# The Murray-Darling Basin: balancing social, economic and environmental factors.

Wednesday  2 November 2016

**John Williams FTSE**

Adjunct Professor,

ANU Crawford School of Public Policy and
CSU Land Water and Society

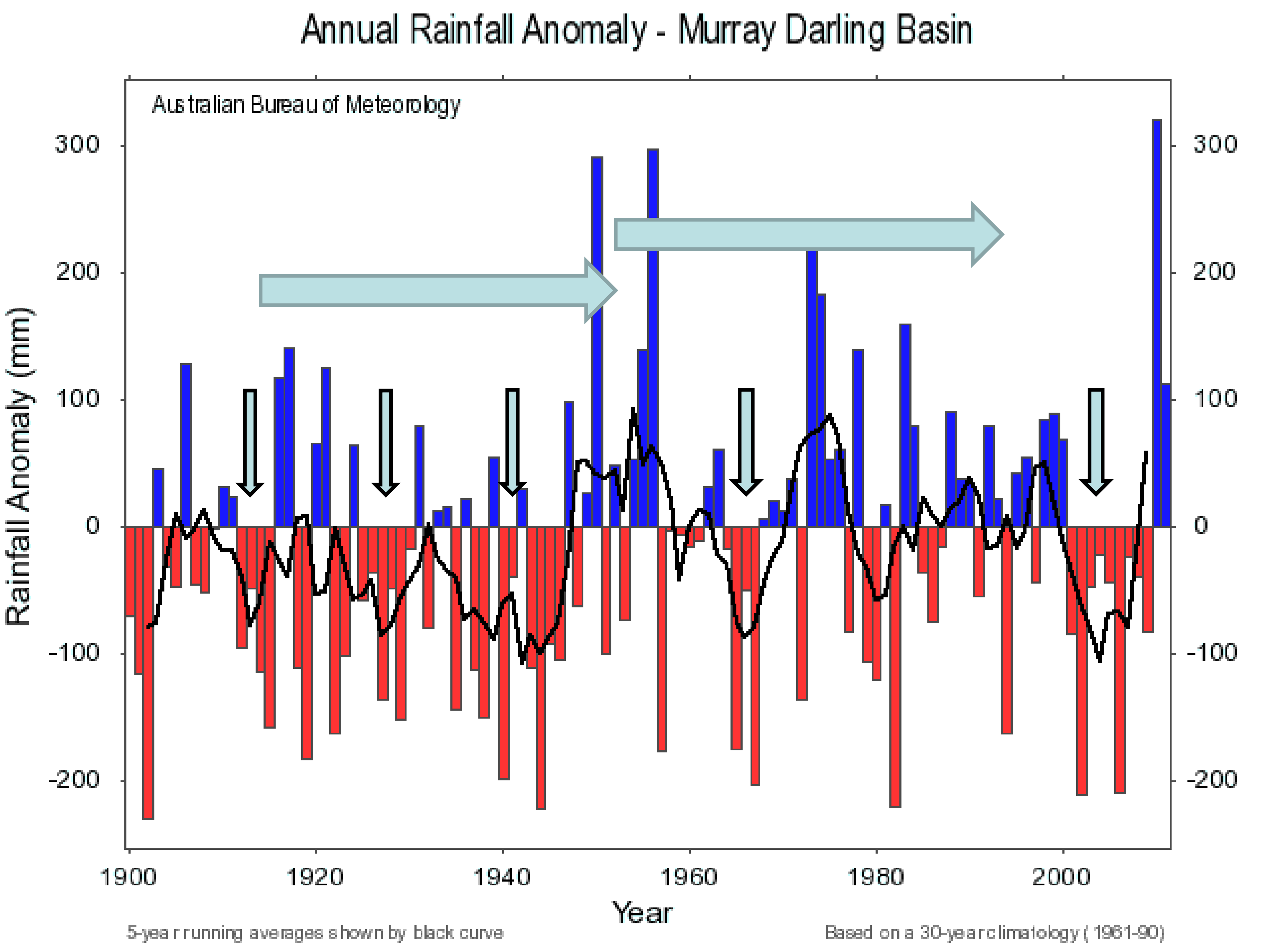

BARWON-DARLING RIVER
WARNING
HARMFUL ALGAE MAY BE PRESENT IN THIS WATER
CONTACT MAY CAUSE SERIOUS HARM TO
HUMANS AND ANIMA S
FOR MORE INFORMATION CALL THE ALGAL INFORMATION LINE
OR VISIT THE WC WEBSITE AT
www.dlwc.nsw.gov.au/
/rural_water_mngmt

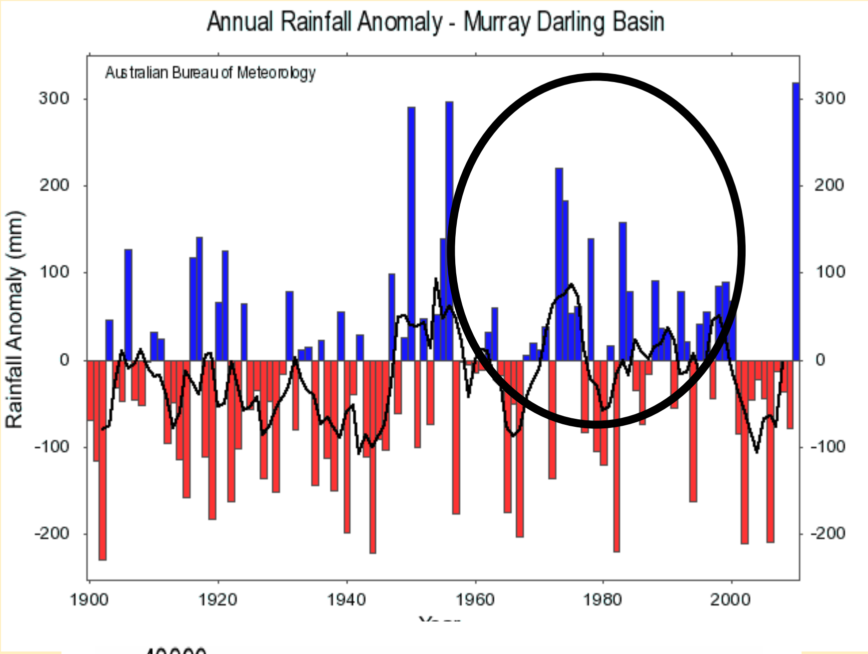

c) Murray River upstream of Torrumbarry

*Table 1: Health ratings of river valleys of the Murray-Darling Basin*[25]

| Health Rating | River Valley |
|---|---|
| Good | Paroo |
| Moderate | Border Rivers, Condamine |
| Poor | Namoi, Ovens, Warrego, Gwydir, Darling, Murray Lower, Murray Central |
| **Very poor** | **Murray Upper, Wimmera, Avoca, Broken, Macquarie, Campaspe, Castlereagh, Kiewa, Lachlan, Loddon, Mitta Mitta, Murrumbidgee, Goulburn.** |

**Davies, P., Harris, J., Hillman, T. and Walker, K., 2008. *Sustainable Rivers Audit: A report on the ecological health of rivers in the Murray-Darling Basin, 2004–2007.* Prepared by the Independent Sustainable Rivers Audit Group for the Murray–Darling Basin Ministerial Council**


Annual Rainfall Anomaly - Murray Darling Basin
Australian Bureau of Meteorology
Rainfall Anomaly (mm)
300
200
100
0
-100
-200
1900
1920
1940
1960
1980
2000
Year
5-year running averages shown by black curve
Based on a 30-year climatology (1961-90)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300
200
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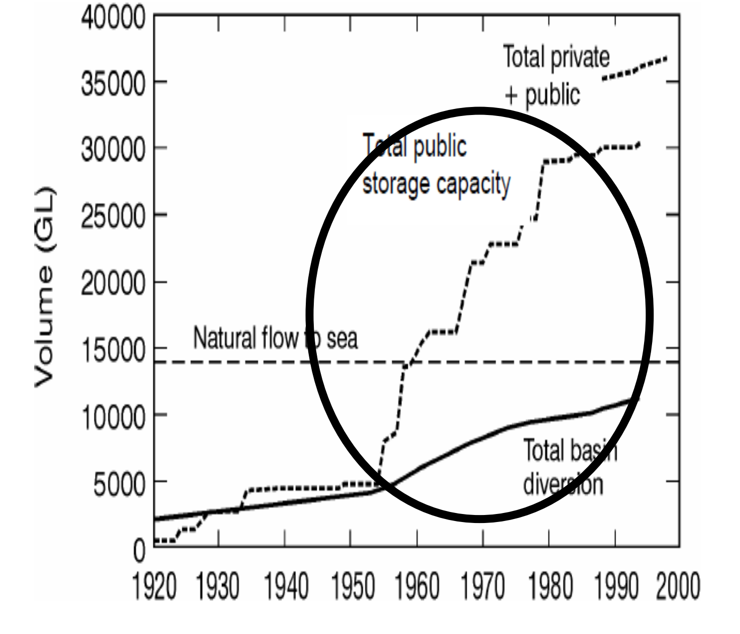
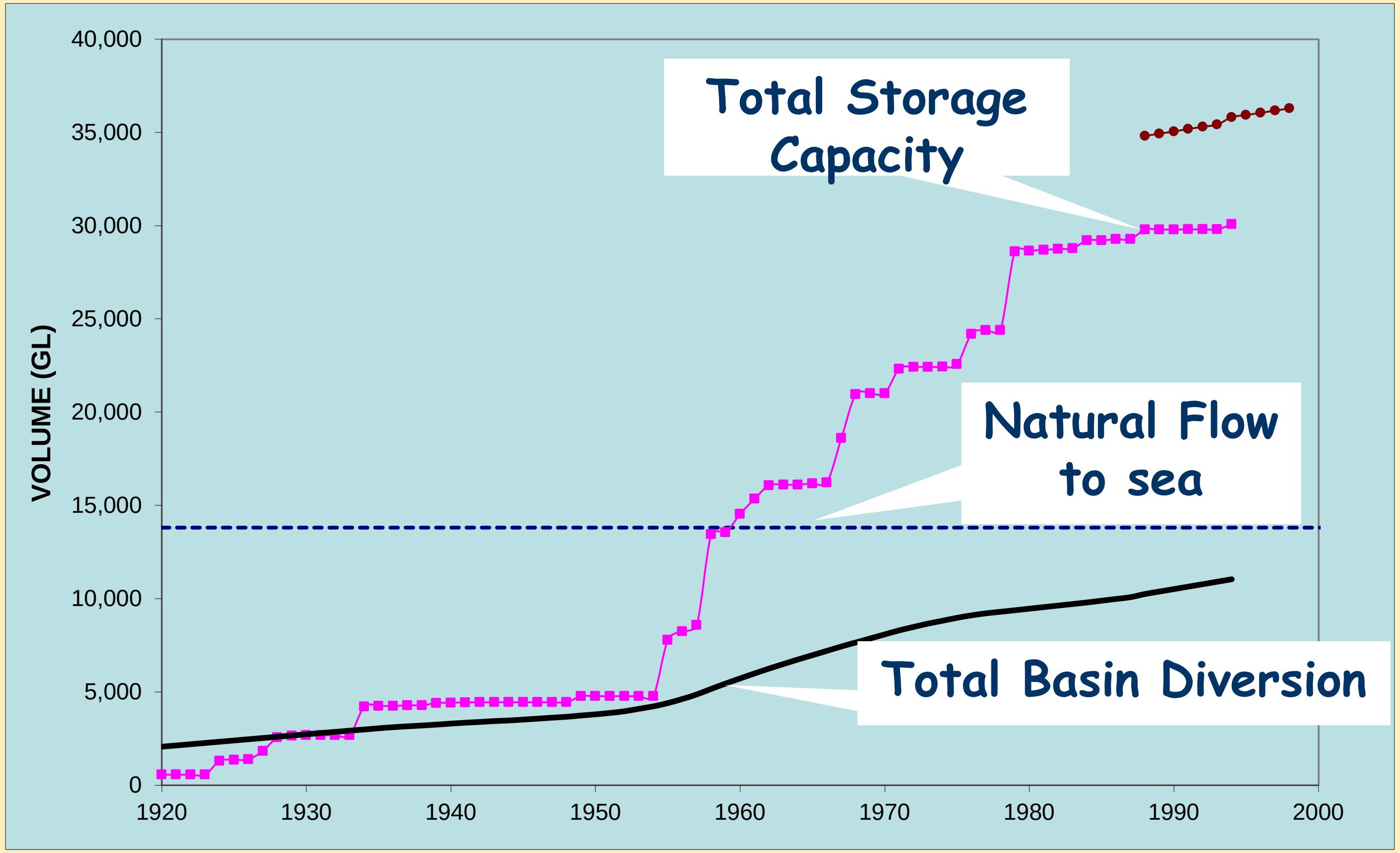
2000

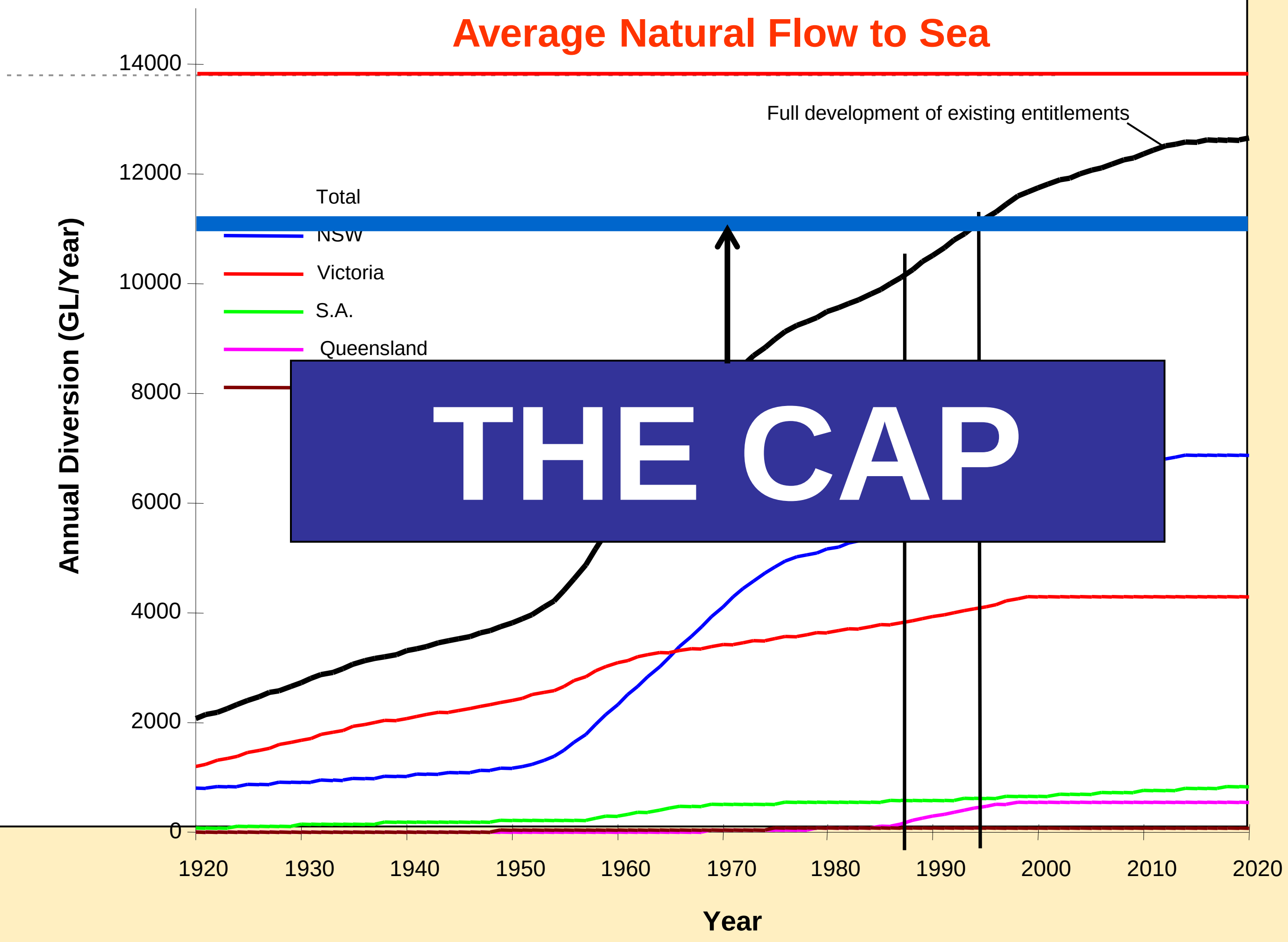

Volume (GL)
40000
35000
30000
25000
20000
15000
10000
5000
0
Total private
+ public
Total public
storage capacity
Natural flow to sea
Total basin
diversion
1920
1930
1940
1950
1960
1970
1980
1990
2000

# Storage Capacity and Diversions in the Murray-Darling Basin over Time



Key Messages – storage capacity 50% greater than the average flow of all rivers – carryover storages essential to deal with climate variability

# Growth in Water Use in Murray-Darling River



Key Message – available water is heavily used – relatively small volume left to ensure healthy river

## Average annual surface water balance for the MDB

| | Without-development, historical climate | Current development, historical climate | Current development, median 2030 climate | Future development, median 2030 climate |
|---|---|---|---|---|
| | GL/y | | | |
| Inflows | | | | |
| Inflows | 28,630 | 28,711 | 25,846 | 25,602 |
| Transfers into basin | 1,010 | 1,068 | 1,041 | 1,041 |
| Irrigation and urban returns | 0 | 163 | 155 | 154 |
| **Sub-total** | **29,640** | **29,942** | **27,041** | **26,797** |
| Surface water use | | | | |
| Surface water diversions | 0 | 10,075 | 9,673 | 9,575 |
| Channel and pipe loss | 0 | 1,233 | 1,183 | 1,181 |
| Net streamflow loss induced by groundwater use | 0 | 181 | 229 | 352 |
| Evaporation from reservoirs and lakes | 4,448 | 3,851 | 3,473 | 3,428 |
| Losses | 12,959 | 9,868 | 8,908 | 8,779 |
| **Sub-total** | **17,407** | **25,209** | **23,467** | **23,315** |
| Outflows | | | | |
| Outflows | 12,233 | 4,733 | 3,575 | 3,482 |
| Efficiency | | | | |
| Efficiency (outflow/net inflow) | 41% | 16% | 13% | 13% |

nature climate change

PERSPECTIVE

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# Global insights into water resources, climate change and governance

R. Quentin Grafton*[1], Jamie Pittock[1], Richard Davis[2], John Williams[1], Guobin Fu[3], Michele Warburton[4], Bradley Udall[5], Ronnie McKenzie[6], Xiubo Yu[7], Nhu Che[8], Daniel Connell[1], Qiang Jiang[1], Tom Kompas[1], Amanda Lynch[9], Richard Norris[10†], Hugh Possingham[11] and John Quiggin[11]

**The threats of climate change and the trade-offs between extractions and flows are examined for the Colorado, the Murray, the Orange and the Yellow Rivers. In all four basins, and over a long period of time, outflows have greatly reduced as a direct result of increased water extractions. Although climate change will aggravate hydrological impacts on river systems, currently high levels of water extractions remain the principal contributor to reduced system flows. Changes in governance, including sharing the variability between the environment and consumers, are urgently required if the health of these rivers is to be maintained.**

In past decades there has been a sharp decline in per capita water availability in many countries[1], and this is expected to get worse with growing populations and economic growth[2,3]. If per capita water availability continues to fall, it will exacerbate underlying tensions between extractive and in-stream uses of fresh water and, with business as usual, will result in further environmental decline[4].

Research so far has focused either on the microscale, with studies of particular rivers, or on the macro- or global scale, with studies of anthropogenic stresses on river systems[5,6], climate change impacts[7–9] or climate adaptation[10,11]. Despite this rich literature, a mesoscale analysis remains unexplored, especially cross-continental, basin-scale comparisons.

We compare both the effects of water extractions and projected climate change on river flows for four continental river systems. We show that the hydrological effects of past and current water extractions far exceed projected impacts of climate change. This is an important realization, but paradoxically offers the promise that improved water governance could both reduce existing water stresses and prevent further deterioration as a result of projected declines in inflows due to climate change.

The analysis focuses on rivers in semi-arid zones with 'closed' drainage basins[6] that lie in the 30–40° latitude range in which projected drying associated with climate change is most pronounced[12]. The four river systems are: the Colorado, the Murray–Darling, the Orange–Senqu and the Yellow (Huang He) (Fig. 1; Table 1). Our contribution is: (1) to demonstrate the hydrological effects of current management practices on these rivers; (2) to summarize the findings of previous studies of hydrological ecosystem impacts on these river systems; (3) to compare current water extractions with the projected hydrological consequences of climate change; and (4) to present insights from these river systems into water governance to improve ecosystem health in the presence of climate change.

### Trends in river flows and precipitation

Figure 2a shows that the outflows of the Colorado River at the US–Mexican border are a tiny fraction of the upstream inflows measured at Lees Ferry. Although evaporation accounts for some of this difference, most of it is a result of water extractions from the river. Similarly, Figs 3a to 5a show that there is a very large disparity between simulated and actual flows in the Yellow, Murray and Orange rivers. This difference is primarily a result of water extractions and associated infrastructure. In particular we examined the median outflows for the most recent 5 years for which data were available and compared these with the median simulated (natural) flow (see Figs 2a, 3a, 4a and 5a; inflows at Lees Ferry used in the case of the Colorado). Our calculations show that over the most recent 5 years, current median outflows are 0%, 41%, 12% and 33% of their current median simulated (natural) flows for the Colorado, Yellow, Murray and Orange rivers.

Figures 2b–5b show the annual precipitation and 5-year average for each of the rivers. The time period ranges from 50 years for the Yellow River to 90 years for the Orange and about a century for the Colorado and Murray Rivers. In all four river systems there are very large temporal annual variations in precipitation. Although there are extended periods of low precipitation in all of these basins, there is no apparent downward long-run trend in precipitation with the possible exception of the Yellow River. Our assessment of these long-run flow and precipitation records is that the marked decline in outflows in these rivers is largely a result of increased water extractions.

**Colorado** The Colorado River is primarily a snow-melt driven river with 92% of the flow originating above the Grand Canyon of the Colorado. Since the 1930s, significant infrastructure has been constructed on the system, including the two largest reservoirs in the United States (Lake Mead and Lake Powell) such that total storage in the basin now exceeds four times the annual flow. Flows in the Colorado were allocated in perpetuity by an interstate

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AMBIO
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KUNGL. VETENSKAPS- AKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES

PERSPECTIVE

# Water Planning and Hydro-Climatic Change in the Murray-Darling Basin, Australia

**R. Quentin Grafton, Jamie Pittock, John Williams, Qiang Jiang, Hugh Possingham, John Quiggin**

Received: 19 August 2013 / Revised: 15 December 2013 / Accepted: 7 February 2014

**Abstract** More than a third of humanity lives in regions with less than 1 million liters of fresh water per person per year. Population growth will increase water demand while climate change in arid and semi-arid areas may reduce water availability. The Murray-Darling Basin in Australia is a region where water reform and planning have been used to reduce consumptive extraction to better sustain river ecosystems under climate variability. Using actual data and previously published models that account for climate variability and climate change, the trade-off between water extractions and water essential to the long-term ecological function of river systems is analysed. The findings indicate that better water planning and a more complete understanding of the effects of irrigation on regional climate evapotranspiration could: (1) increase the overall benefits of consumptive and non-consumptive water use; (2) improve riparian environments under climate variability; and (3) be achieved with only small effects on the profits and gross value of food and fiber production.

**Keywords** Water planning · Climate variability · Irrigated agriculture · River ecosystems

## INTRODUCTION

Projected effects of climate change and hydro-climatic shifts induced by irrigation (Destouni et al. 2013) affect water availability at a basin-scale. At a global level, per capita water availability is declining in many countries (WWAP 2012). If water availability continues to fall, it will exacerbate underlying tensions between extractive and non-consumptive uses of fresh water and, with business as usual, result in environmental decline (Vorosmarty et al. 2010).

The Murray-Darling Basin (MDB), Australia offers insights about how to undertake water reform and planning in a region with highly variable and declining water availability. Planned MDB reforms have been undertaken to improve aquatic ecosystems without damaging the value of agricultural production. This basin is noteworthy as one of the world's most variable regions in terms of streamflows (McMahon et al. 2007) and precipitation (see Fig. 1), the large size of its water extractions relative to inflows (Grafton et al. 2012), and the relative importance of irrigated agriculture in terms of both its diversions and value added. Further, the MDB is a "test case" of water reform (Connell and Grafton 2011) because of the size of the proposed reductions in water extractions within a basin-wide water planning framework and the extensive use of markets for water reallocation (Grafton et al. 2011b; Grafton and Horne 2014).

Our evaluation provides insights about how to manage the trade-offs between consumptive and non-consumptive water in the MDB and also other locations, such as the Colorado Basin in the US, where current water management imposes major environmental costs (Glenn et al. 1996). Our review of the MDB: (1) assesses the ecosystem impacts of current water reform; (2) considers the costs and benefits of reallocating an increased share of the available surface water to environmental flows; and (3) provides insights about how to improve basin-wide water management.

## KEY FEATURES OF THE MURRAY-DARLING BASIN: HYDROLOGY AND WATER EXTRACTIONS

The MDB encompasses about 1 million km$^2$, some 14 % of the Australian continent, and stretches across extensive



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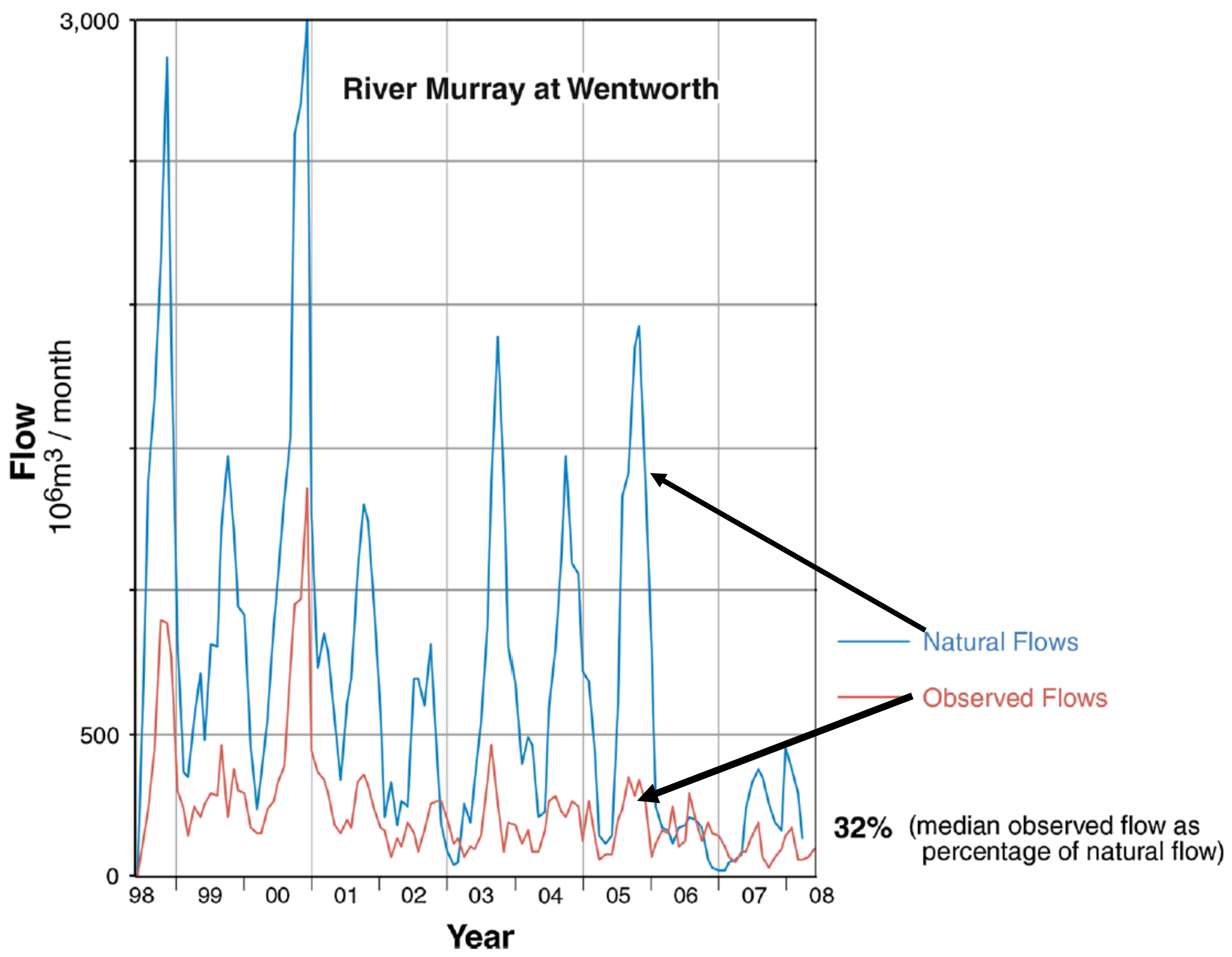


**g. 5** Natural and observed annual flows of Murray River at Wentworth

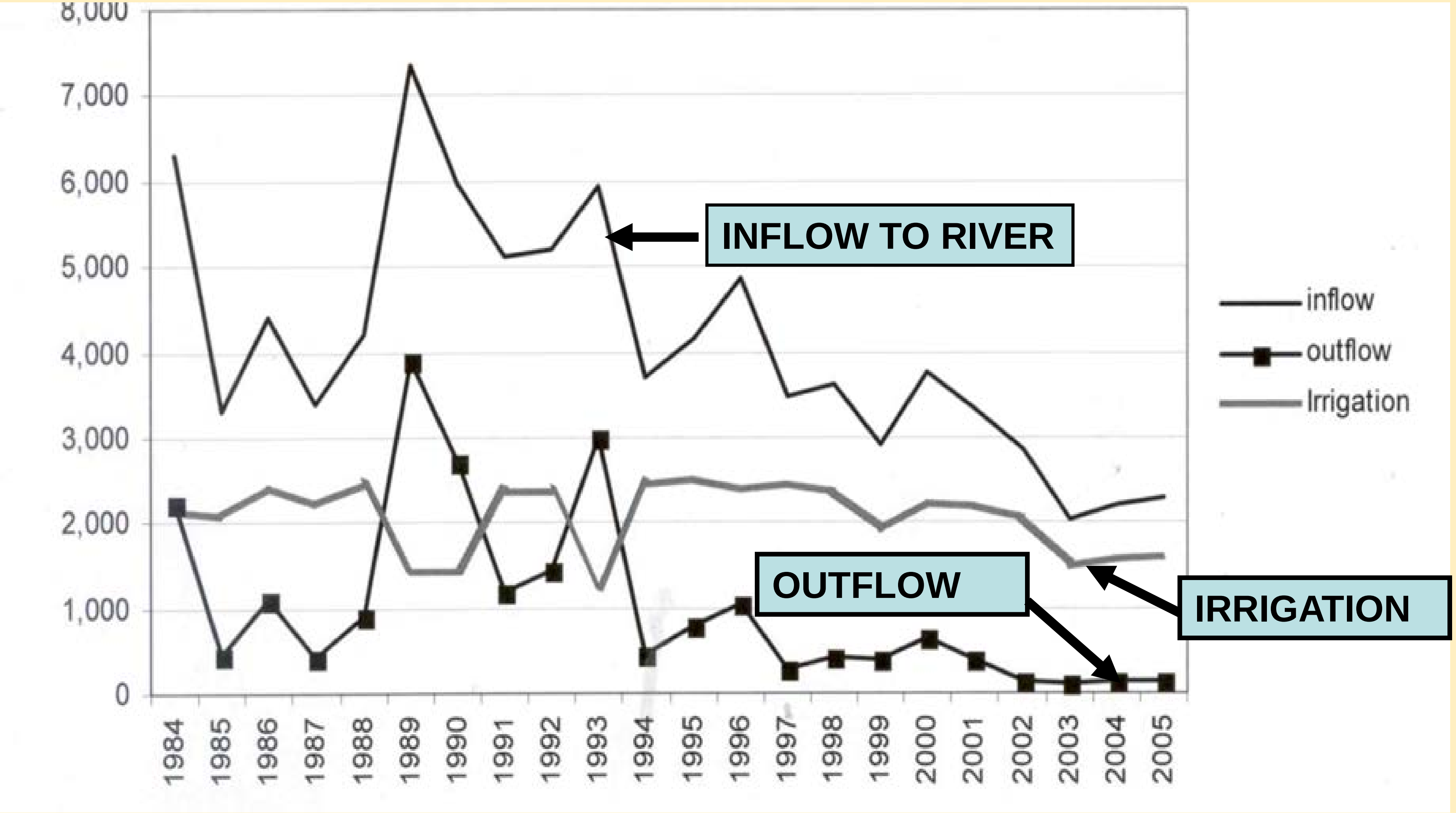


*Figure 5:* ***Murrumbidgee River: inflow, outflow and water used for irrigation[i]***

[i] Water Climate and Economic loss in the Murrumbidgee River and Southern Murray Basin. Professor Tom Kompas, Australian National University

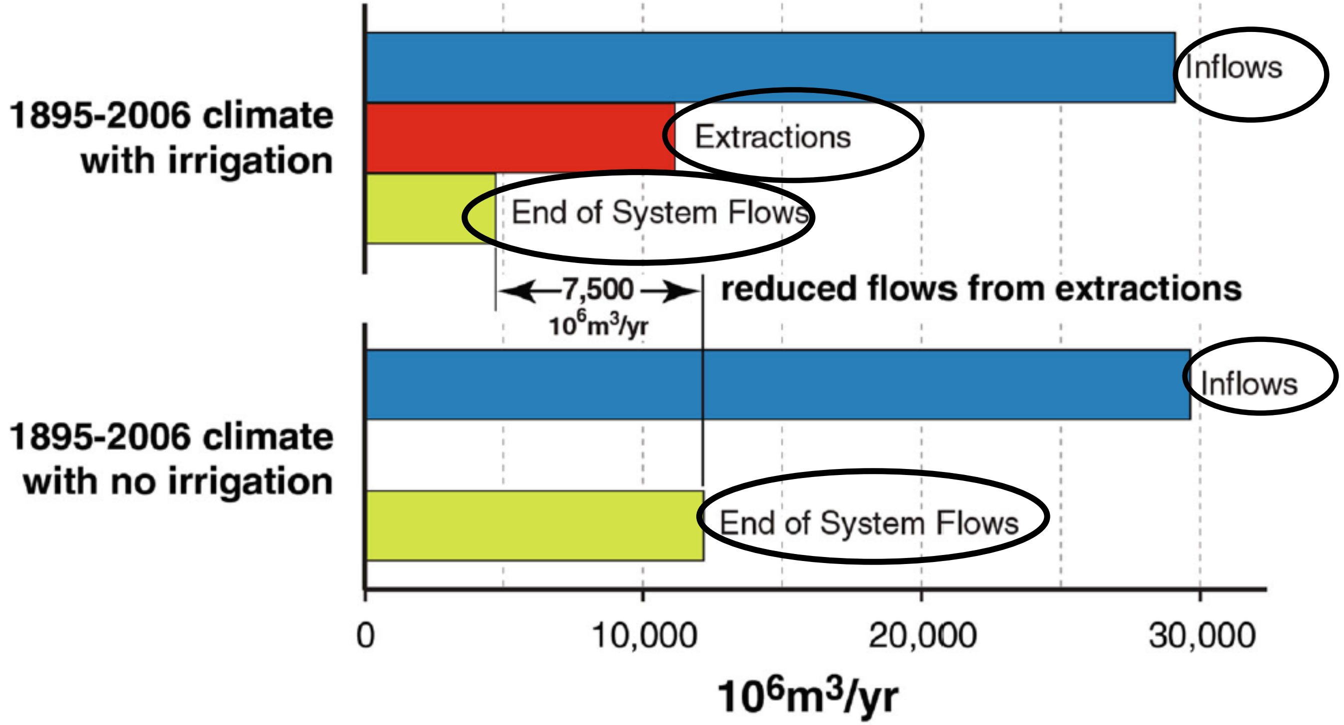


**Fig. 4** Long-term average annual basin flows

*Table 1: Health ratings of river valleys of the Murray-Darling Basin*[25]

| Health Rating | River Valley |
|---|---|
| Good | Paroo |
| Moderate | Border Rivers, Condamine |
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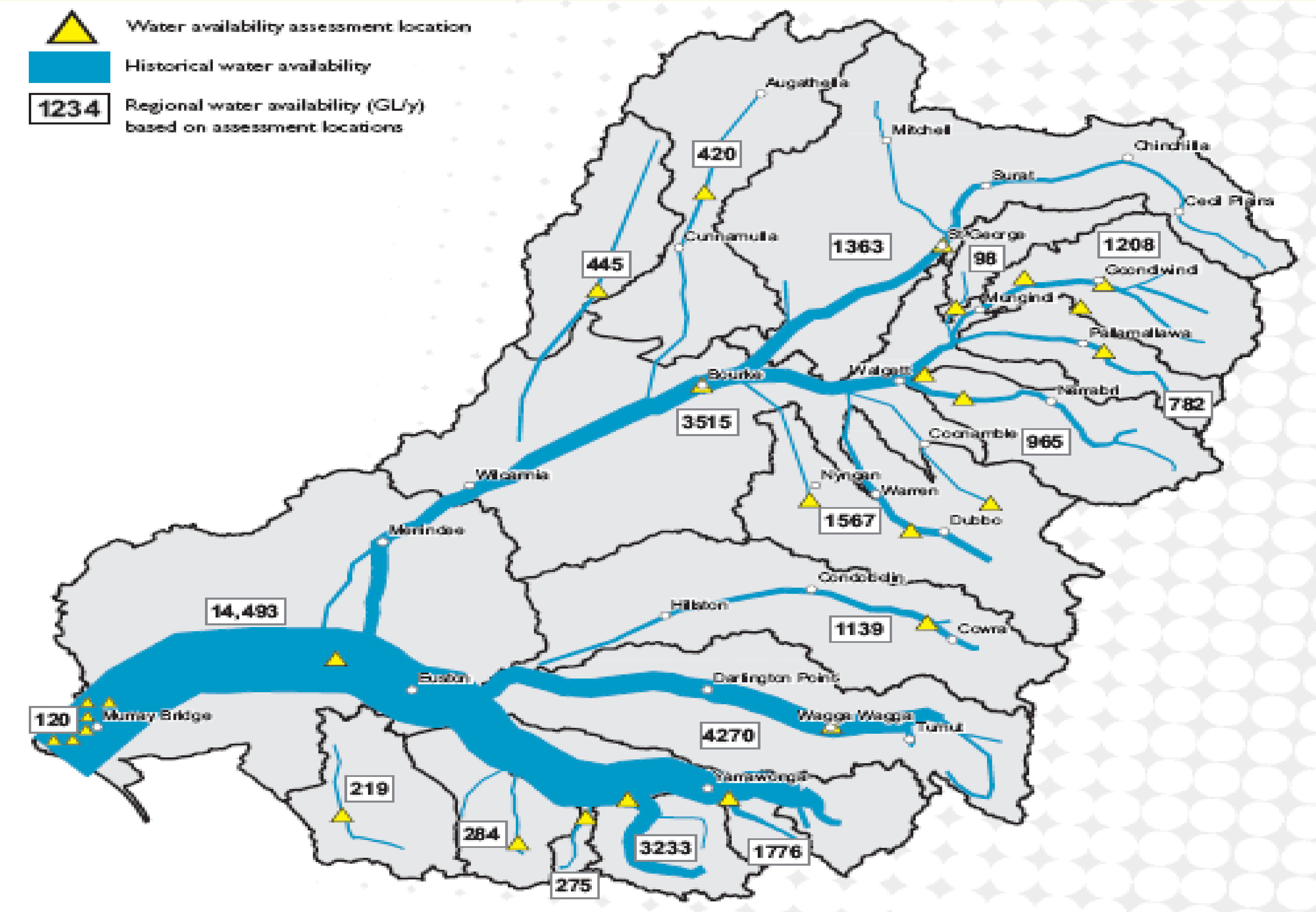
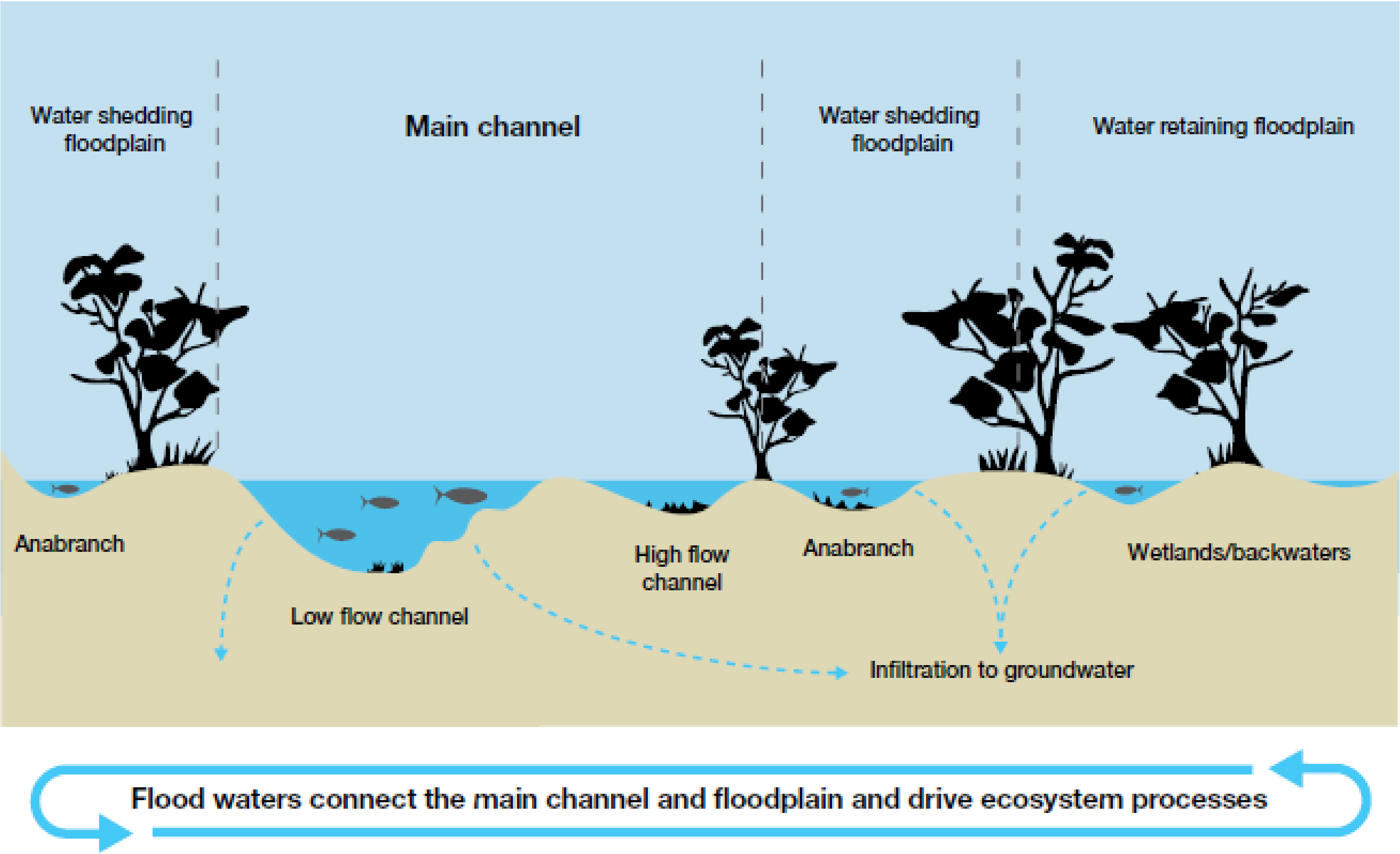


Water availability assessment location
Historical water availability
1234
Regional water availability (GL/y)
based on assessment locations
Augathella
Mitchell
Chinchilla
Surat
Cecil Plains
420
Cunnamulla
1363
St George
98
1208
Goondiwindi
445
Mungindi
Pallamallawa
Bourke
Walgett
Narrabri
782
3515
Coonamble
965
Wilcannia
Nyngan
Warren
1567
Dubbo
Menindee
Condobolin
Hillston
1139
Cowra
14,493
Euston
Darlington Point
120
Murray Bridge
Wagga Wagga
Tumut
4270
Yarrawonga
219
284
3233
1776
275

Figure 4: Cross section view of ecological functions and the hydrology of red gum forests



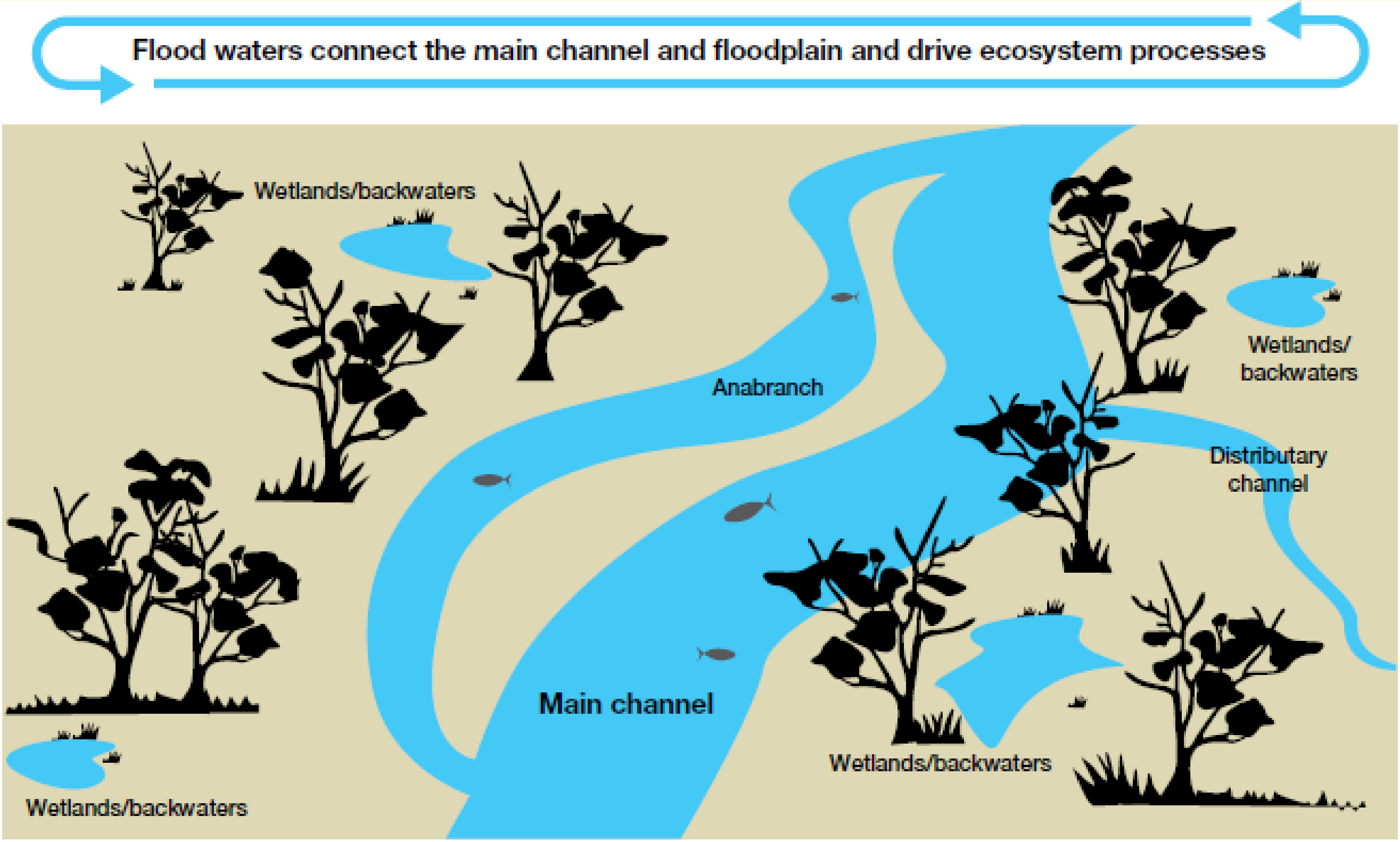



Figure 5: Oblique view of ecological functions and the hydrology of red gum forests

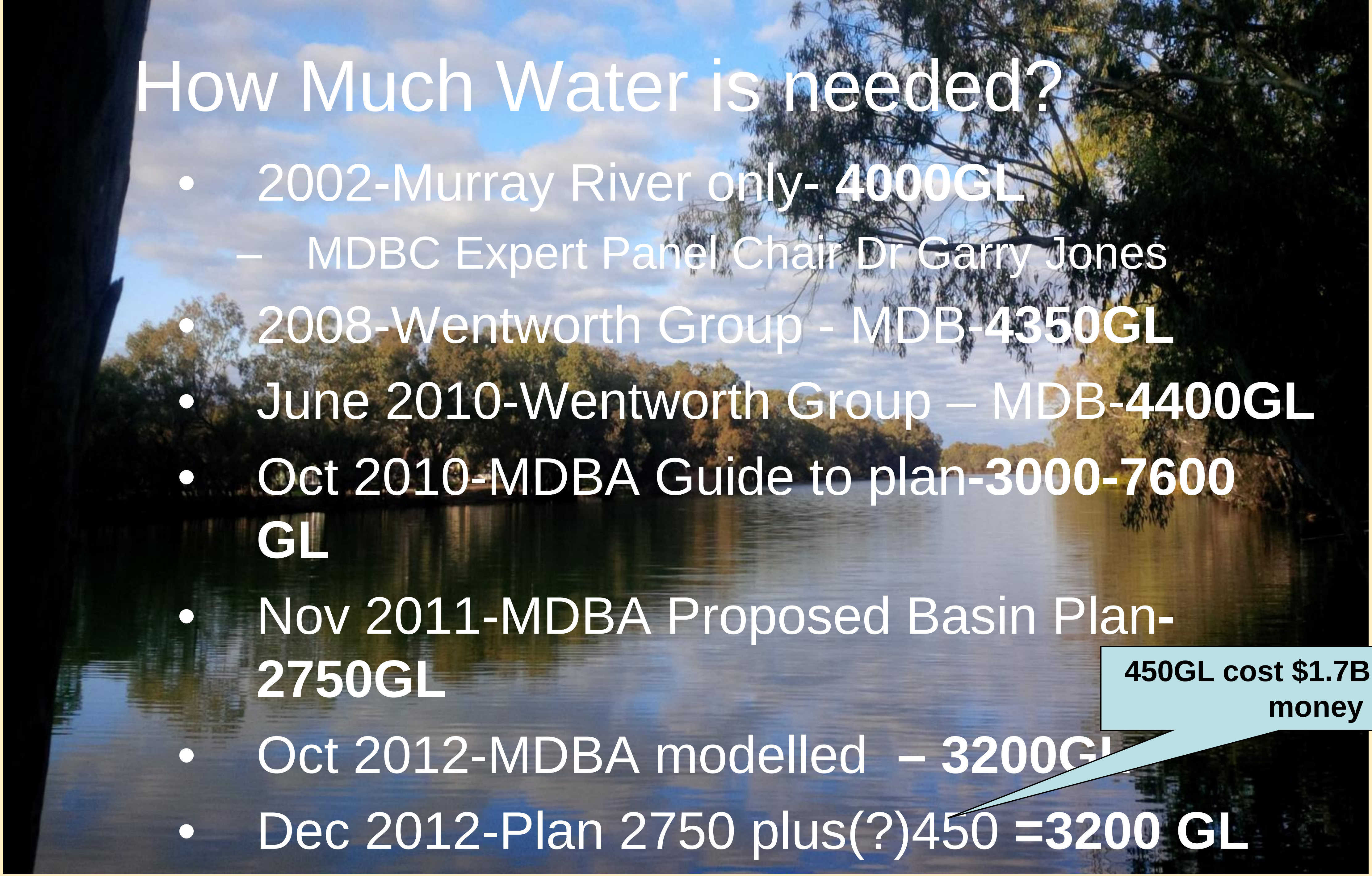
Photo courtesy of Anne Jensen

Photo courtesy of Anne Jensen

Photo courtesy of Anne Jensen

# Water Reform History

- In 1990's River health in decline…The CAP 1994-5
- Science indicated need to return large amounts of water to rivers.
- An accord was conceived
  - where public water licences were converted to a tradeable private property right as an entitlement which generated an allocation.
  - In return water would be returned to the rivers by public purchasing from willing sellers the entitlement to yield heathy working rivers.

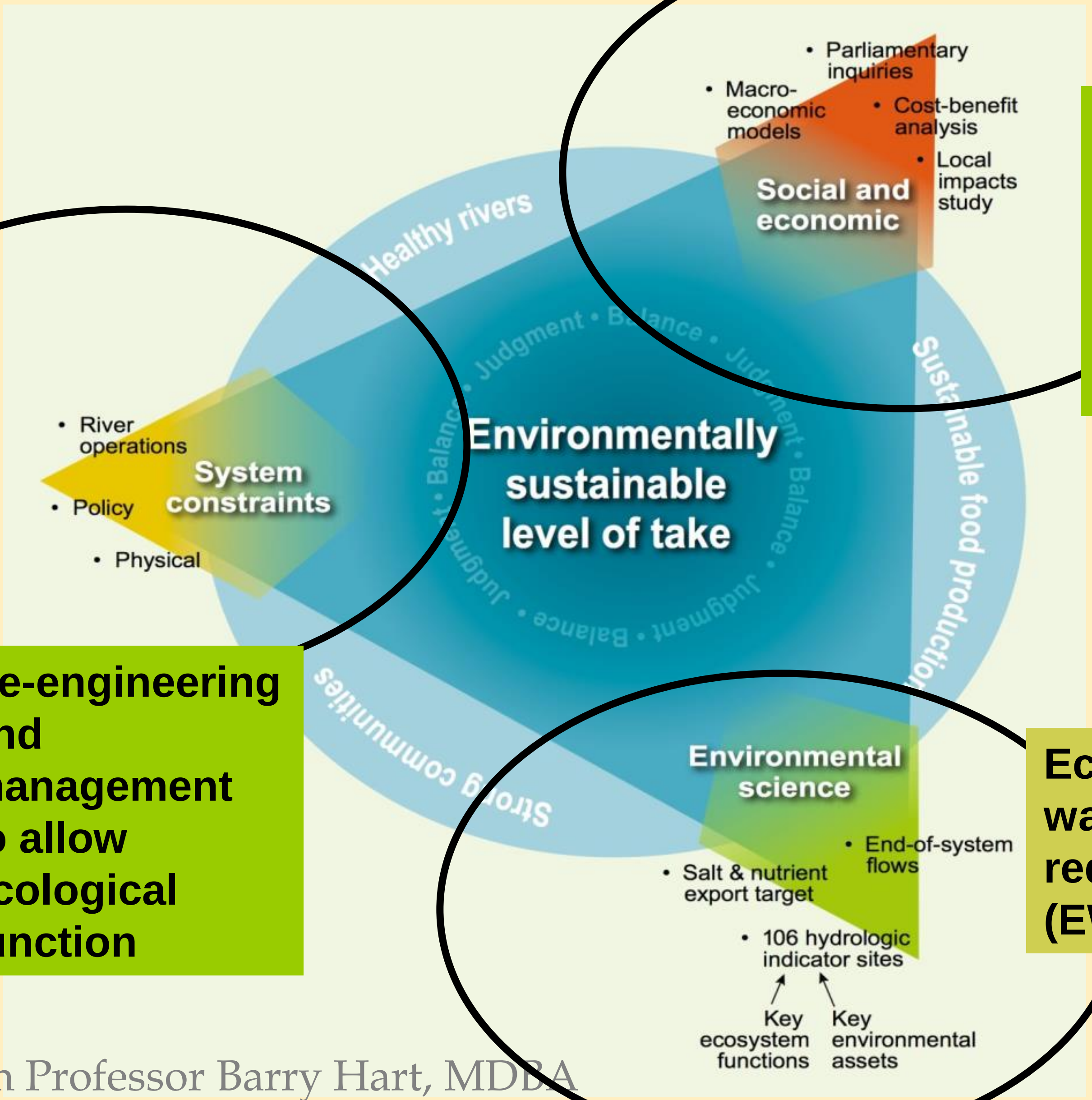


# How Much Water is needed?

- 2002-Murray River only- **4000GL**
  - MDBC Expert Panel Chair Dr Garry Jones
- 2008-Wentworth Group - MDB-**4350GL**
- June 2010-Wentworth Group – MDB-**4400GL**
- Oct 2010-MDBA Guide to plan**-3000-7600 GL**
- Nov 2011-MDBA Proposed Basin Plan**-2750GL**
- Oct 2012-MDBA modelled **– 3200GL**
- Dec 2012-Plan 2750 plus(?)450 **=3200 GL**

**450GL cost $1.7Billion new money**

# The Task



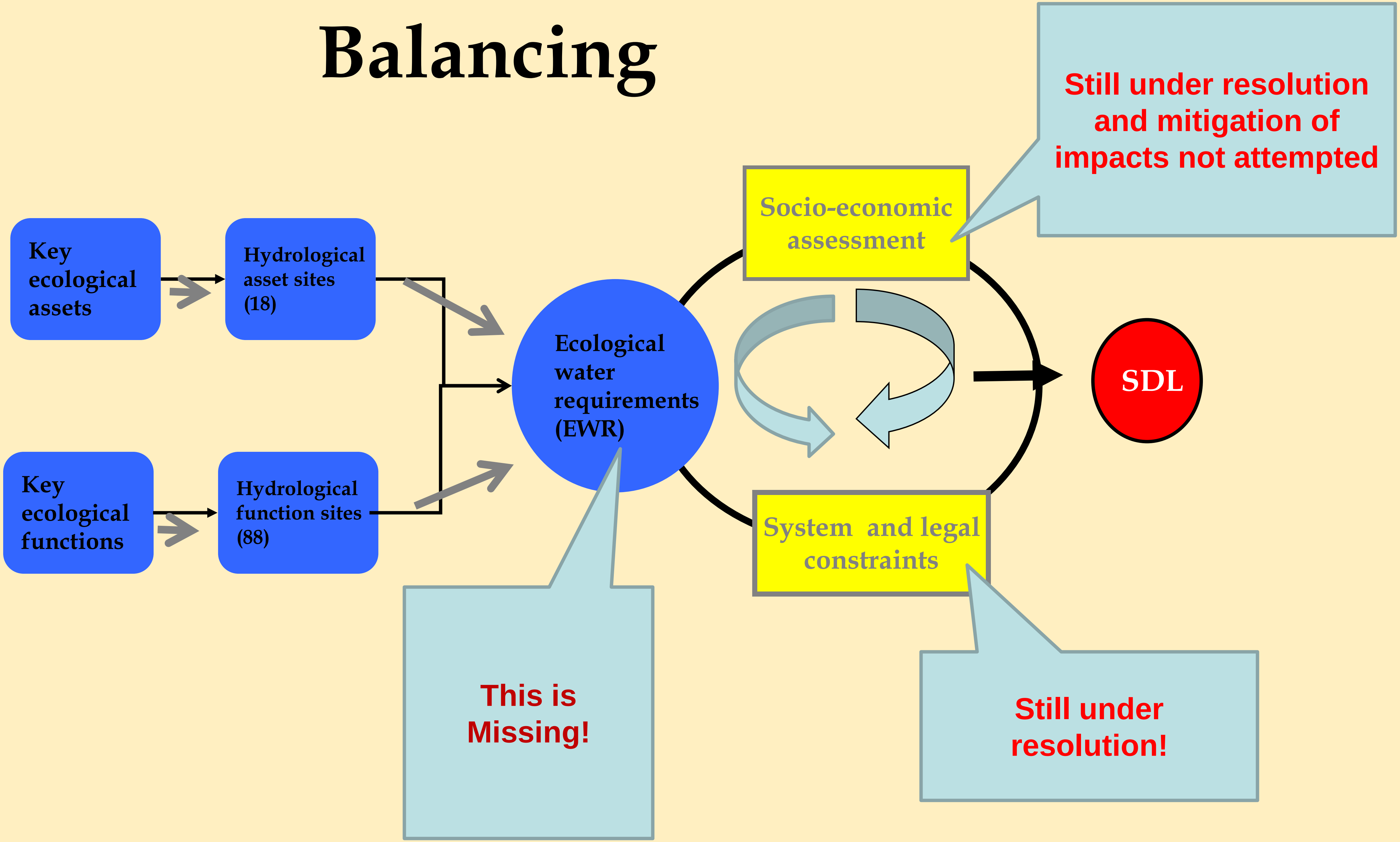

**Policy to facilitate Community Adjustment and Development**

**Re-engineering and management to allow ecological function**

**Ecological water requirements (EWR)**

Derived from Professor Barry Hart, MDBA

# Balancing




Courtesy Professor Barry Hart, MDBA

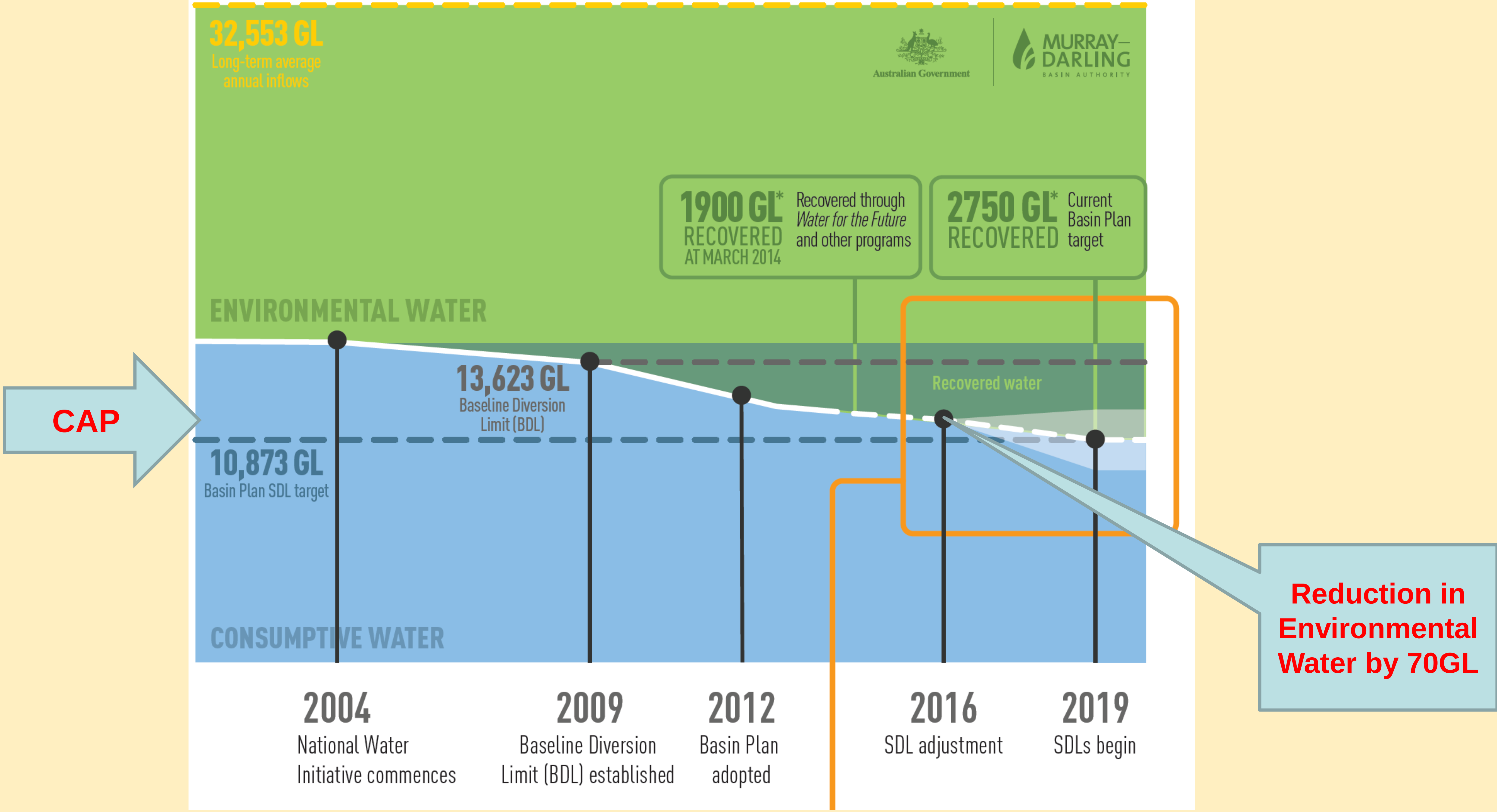
# Baseline Sustainable Diversion Limits (BSDL)

| Traditional Diversions | Stream Diversions | Dams Interception | Plantation Interception | Total (GL) |
|---|---|---|---|---|
| 10,635.9 | 267.0 | 2,384.3 | 336.0 | 13,623.2 |

**These diversions added to CAP diversions and entitlements**

**Question:** By increasing the BSDL by **2720.0 GL** above **10902.9 GL** and then reduce this base by **2750 GL** to arrive at SDL= **10,873.0 GL**
**What have we done?**

# Environmental water recovery progress and SDL adjustments



# Groundwater

The Senate

Rural and Regional Affairs
and Transport
References Committee

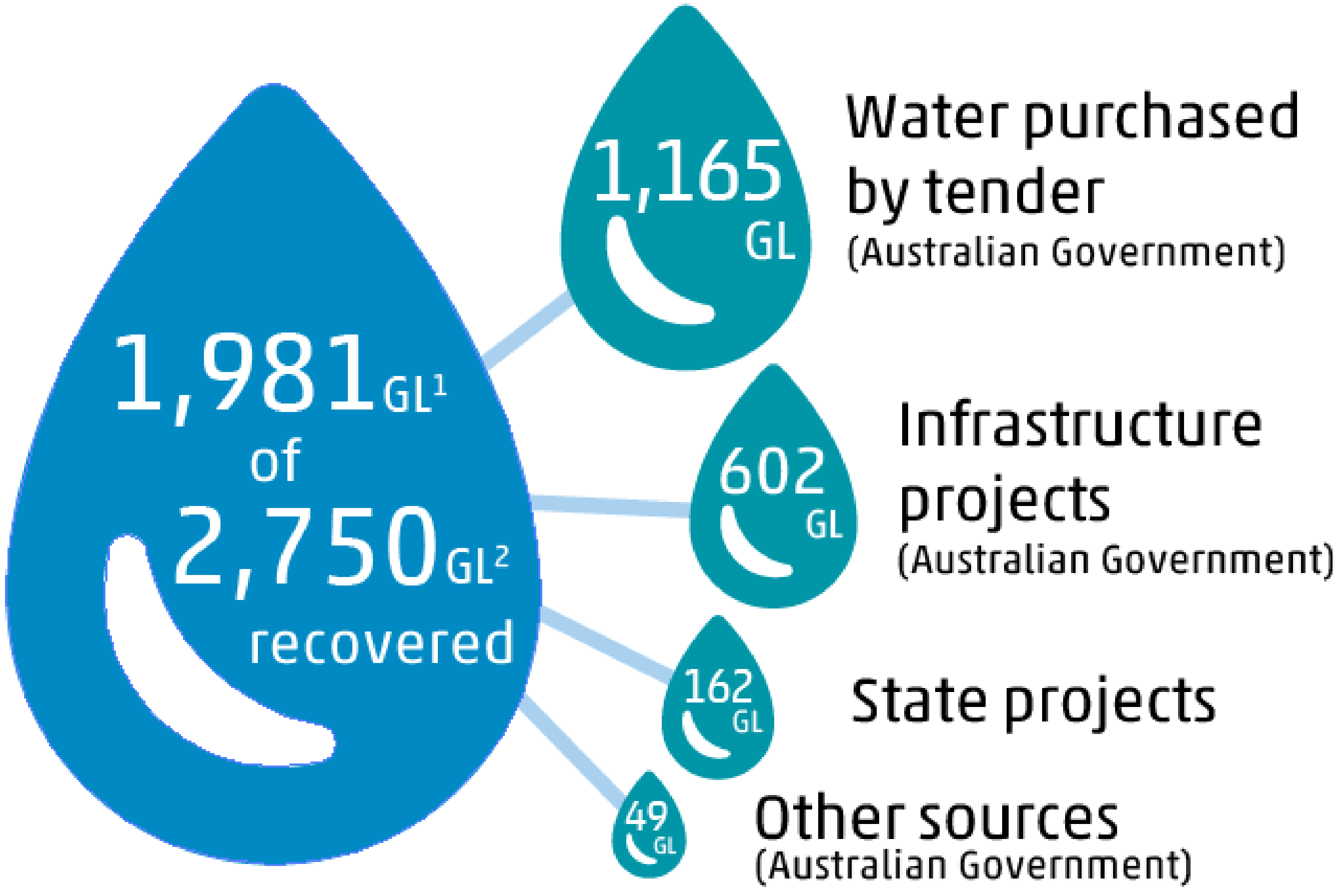
The management of the Murray-Darling Basin

March 2013

**Table 3.1—Groundwater SDLs and BDLs from the Guide to the Basin Plan**

| | The Guide (October 2010) | Basin Plan (November 2011) | Basin Plan (May 2012) | Basin Plan (August 2012) | Final Basin Plan (November 2012) |
|---|---|---|---|---|---|
| BDL GL/y | 1786[2] | 2352[3] | 2373[4] | 2378[5] | 2386[6] |
| SDL GL/y | 2095[7] | [illegible] | [illegible] | [illegible] | 3334[11] |

# Progress towards the 2019 surface water recovery target, figures as at 30 June 2016



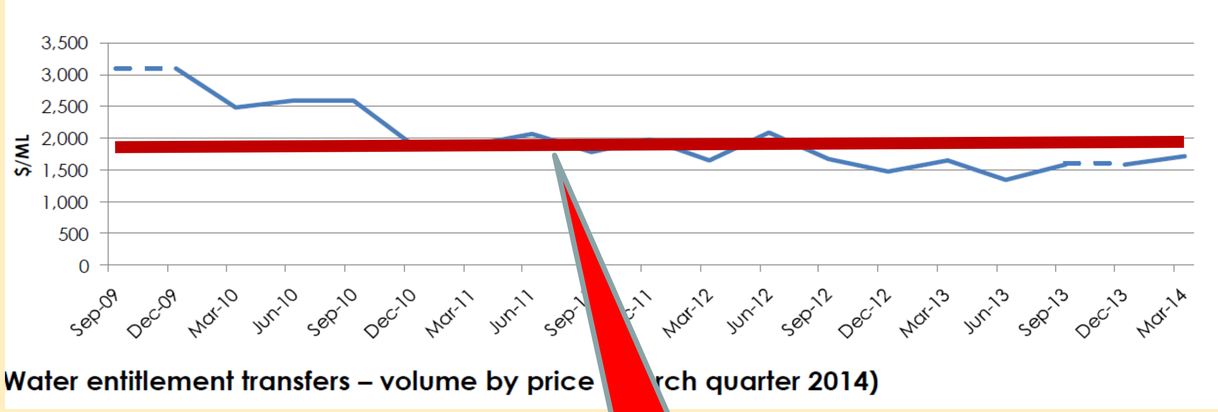

1 This figure is based on contracted water recovery and so includes commitments to acquire entitlesments. Note that the smaller numbers are rounded to the nearest GL. As at 30 June 2016 the total recovered was 1,981.4 GL.

2 The recovery target could change due to the sustainable diversions limit adjustment process and the northern Basin review.

**Table 3: Major infrastructure projects funded by the Australian Government (GL)**

| State | Programme/Project | Contracted ($m) | Water recovery towards Bridging the Gap (GL LTAAY) | Market Multiple |
|---|---|---|---|---|
| NSW | SPP[1]—NSW—Private Irrigation Infrastructure Operators Program (PIIOP) | 642 | 113 | 2.4 |
| | SPP—NSW Water Metering Scheme (Pilot Project) | 22 | 4 | 3.5 |
| | SPP—NSW Water Metering Scheme (excluding pilot) | 199 | 28 | 2.3 |
| | SPP—NSW Basin Pipes (Stock and Domestic) | 137 | 30 | 2.5 |
| | SPP—Irrigated Farm Modernisation (Border Rivers-Gwydir Pilot Project) | 7 | 0.5 | 2.3 |
| | SPP—Irrigated Farm Modernisation Project | 85 | 12 | 2.5 |
| | Nimmie Caira Enhanced Environmental Water Delivery Project | 180 | 133 | 2.4 |
| Qld | SPP—On Farm Water Use Efficiency Project (Healthy Headwaters)—rounds under contract to date | 51 | 7 | 2.0 |
| Vic | SPP—NVIRP Stage 2 Project (now known as Goulburn-Murray Water Connections Project Stage 2) | 956 | 102 | 4.9 |
| | SPP—NVIRP on-farm component | 44 | 10 | 2.3 |
| | Victorian Farm Modernisation Project (assuming all three tranches proceed) | 100 | 30 | 1.9 |
| | Sunraysia Modernisation Project | 103 | 7 | 7.1 |
| SA | SPP—SA Private Irrigation Infrastructure Program (PIIP-SA) | 14 | 3 | 2.6 |
| | South Australian River Murray Sustainability Program (SARMSP)—irrigation efficiency component[2] | 80 | 16.8 | 2.5 |
| Southern Basin | On-Farm Irrigation Efficiency Program—including pilot projects and first three rounds under contract. | 296 | 83 | 2.3 |
| Total 'bridging the gap' infrastructure water recovery[3] | | 2916 | 560[4] | |

# Direct buy back cost

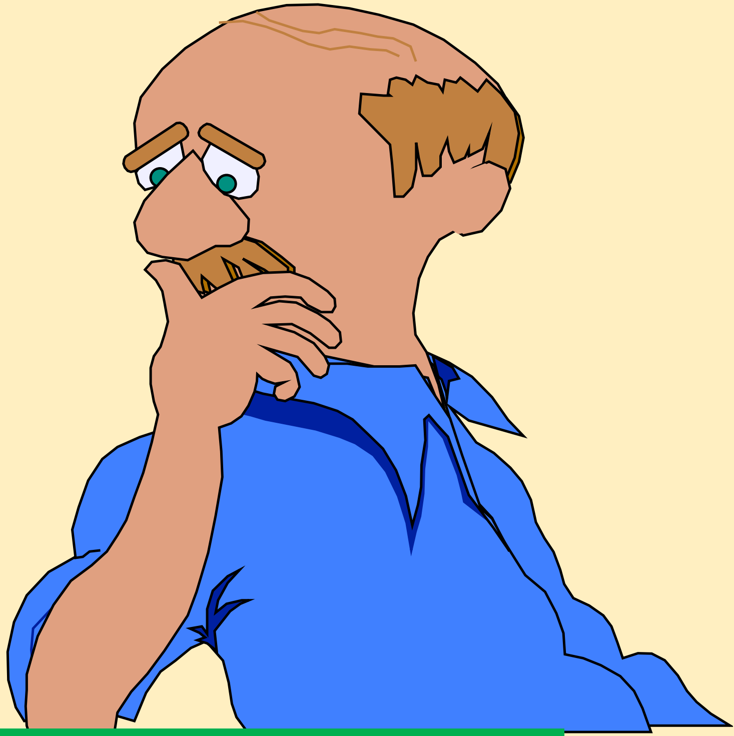



**$5,210 per ML**

**Worst case is $2,000 per ML**
**$886 per ML**

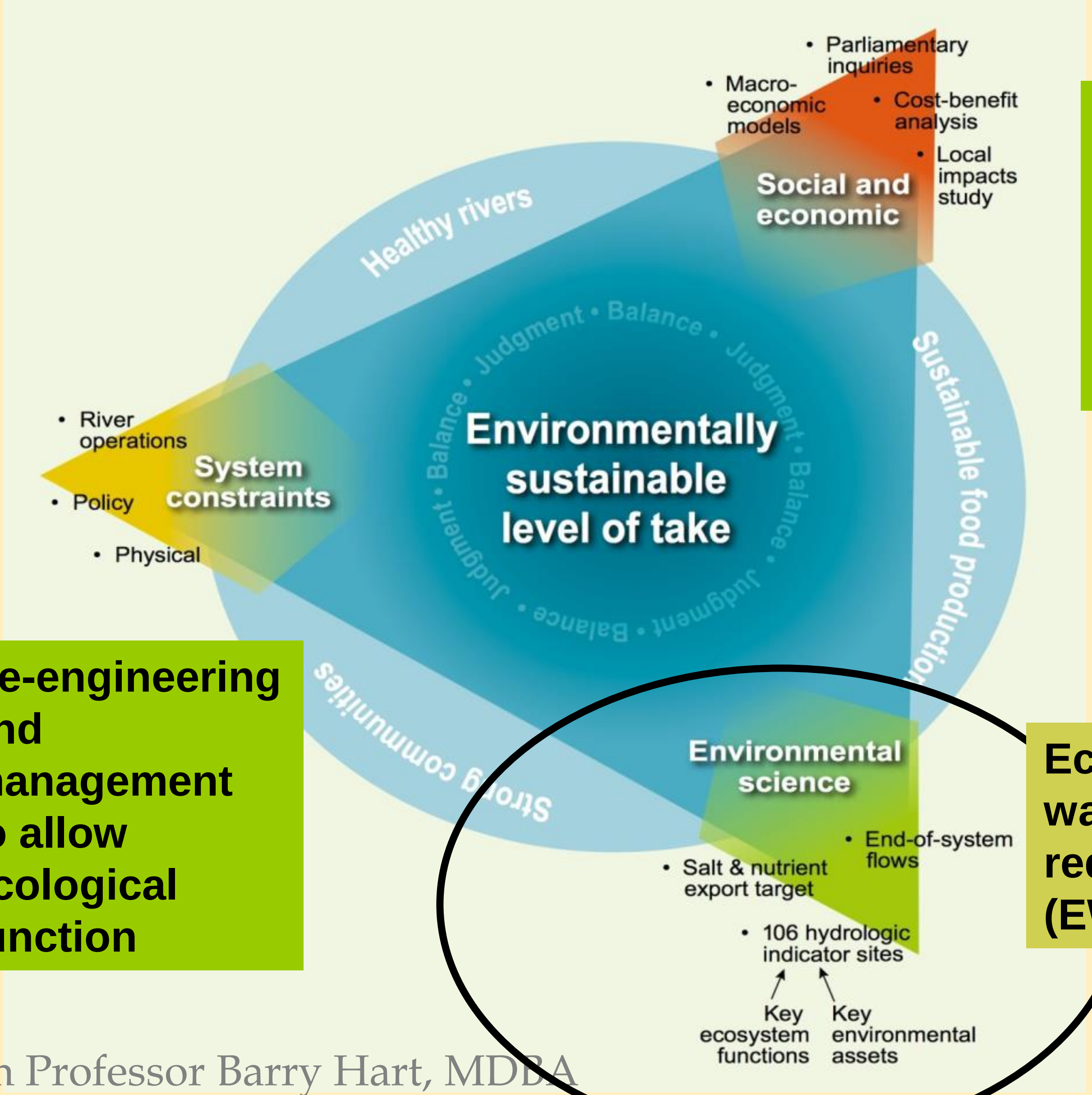
# Questions for Science

- Was the Science base for SDL established as required by Act, was science subject to transparent review?
- Was science for large increase in GW extraction subject to transparent review?
- Was surface and groundwater properly linked yet are strongly interdependent-flood and recharge?
- Were constraints to use of water for flooding and gaining ecological function underpinned by science?
- Use of science to adjust and manage for climate change not done!.



**The future must be about using the best science we have.**

# The Task



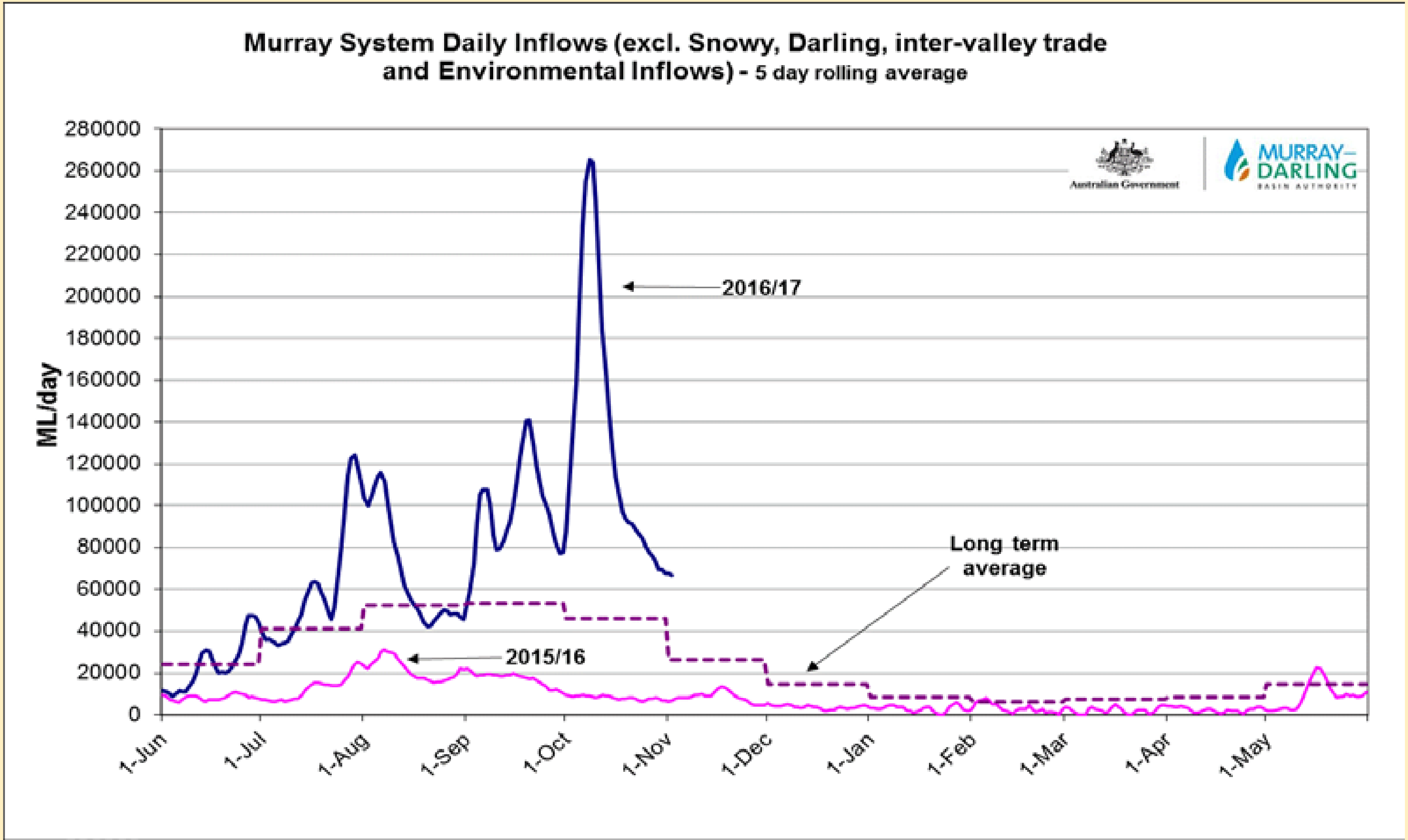

**Policy to facilitate Community Adjustment and Development**

**Re-engineering and management to allow ecological function**

**?**

**Ecological water requirements (EWR)**

Derived from Professor Barry Hart, MDBA


Murray System Daily Inflows (excl. Snowy, Darling, inter-valley trade and Environmental Inflows) - 5 day rolling average
ML/day
280000
260000
240000
220000
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
2016/17
2015/16
Long term average
Australian Government
MURRAY–DARLING BASIN AUTHORITY

2003
2006
2010
2013
2014
2015
2016

- The Australian and South Australian governments are currently dredging sand out of the Murray Mouth to ensure it remains open. Dredging, which is not new to the region, is the process where sand is pumped out of the Mouth and transferred by pipeline further out to sea, to ensure the Coorong remains connected to the Southern Ocean.

- This process has been underway since January 2015, and will continue for at least another year, to maintain the opening and subsequently the health of the mouth.

- By mid-April 2016, almost 1.2 million cubic metres of sand had been dredged. This has resulted in a net reduction of sand at the Mouth of 241,000 cubic metres.

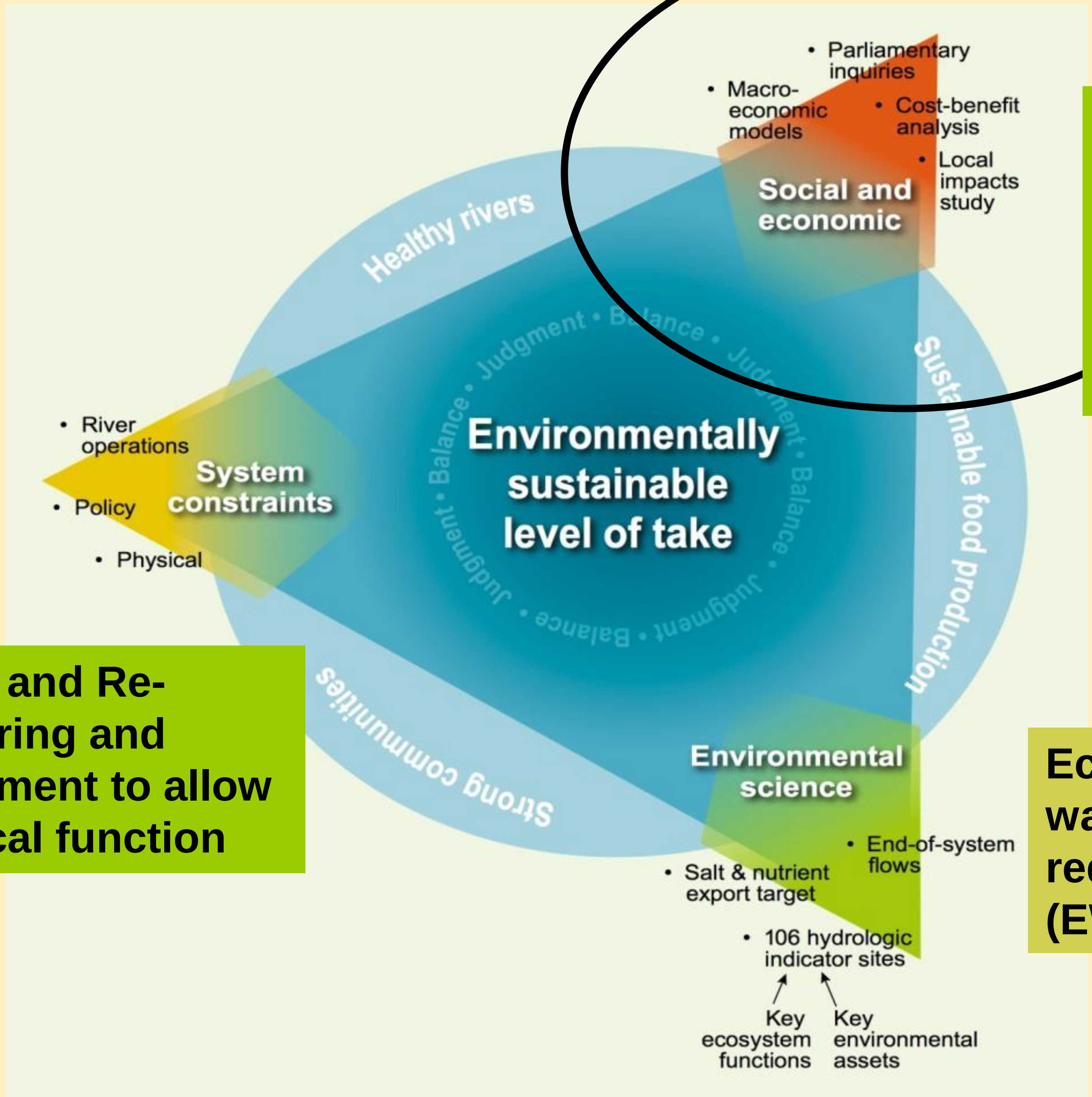
- In the future, under the Basin Plan, greater flows to sea will reduce the frequency of dredging.


http://www.mdba.gov.au/news/where-river-meets-ocean
Recent barrage releases have scoured a modest amount of sand,
but sufficient to improve connectivity of the Murray Mouth in the short term.
Larger flows through November and into December are expected to scour larger volumes of sand.
Flow this month was 1435 GL…..
*Mouth of the Murray River, South Australia, November 2016*

# The Task

?

Policy to facilitate Community Adjustment and Development




Science and Re-engineering and management to allow ecological function

Ecological water requirements (EWR)

Derived from Professor Barry Hart, MDBA

**Table 2** Reduction in annual net profits and annual gross value of irrigated production (GVIAP) in irrigated agriculture (% from base case) in the MDB from a least-cost acquisition of surface water entitlements owned by irrigators based on long-term agricultural surface water diversions ($10^6$ $m^3$ $year^{-1}$ on average)

| | 3000 GL reduction | 3500 GL reduction | 4000 GL reduction | 4400 GL reduction | 7600 GL reduction |
|---|---|---|---|---|---|
| % Reduction in net profits | 10 | 14 | 17 | 21 | 46 |
| % Reduction in GVIAP | 10 | 13 | 16 | 18 | 41 |

## Option 3 –
## Reasonable return and community development program

Under Options 1 and 2, only those with water to sell will receive financial compensation, and only irrigators will benefit from infrastructure improvements. Little assistance is provided to help the broader communities in the affected catchments adjust to a future with less water.

Prof R. Quentin Grafton, Ian Kowalick, Prof Chris Miller

Under this approach, the level of funding available to each affected community would be based on the economic impact resulting from the withdrawal of water for consumptive use in that district. In some of the worst affected communities, these sums could be significant.

It is most likely to achieve all three objectives of the Water Act and represents much better value for money for Australian taxpayers. In doing so, it can free up significant financial resources that can be used to assist communities re-build their regional economies and adapt to a future with less water.

*Figure (iii): Cost-Effectiveness of alternative approaches for obtaining water for the environment*

| | Volume of water obtained for the environment | Funds for purchase of water for environment | Funds for irrigation infrastructure investment[i] | Funds for infrastructure investment (irrigation and other) |
|---|---|---|---|---|
| Option 1: *Water for the Future* | 2,910 GL ($3,058/ML[ii]) | $3.1 billion | $5.8 billion | - |
| Option 2: Market buyback and infrastructure | 4,400 GL ($1,932/ML[ii]) | $8.5 billion | - | $400 million |
| Option 3: Reasonable return and community development | 4,400 GL ($886/ML[ii]) | $3.9 billion ($1.2 billion plus $2.7 billion) | - | Up to $5 billion |

*Table 4: Reductions in annual net returns from a 30% and 40% reduction in agriculture surface water diversions in the Murray-Darling Basin based on data from 1 July 2000 to 30 June 2001*

| Catchment | Reduction in annual net returns from a 30% reduction in Basin agriculture diversions | Reduction in annual net returns from a 40% reduction in Basin agriculture diversions |
|---|---|---|
| | (%) | (%) |
| Paroo | - | - |
| Warrego | - | - |
| Condamine-Balonne | 2.0 | 13.2 |
| Moonie | 0.2 | 34.6 |
| Border Rivers | 0.7 | 3.7 |
| Gwydir | 0.4 | 1.3 |
| Namoi | 2.2 | 7.7 |
| Macquarie-Castlereagh | 1.4 | 8.2 |
| Barwon-Darling | 0.5 | 2.2 |
| Lachlan | - | - |
| Murrumbidgee | 25.8 | 32.4 |
| Murray | 11.5 | 14.3 |
| Ovens | 0.1 | 10.4 |
| Goulburn-Broken | 0.3 | 13.8 |
| Campaspe | - | 90.4 |
| Loddon-Avoca | - | 43.5 |
| Wimmera | - | - |
| Eastern Mt Lofty Ranges | 0.1 | 8.1 |
| **Murray-Darling Basin** | **9.5** | **16.3** |

### *Thriving Communities model*

The scale of the water reform to restore the health of rivers, wetlands, floodplains and the estuary in the Murray-Darling Basin is daunting. It can only be achieved by working with the communities of each catchment affected to bring about these reforms.

The *Thriving Communities* model may provide a useful approach for this work. The model is based on an inclusive social and economic development approach. It respects that the various communities along the Basin live first-hand with the realities of the prolonged drought and the challenge of reducing water extractions. They are experts about the impacts for them, their families and their towns. Communities know better than anyone the history, issues and previous interventions in their particular areas: what has been tried before, what has worked, and what has not. They have the knowledge and deep understanding of local collective assets, capacities and potential available for adjustment processes.

The *Thriving Communities* model involves three steps:[58]

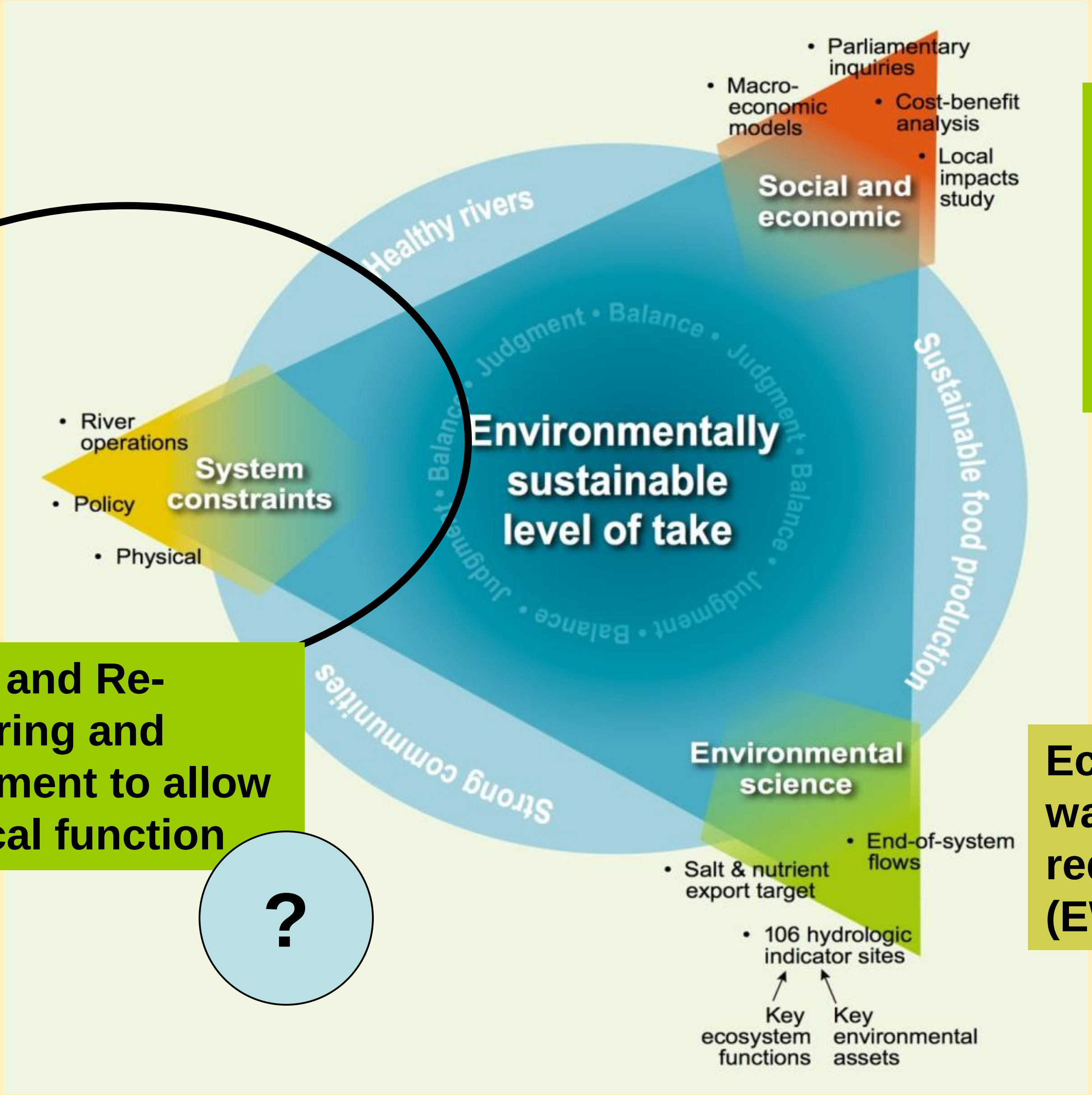
**Step 1 ►** Bringing people together and sharing knowledge, so they have a more comprehensive picture of the issues, challenges and opportunities they face as a community.

**Step 2 ►** Focusing on providing the community with an opportunity for structured dialogues. For communities to have a sustainable future the energy, vitality and economic creativity must come from within. The *Thriving Communities* model recognises that people who have different and often competing interests need the opportunity to talk – sometimes with anger and frustration – and to listen and learn from one another, then turn their collective attention to building a better future.

**Step 3 ►** Developing a plan for the future. This step could be undertaken by a representative body. It could be in the form of a local compact between each community and Local, State and Federal Government. However, implementing the plan would require resources, drawing on both local capital and matching government support, and an organisational framework.

Current State and Federal Government departments do not have the capacity to lead this process. To undertake this process effectively would require a specifically appointed multi-disciplinary National Task Force of expert practitioners in local economic and social development working over a minimum of two years. It would also be essential to have a small team of evaluators attached to the Task Force to ensure an iterative evaluation with lessons learnt from the work incorporated on an ongoing basis.

# The Task

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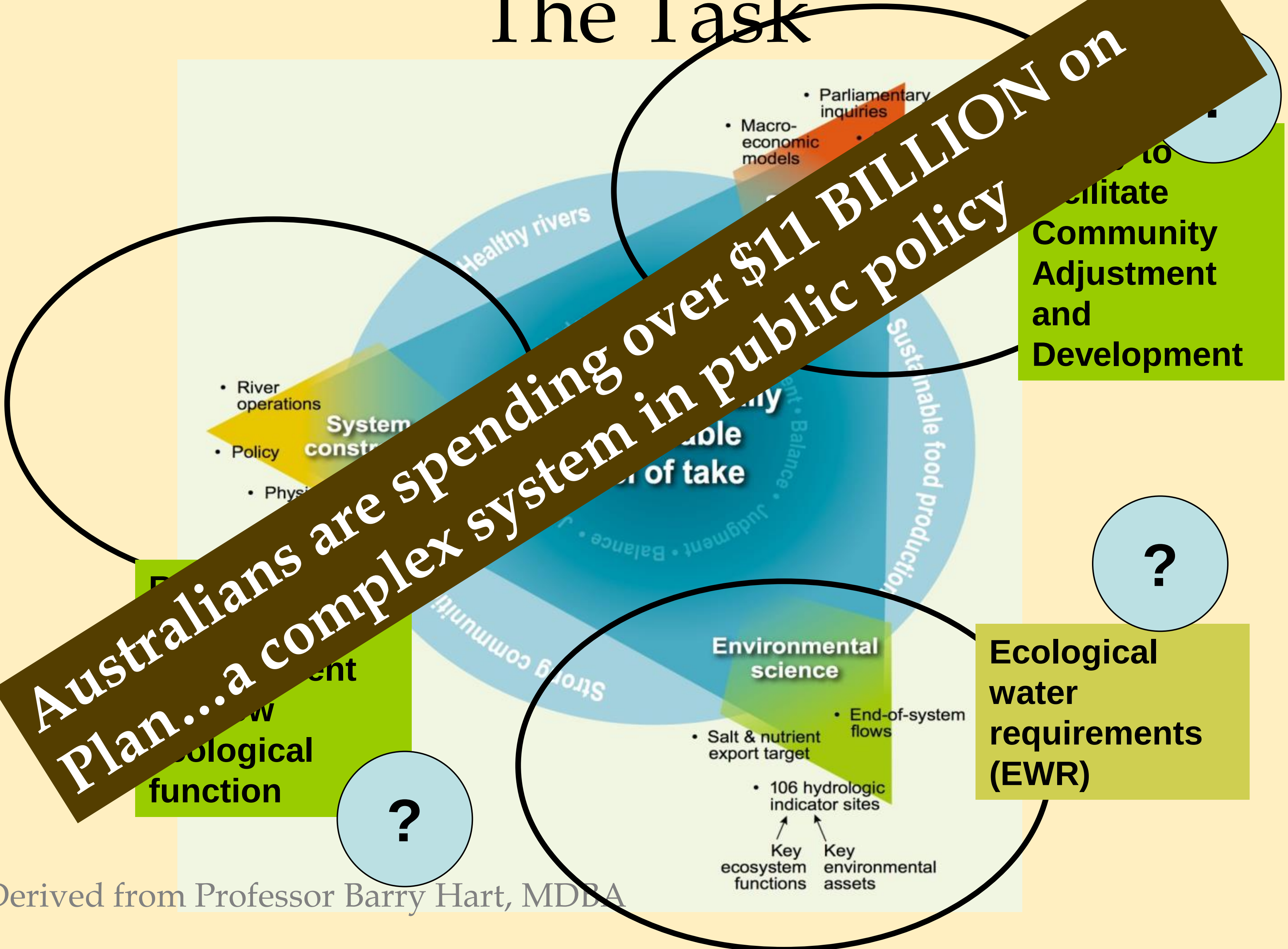
*Blackwater in Barber Creek, in the Edward-Wakool River System. Pic. J.Abell*


WE ARE GETTING SOME THINGS TO WORK WELL

# The Task




Australians are spending over $11 BILLION on Plan…a complex system in public policy

Community Adjustment and Development

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