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# Advancing Water Information.



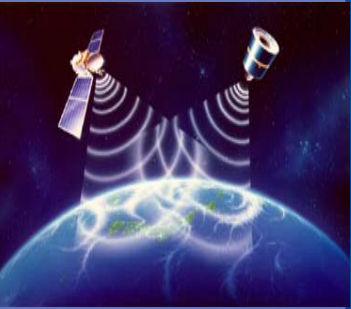
**Rob Vertessy**  
Bureau of Meteorology

*Water Information Industry Seminar  
Sydney  
November 22, 2007*



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## My hopes for today.



- Raise awareness about the Bureau's new role in water information
- Enthuse you about the value of our new role
- Describe key implementation arrangements
- Highlight who we are depending on and how



# Functions of the Bureau of Meteorology.

National  
Weather Service

Climate and  
Meteorological  
Research  
(with CSIRO)

National Climate  
Monitoring  
System

National Water  
Information  
Service



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National Flood  
Warning and  
Forecasting  
Service

National Tidal  
Centre

National Ocean  
Current  
Prediction

National  
Tsunami Alert  
Service



# Water management in Australia.

## Federal Government

*Policy, Audit, Funding*

*Weather, Climate, Flood Warning & Forecasting*

## 6 State + 2 Territory Governments

*Natural Resources Management*

*Environmental Protection*

*Urban Water Supply*

*Rural Water Supply*

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## Regional (sub-State) Authorities

*Catchment Management Authorities*

*Cross-Border Catchments & Aquifers*

*Irrigation Companies and Trusts*

*Urban Water Retailers*

Authority  
devolved  
from States and  
Territories

## Local Government

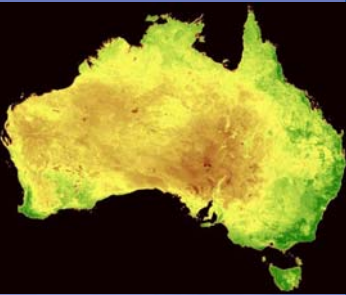
*Sewage, Stormwater, Town Water Supply*



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# The Bureau's new functions.

*(as set out under the NPWS and Water Act 2007)*



1. Set standards for water data measurement and transmission.
2. Gather water information and make it freely available via the web, with value-added analyses.
3. Conduct annual national water resource assessments.
4. Produce an annual national water account.
5. Provide continuously updated water availability forecasts.



# The water information value ladder.



**Data >>> Information >>> Insight**

**>>> Increasing value >>>**

Measurement

Quality assurance

Archiving in house

Integration

Distribution

Analysis

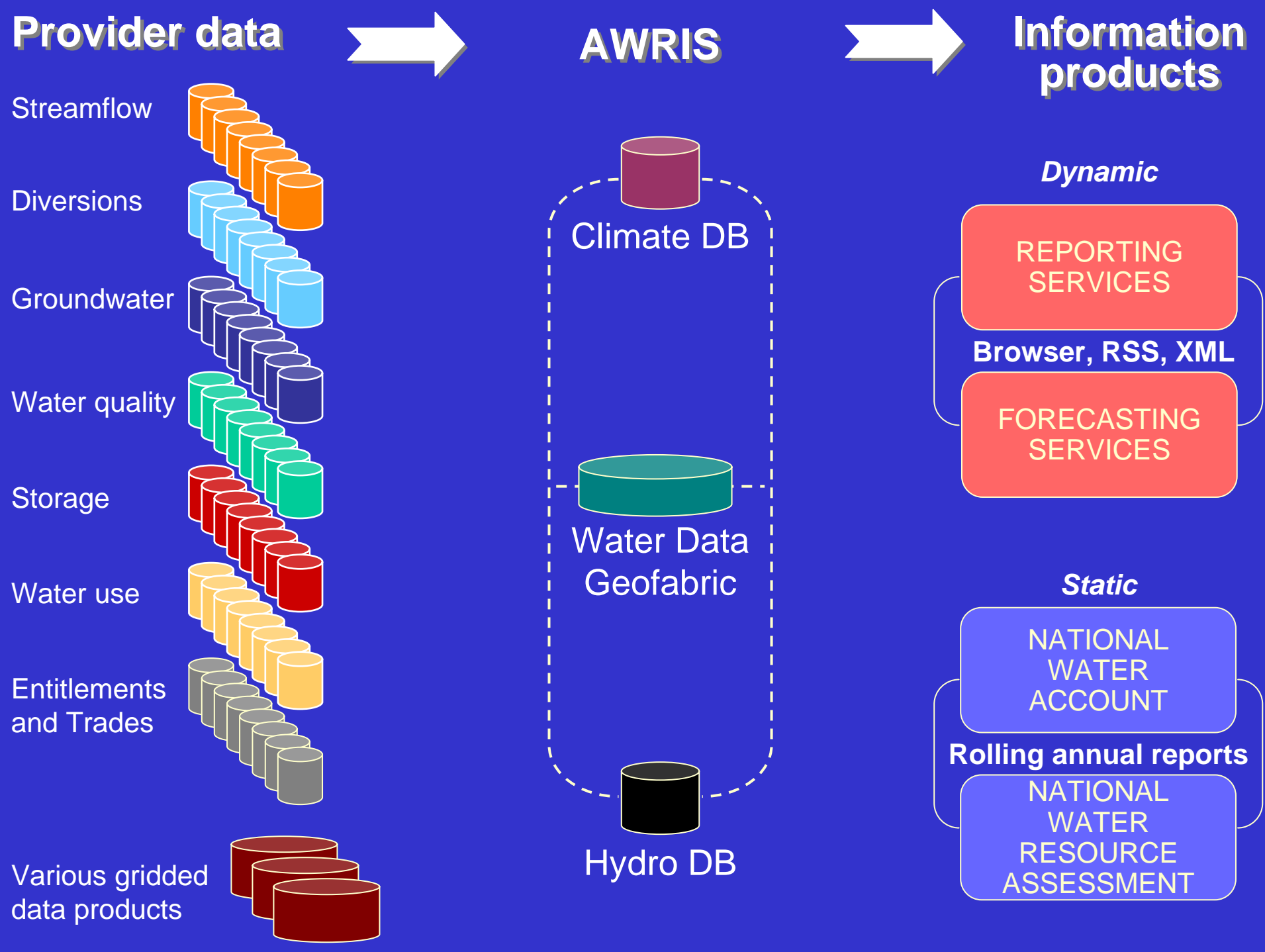
Reporting

Forecasting

Generally done well, by over 100 groups, but could be vastly improved with new technology

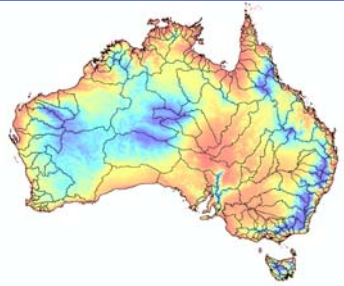
Generally done poorly

Rarely done





# A national water data 'geofabric'.

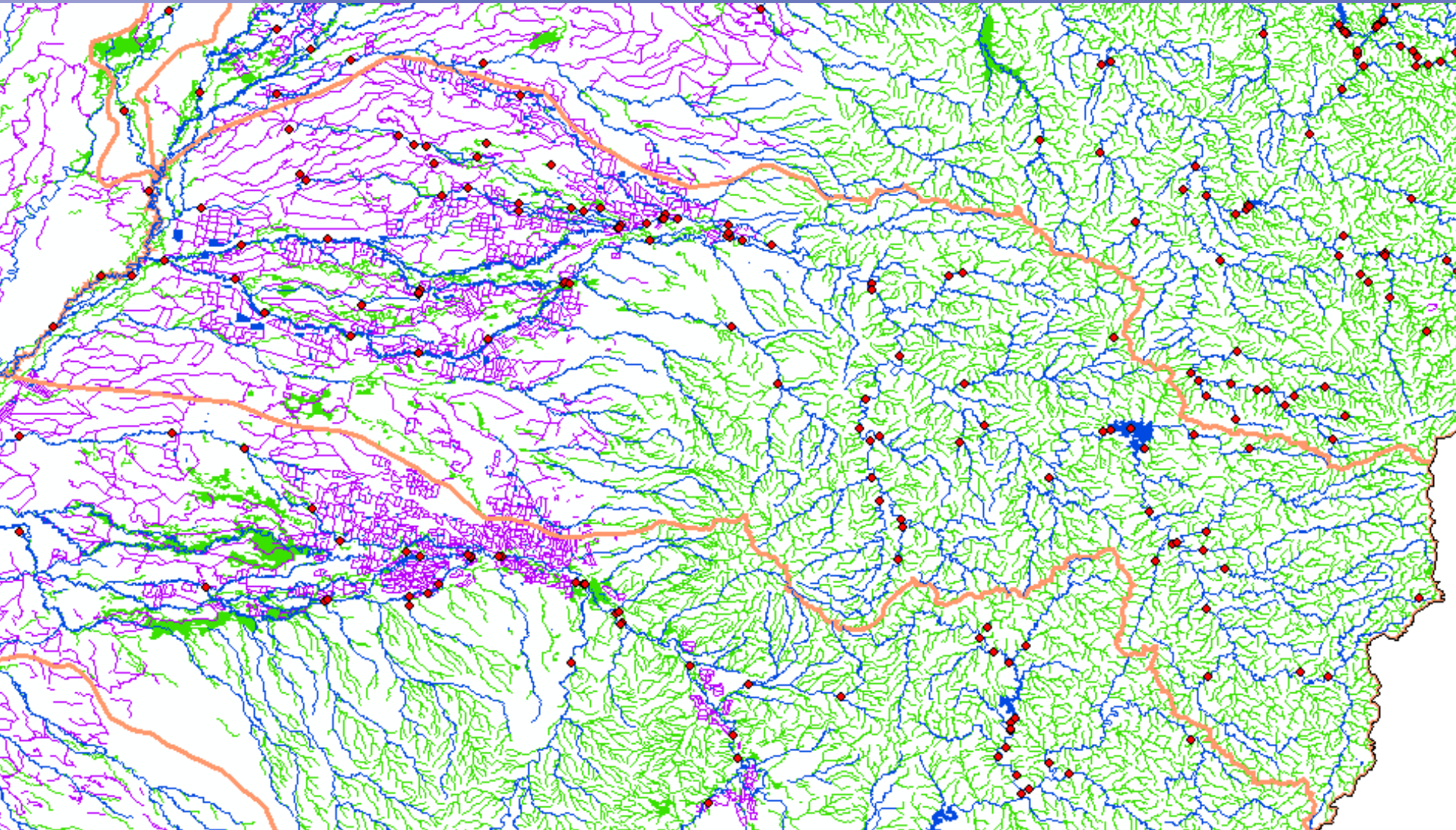


- Digitisation, new delineations, numbering and connectivity schemes for:
  - Surface water catchments and groundwater systems
  - River reaches and other water bodies
  - Irrigation system delivery and drainage channels
  - Hydrometric monitoring stations
  - Water extraction points (metered and non-metered)
  - Etc
- *Pretty much like the US has accomplished with NHDPlus and ArchHydro.*



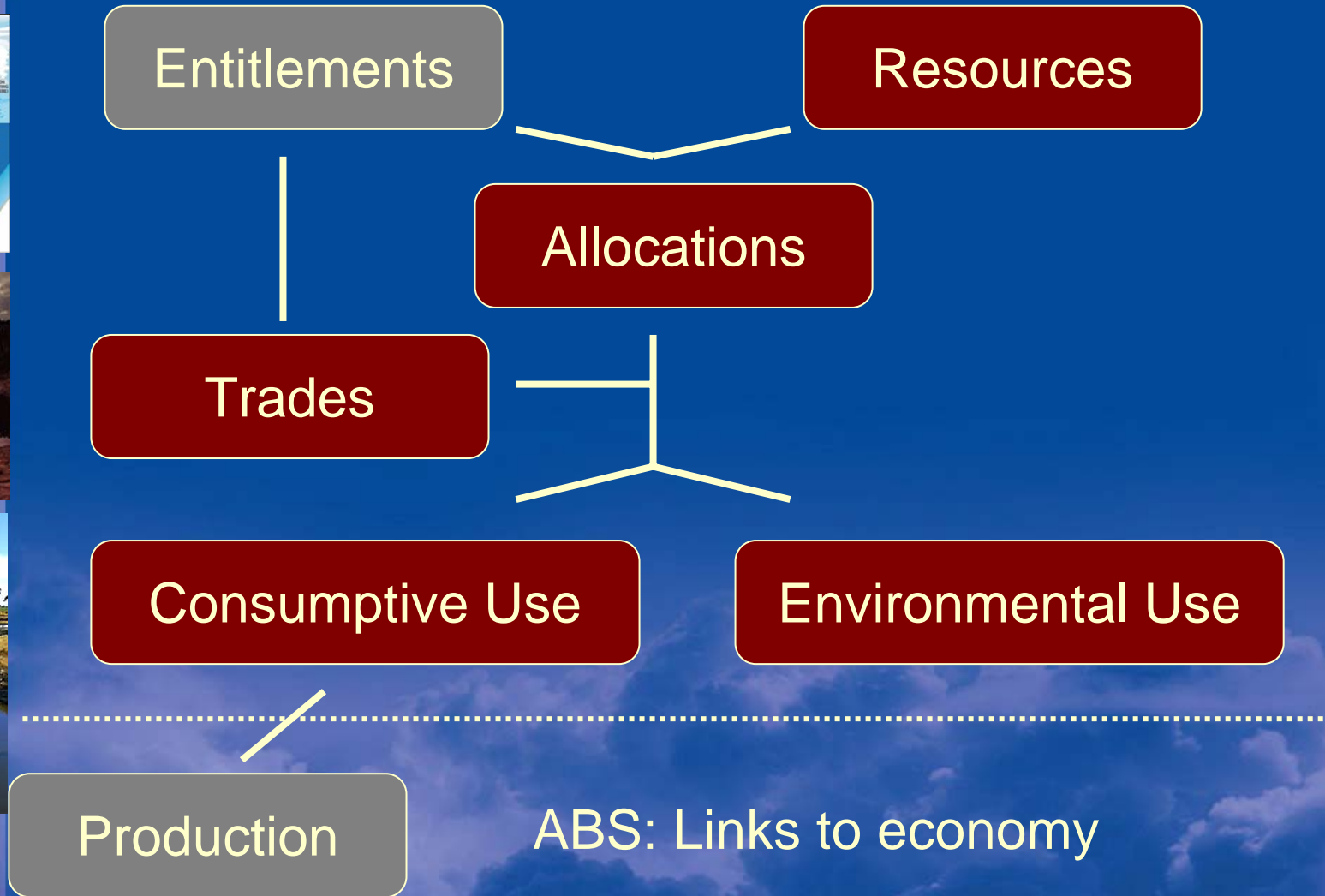
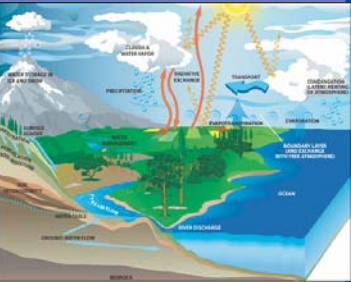
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# Subset of the Gwydir catchment, NSW.





# A national water account.





# Hydrologic forecasting services.

(Possible areas of effort - to be resolved)

Time span increases  
Time resolution decreases



- Flood Warning and Forecasting
  - Hours to days, as per current activity
- River/Irrigation Operations Support
  - 1-5 days, linked to numerical weather prediction
- River/Irrigation Management Support
  - 3-12 months, linked to seasonal outlooks
- Long-range Hydrologic Modelling
  - Years-decades, linked to global circulation models



## Resourcing.



### **\$460m over 10 years for 3 things:**

- Core staffing and operating infrastructure.
- Special data sets, tools and knowledge.
- Improving hydrologic observing systems.

### ***Complemented by \$620m over 10 years for a major water use metering and telemetry rollout***

(The Bureau wont manage this but will receive the data streams from several thousand water meters.)



# 1. Core staffing and infrastructure. (\$210m over 10 years)

- The Bureau will employ another ~120 staff to deliver a range of **functions**, including:
  - Data Capture and Handling
  - Analysis and Reporting
  - Forecasting
- Investments in data storage, web serving and computational power (and possibly satellite receiving stations).





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## 2. Special data, tools and knowledge. (\$170m over 10 years)

- Systems development
  - Geofabric, AWRIS, modelling systems
- Filling fundamental gaps in hydrologic knowledge
  - SW/GW interactions, interception
- Water resource investigations
  - One-off investigations, commissioned as needed
- Commercial data procurements
  - National Digital Elevation Model (DEM)
  - Annual mapping of landuse and farm dam extent
  - Remote sensing imagery for various other purposes





### 3. Improving hydrologic observing systems. (\$80m over 5 years)



- The Bureau won't make observations beyond current meteorological and flood monitoring, but has ...
- \$80m to invest with the States to update hydrologic monitoring networks (not including water use metering)
- Some likely funding preferences:
  - Improving data quality and currency of water data
  - Technology to simplify data ingestion
  - Filling critical gaps in networks





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# Getting the job done.



- In-house (existing capability)
- In-house (new capability; now being recruited)
- R&D partners
- Consulting industry
- State collaborators
- Commonwealth collaborators



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# Water Act 2007 (Part 7 - Water Information).



- Clauses 118-135, pages 131-139
- General
  - Functions
  - Definitions
- Sets out Bureau's powers
  - Requesting information
  - Setting information standards
- Sets out Bureau's obligations
  - Publishing water accounts
  - Publishing information generally

<http://www.environment.gov.au/water/action/npws-act07.html>



## Regulations under S126.



- Under negotiation with the States and Territories
- To be published by the GG when the Water Act is proclaimed in March 2008
- [www.bom.gov.au/water/regulations](http://www.bom.gov.au/water/regulations)

### 4 Schedules:

- A. Persons or classes of persons who must give water information
- B. Kinds of water information to be given
- C. Time within which information must be given
- D. Form of the water information and manner of transmission



## External coordination and consultation.

1. **Australian Water Information Advisory Council** - advising how best to contribute to national water reform.
2. **Jurisdictional Reference Group on Water Information** - working through implementation issues with the States and Territories.
3. **Expert Panels** - getting talent to help us develop and promulgate a variety of standards and methods.





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# New South Wales membership of JRGWI.

DWE nominated as the lead NSW water agency.

Paul Pendlebury

*Director, Water Systems, DWE*

Dugald Black

*Manager, Resource Processes, DWE*





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## National workshops on technical issues.

**>100**

### Four national workshops held so far:

- Water Data Standards
- Water Information Systems Architectures
- Water Data Interoperability (international)
- Telemetry Systems for Water Data



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## Keeping you informed.



- Public seminars
- Newsletters
- Our web site
- Direct contact with your agencies



# Deeper engagement.

## **At the technical level:**

- Expert panels
- Conferences and workshops
- Secondments

## **At the end user level:**

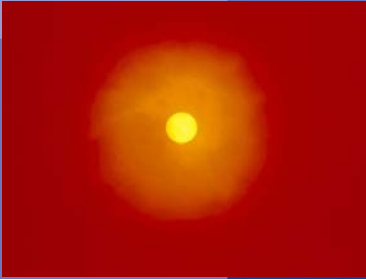
- End user needs analyses
- End user satisfaction surveys
- Secondments



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# Water scarcity: A deepening problem.



Drying & Warming Climate



Growing Urban Demand



Over-allocation to Irrigation



Uncapped Groundwater Extraction

## The big 8

### water scarcity factors



Expanding Plantations



Expanding Farm Dams



The Environmental Flows Imperative



Bushfire Recovery Impacts



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## Outcomes.

- National water information standards established.
- Currency and quality of water data improved.
- Value-added water information products.
- Greatly improved water availability forecasting.
- Seamless national information coverage.
- Enhanced public access to information.
- An independent, authoritative voice.



<http://www>

***All leading to greater rigour, foresight and confidence in water resources management.***



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## Contacts.

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