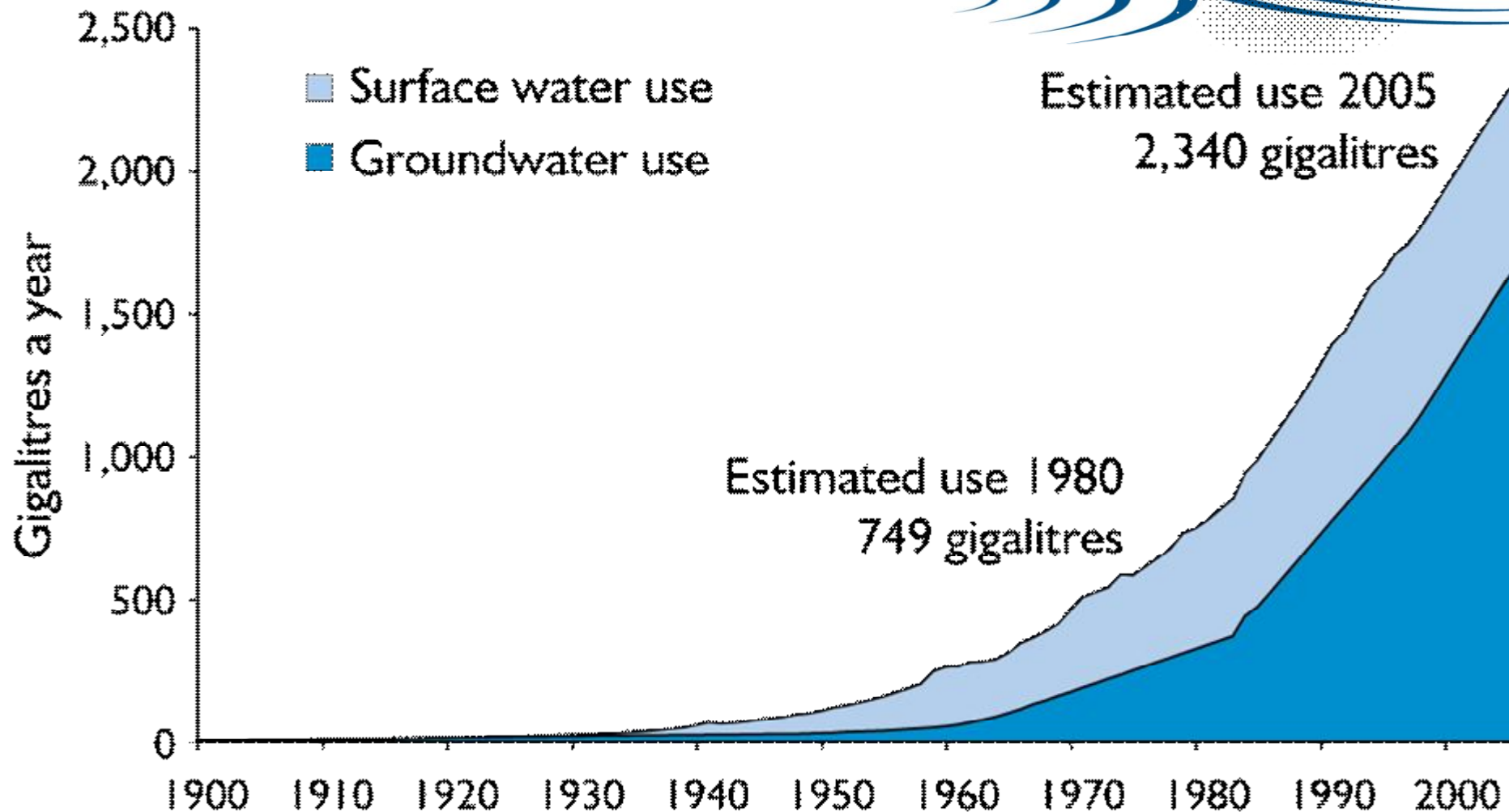

Australian Government
Bureau of Meteorology



Trend in Mean Temperature
1970-2010 (°C/10yrs)



Demand

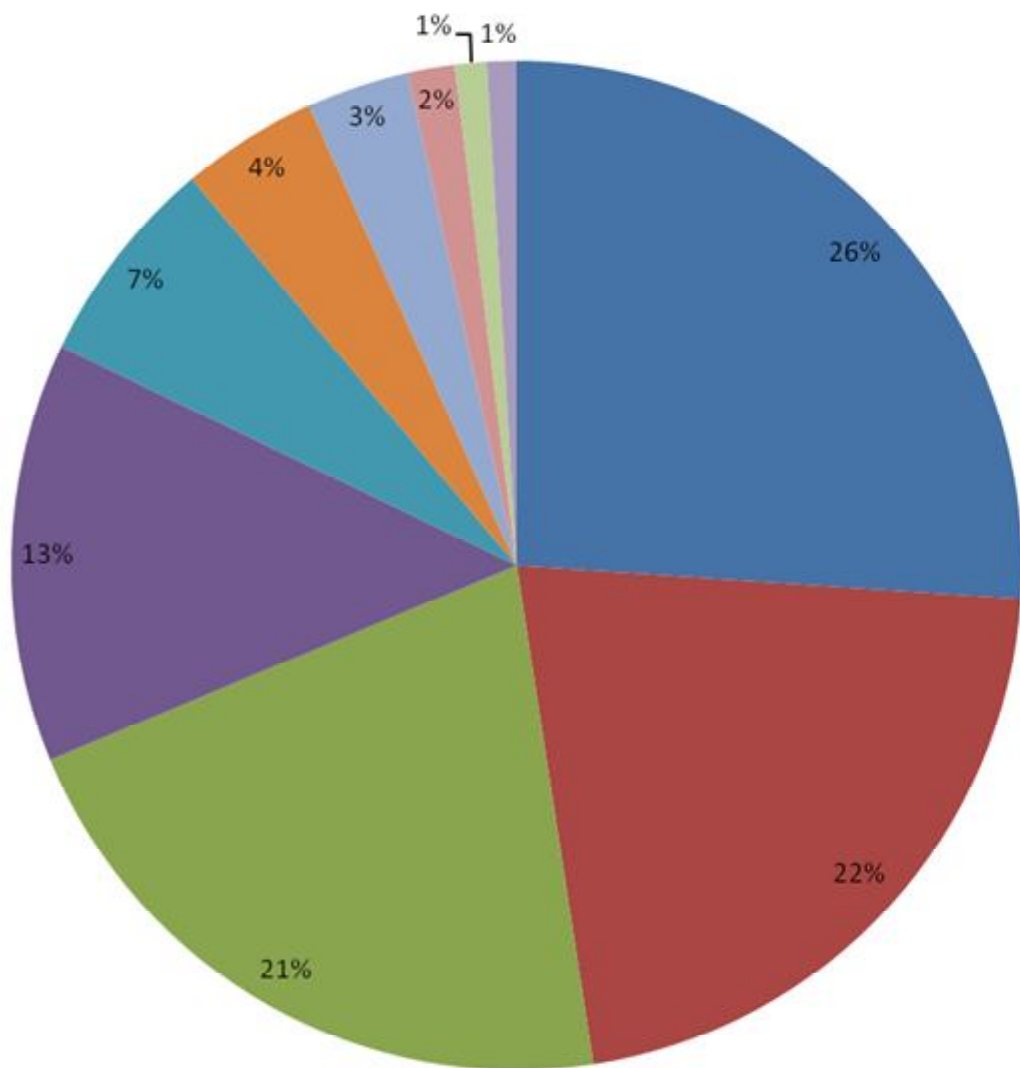


Historical water use in Western Australia



Sector water use

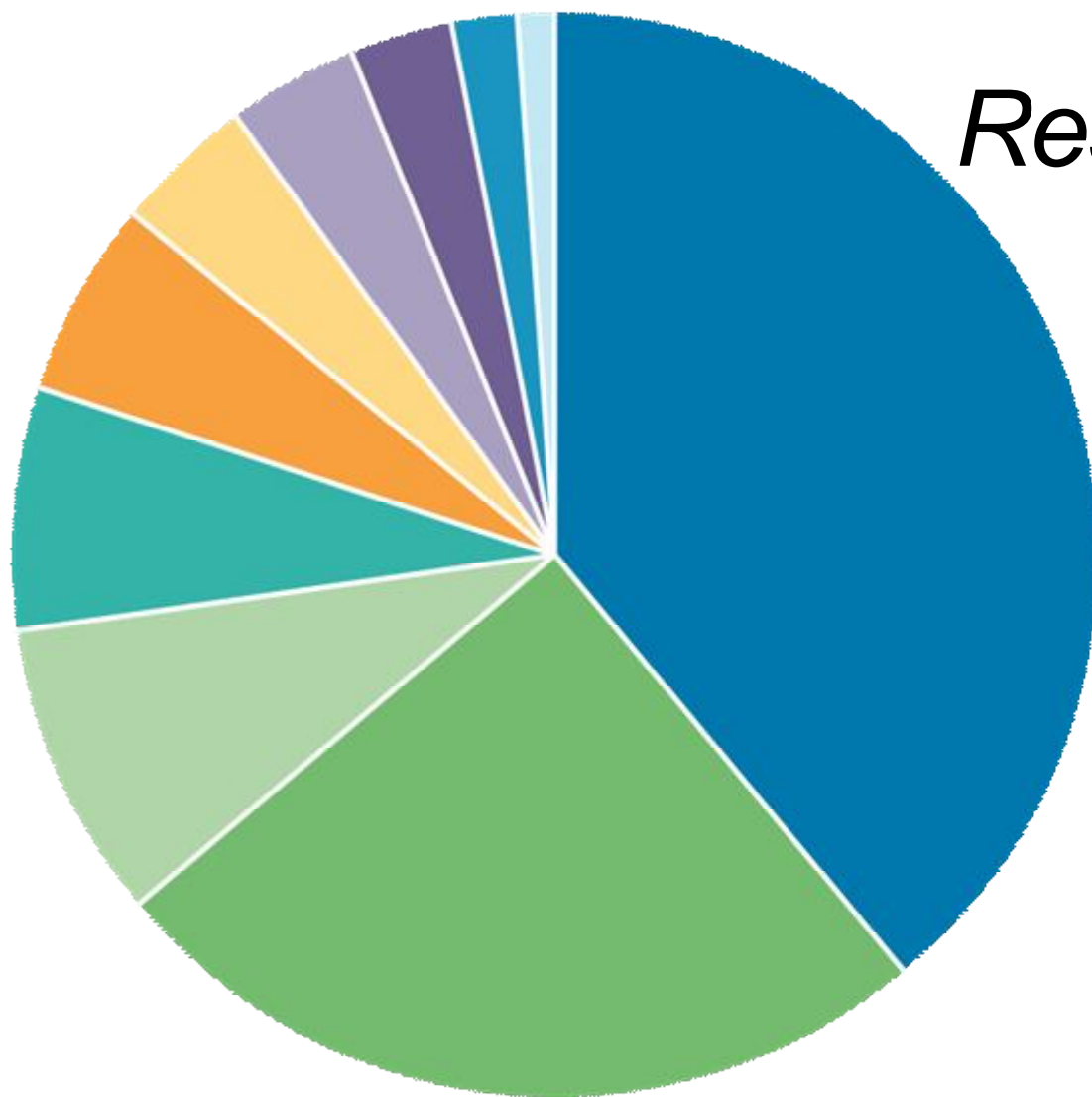
Total Use in 2005: 2,340 gegalitres



- Mining
- Agriculture
- Public water supply scheme
- Irrigated water supply
- Commercial and Institutional
- Industry and power generation
- Parks and Reserves
- Other
- Stock and domestic
- Environment and conservation



Residential water use

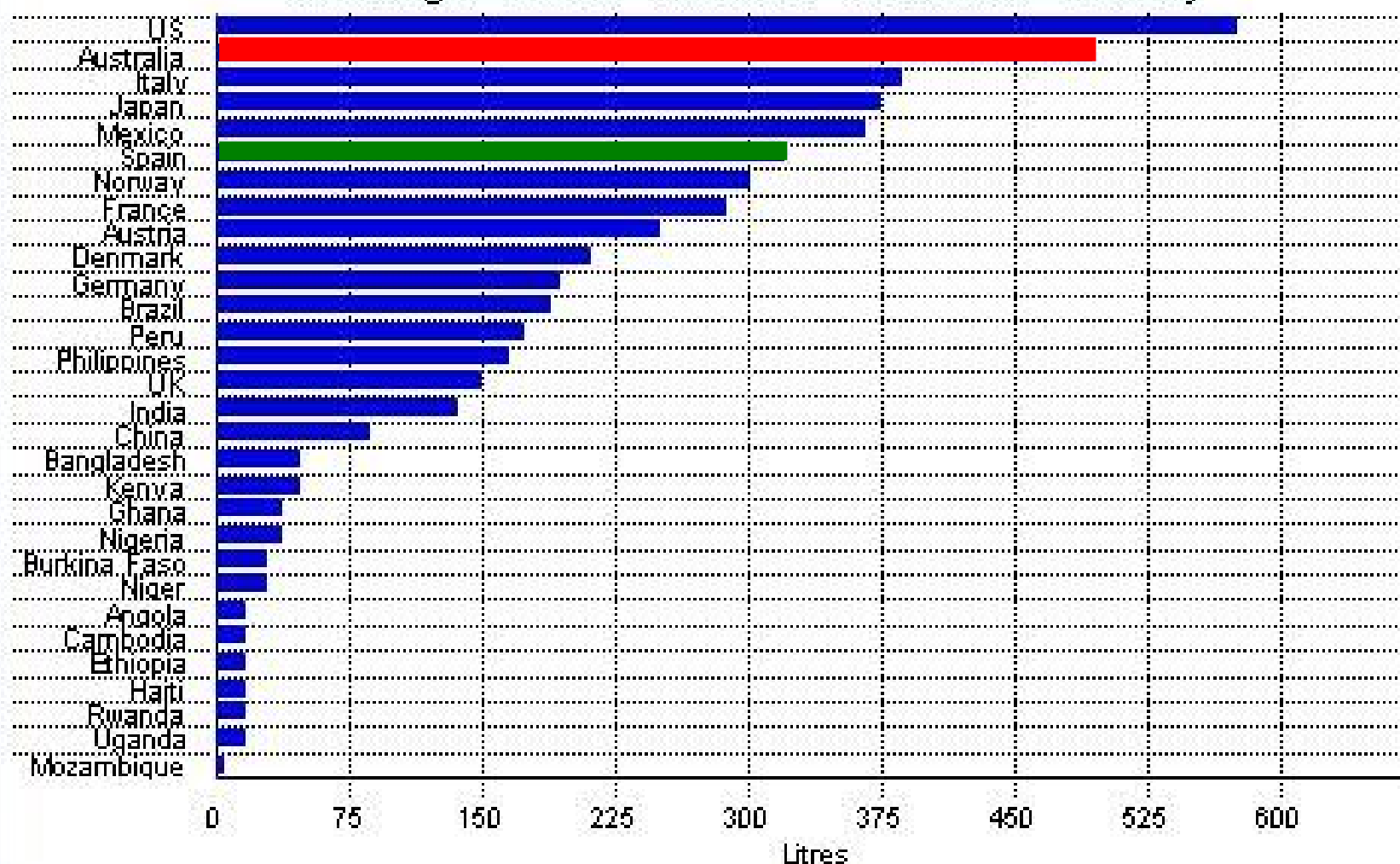


- Irrigation **39%**
- Shower and bath **25%**
- Toilet **9%**
- Washing machine **7%**
- Taps **6%**
- Evaporative air conditioner **4%**
- Leaks **4%**
- Handwatering **3%**
- Pool & spa **2%**
- Dishwasher **1%**

Average Perth residential water use, by area (%)



Average Water Use Per Person Per Day



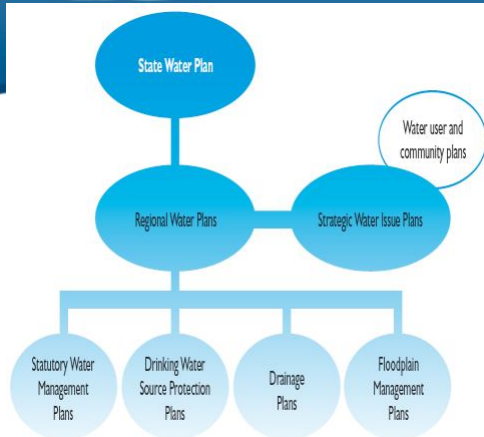


Some current Management responses



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Management responses



State Water Plan

State Planning Strategy

Regional Water Plans
(DoW)

Regional strategy,
regional structure plan

Drainage & Water
Management Plan

District structure plan, local planning
strategy or region scheme amendment

DWMPs

Byford
Caversham / West Swan
Jandakot
Mundijong / Whitby
Murray (Interim) Districts
Baldivis / Karnup
Keralup/Nth Mandurah

LWMS Guidelines
(proposed)

UWMP Guidelines
(draft)

Local planning scheme amendment or
local structure plan

Subdivision proposal

Local government
Development
proposal

Plan making

Development assessment

Management responses



Management responses



The Murray DWMP project

Supporting tech studies

- Flood & Stormwater
- Groundwater Interaction
- EWR Study (Wetlands & Ecology)
- Nutrients & Peel-Harvey Estuary
- Acid Sulphate Soils
- Water Use (Allocation and Reuse)

combined into the:

Murray drainage & water management plan



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Management responses





Solutions



Diverse but integrated

- Surface water
- Groundwater
- Desalination
- Managed aquifer recharge
- Recycling
- Water efficiency
- Rainwater tanks
- Demand management
- Local water supply



