Modern Agriculture Under Stress: Lessons from the Murray-Darling

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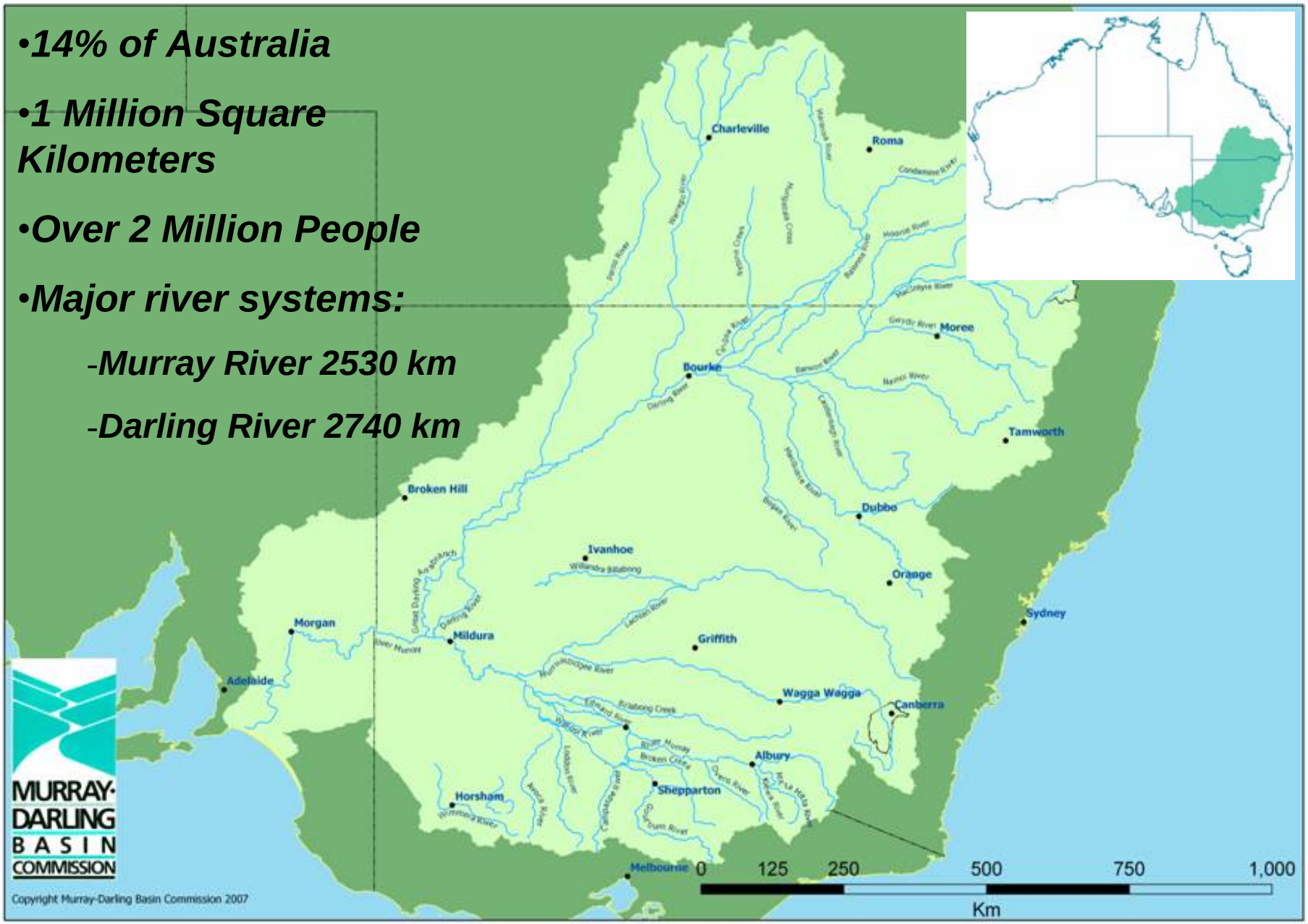
Chief Executive

Murray-Darling Basin Commission

Wednesday 25 June

Murray-Darling Basin



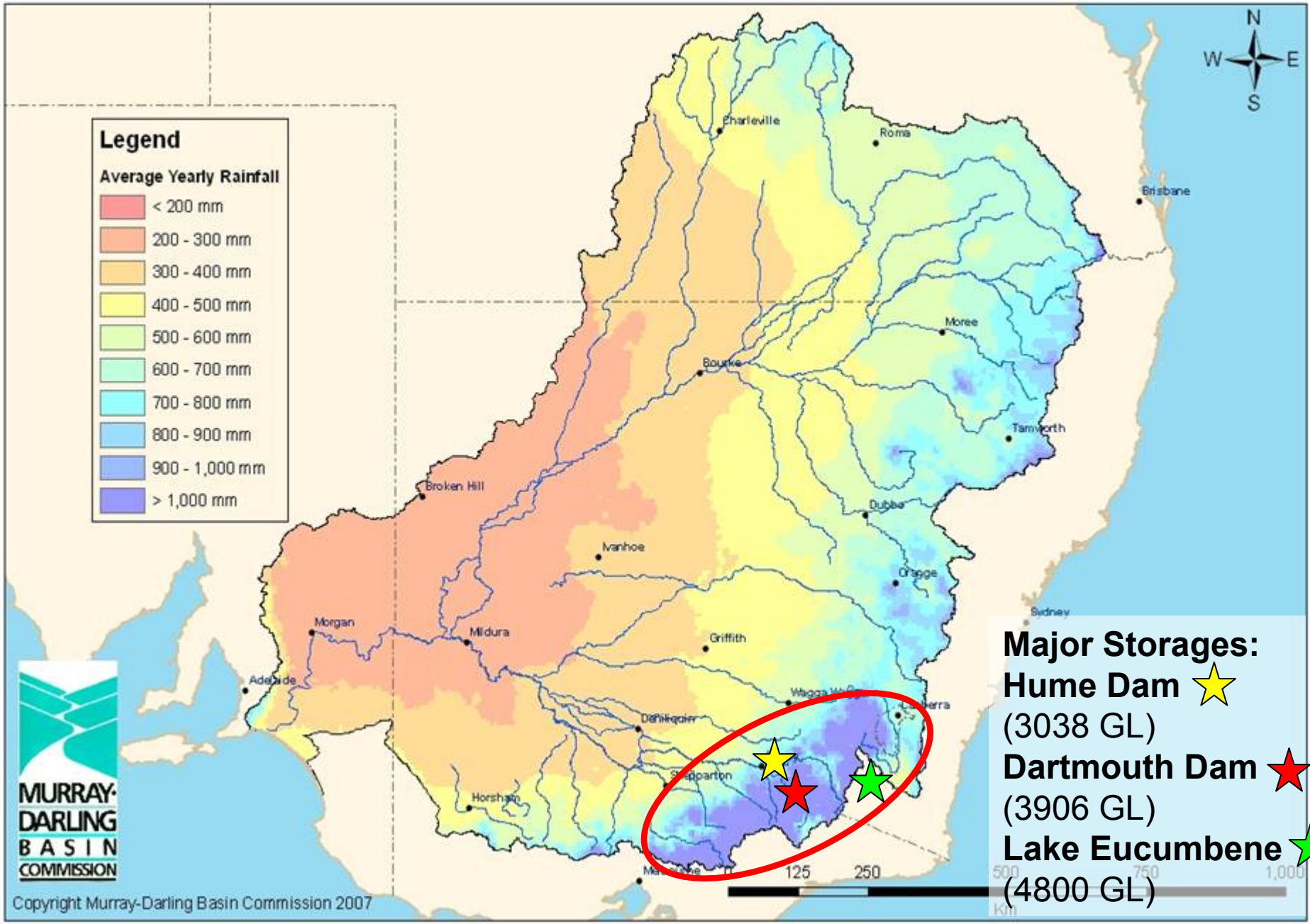
Spain and the Murray-Darling Basin:
Relative size

Highly Variable Flows

"A land of droughts and flooding rains"

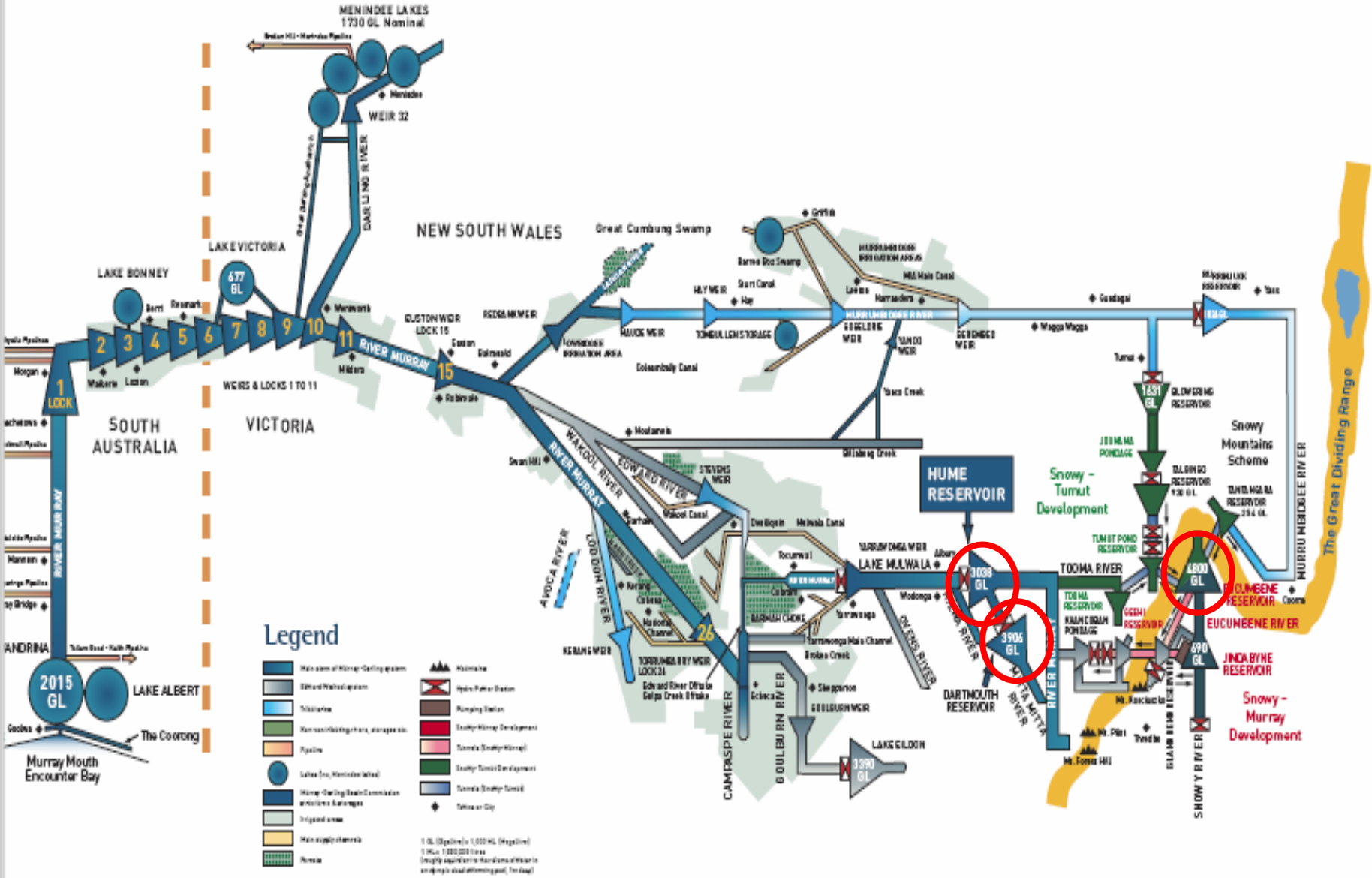
COUNTRY	RIVER	RATIO BETWEEN MAXIMUM and MINIMUM ANNUAL INFLOWS
BRAZIL	AMAZON	1.3
SWITZERLAND	RHINE	1.9
CHINA	YANGTZE	2.0
SUDAN	WHITE NILE	2.4
USA	POTOMAC	3.9
SOUTH AFRICA	ORANGE	16.9
AUSTRALIA	MURRAY	31
AUSTRALIA	DARLING	>4,000

Rainfall Distribution in the Basin

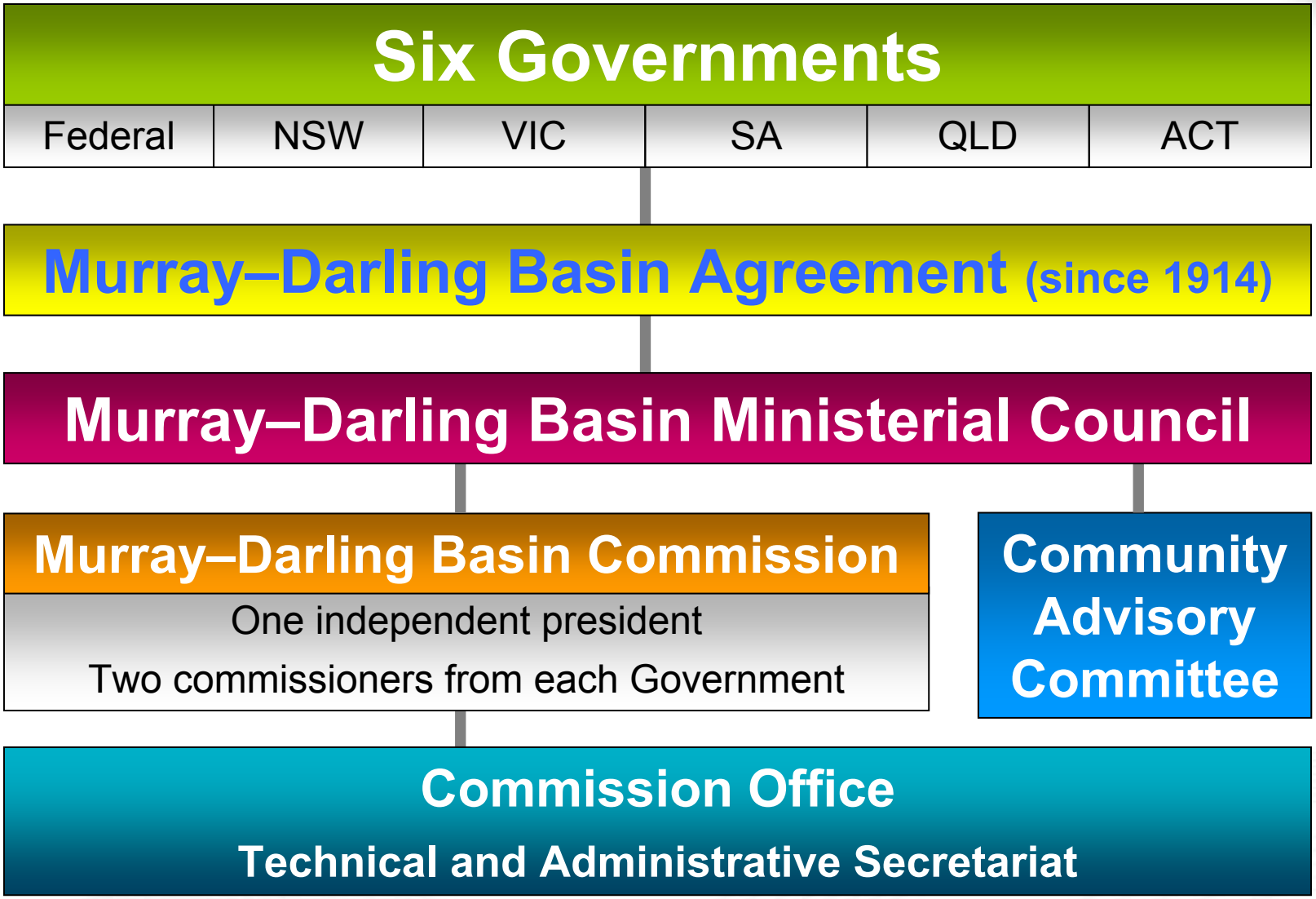


A Highly Regulated System

$2 billion AUD of Infrastructure



MDBC Structure



The MDBC Has Many 'On the Ground' Successes

Day to Day River Management:

1. River Operations
2. Asset Management
3. Water Accounting
4. Interstate Water Trade
5. Drought Contingency Planning

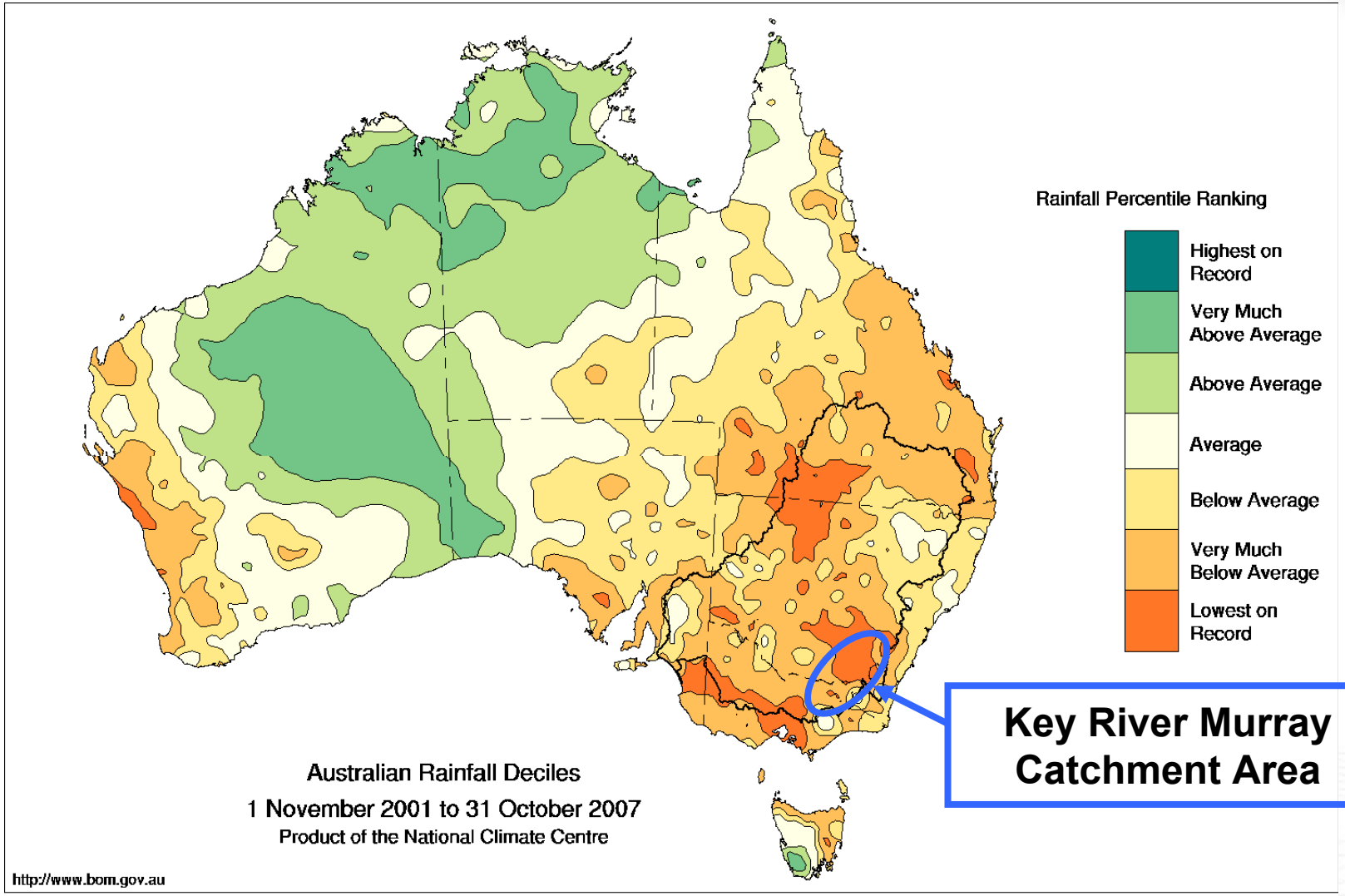
Sustainable Resource Management:

6. The Cap on Diversions
7. The Living Murray – Water Recovery
8. Water Quality Monitoring
7. Basin Salinity Management
10. Native Fish Strategy

Planning for the Future:

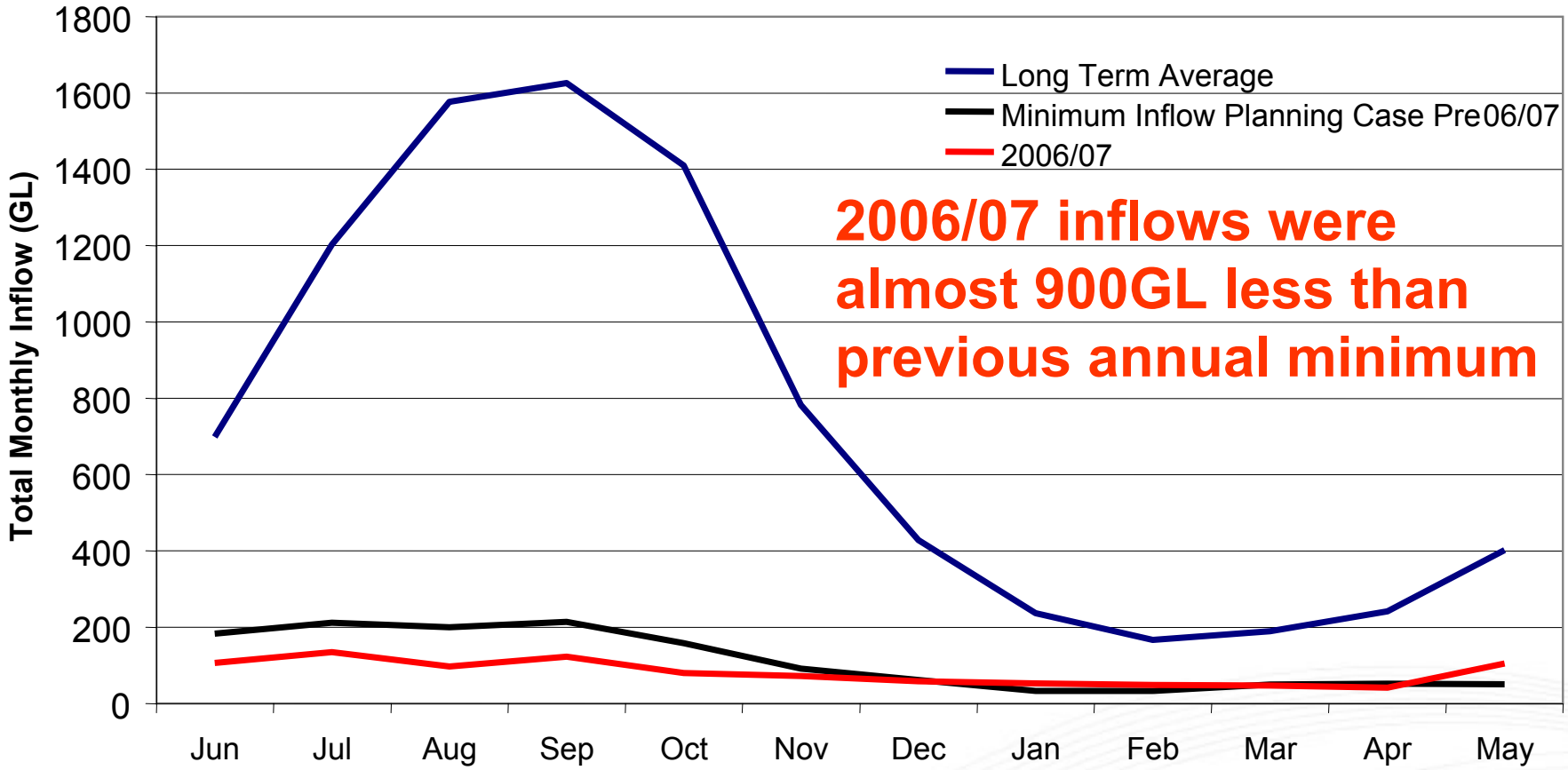
11. Sustainable Rivers Audit
12. Northern Basin Project
13. Integrated Basin Reporting
14. Risks to Shared Water Resources
15. Water Policy Development
16. River Murray Operations Review

Five Factors make this Drought Different



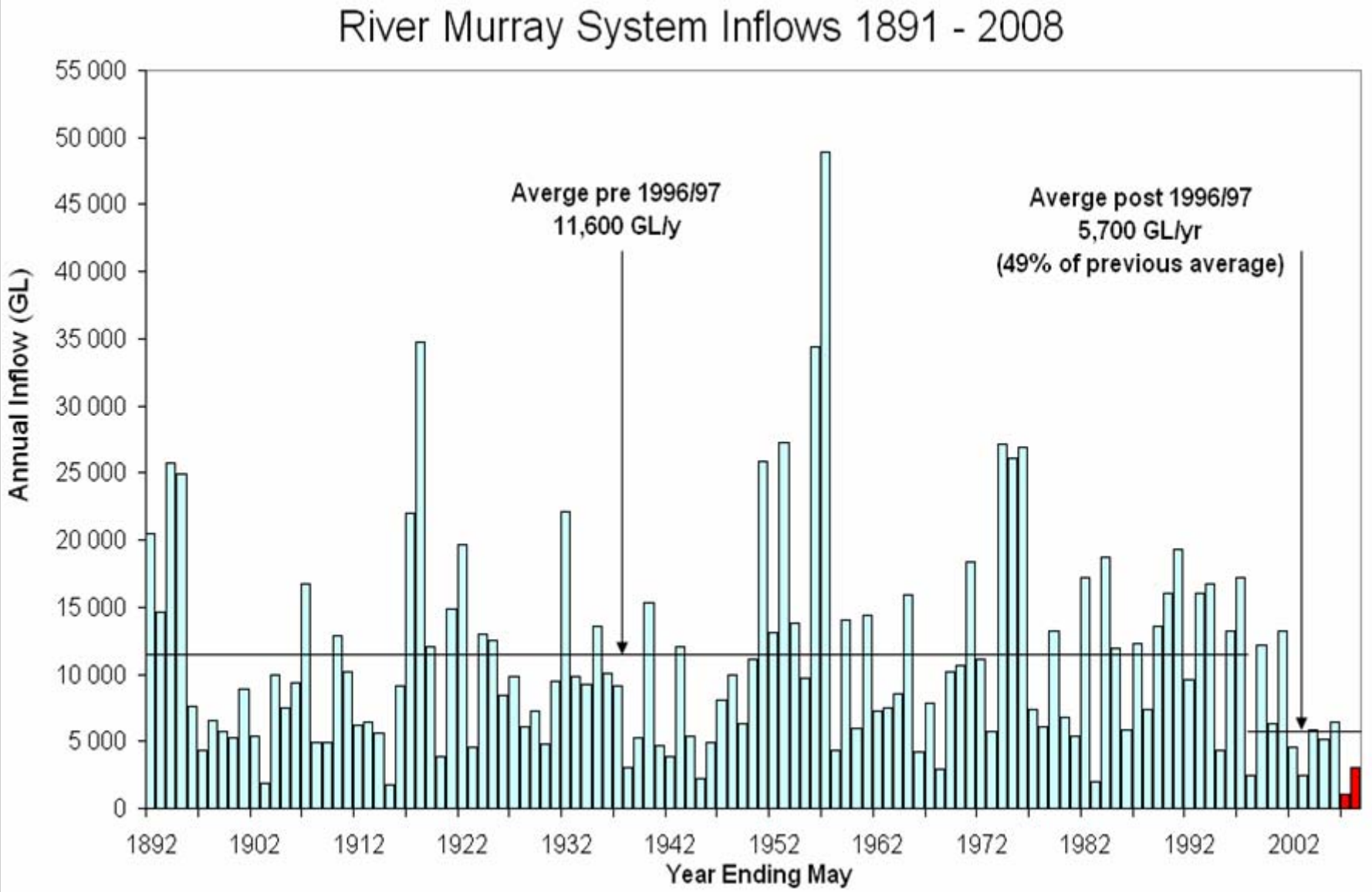
1. Record Low Annual Inflow 06/07

Inflows to the River Murray (excluding Menindee and Snowy)
Long Term Average and Selected Water Years



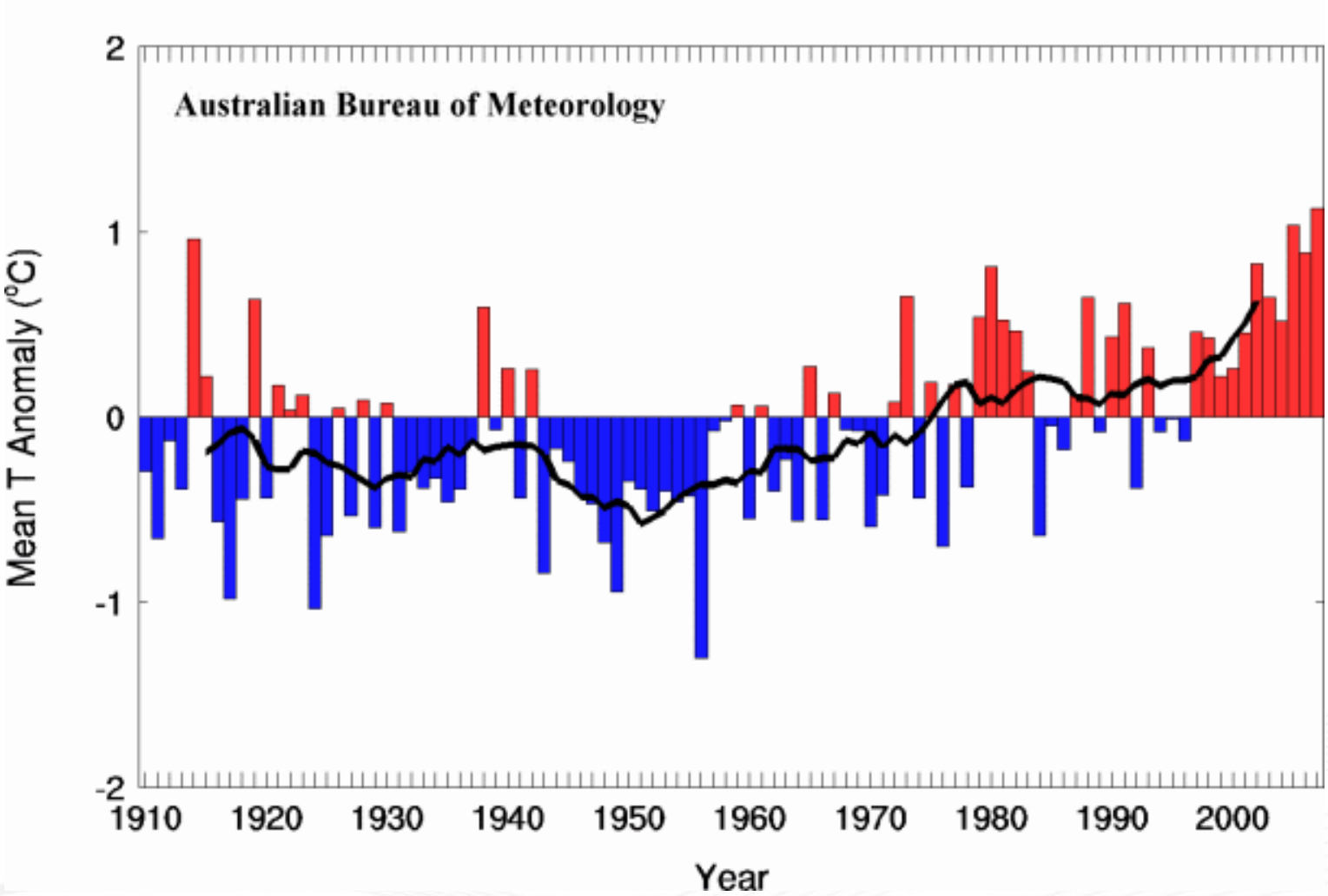
Murray-Darling Basin Commission January 2008

2. Two Consecutive Very Dry Years

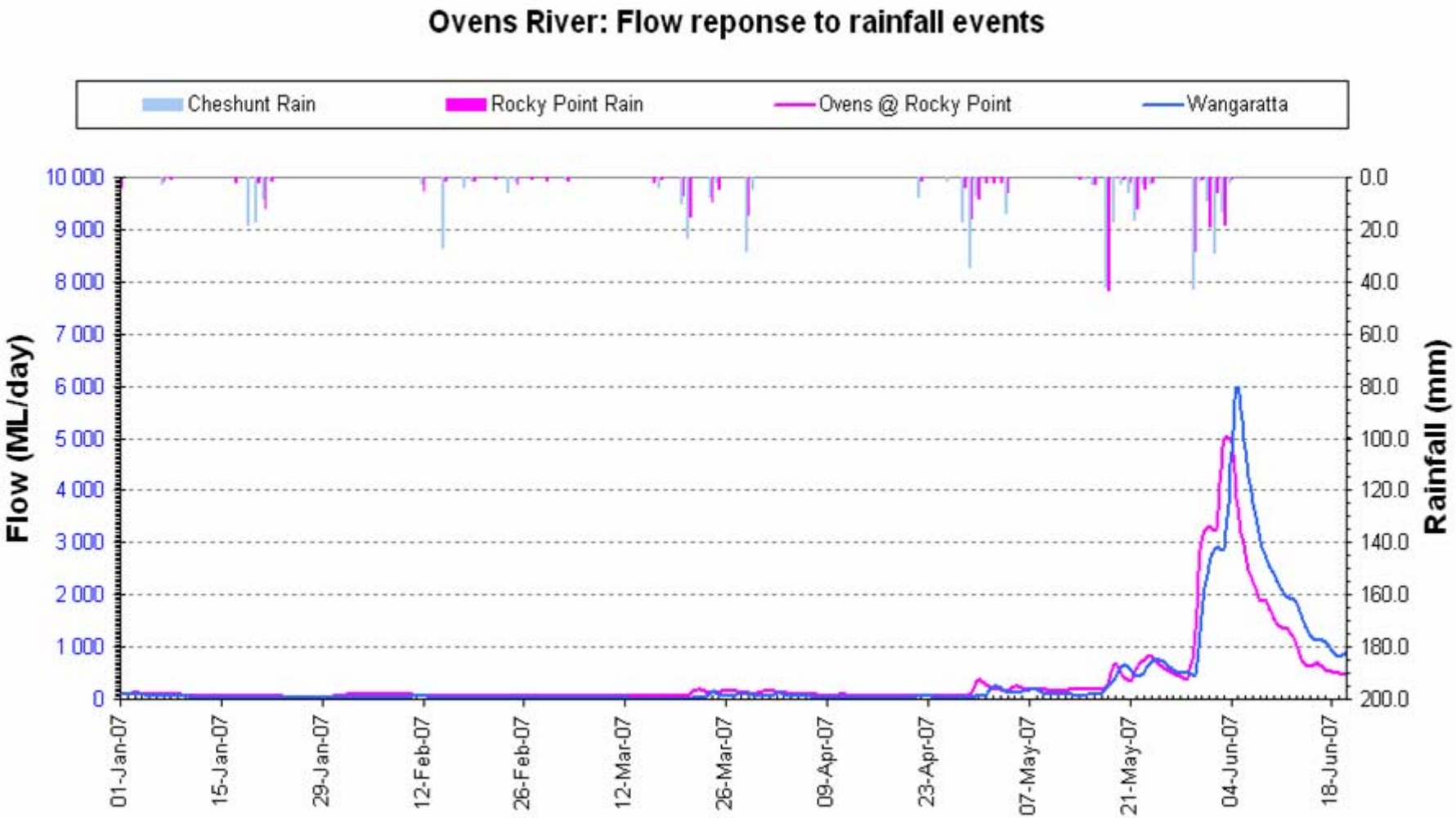


3. Record High Temperatures

MDB Mean Temperature Anomaly



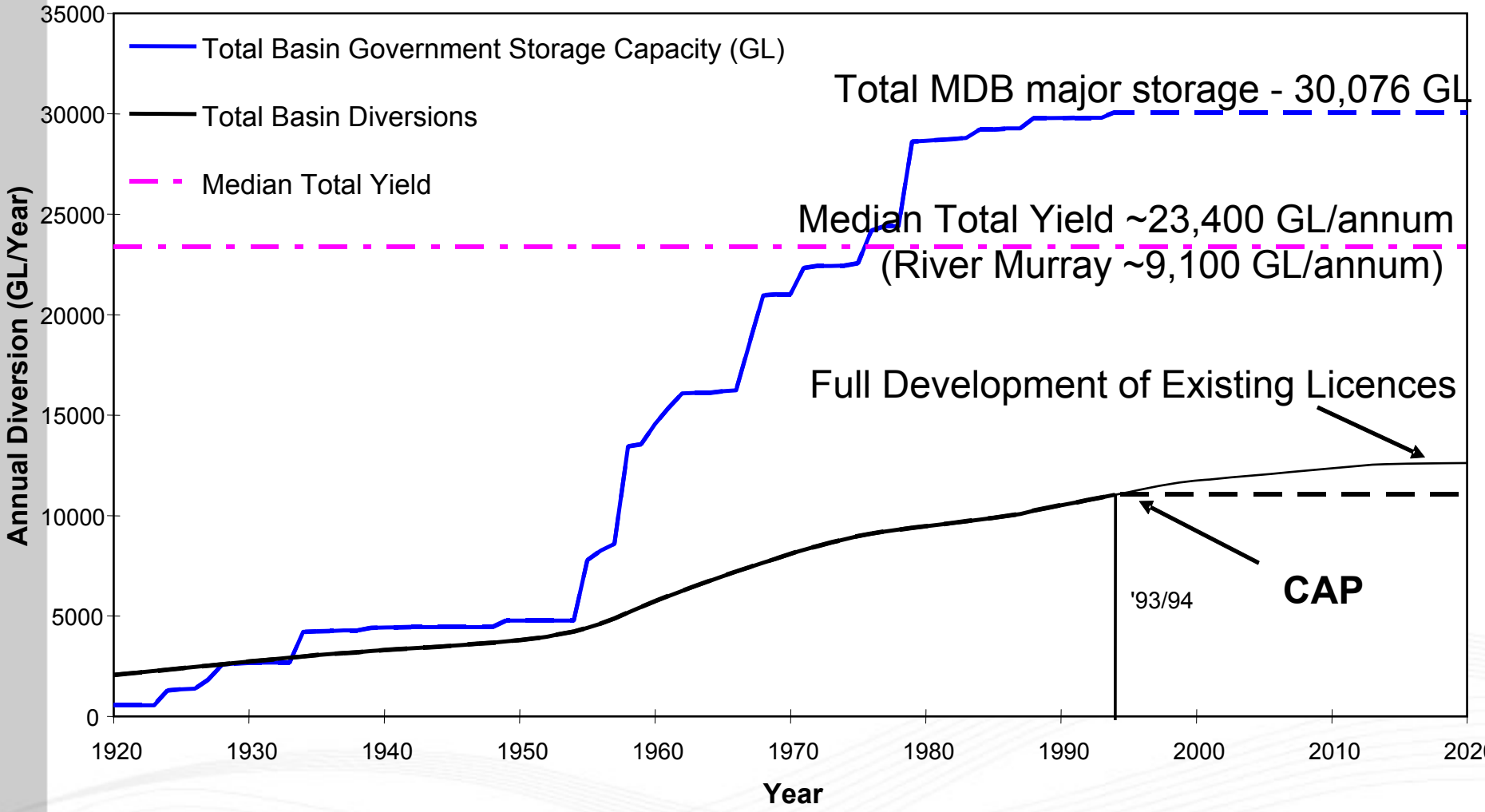
Dry Catchment Impact on Runoff:
The Ovens River



4. Surface Water Over-Allocation

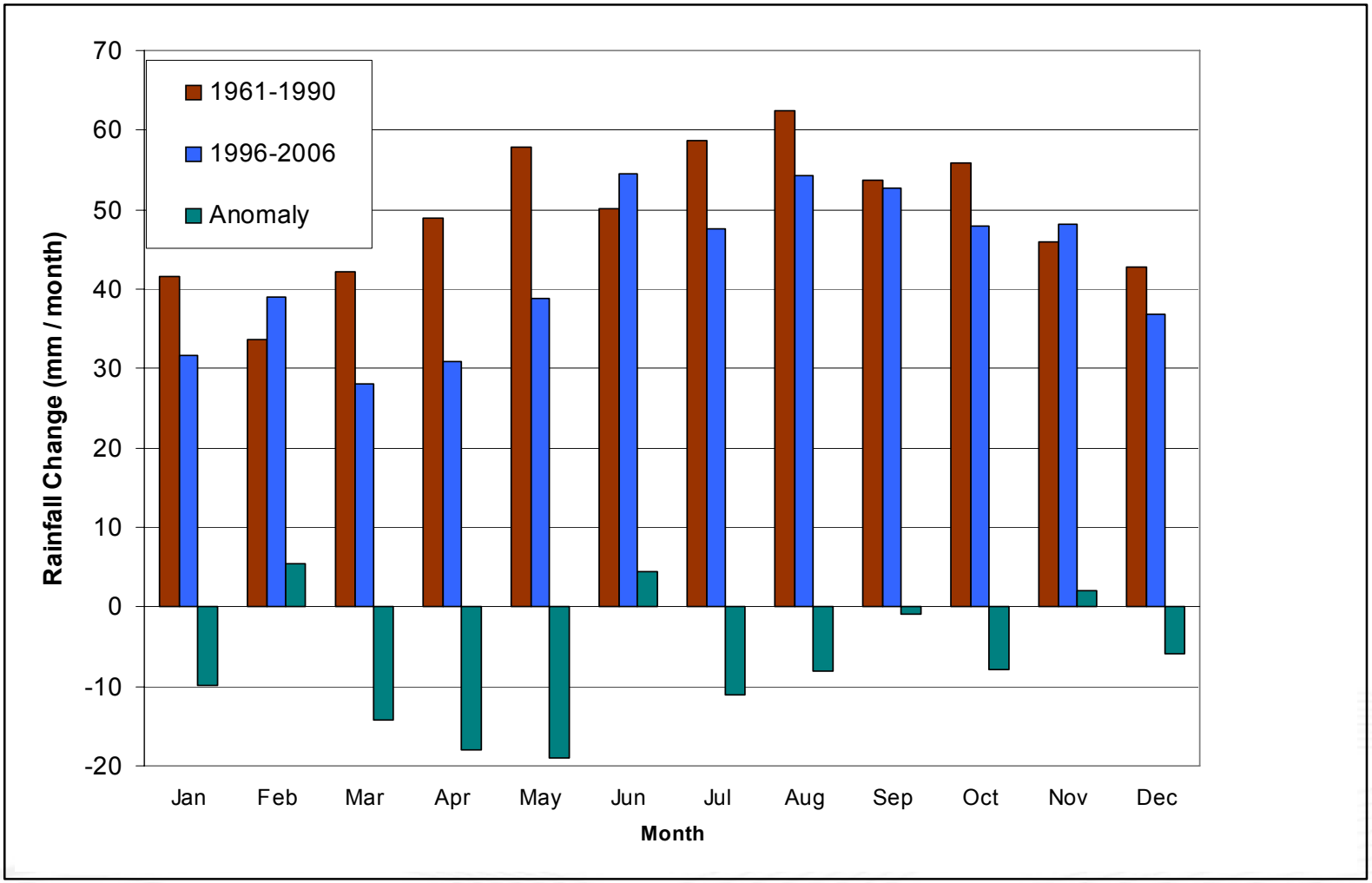
Growth in Water Use in Murray-Darling Basin

Unsustainable, Over-Allocated Surface Water Diversions

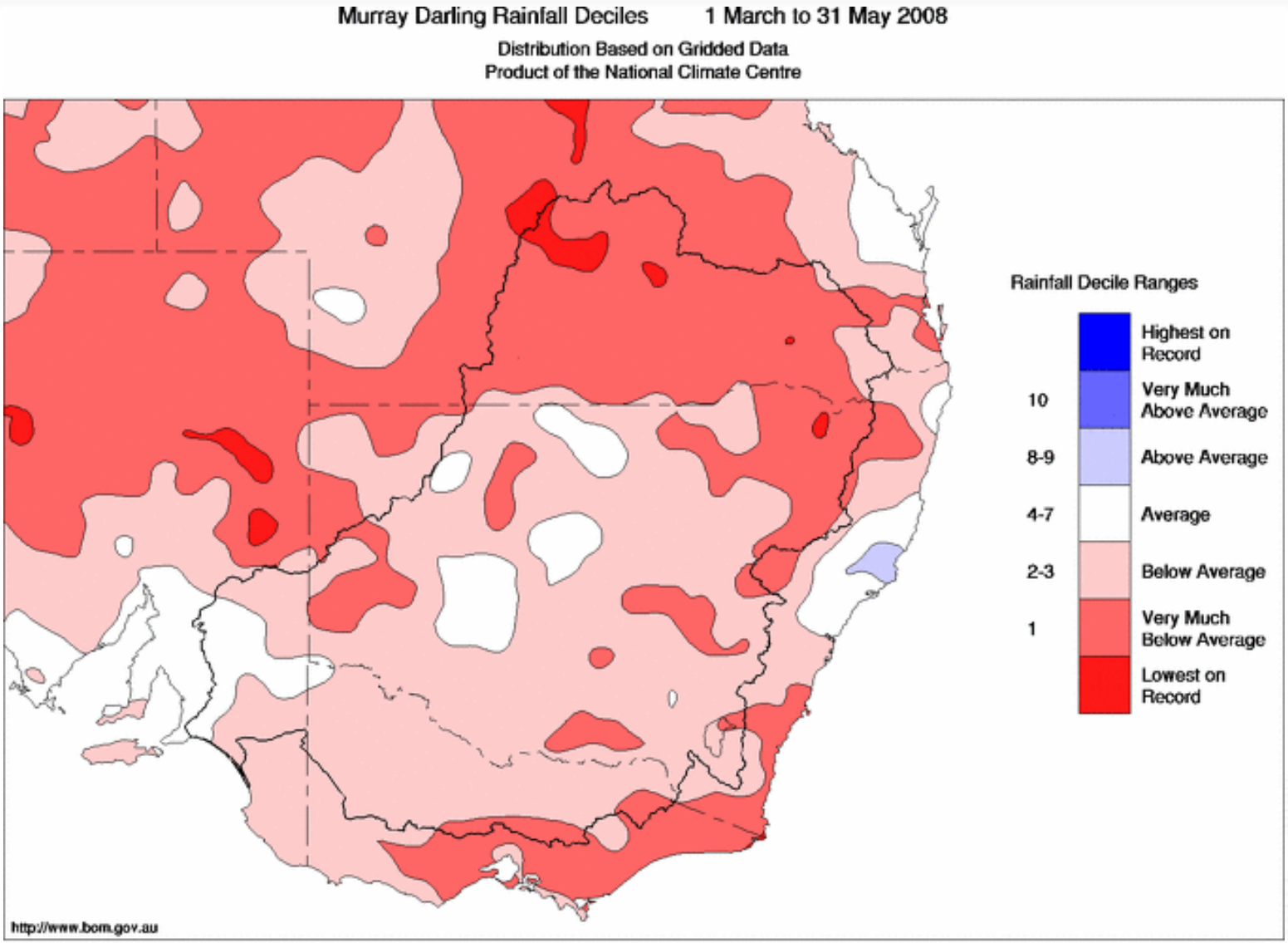


5. Drier Autumns

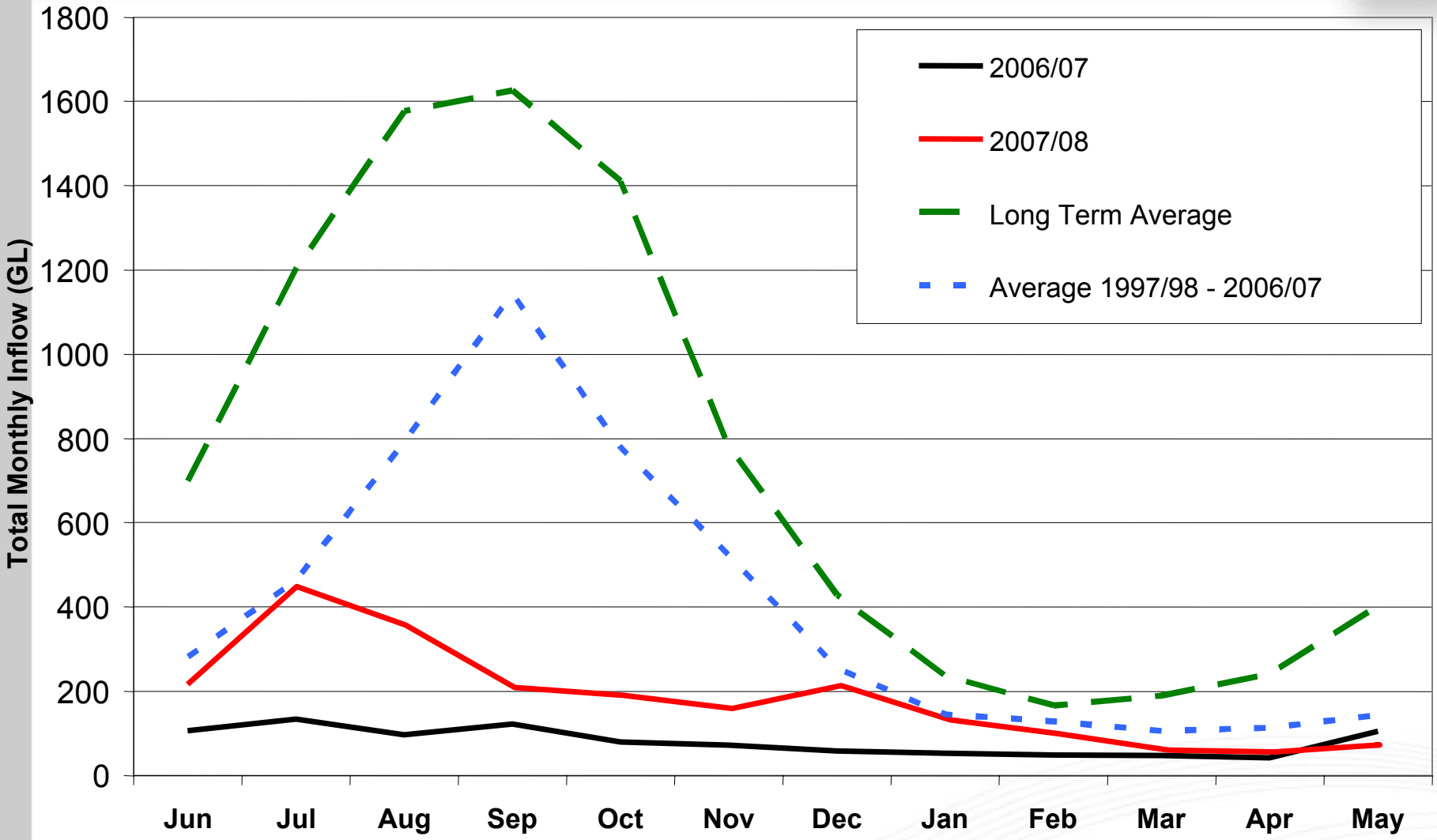
Monthly mean south eastern Australia rainfall, 1961-1990, 1996-2006 and anomaly



Rainfall Autumn 2008:
March, April and May

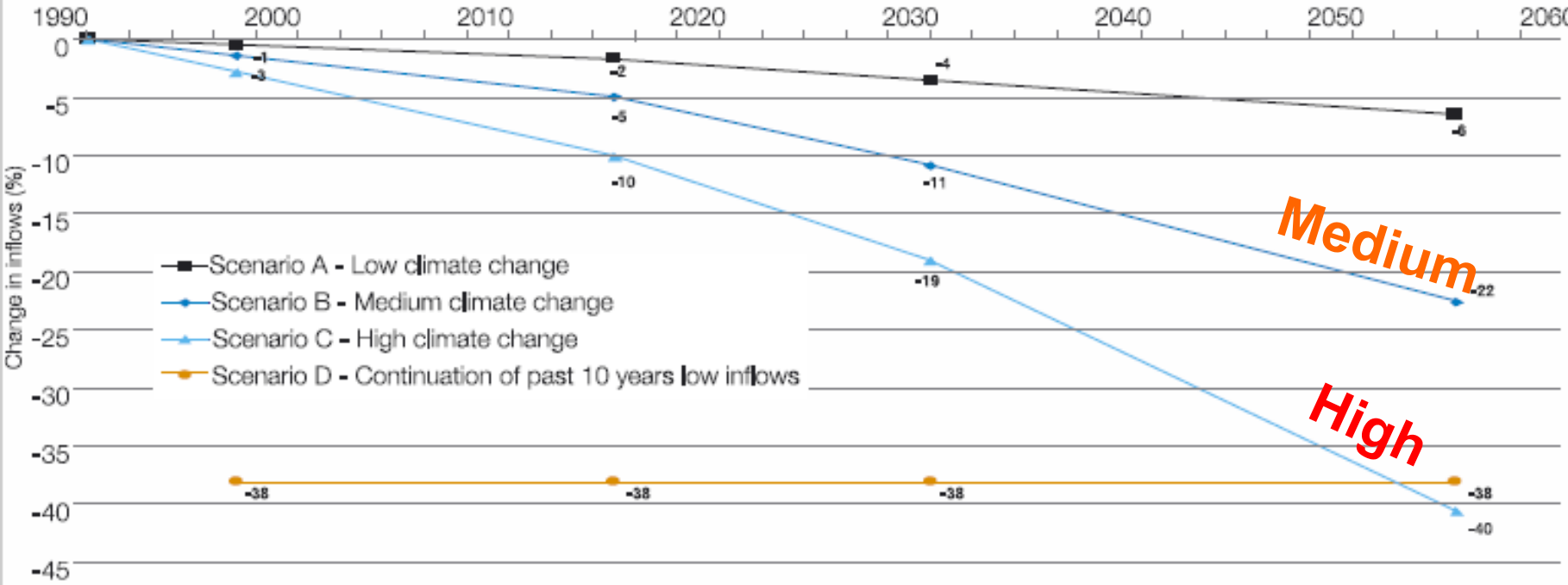


River Murray Inflows:
Inflows exclude Menindee and Snowy



River Murray & Climate Change:
A Typical Prediction

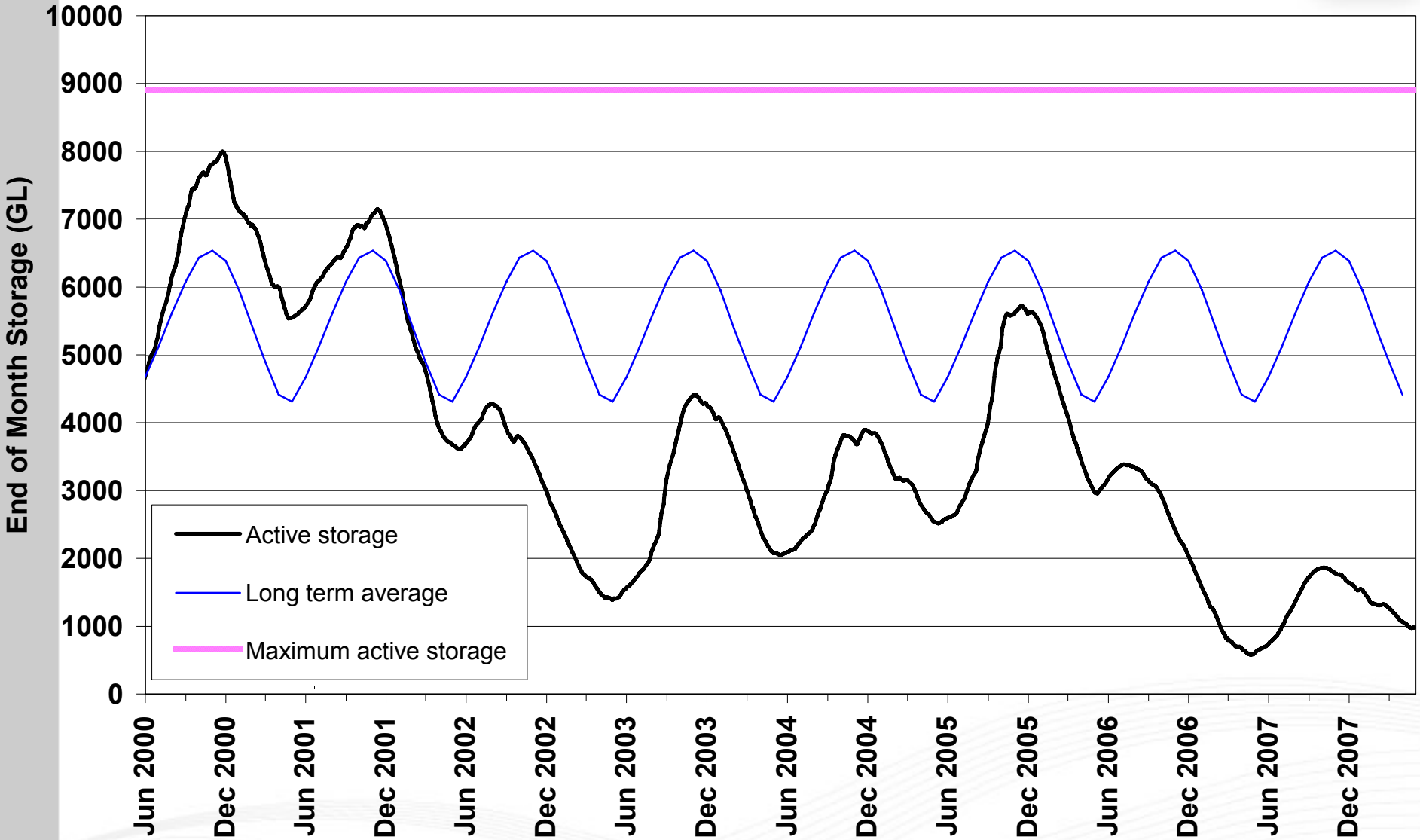
Figure E.2 Potential reduction in total inflows for the Murray system over 50 years (compared with the long-term average)[1]



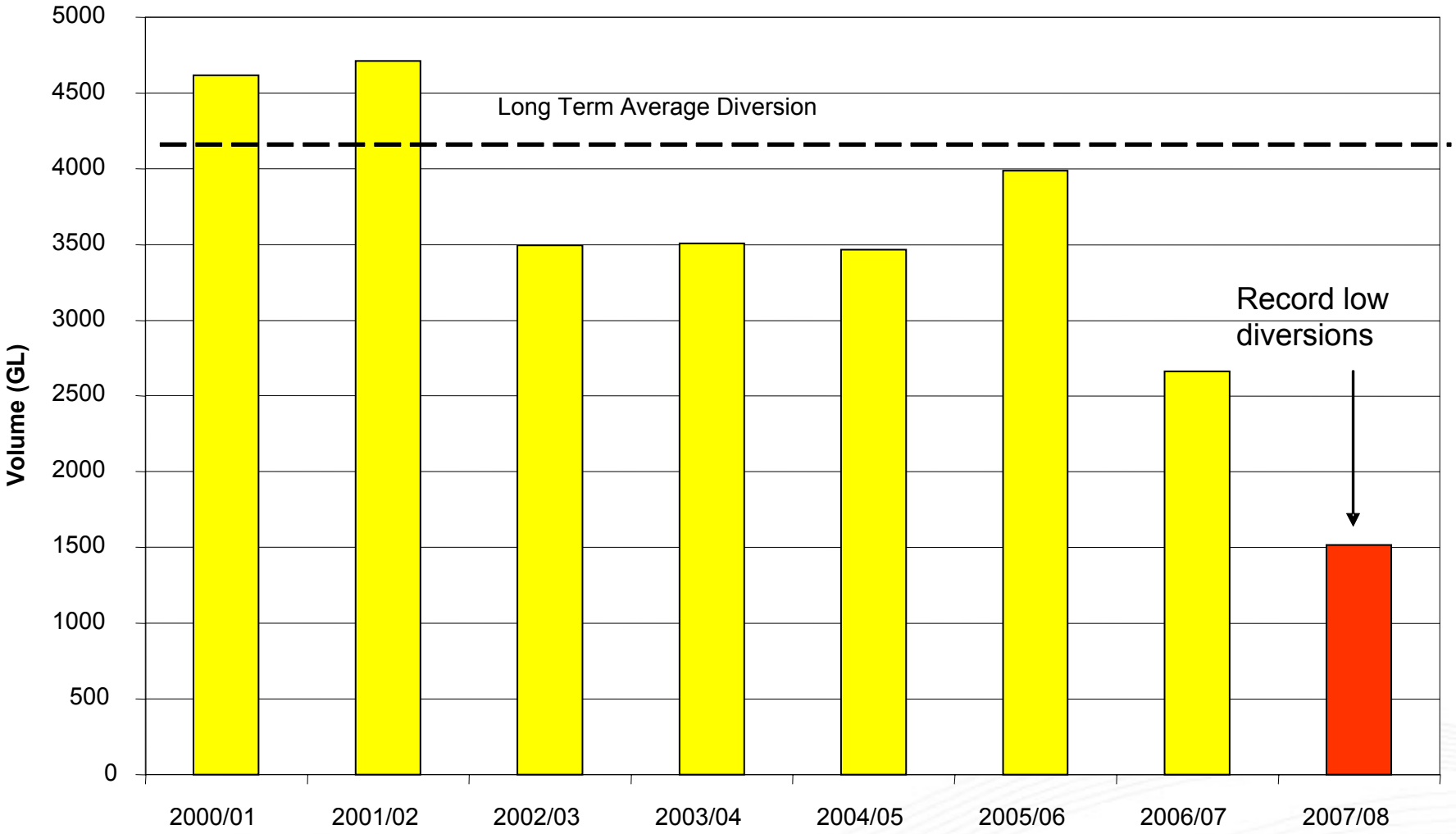
Source: Department of Sustainability and Environment Victoria – Northern Region Sustainable Water Strategy discussion paper 2008

Models consistently predict lower rainfall and streamflows

Active Storage:
Storages are close to record low levels



Irrigation Impacts:
2007/08 Record Low Diversions

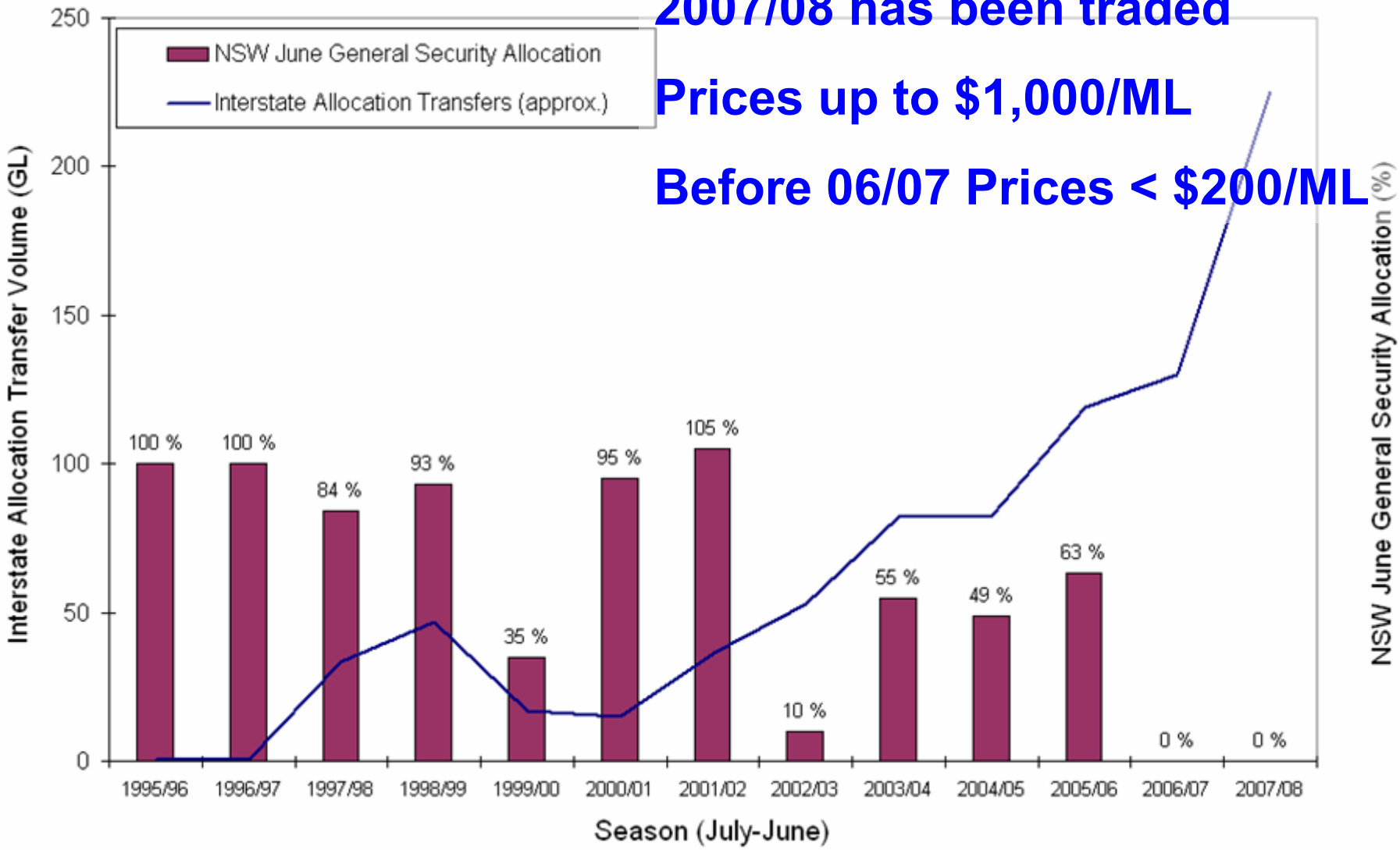


Inter-State Water Trade:
Reducing the Economic Impact of Drought

≈ 30% of the water used in 2007/08 has been traded

Prices up to $1,000/ML

Before 06/07 Prices < $200/ML



Irrigation Impacts:
Response from the Irrigation Industry

"Triage" of permanent plantings

- Unprofitable value varieties abandoned
- Mid-value varieties – survival, minimise impact on next year
- High value varieties – cropped but with lower yield

Modification of business practices

Significant increase in water trade

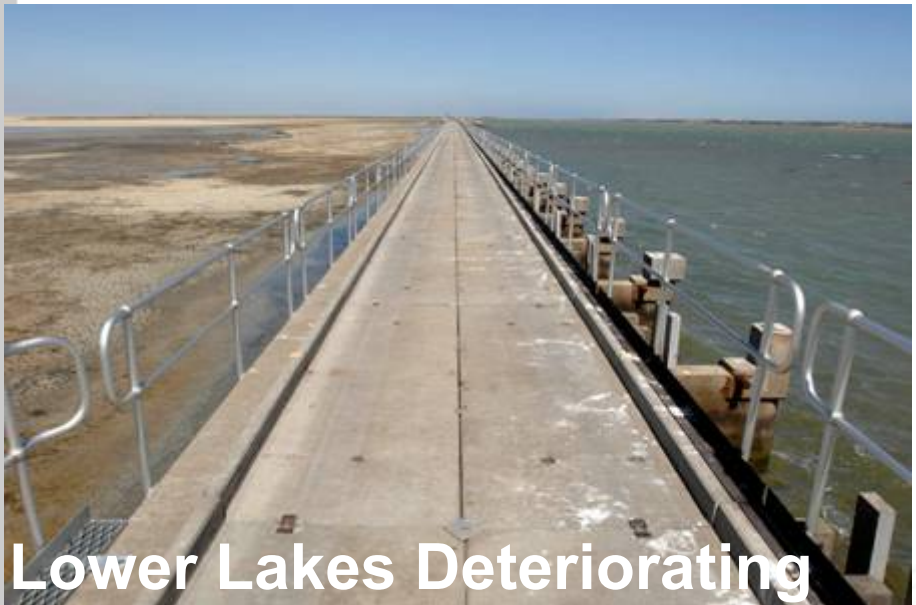
- ≈ 30% of water used has been traded
- Record prices over $1,000/ML

Drought and Contingency Measures

A significant environmental impact

Wetland Disconnection

Acid Sulphate Soils



Lower Lakes Deteriorating

Recent Watering:
≈1% of available water used

Risk Management:
Short-term contingency responses

Aim to reduce evaporation and losses and maximise flexibility:

- Retain water in headwater storages
- Lake Mulwala drawdown capture Ovens River peak flows
- Lower weir-pool levels reduce evaporation
- Reduced flows in the Murray, especially over Lock 1
- Early pumping to Adelaide storages
- Disconnecting artificially inundated wetlands
- Lower pumps at off-takes

Risk Management:
Medium-term contingency responses

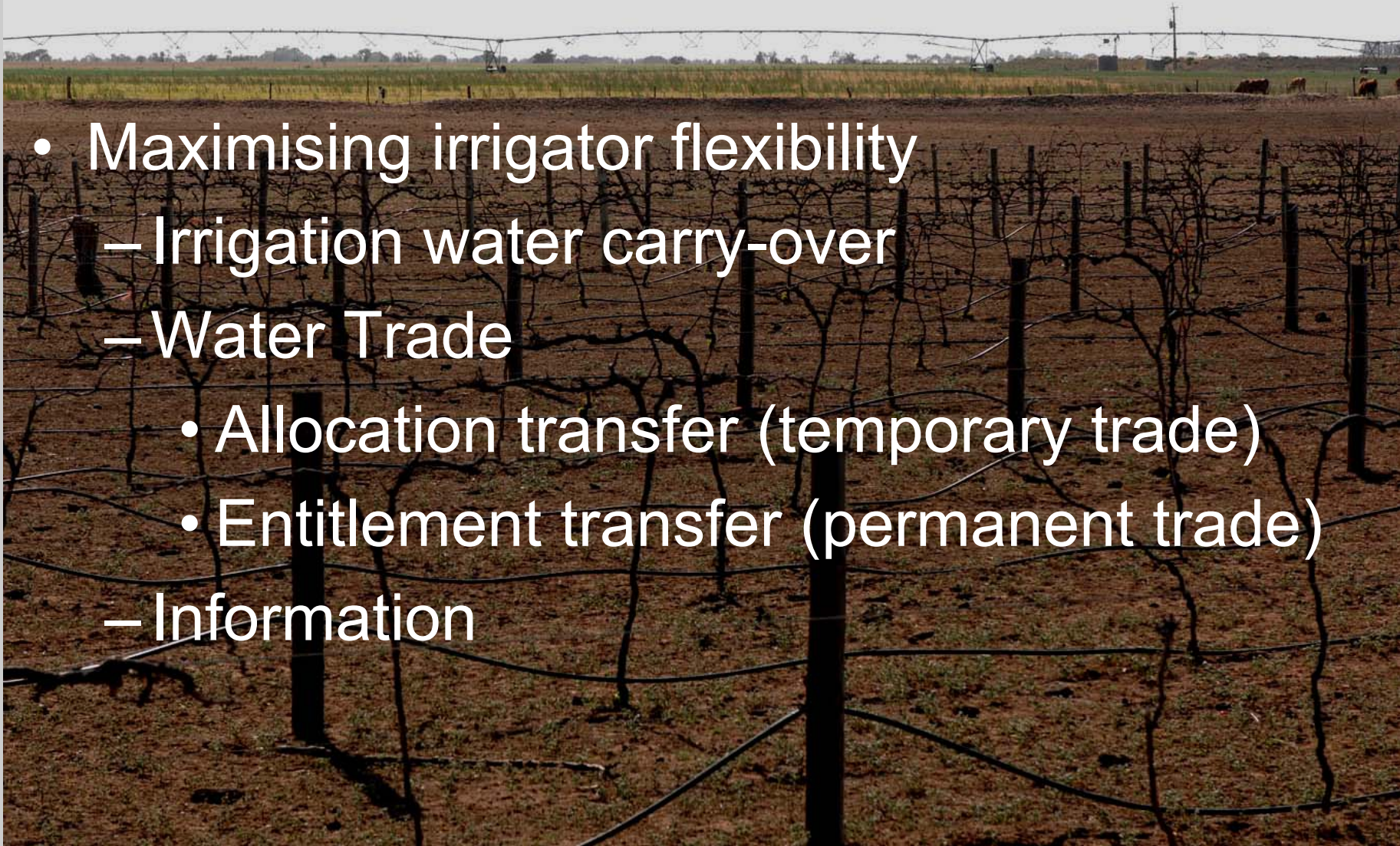
Aim to maximise water manager and irrigator flexibility:

- Critical water carry-over in all states
- Allocation water carry-over available for all irrigators
- Relaxed water trade restrictions
- Some contingency measures are continuing
- Communicating ongoing drought issues to irrigators and the public

Long-term Adaptation:
Public risk management

- Guaranteeing critical urban, stock and domestic water requirements:
  - Minimum water carry-over
  - Changed Snowy rules
  - Reduced planning minimums
  - Wetland disconnection (a last resort)
- Changing water sharing arrangements
  - Equitable shares in wet and dry conditions
- Preserving environmental 'Museum Pieces'

Long-term Adaptation:
Private risk management



- Maximising irrigator flexibility
  - Irrigation water carry-over
  - Water Trade
    - Allocation transfer (temporary trade)
    - Entitlement transfer (permanent trade)
  - Information

Issues for the Future:
Adapting to reduced water availability

- Rebalancing consumptive and environmental water shares
- Planning for new minimum flows
  - Impacts on irrigation and the environment
- More extreme events
- Technological advancements
- Social adjustment

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