Plan de gestión integrada para la cuenca de Copiapó

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CSIRO

What we do

Our Vision
Our science is used to make a profound and positive impact for the future of Australia and humanity.

Our Mission
We deliver innovative solutions for industry, society and the environment through great science.

CSIRO

People	6500
Flagships	9
Locations	58
Budget	$1B+

Top 1% of global research institutions in 14 of 22 research fields
Top 0.1% in 4 research fields

62% of our people hold university degrees
2000 doctorates
500 masters

With our university partners, we develop **650** postgraduate research students

What we do: our distinct role

Large scale

We provide scientific responses to major national and global challenges

Multidisciplinary

Our research Flagships promote radical innovation to reshape industries

Mission directed

We take a collaborative approach to scientific research and delivery

Our Science Programs (Flagships)

AGRICULTURE

BIOSECURITY

DIGITAL PRODUCTIVITY

ENERGY

FOOD & NUTRITION

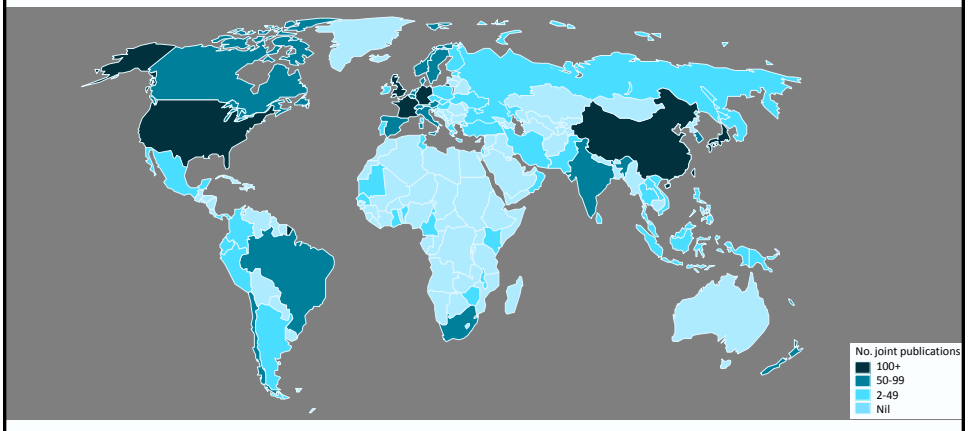
LAND & WATER

MANUFACTURING

MINERAL RESOURCES

OCEANS & ATMOSPHERE

Global connections

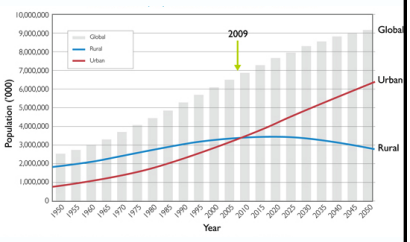


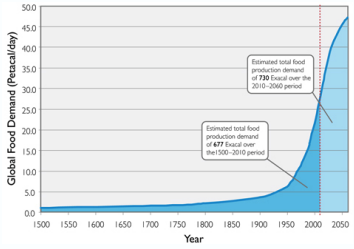
We work with partners in over 80 countries

- Foreign governments
- Small to large companies
- Multi-nationals
- International foundations
- Leading scientific institutions
- Over 700 research activities

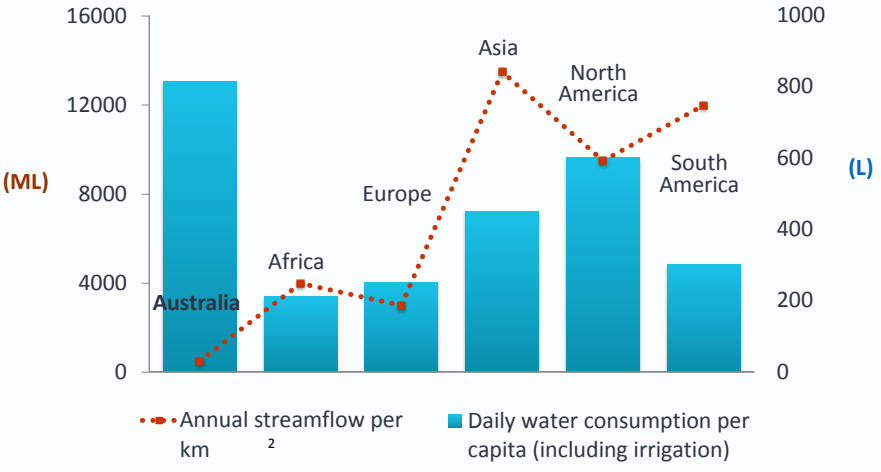
Water management – a global challenge

- Climate change complexities
  - Acceleration of the global water cycle
  - Redistribution of a limited resource
- Population growth
  - Additional 2.5 billion globally by 2050
- Urbanisation & industrialisation
  - Increasing demand for water, energy, resources, land and food
  - Increasing waste streams – sewage & industrial
- Global food security
  - Increasing demand for high protein diet
  - Increasing energy intensity for food production
- Environmental consequences
  - Changes in river and groundwater hydrology
  - Changes in water quality
  - Changes to biodiversity and ecosystem services

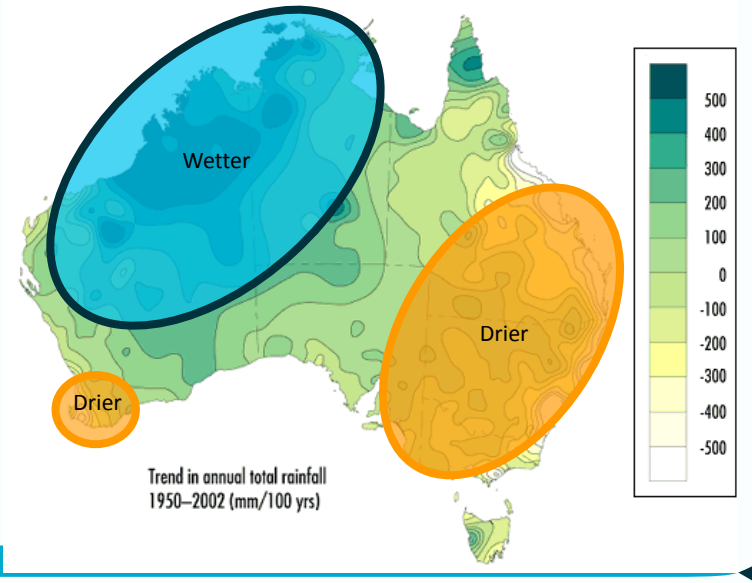




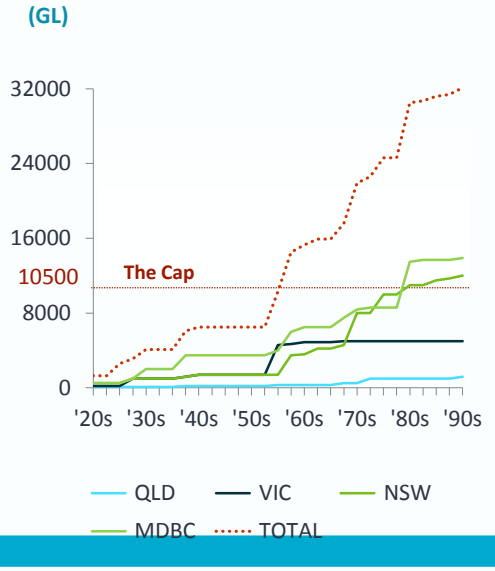
Australia – the driest inhabited continent – with the highest per capita water use



Rainfall distribution has changed since 1950



The Murray-Darling Basin



- **70%** of Australia's irrigated agriculture

However...

- Serious **over-allocation** of water between 1960s-1980s

Crisis in Australia forced the integrated water management process

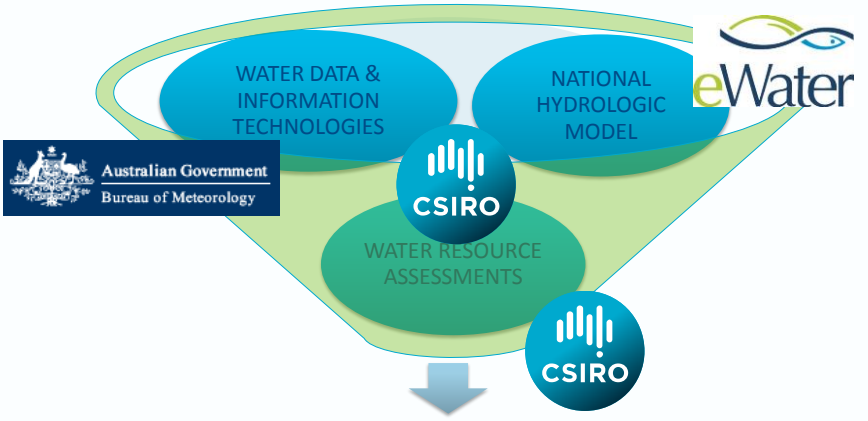
- Science – evidence and decision support
- Trust – put down the guns
- Sharing of power – institutional reform; laws, policies & programs
- Time – 20 years
- Mandate – is the time right
- Resources – commensurate with the problem

Ongoing capacity building, consultation & communication

National Water Initiative –
a transformational policy response

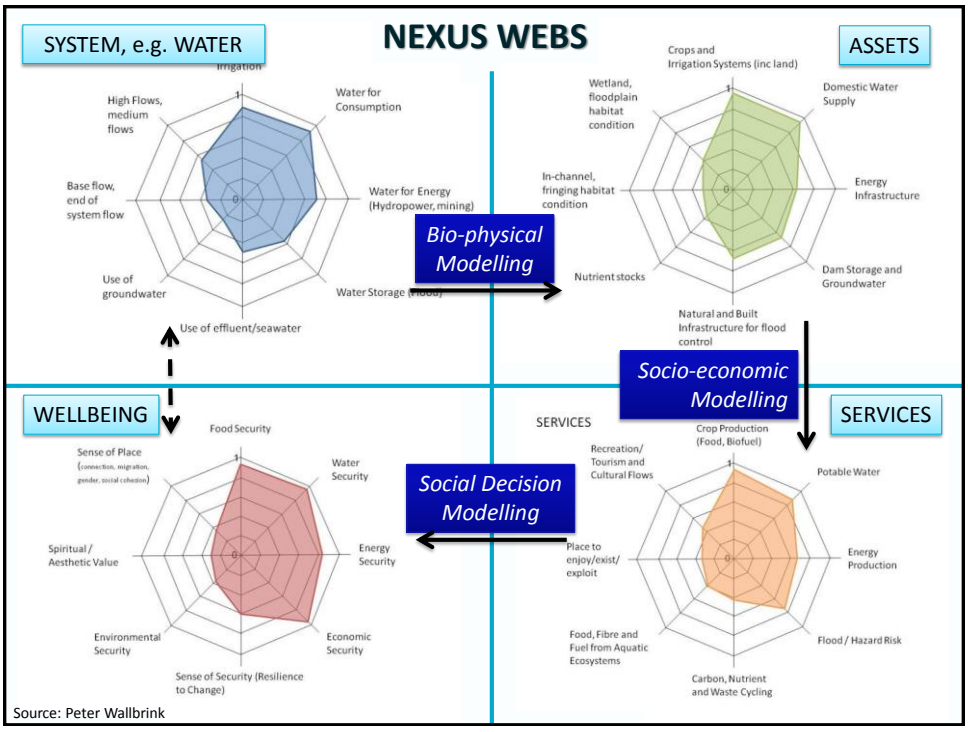
- Return all water systems to **sustainable levels of extraction**
- Provide **secure water entitlements** for **irrigators** and the **environment**
- Improve **security** and **management of urban water supplies**
- Improve water **data collection and accounting**
- Invest in **knowledge** and **build capacity**

In 2005, >$600M government investment into Water Information, Knowledge and Tools



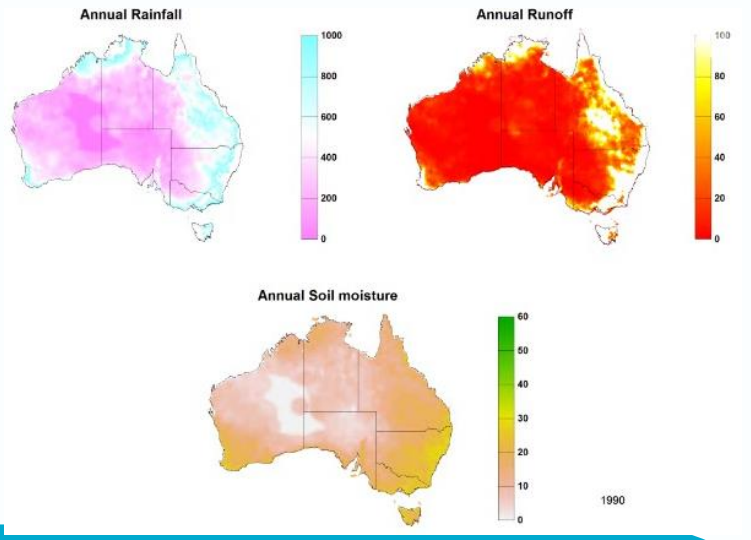
National technological capability to support basin-scale water resources planning and management under climate change

Integrated modelling – systems nexus



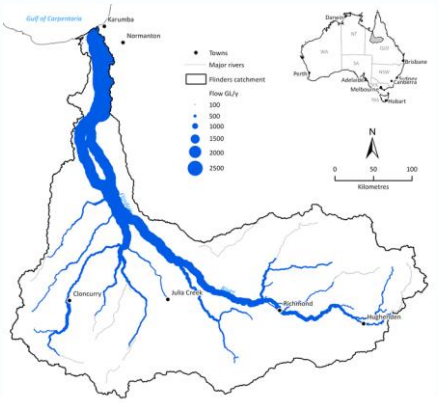
Source: Peter Wallbrink

Continental water balance modelling

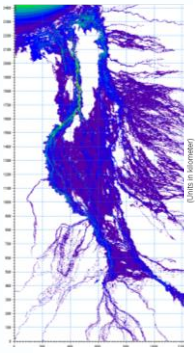


Viney et al., 2013, CSIRO
King et al., 2011, WIRADA Sci. Symp.

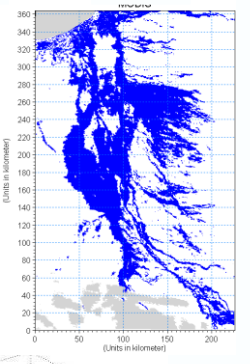
Modelling in a data sparse environment

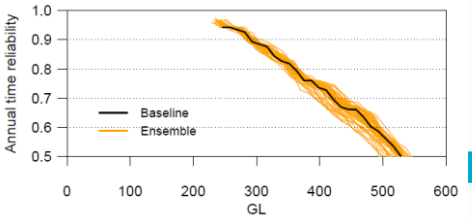


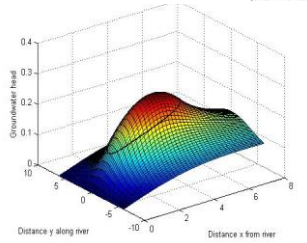
Modelled



MODIS



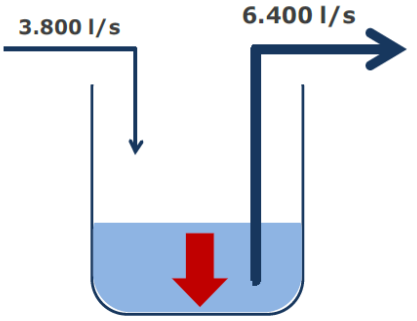




DGA (March 2012) estimate of imbalance

Rights issues exceed 19.000 l/s **Storage losses are 2.600 l/s**

Most water rights are not used because of:
1) lack of water, 2) high cost of extraction, 3) poor quality
4) need for water supply security, 5) speculation ?



- **Agricultura:** 4.500 l/s ➔ **71%**
- **Minería:** 1.430 l/s ➔ **22%**
- **Consumo humano:** 400 l/s ➔ **6%**
- **Otros:** 70 l/s ➔ **1%**

All demands are increasing

Plan de gestión integrada para la cuenca de Copiapó

- Una Estrategia de desarrollo para la cuenca de Copiapó, establecida de común acuerdo entre los diferentes actores participantes, qué considere los valores de la minería, la agricultura, el medio ambiente y los valores sociales.
- Un marco y una metodología general para una planificación integrada de cuencas, adecuada para aplicarse a nivel nacional, la cual debe estar alineada con la Estrategia Nacional de Recursos Hídricos.

Plan de gestión integrada para la cuenca de Copiapó

- **Fase 1**
  - Bases del proyecto
  - 6 meses
- **Fase 2**
  - Implementación del proyecto
  - 2,5 - 3 años

Resumen Fase 1

- **Diseño del proyecto**
  - **Estructura de gobernanza y actores clave**
- **Aumentando la participación**
  - **Consultas con actores clave**
  - **Desarrollo de "Visión Compartida"**
- **Difusión del proyecto**
  - **Identificación y reuniones con posibles fuentes de financiamiento**
  - **Delegación a Australia**
- **Desarrollo de TdRs para la Fase 2**
  - **Modular: US$ 2 millones v/s US$ 2+ millones**

Visión Fase 2

Phase	Stage/timeframe	Year 1	Year 2	Year 3	Year 4 +
Two	**Underpinning studies**				
	Establish vision & baseline				
	Identify sustainable yields				
	Identify options (1st pass)				
	Develop and analyse options				
	Decision support tools				
	Refine and select options				
	Pilot 1				
	Implementation				
	Review & improve				
Three	**Phase 3 - Pilot 2 (scaled out)**				

Potenciales productos de la Fase 2

- **Específicos**
  - Estado de la cuenca
  - Escenarios futuros acordados (derechos y límites)
  - Plataforma de información sobre recursos hídricos (accesibilidad)
  - Procesos y modelo para fortalecimiento de capacidades
- **Generales**
  - Plan de gestión integrada para la cuenca de Copiapó
  - Marco general de aplicación a nivel nacional

Pilotos

- Principios
  - Win-win
  - Sin arrepentimiento
  - Arrepentimiento bajo
  - Balance público-privado
  - Triple bottom line considerations
- Ejemplos
  - Infraestructura (reutilización de aguas urbanas/mineras)
  - Water trading (cap and trade; auction; buy back)

Gracias

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