The Environment Institute

Where ideas grow

THE UNIVERSITY OF ADELAIDE AUSTRALIA

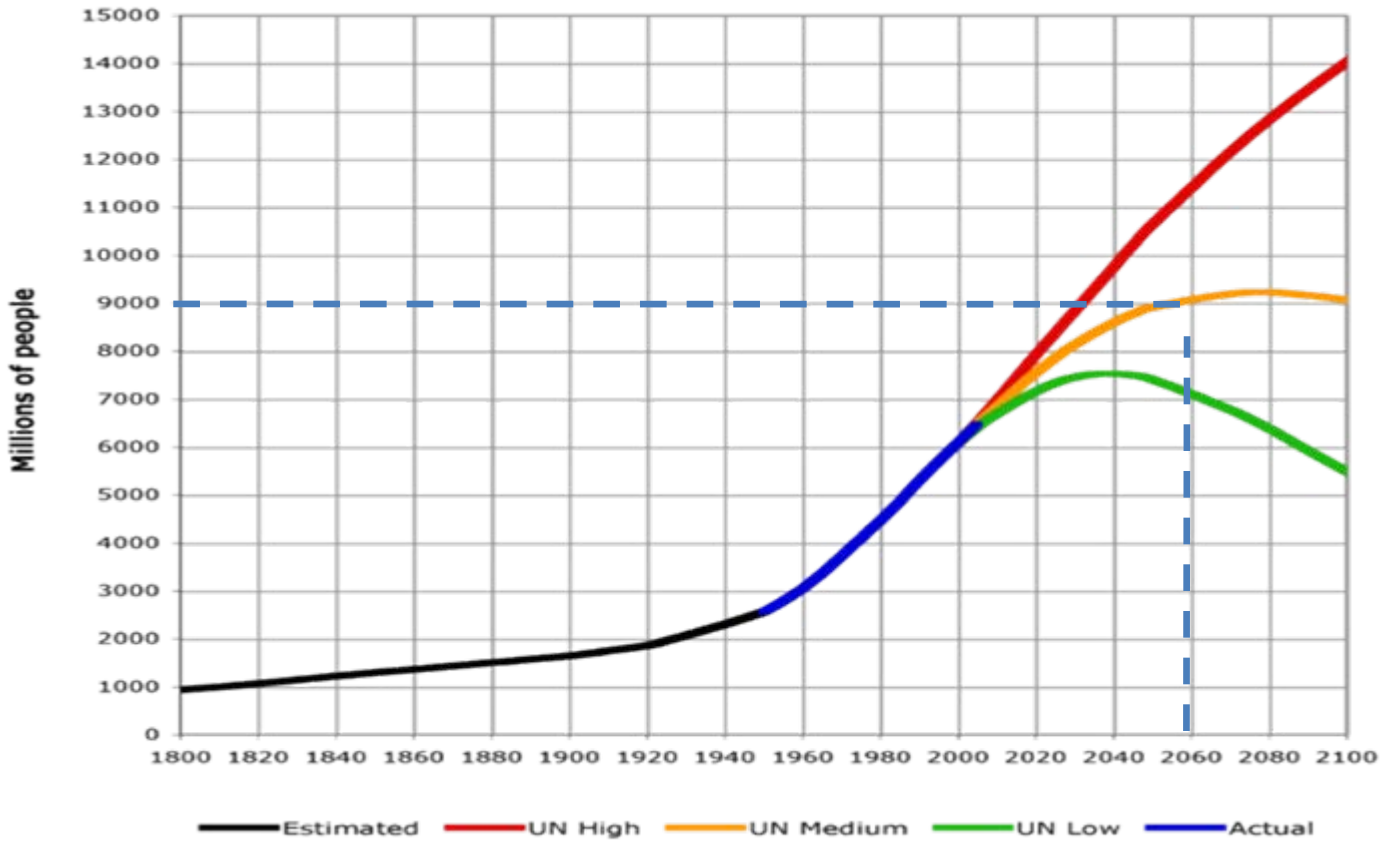



Managing water across the full range of stakeholders

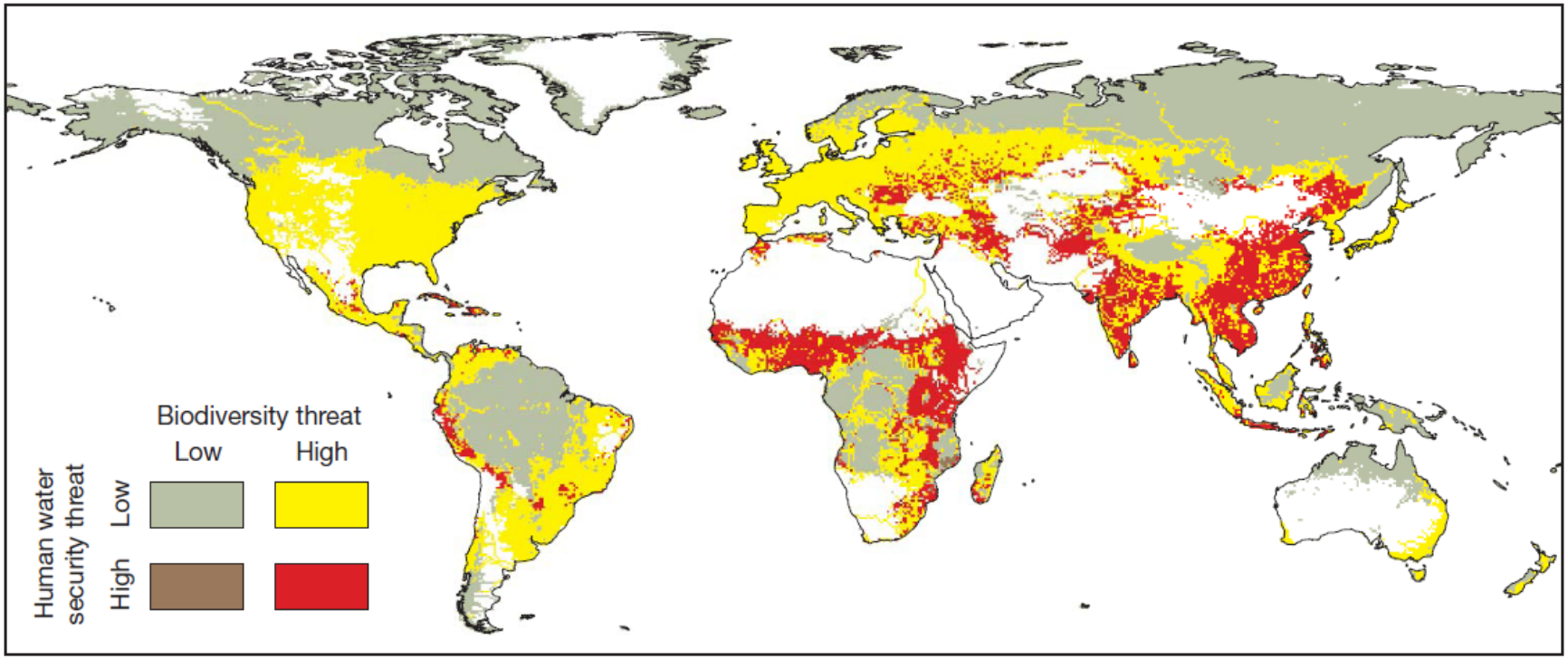
Mike Young

Executive Director, The Environment Institute

World Population => 9 b?

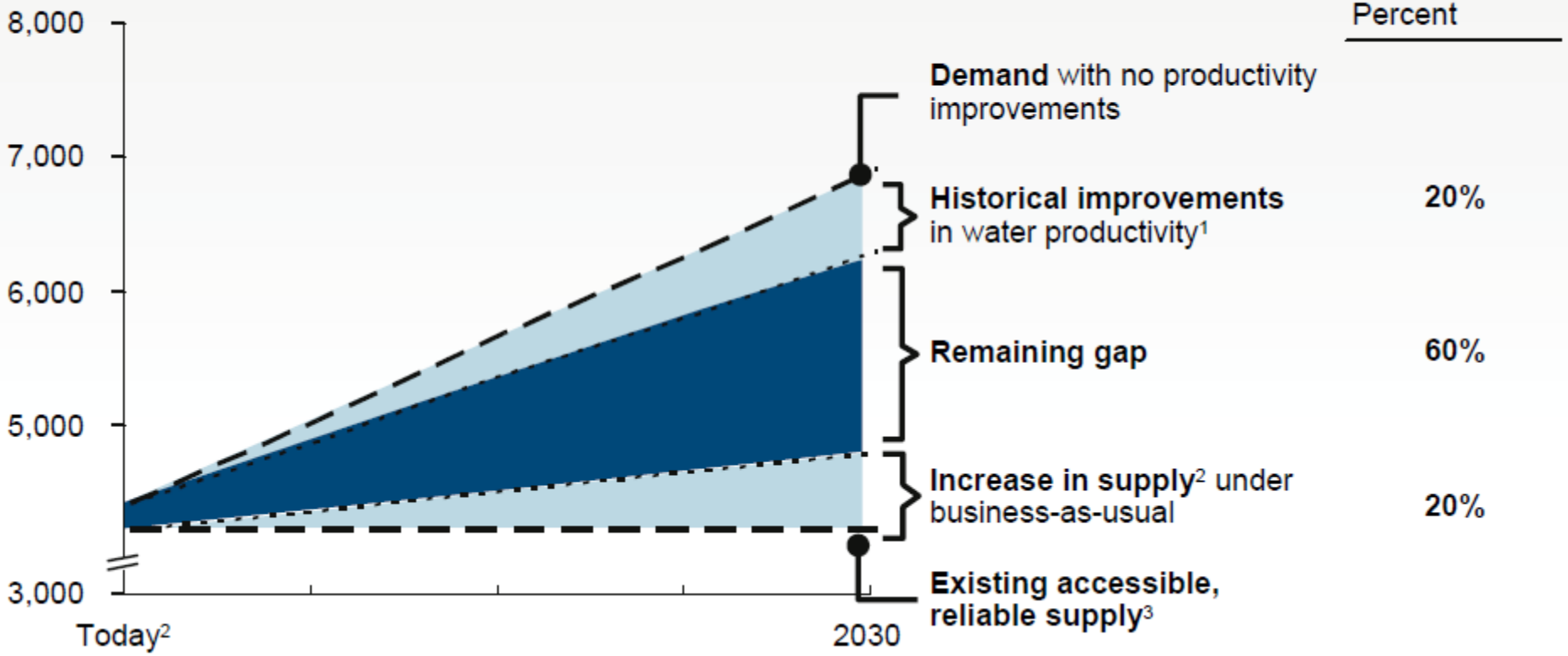


Biodiversity is being compromised!



After Vörösmarty and others (2010).

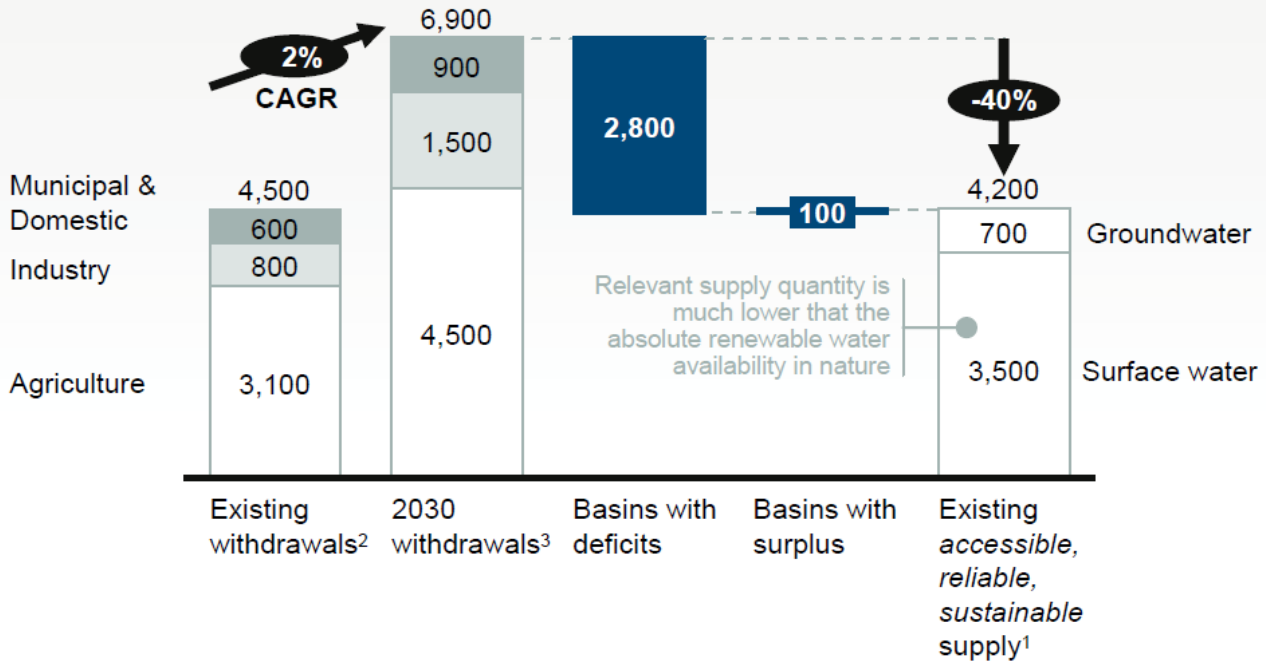
Water scarcity gap – billions m^3



After 2030 Water Resources Group

Aggregated global gap between existing accessible, reliable supply[1] and 2030 water withdrawals, assuming no efficiency gains

Billion m^3, 154 basins/regions

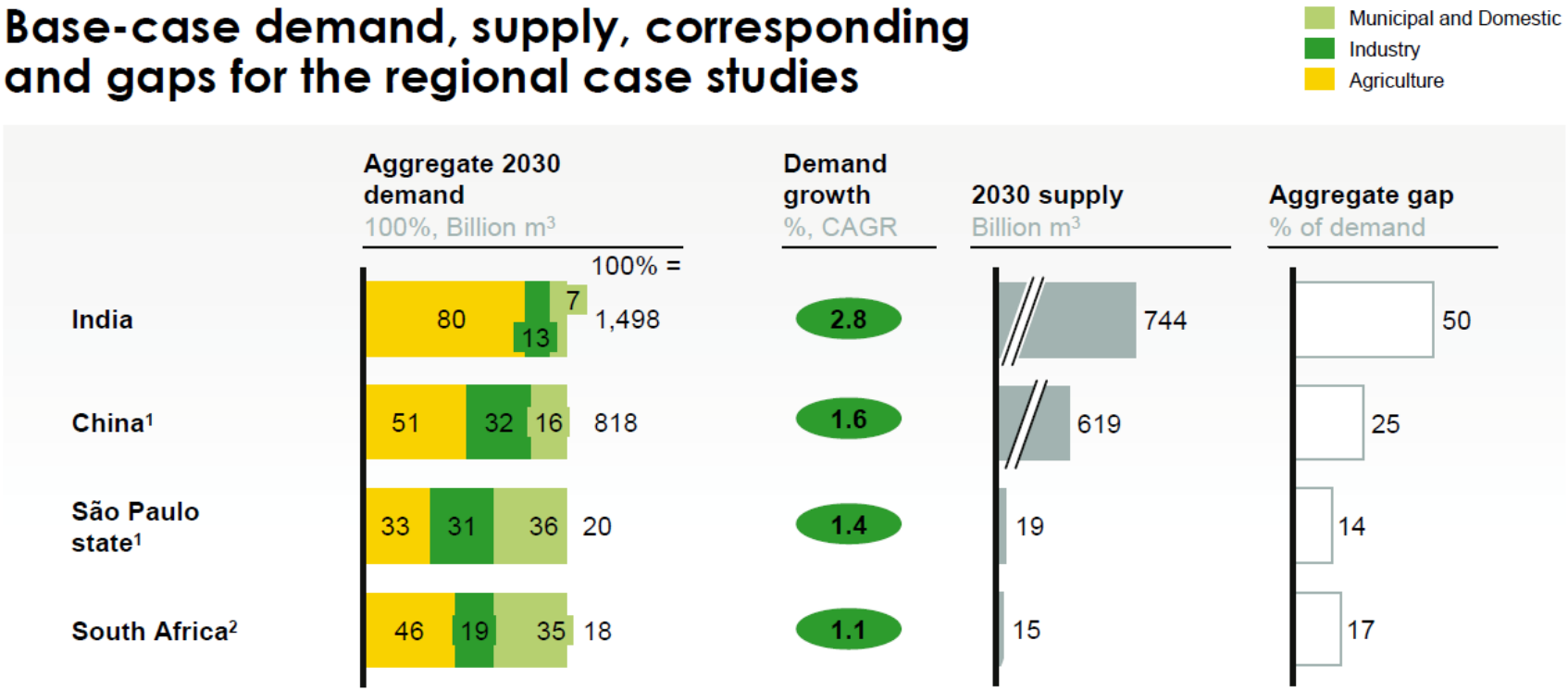


1 Existing supply which can be provided at 90% reliability, based on historical hydrology and infrastructure investments scheduled through 2010; net of environmental requirements
2 Based on 2010 agricultural production analyses from IFPRI
3 Based on GDP, population projections and agricultural production projections from IFPRI; considers no water productivity gains between 2005-2030

After 2030 Water Resources Group

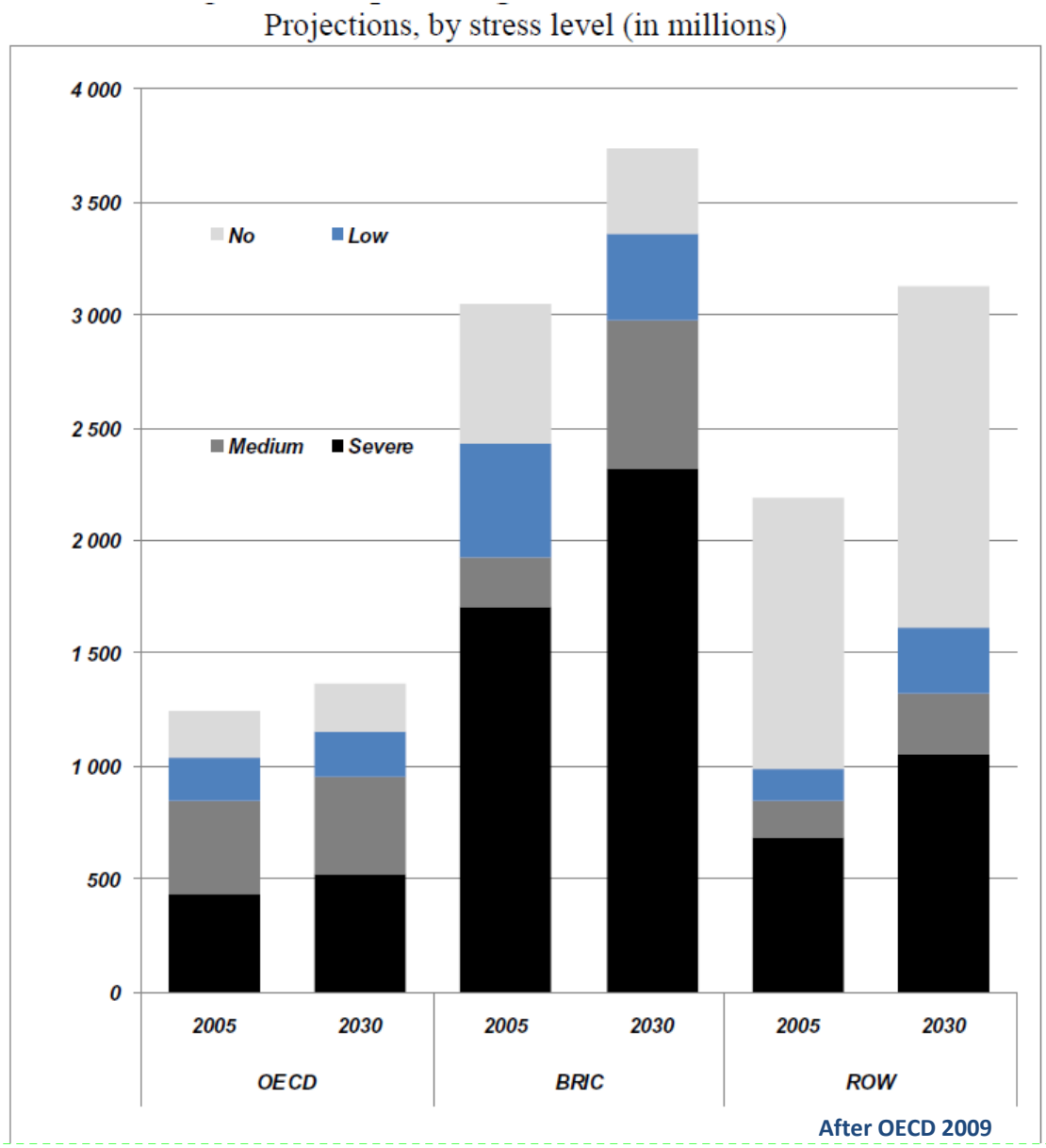
Growth in water demand, 2030

Base-case demand, supply, corresponding and gaps for the regional case studies



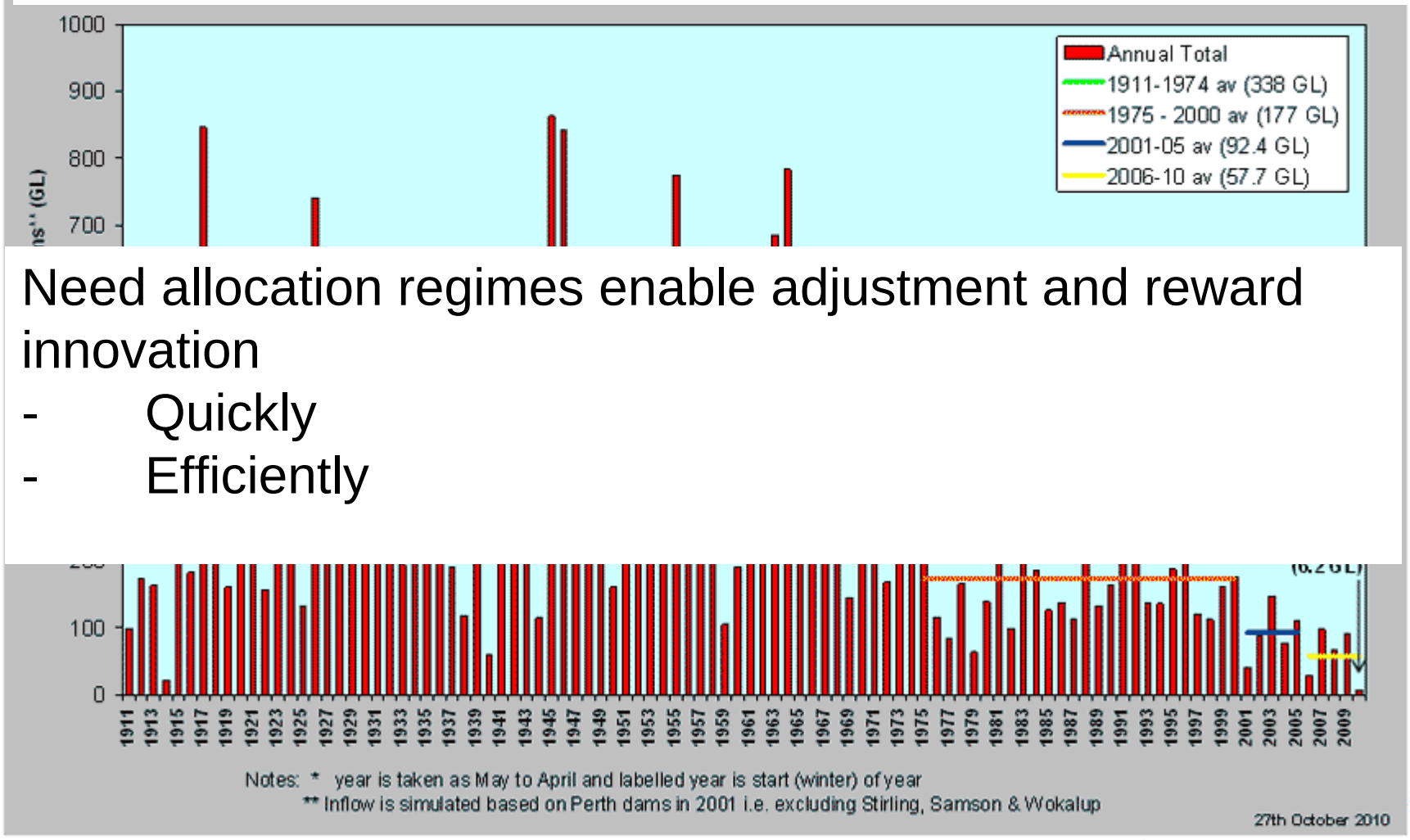
1 Gap greater than demand-supply difference due to mismatch between supply and demand at basin level
2 South Africa agricultural demand includes a 3% contribution from afforestation
SOURCE: 2030 Water Resources Group

Water stressed people



After OECD 2009

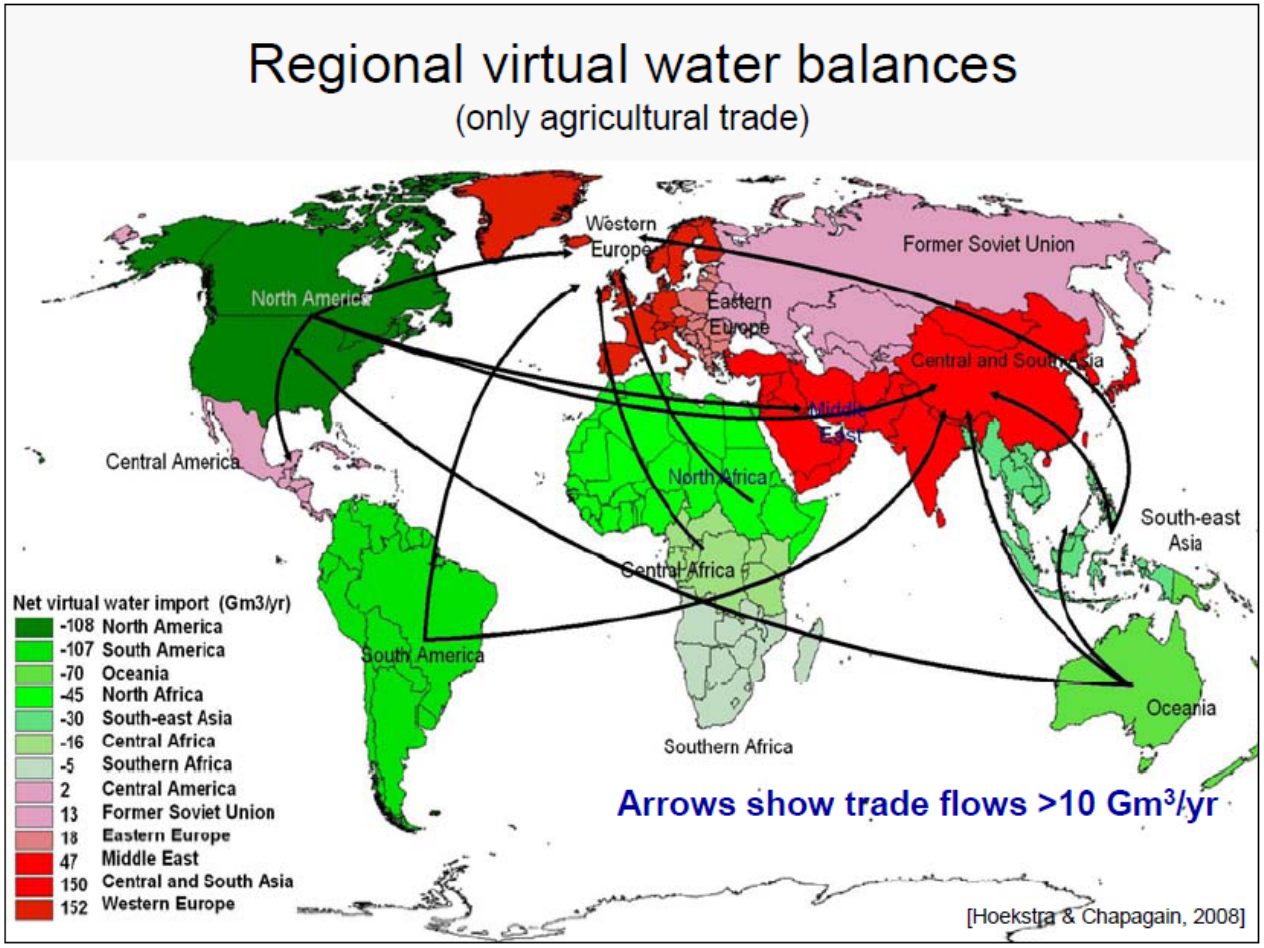
It can get drier – much drier!
Perth's dam inflow experience is real



Need allocation regimes enable adjustment and reward innovation

- Quickly
- Efficiently

International "water" trade

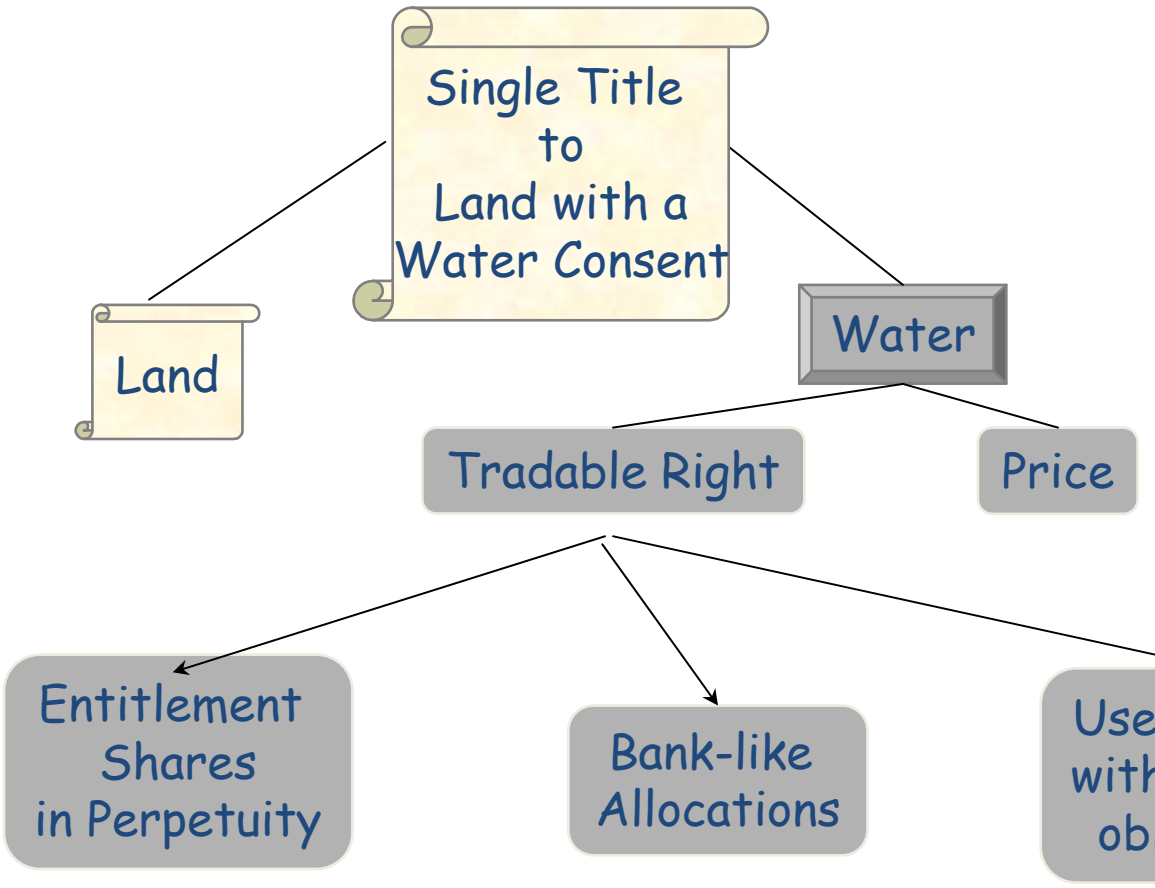


After Hoekstar & Chapagain 2007

My Father

- The Navy Way
- If something is broken, fix it properly!
- Design for the future not what you have today!

Entitlement reform & unbundling



National Competition Policy 1993/94 Plus Cap

National Water Initiative 2004

Mistakes Australia made

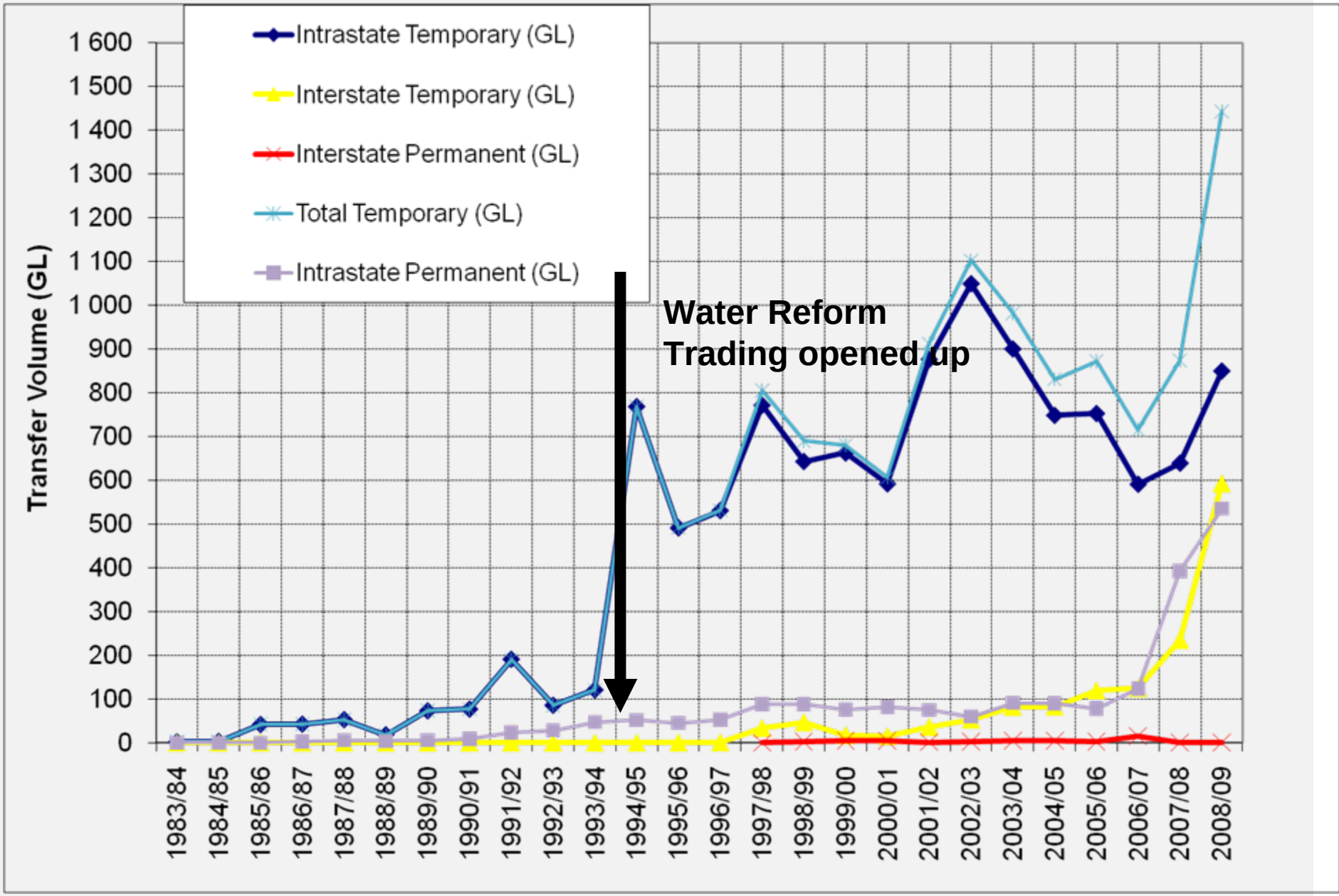
- Massive water accounting errors
  - Left lots of uses out of the system
  - Forgot about connectivity
  - Forgot about return flows
- Started with consent systems that lacked hydrological integrity
  - Did not include forests, groundwater, environment in the regime
  - Should have capped total entitlement not “use”
  - Should have specified entitlements as shares of water allocation arrangements specified in plans
  - Many entitlements got diluted as people activated previously unused water – we forgot to plan for change

Result

- Over-allocation
  - On average, use has to be reduced by 22-29% which means consents have to be reduced by 27-37%!
- Government investing
  - NZ$3.9 billion to buy back water for the environment
  - NZ$7.7 billion on upgrading infrastructure with 50% savings going to the environment
  - =>NZ$702 thousand per irrigator (16,600 irrigators)
  - Plus NZ$1.3 billion on collecting new information

Your Entitlement Regime

- First come, first served
  - Lawyers paradise
  - No reward to innovation
  - Minimum incentive to become efficient
- Pools of water where access is shared in proportion to each person's holding
  - Increased role for plans – nested governance
  - Diminished role for lawyers in adjustment processes
  - Separate instruments for each objective
  - Markets work
  - Financial reward to innovation and efficiency


Intrastate Temporary (GL)
Interstate Temporary (GL)
Interstate Permanent (GL)
Total Temporary (GL)
Intrastate Permanent (GL)
Water Reform
Trading opened up
Transfer Volume (GL)
1 600
1 500
1 400
1 300
1 200
1 100
1 000
900
800
700
600
500
400
300
200
100
0
1983/84
1984/85
1985/86
1986/87
1987/88
1988/89
1989/90
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
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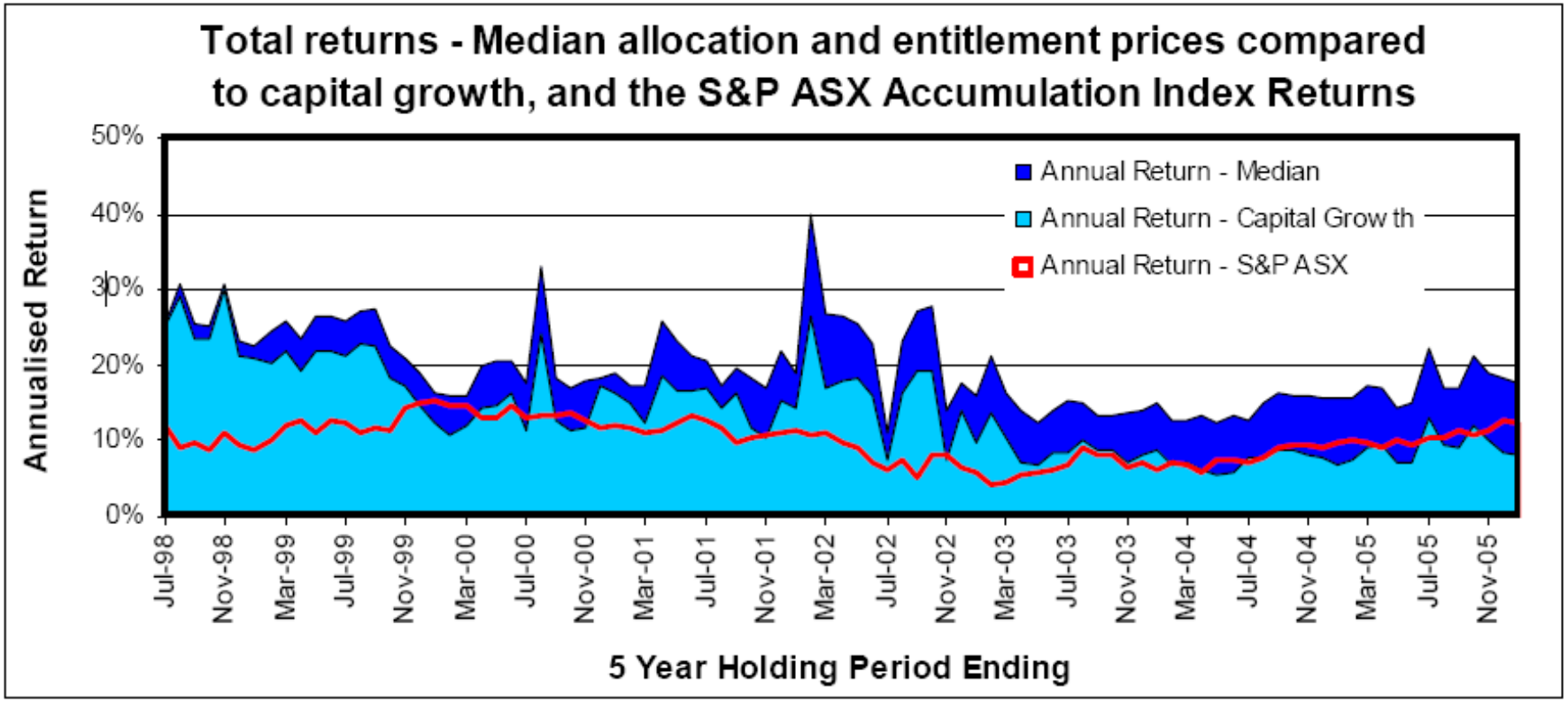
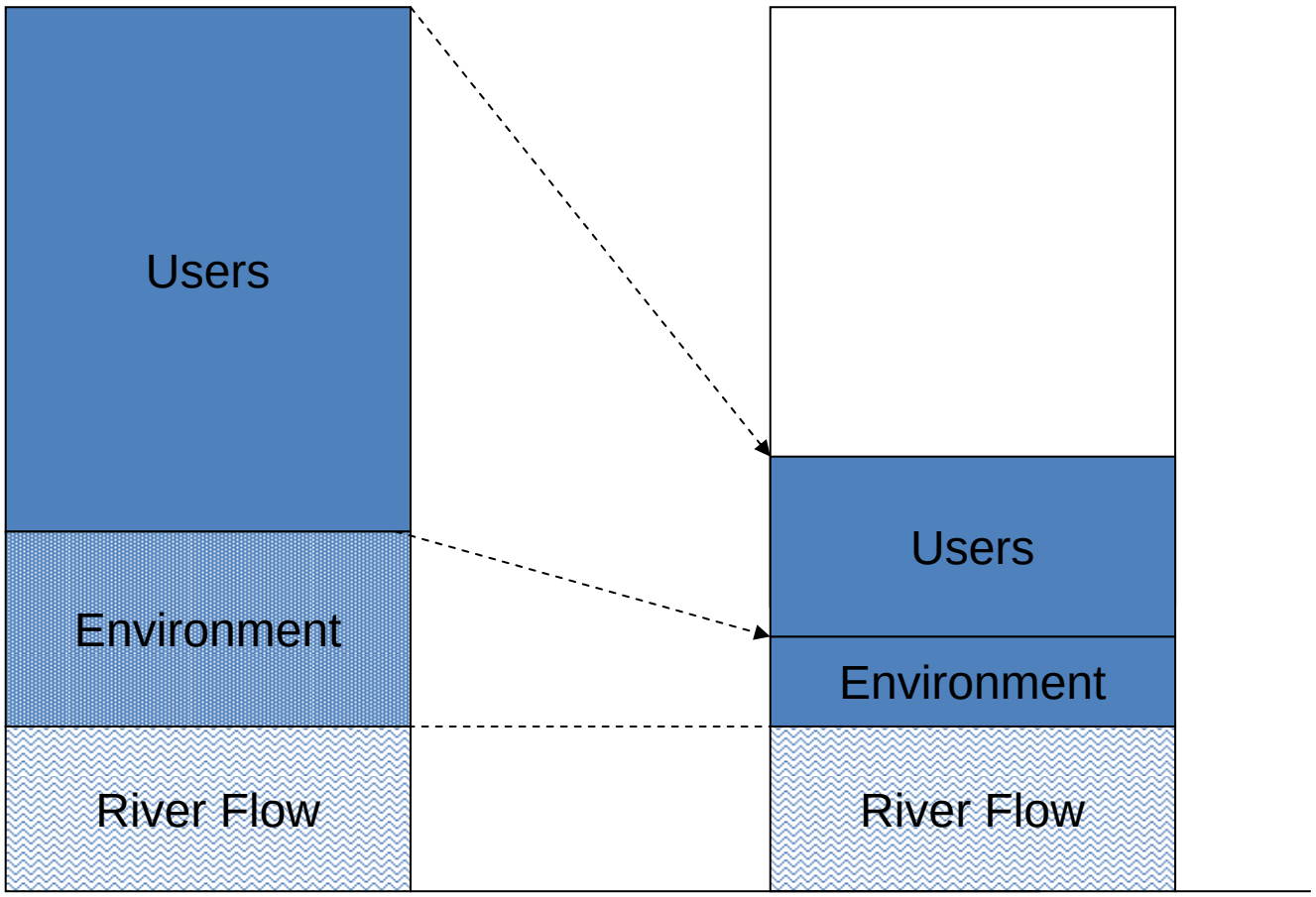
2005/06
2006/07
2007/08
2008/09

Annualised return to water reform



After Bjornlund & Rossini 2007


Users
Environment
River Flow
Users
Environment
River Flow

Governance

- Trying to use an Independent Authority to produce a new plan that gets the fundamentals right
- Defining conveyance water as water needed by all users including the environment
- Considering giving the environment a formal consent so all users face the same supply risks
- The system manager is not the environmental manager responsible for over-bank flows

Stuff farmers hate

- Every use, every off-take should be metered and you should have to pay for the water you take
- Only allocate water that exists
- As water efficiency increases, plan for allocations to go down
- Allow water to move to industry and to the environment
- Plan for supply infrastructure redundancy

Concluding observations

- Trading is essential for prosperity and environmental health in a changing world
- Design your entitlement regime to facilitate rapid adjustment in an ever changing world
- But get your accounting right
- Make sure the environment's future is secure as all user's future – force risks to be shared
- Design constellation of governance arrangements to drive innovation and allow markets to manage scarcity
  - Allow autonomous adjustment
  - Drive innovation
  - Expect water availability to go down as product prices go up
  - Enjoy the prosperity that these challenges will bring collectively
- See increased water scarcity as opportunity

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Australian trading experiences

- Enabled irrigation system to adjust quickly to sudden changes
  - Willing buyers quickly dealing with willing sellers saved a lot of business and saved a lot of plantations
- Has driven lots of innovation
- Has created lots of wealth and avoided regional economic disasters in drought
- Solved lots of water quality problems
  - People willingly moved water use away from problem areas
- But Australia traded the Murray into trouble
  - Australia got some accounting fundamentals wrong
  - Assigned most of the accounting error risks to the environment
- All the mistakes made could have been avoided
- We are still searching for the right constellation of governance arrangements and increased clarity about nesting with clarity
  - National
  - Regional
  - Local
  - Consents issued to individuals and local managers