

Water in the southwest: Reflections and comparisons with world water challenges

Jeff Camkin

Critical Horizons Seminar
Water – Defining the limits of our future

Bunbury, Western Australia
24 July 2008

Presentation Outline

- The world water crisis
- Australia's water reform agenda
- Water in the west
- Reflections on the current state and future for water in the southwest

Acknowledgements

This presentation draws from presentations at ASEM Waternet mid-term conference, Lisbon, April 2008 by:

Carlos Fernandez-Jauregui, Director, United Nations Decade of Water for Life, Spain

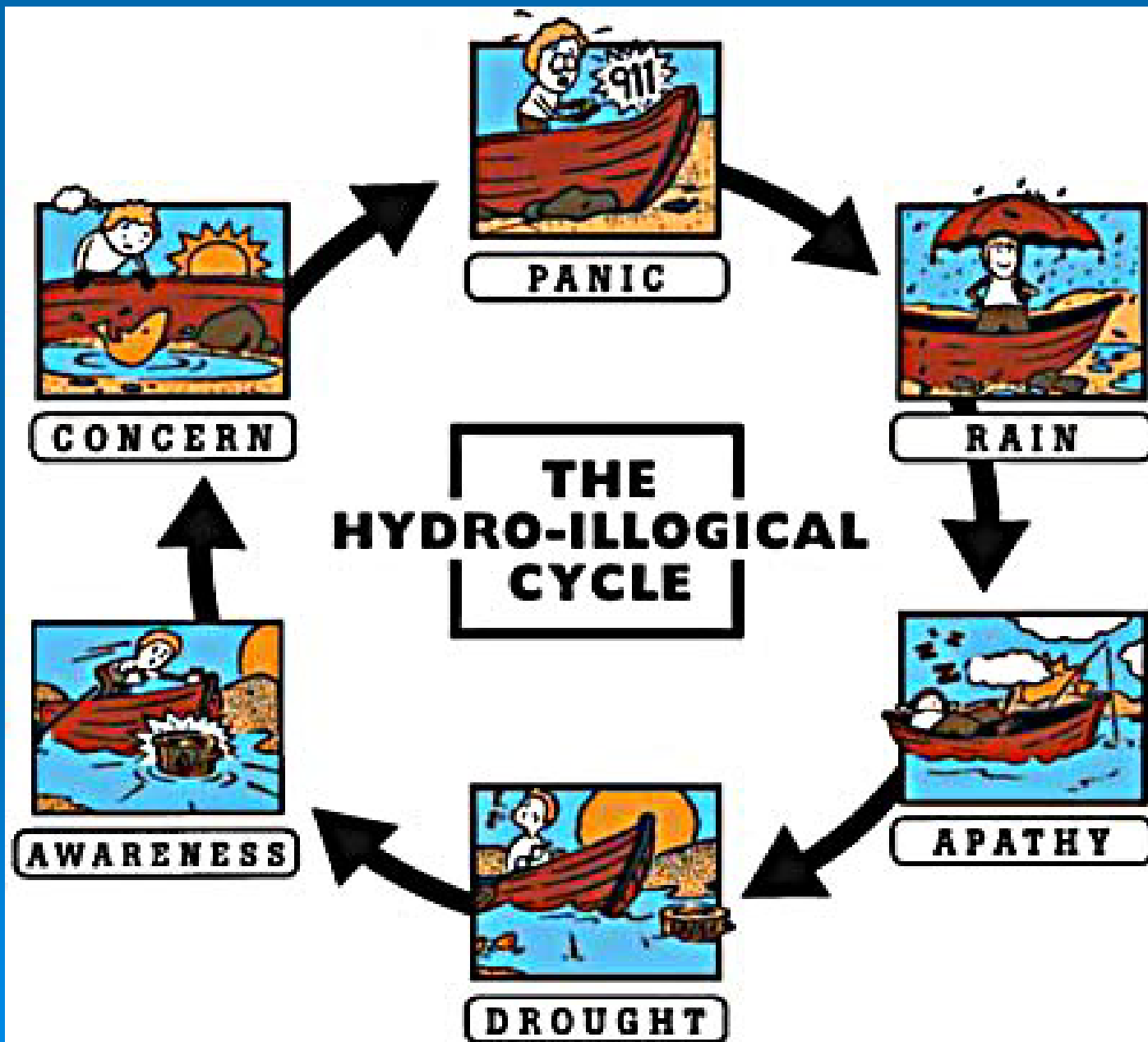
Claudia Pahl-Wostl, Professor for Resource Management, University of Osnabruck, Germany

Joao Paulo Lobo-Ferreira, Technical University of Lisbon, Portugal

Jeff Camkin, CSIRO, Australia

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Drought: A Behavioural Problem



The World Water Crisis

The UN WWAP coordinates the concerns and activities of 25 UN agencies to:

Identify and describe the **nature of water crises**

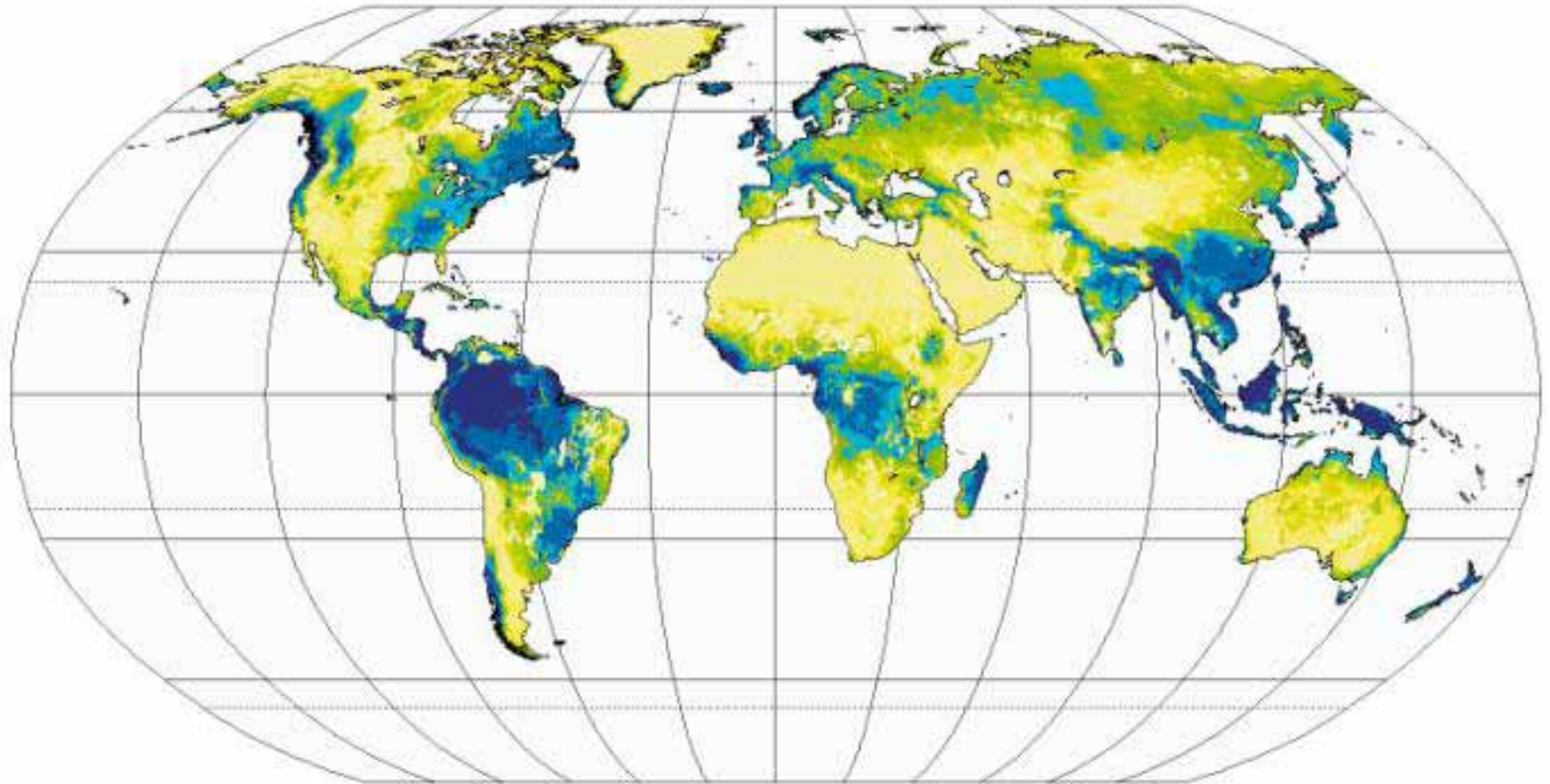
Assess the **coping capacity of societies**

Assess the **effectiveness of policies**

Develop indicators to monitor and report progress against targets

Enhance capacities of the participating countries to perform in-country assessments

Surface Water Resources of the World

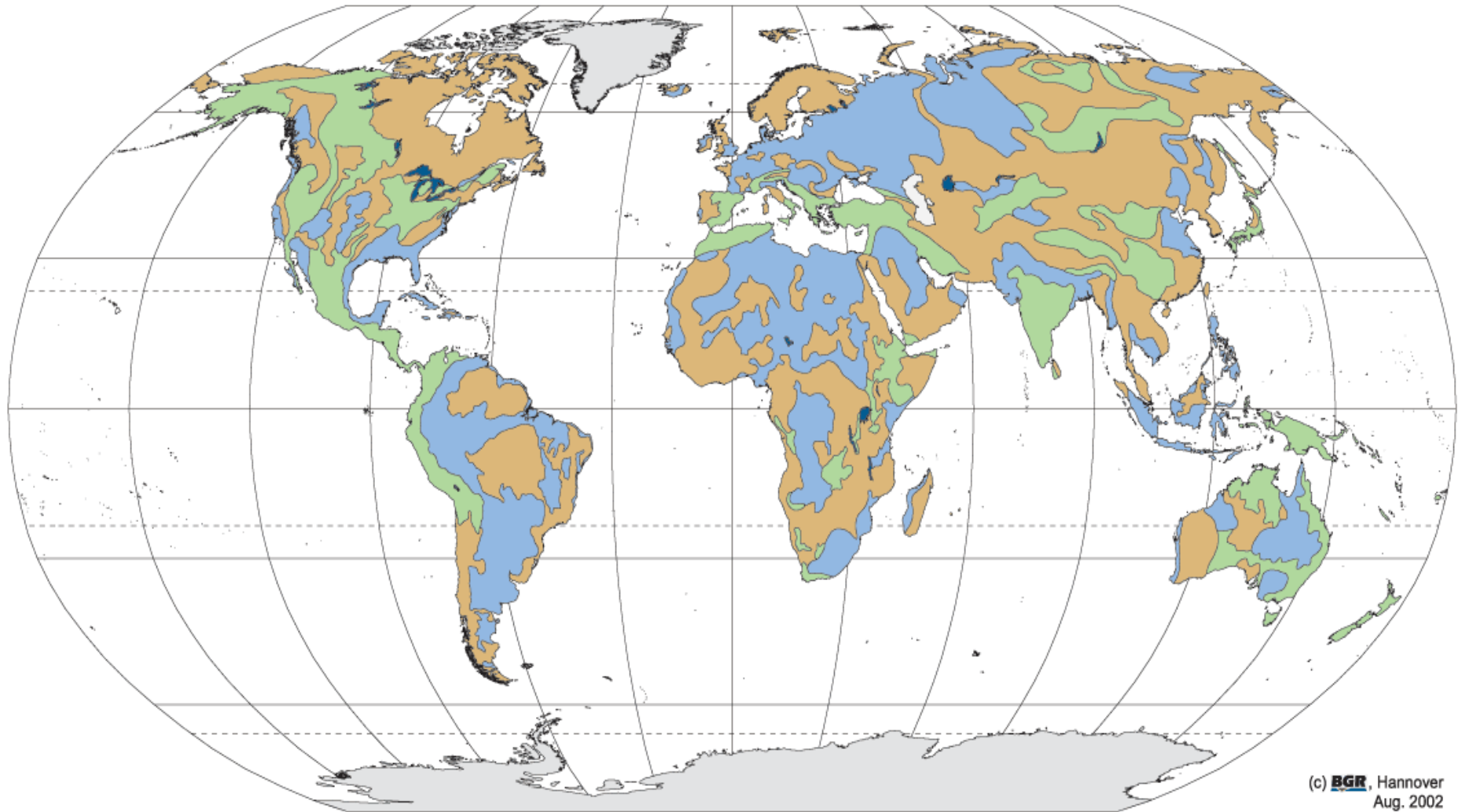


Map 1. Long-term average runoff on a global grid
[mm/annum]



(c) Center for Environmental
Systems Research,
University of Kassel,
April 2002- Water GAP 2.1D

Groundwater Resources of the World



(c) **BGR**, Hannover
Aug. 2002

Legend

- major groundwater basin with highly-productive aquifers
- area with complex structure including some important aquifers
- area with generally poor aquifers, locally overlain by river-bed aquifers
- permanent ice
- large freshwater lake

0 2500 5000 7500 10000 km



Critical Water Problems

Too Much or Too Little Water

- Floods
- Droughts

Poor Distribution

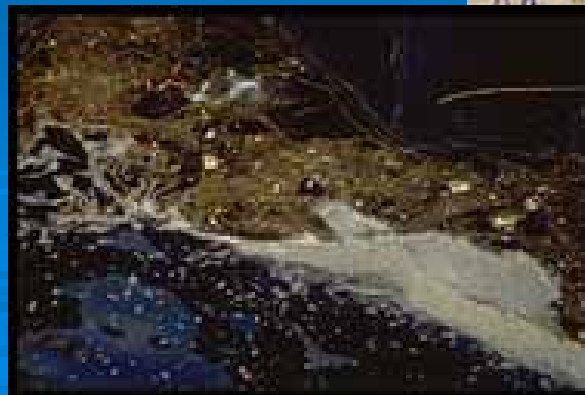
- Famine

Poor Quality

- Health hazards

Poor Management

- Competition
- Conflicts

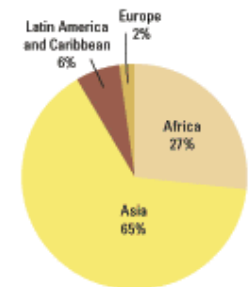


Water and health

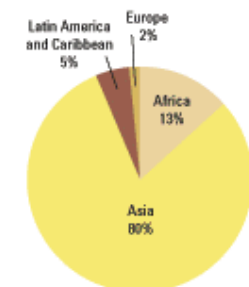
We NEED 20 - 50 litres of clean water per day

Children born in the developed world use 30 to 50 times as much as the developing world

Every day, diarrhea diseases cause some 6,000 deaths, mostly children under 5



Water supply,
distribution of unserved
populations



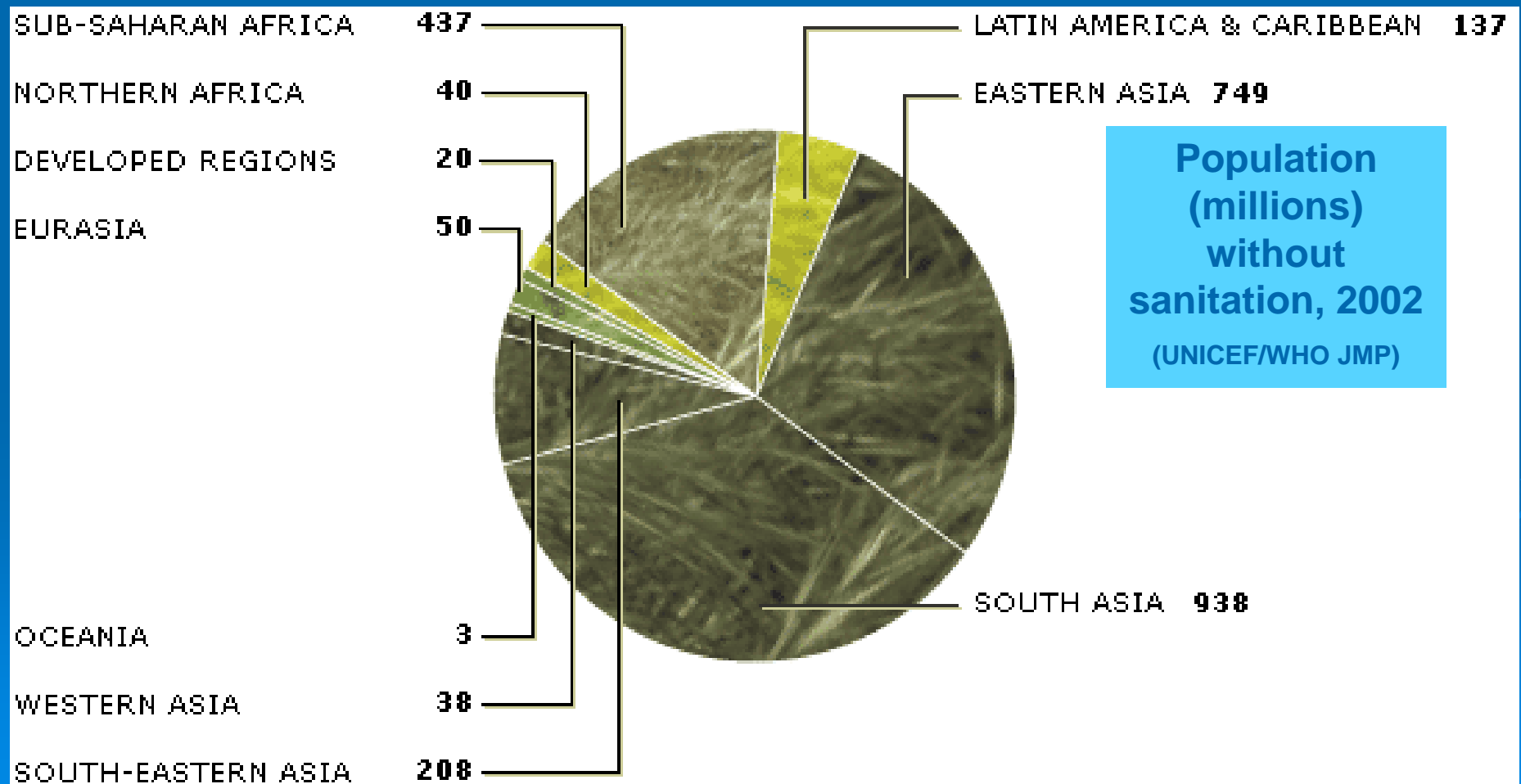
Sanitation,
distribution of unserved
populations

Figure 2:
Water supply and sanitation distribution
of unserved population.

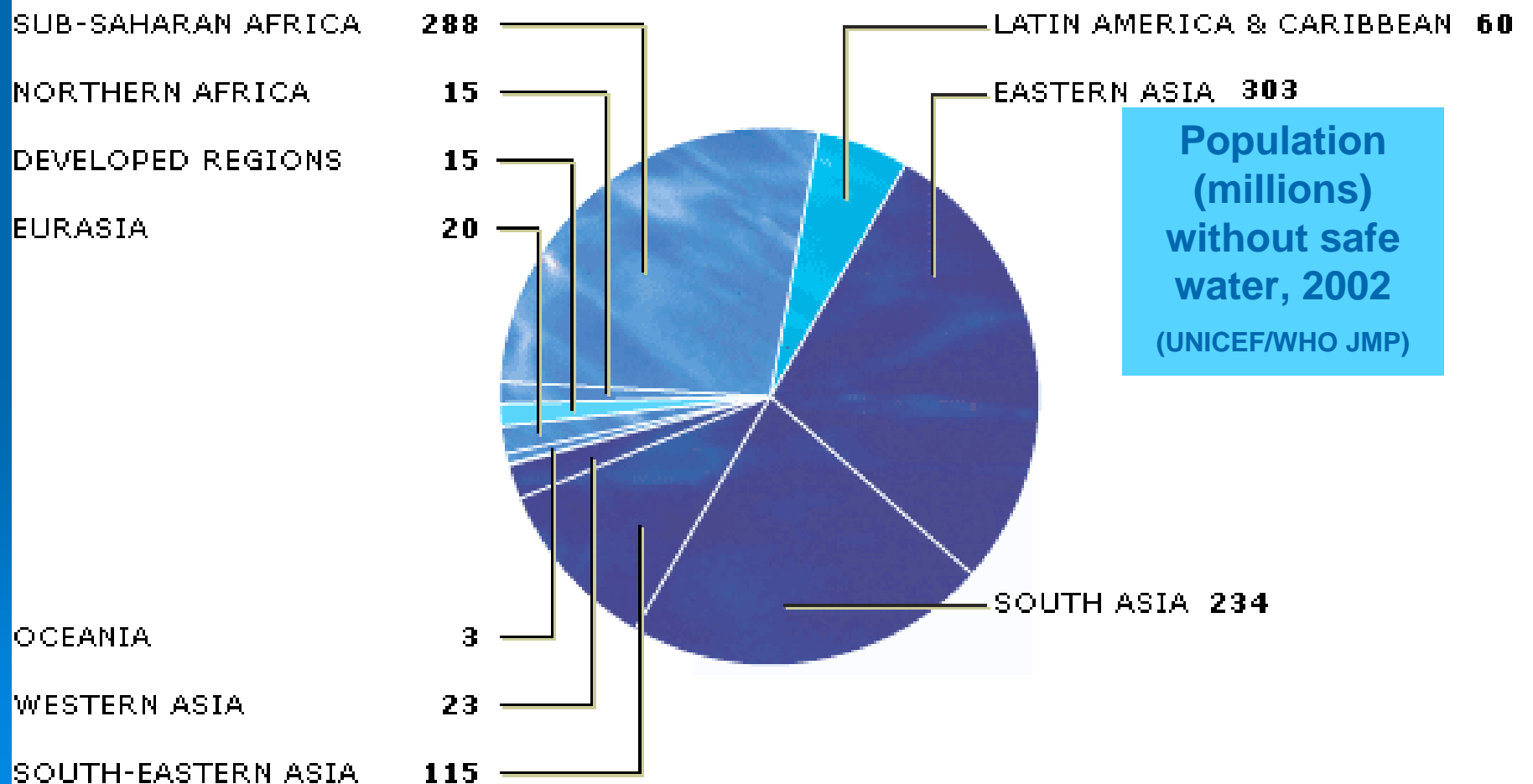
Asia shows the highest number of people unserved by either water supply or sanitation; yet it is important to note that proportionally, this group is larger in Africa due to the difference in population size between the two continents.

Source: WHO/UNICEF Joint Monitoring Programme, 2002.
Updated in September 2002.

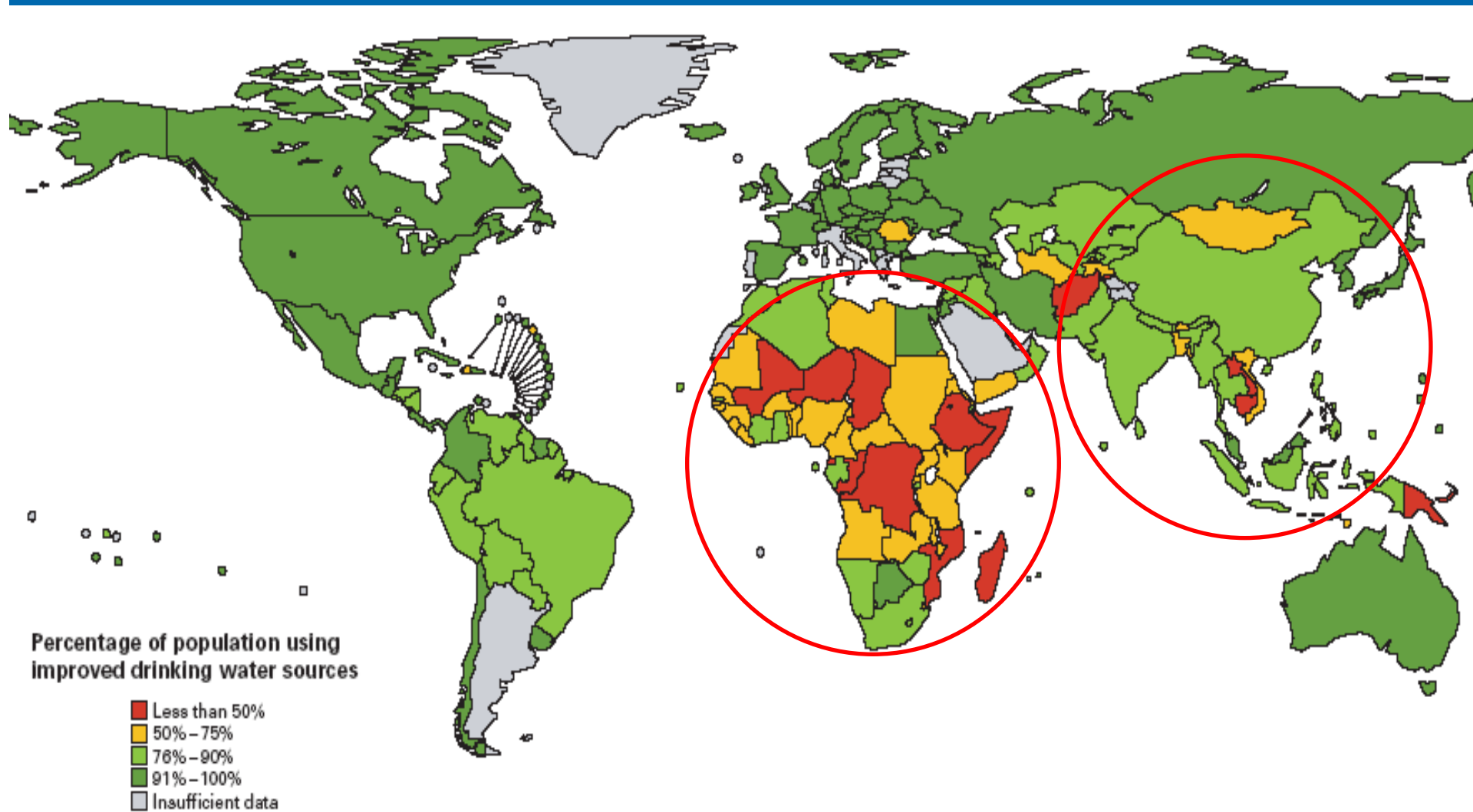
2.6 billion people are without sanitation



1.1 billion people are without safe water



Access to improved water supply (2002)



Source: *Meeting the MDG Drinking Water & Sanitation Target: A Mid-Term Assessment of Progress*. 2004. UNICEF and World Health Organisation

Water and food

Each day, 25,000 people die of hunger

777 million people in developing countries don't have access to sufficient & adequate food

Over several decades, developing nation consumption has increased:
5-6% p.a. for meat
3-4% p.a. for milk & dairy

Table 2: Water requirement equivalent of main food production.

Product	Unit	Equivalent water in cubic metres
Bovine, cattle	head	4,000
Sheeps and goats	head	500
Meat bovine fresh	kilogram	15
Meat sheep fresh	kilogram	10
Meat poultry fresh	kilogram	6
Cereals	kilogram	1.5
Citrus fruit	kilogram	1
Palm oil	kilogram	2
Pulses, roots and tubers	kilogram	1

Source: FAO, 1997b.

This table gives examples of water required per unit of major food products, including livestock, which consume the most water per unit. Cereals, oil crops and pulses, roots and tubers consume far less water.

Water and risks

Between 1990 and 2001 there were 2,200 water-related disasters

Flooding = 50% / Drought = 11%

35% of disasters were in Asia

Proportion of food disasters that are human induced is increasing:

1981	1997	2001
15%	29%	39%

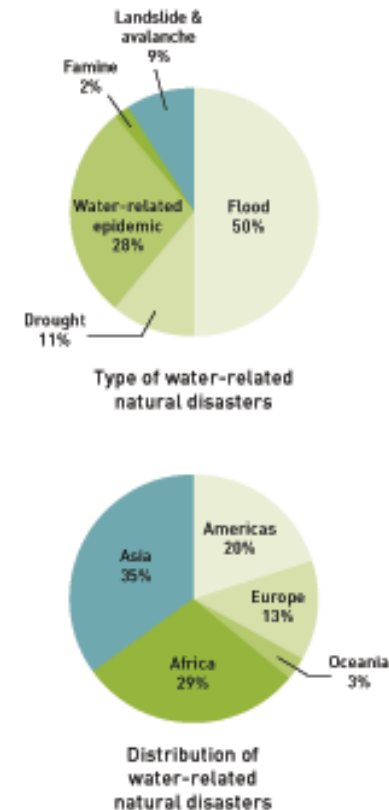


Figure 5:

Types and distribution of water-related natural disasters, 1990–2001.

More than 2,200 major and minor water-related disasters occurred in the world between 1990 and 2001.

Asia and Africa were the most affected continents, with floods accounting for half of these disasters.

Source: CRED, 2002.

Water and cities

Global	1975	2000	2015	2030
Urbanisation	38%	47%	54%	60%

5 billion people will live in urban centres by 2030

In 2000 >900 million urban dwellers lived in slums

In areas poorly served with water & sanitation, child mortality is 10 to 20 times higher

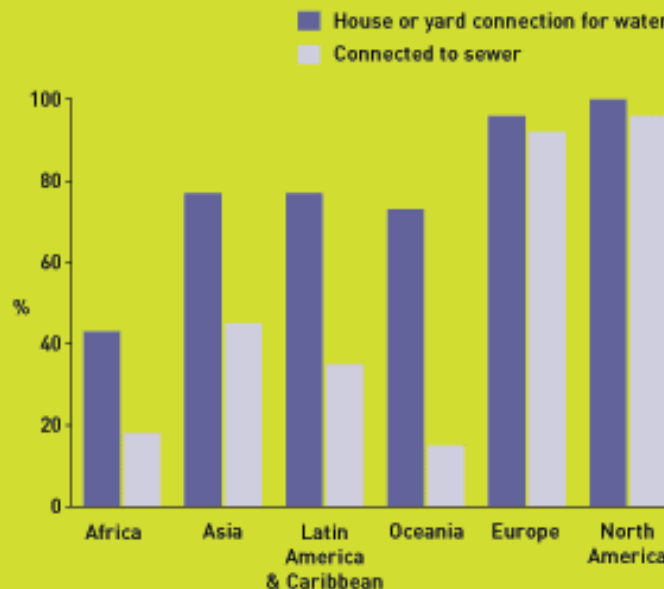


Figure 3:

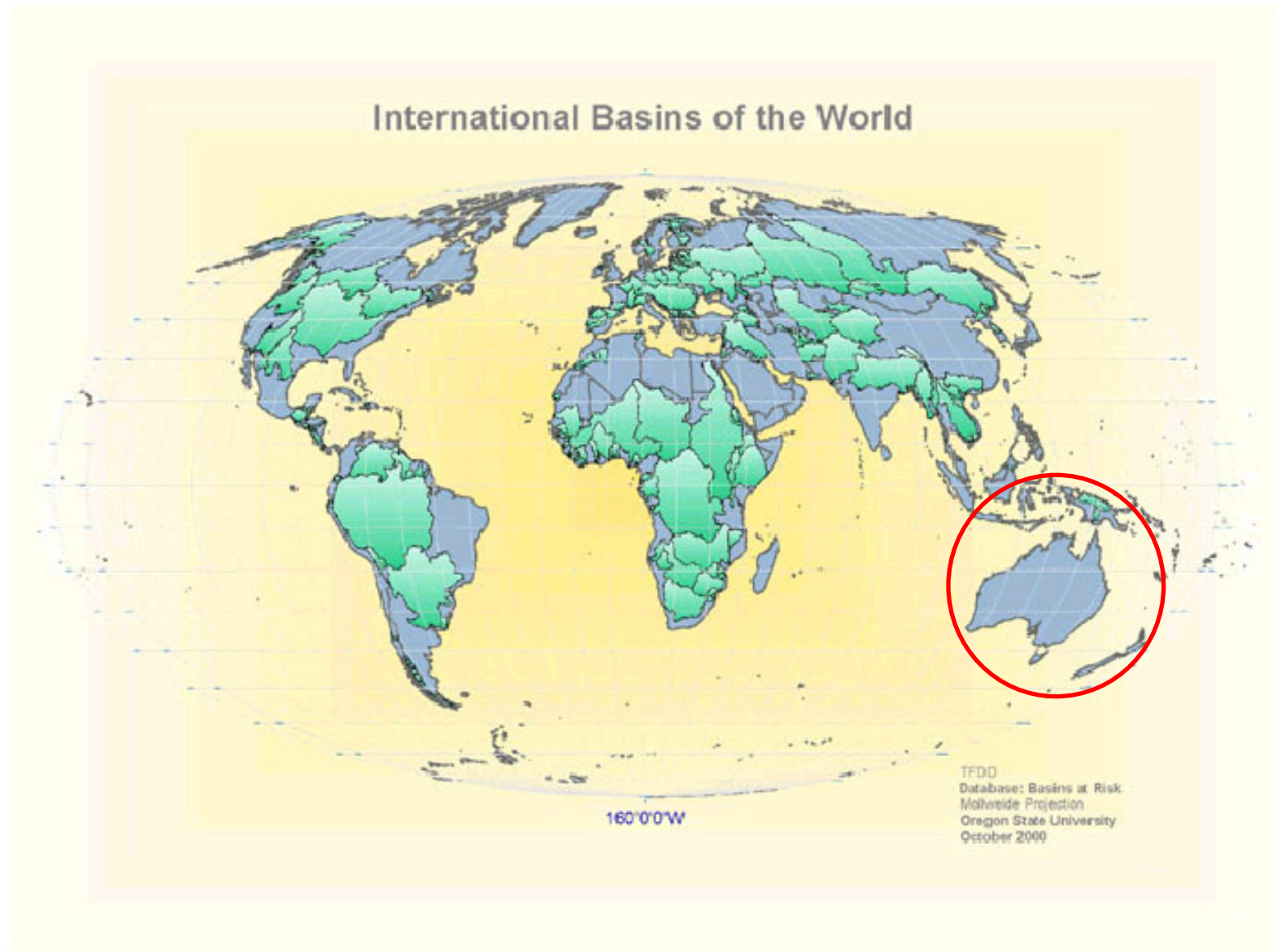
The proportion of households in major cities connected to piped water and sewers.

These are based on information provided by 116 cities. In no region was there a representative sample of large cities, although the figures for each region are likely to be indicative of average levels of provision for major cities in that region.

If adequate provision for sanitation in large cities is taken to mean a toilet connected to a sewer, then this figure indicates there is a significant lack of adequate provision in cities throughout Africa, Asia, Latin America and the Caribbean and Oceania.

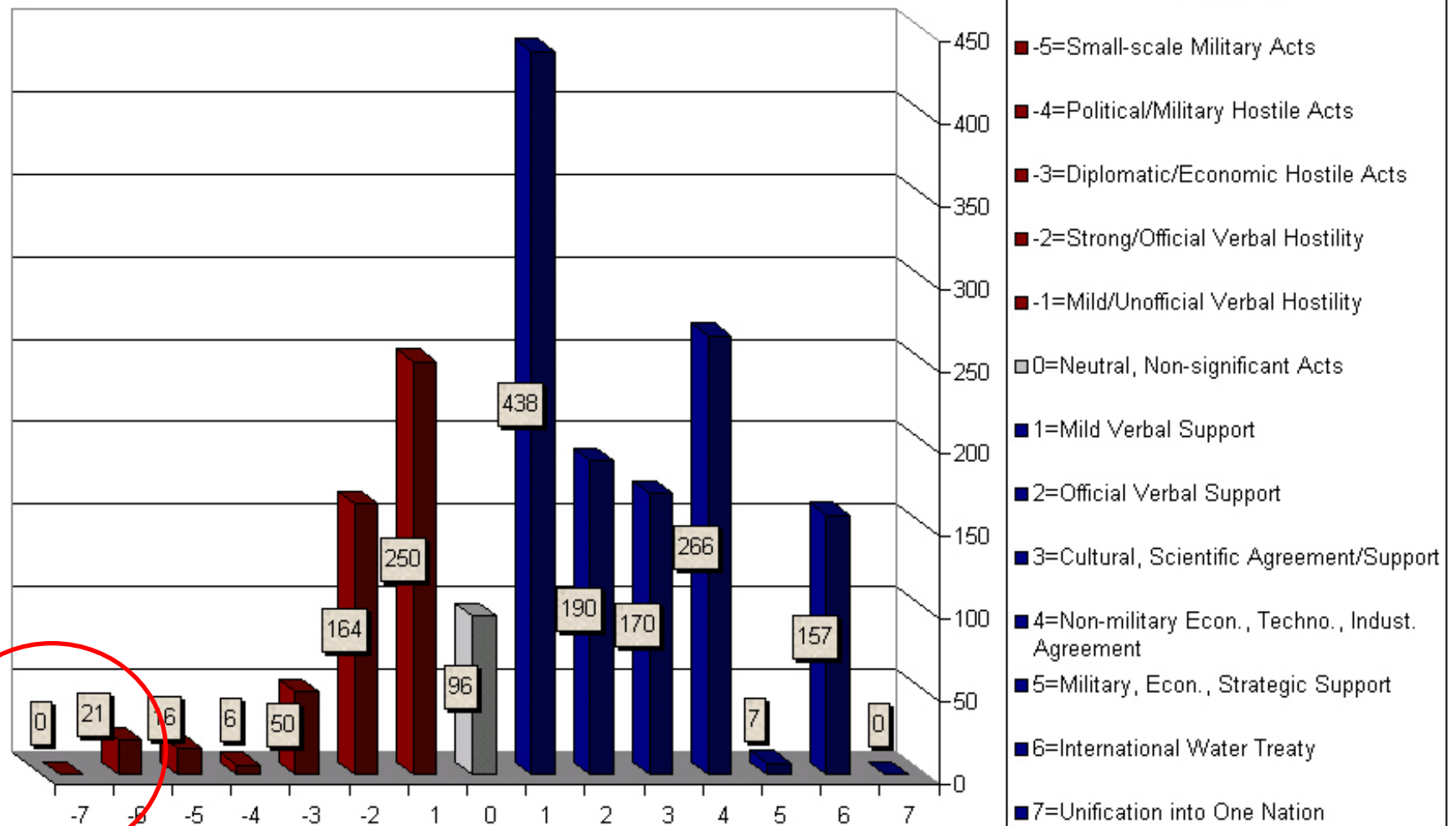
Source: WHO and UNICEF, 2000.

Water and our neighbours



Water and conflict

Number of Events by BAR Scale



Freshwater availability versus population



*“The water crisis is essentially a crisis of governance” **

Water governance refers to the range of political, social, economic and administrative systems that are put in place to regulate development and management of water resources and provision of water services at different levels of society
(United Nations Development Program, 2000)

** Carlos Fernandez-Jauregui, Director, United Nations Office of the Decade of Water for Life, ASEM Waternet, April 2008*

Principles of good water governance

Participatory

Responsive

Consensus oriented

Effective and efficient

Accountable

Equitable and inclusive

Transparent

Follow the rule of law

UN Economic and Social Commission for Asia and the Pacific, 2003

Some changes in international water management (1)

- Participatory management and collaborative decision making
- Increased integration of issues and sectors
- Decentralized and more flexible management approaches
- More attention to management of human behaviour

Source: Claudia Pahl-Wostl, ASEM Waternet, April 2008

Some changes in international water management (2)

- Environment explicitly included in management goals
- Open & shared information sources
- Incorporating iterative learning cycles

Source: Claudia Pahl-Wostl, ASEM Waternet, April 2008

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What is holding the world back from greater progress?

Political constraints: lack of political leadership and commitment to allocating resources

Institutional constraints: lack of appropriate institutions at all levels and chronic dysfunction of institutions that do exist

Financial constraints: lack of financial investment and inability of the poor to pay

Technical Challenges: extending services to the poor in dispersed rural settlements or dense urban communities is one of the toughest design problems!

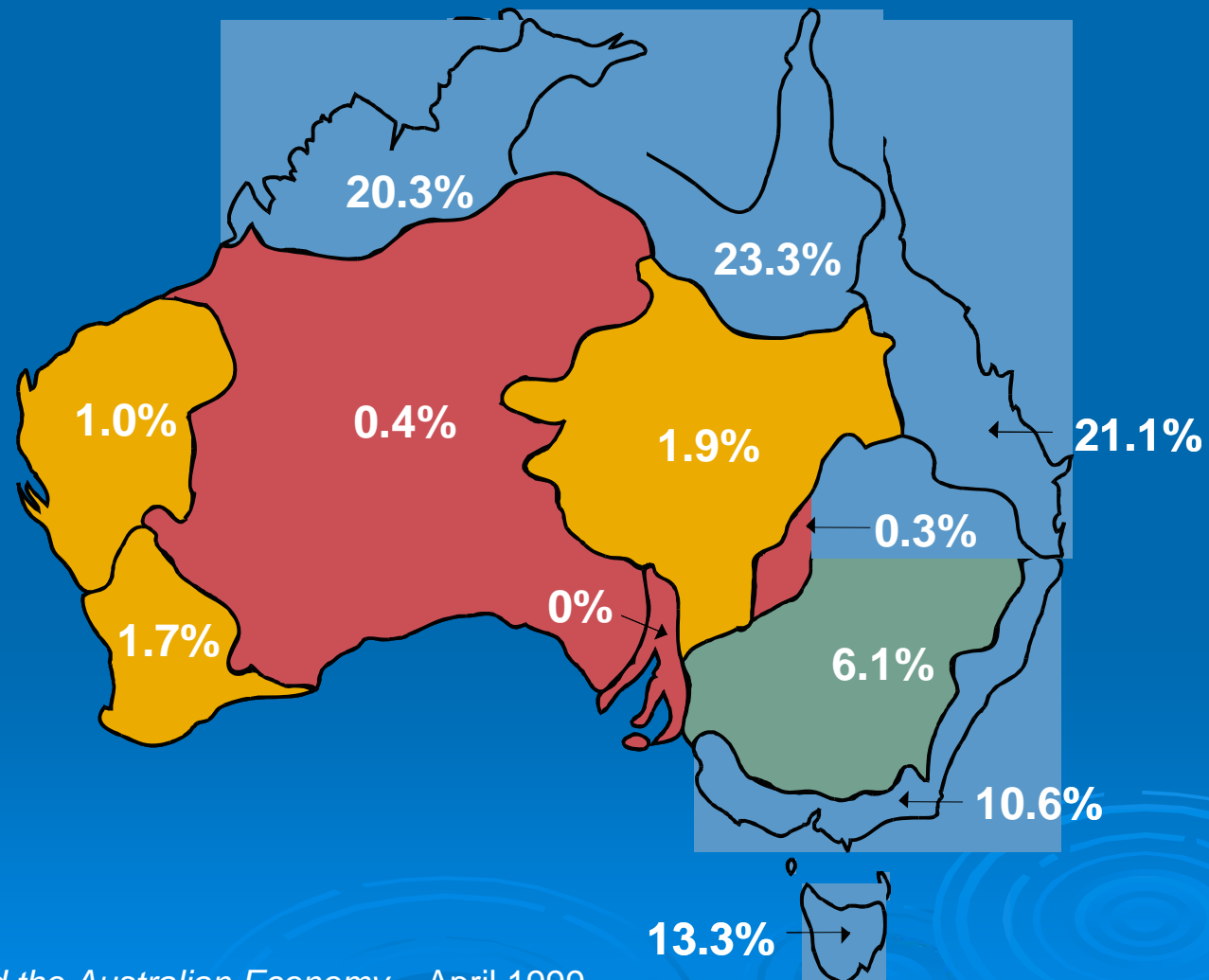
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Water reform in Australia

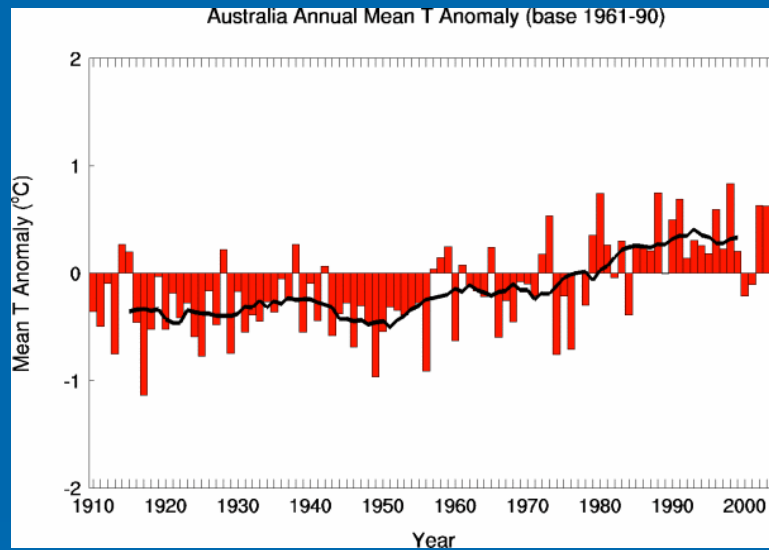


Surface water runoff

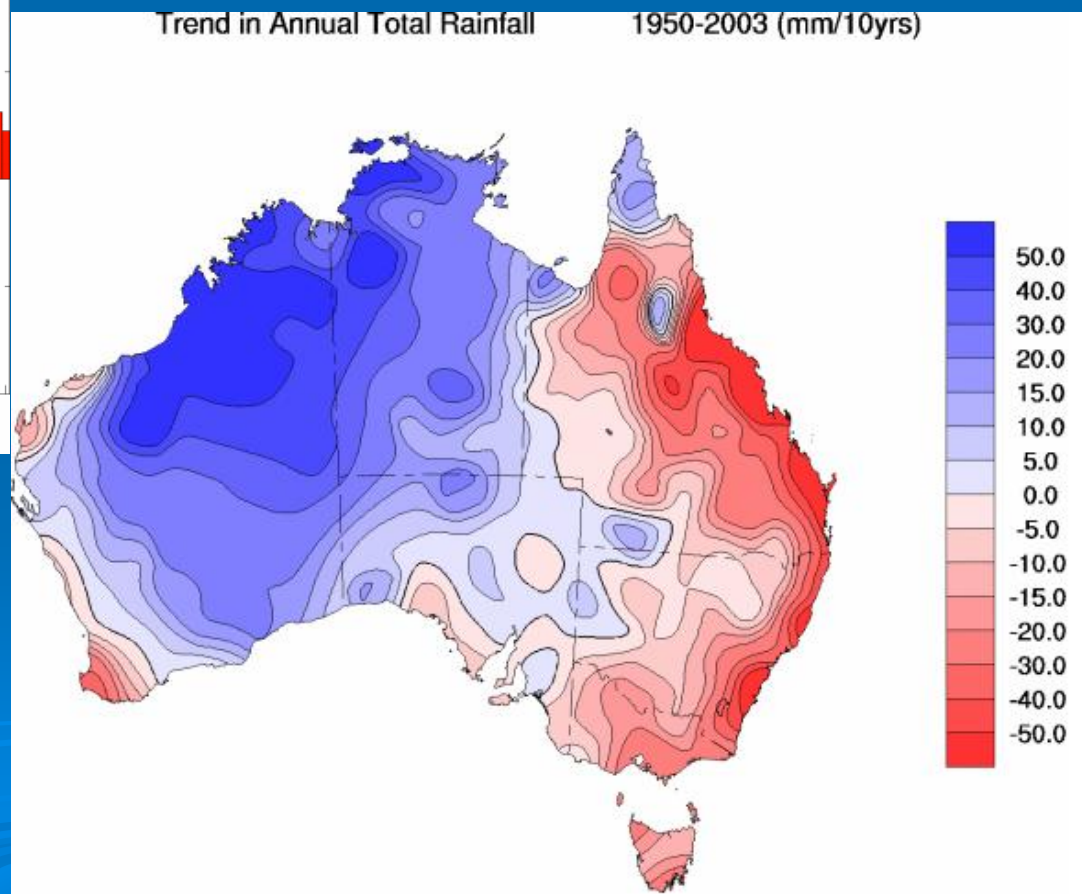


Source: *Water and the Australian Economy* – April 1999

Changing rainfall and temperature (1950-2003)



From 1950 to 2003
there appears to have
been a systematic
change in temperature
and rainfall




Impacts in the Murray-Darling Basin



15 years of national water reform



Key outcomes from the reforms (1)

- Separation of resource management from water supply
 - Inclusion of environment in water resource decisions
 - Clearer government decision-making roles
 - Acceptance of increasing Australian government role
- 

Key outcomes from the reforms (2)

- Stronger focus on the use of economic instruments
- More focus on science inputs
- First ever National Water Act
- An independent body to set a cap on use of the Murray-Darling Basin (MDB Authority)

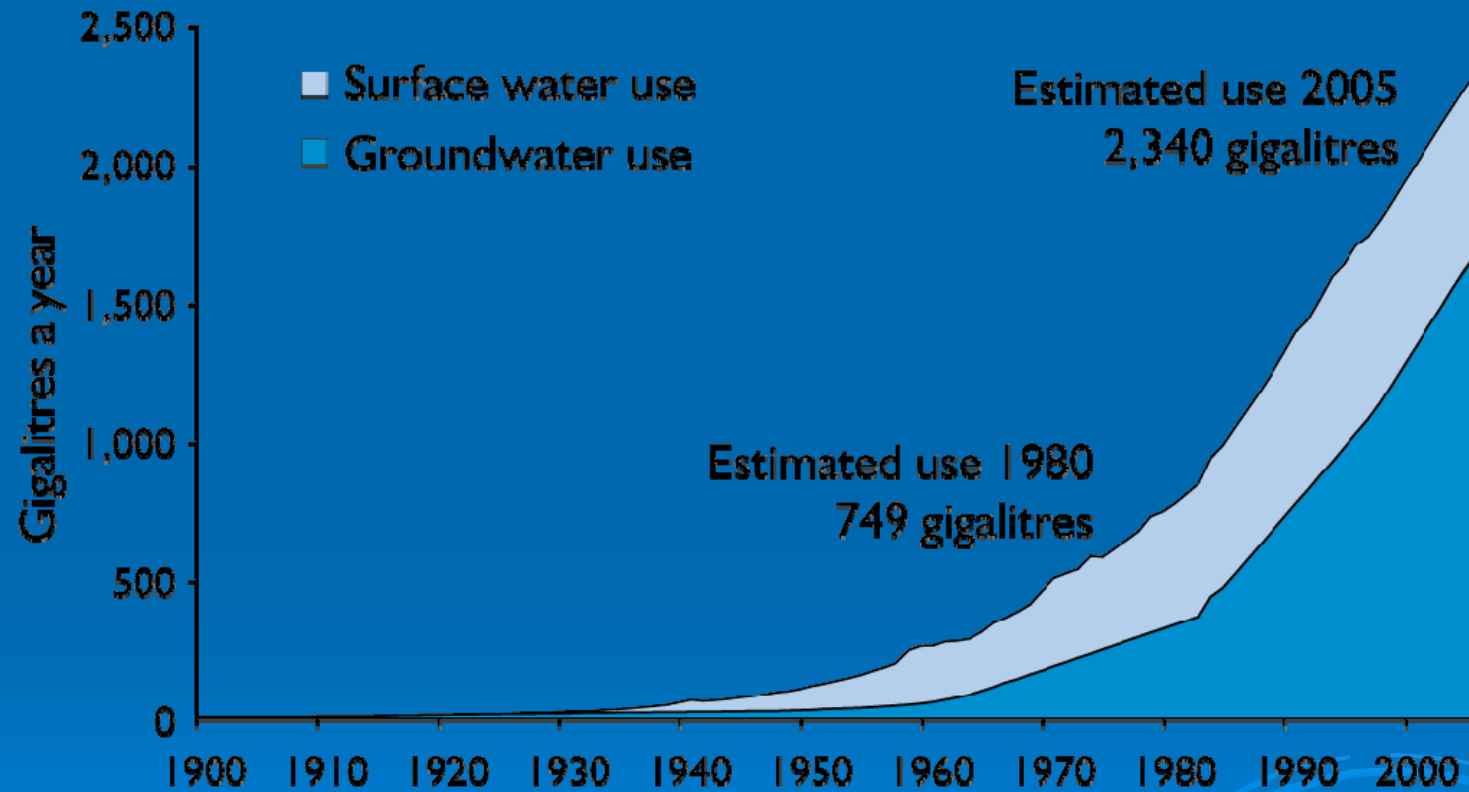
A few thoughts from the national water reform agenda

- Incentives were more effective than penalties in achieving national agreement
- Water trading is an important tool, but just a tool
- Generating shared visions of a desired future is critical to inter-jurisdictional water management
- The importance of the political landscape & timing

Water in the West

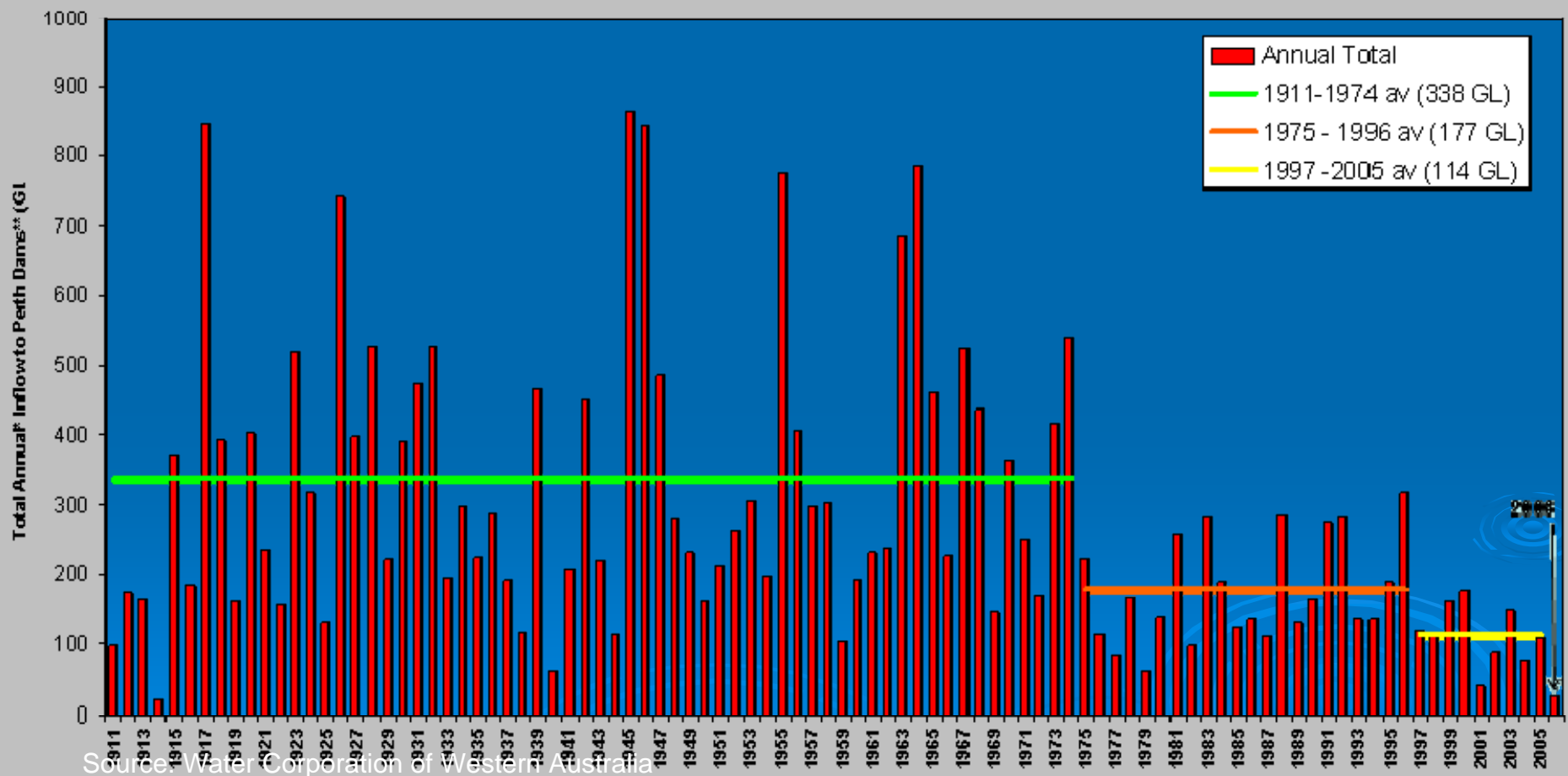


Escalating water demand



Historical water use in Western Australia

Diminishing inflow into Perth dams



Source: Water Corporation of Western Australia

Notes: - A year is taken as May to April
- 2006/07 inflow to 31st December 2006

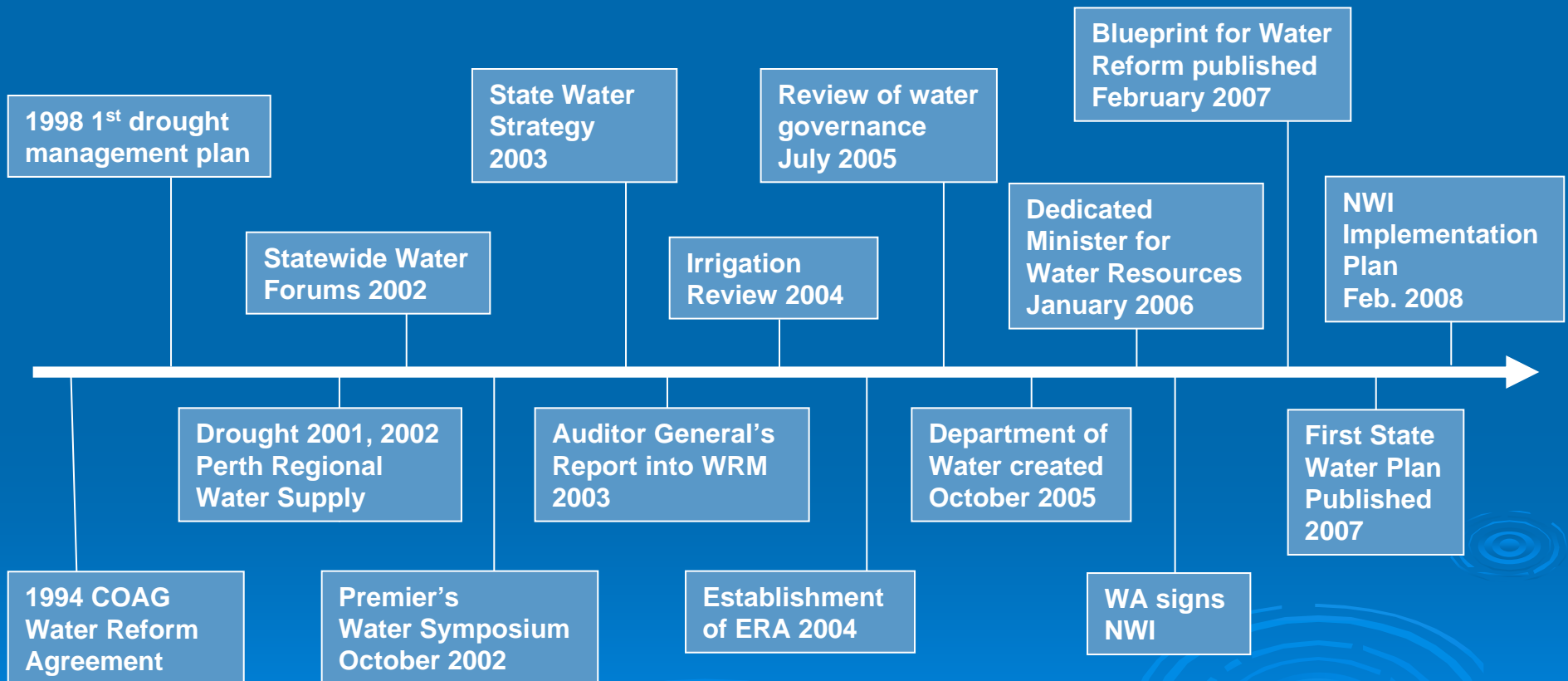
Terrestrialisation of wetlands



Change over 15 years



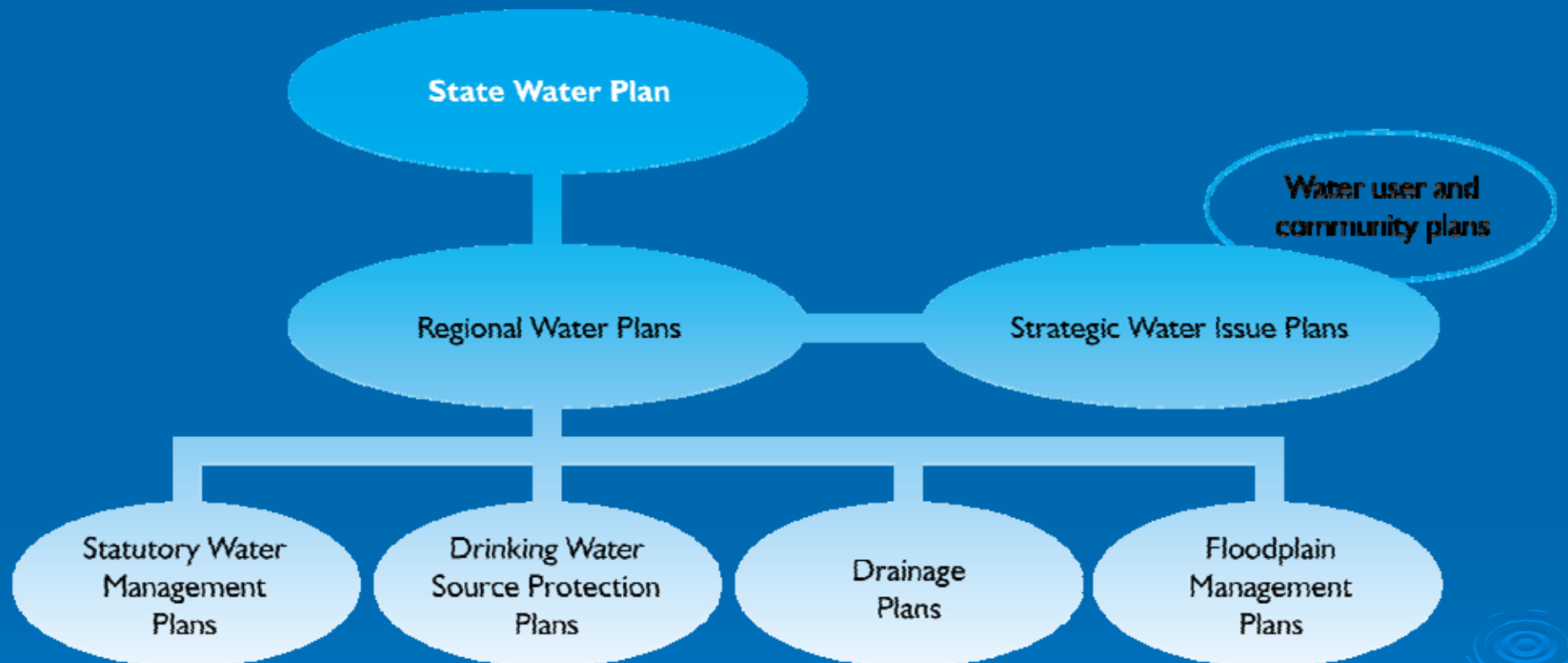
15 years of water reform in Western Australia



WA water reform outcomes: An overarching water policy framework



WA water reform outcomes: A water planning framework

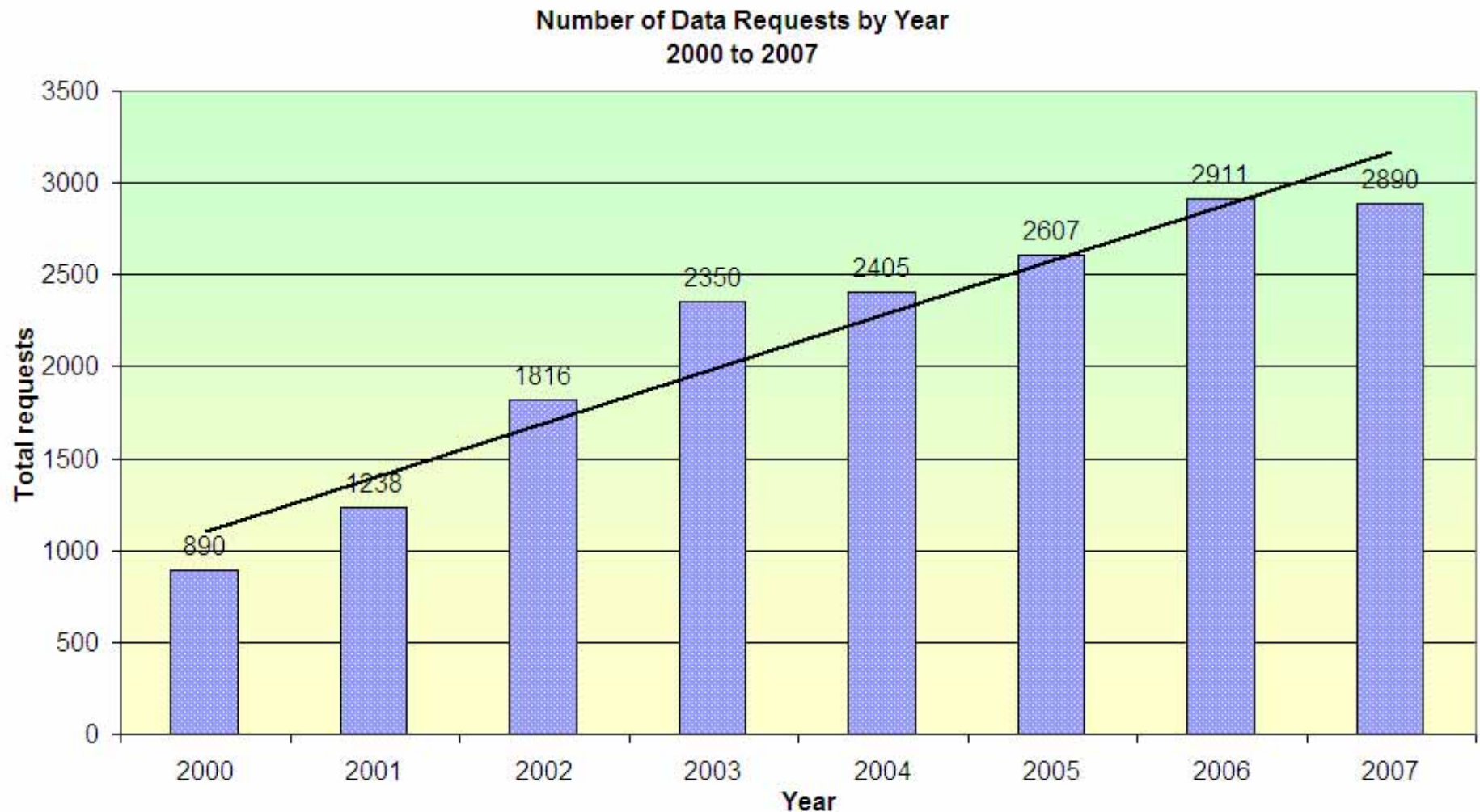


WA water reform outcomes: A security through diversity approach



Source: Mark Leathersich

WA water reform outcomes: An ongoing State Water Forum & community interest



WA now seen as a national leader in water resource management

Face threat of a thirsty future

We know what we have to do about ensuring water supply but we still need more political will

MALCOLM TURNBULL

ALMOST all of Australia is gripped by drought. The inflows into the Murray River are the lowest since records began. The great storages that supply water to three quarters of our irrigated culture are low and dropping. If the drought does not break between now and this time next year, those dams will be at all-time lows.

The last year has seen record low rainfalls in the Murray catchment.

Our great cities are no longer immunised from the threat of a thirsty future.

TUESDAY, SEPTEMBER 26, 2006

PM sets up water ministry

Dennis Shanahan
Political editor

JOHN Howard is planning to take control of the water crisis by creating a



The debate continues...



March 2007

one year on

Summary of achievements

Leading the way...

A year ago, the State Government announced the bold decision to establish the Department of Water, to drive Western Australia's water reform agenda.

Our decision was both responsible and visionary. Looking back, it has been a phenomenal 12 months. The task of managing Western Australia's water resources has never been more critical and the Department has

than up to... ent has been or its work by Government, unless nities that have d the hard vation of



Reflecting on water

Water has been the hot topic for the last year, and it has been an amazing time to be part of the water industry as we create history.

Western Australia has long been aware of the importance of water, and it was initiatives such as the groundbreaking State Water Strategy and Irrigation Review that led the State Government to establish the Department of Water on 26 October, 2005.

drinking water sources in the community was selected by the Federal Government for all other states to follow.

Although the south west of WA has been hardest hit by the changing climatic conditions, we have been the best managers of our changing conditions, indicating we are indeed leading the nation in water management.

Signing the National Water Initiative

38 • WEDNESDAY, SEPTEMBER 27, 2006

News

WA leading way in water management

CHRIS JOHNSON
CANBERRA

John Howard's new Office of Water Resources will provide a means for other States to learn from WA, Malcolm Turnbull said yesterday.

The Prime Minister announced the formation of the new office designed to co-ordinate and drive water policy across State borders.

His parliamentary secretary responsible for water, Mr Turnbull, said WA was leading the way in many areas and would

water trading and sustainable allocation of water entitlements as well as evaluate proposals for major transformative water infrastructure proposals including storage, distribution and recycling," he said.

"WA is leading the way in many areas of water management."

James Horne will head up the new office and report to Mr Howard and Mr Turnbull. Other water policy experts will be recruited to the office, which will be in Canberra.

Relief for bore owners

ALMOST 3000 domestic bore owners will not have to pay annual water licence fees.

Water Resources Minister John Kobelke said the changes to the fees would mean

Bunbury who drew from an artesian aquifer, were being asked to pay a fee even if they used the water just for domestic purposes.

Licences will still be required for water

Forward planning should keep future water problems at bay

Western Australia has a right to feel smug about its groundbreaking water-supply efforts, says

50 kilometres south of Perth, will account for an estimated 17 per

Big consumers like miners, farmers and councils should splash out according to amount of water they use, say experts

Call for groundwater charge

AMANDA BANKS

Mining companies, farmers and councils should be forced to pay for the billions of litres of groundwater they are using every year, according to conservation and water experts.

Dam plan waits on Govt support

By BEATRICE THOMAS

Committee said charges other than the administration fee should not be introduced until there was a national approach and licences were converted to water access entitlements.

The draft report says most water used by the mining industry — the

Water Resources Minister John Kobelke said debate over charges for groundwater was welcome and there was no doubt commercial licence holders would ultimately be charged for water management. But WA would not consider volumetric char-

Water cuts to hit Harvey irrigators

SUELLEN JERRARD

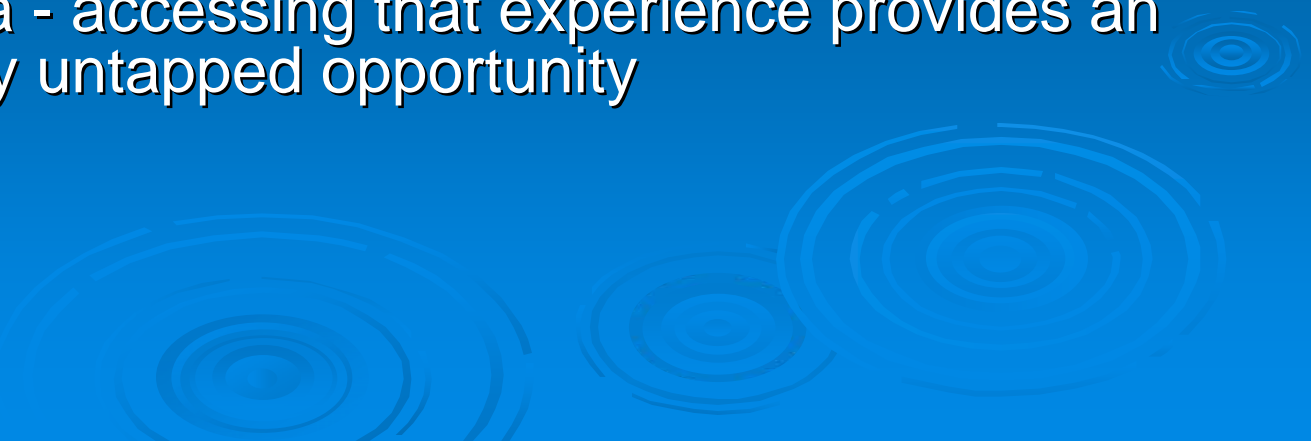
Where does that leave the water resources of southwest WA? (1)

- Southwest WA is one of the places hit hardest and earliest by the shift in climate – WA had to act
- Many of the recent changes in water management in WA reflect the paradigm shifts occurring internationally
- Changes to water governance in WA have been significant and reflect a more strategic approach to water

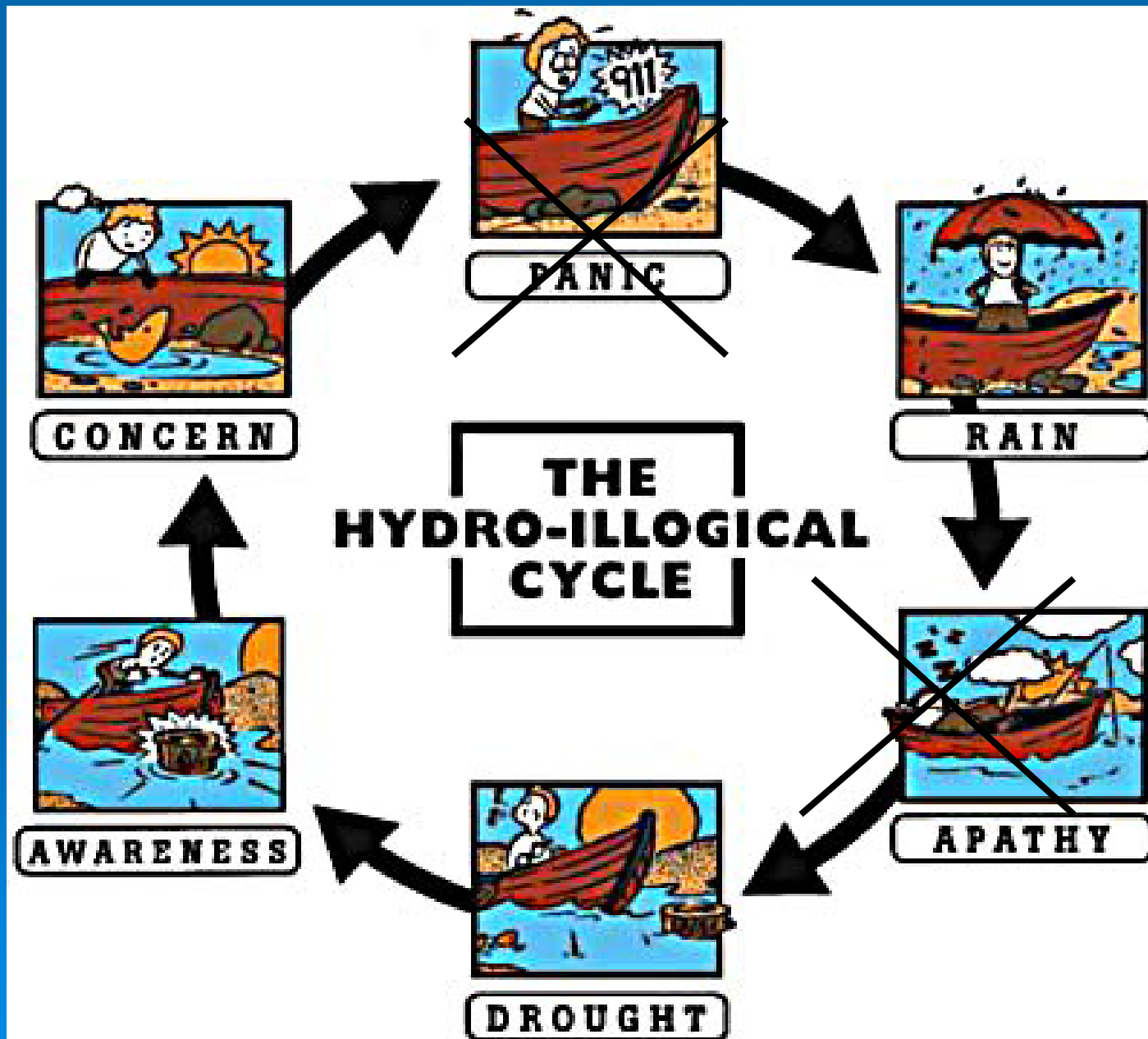
Where does that leave the water resources of southwest WA? (2)

- WA is not burdened with many of the constraints experienced in other regions, particularly developing nations
- Managing water in the southwest will be increasingly complex, requiring increasingly sophisticated solutions
- Adaptive water management will require explicit integration of experimental learning into policy & management cycles

Where does that leave the water resources of southwest WA? (3)

- Strong long-term partnerships between community stakeholders, government and researchers will be critical
 - Building and maintaining human resource capacity is a major challenge for southwest WA, as is internationally
 - A world of experience in water is available to southwest Western Australia - accessing that experience provides an enormous, largely untapped opportunity
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- The bottom of the slide features a decorative graphic of several concentric circles, resembling ripples on water, in a lighter shade of blue against the main blue background.

The Hydro-Logical Cycle



Thank you

Jeff Camkin

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