Department of Water
Government of Western Australia

Department of Water

Lindsay Preece
Manager Water Information

6364 7204

May 2010

www.water.wa.gov.au

Department of Water
Government of Western Australia

Department of Water - Overview

The Department of Water is the Western Australian government agency responsible for ensuring the State's water resources are:-

- **planned,**
- **managed,**
- **developed.**

Department of Water
Government of Western Australia

Department of Water - Overview

Our purpose

The Department of Water manages water to support Western Australia's economy, provide amenity for the community, and sustain the environment.

We manage 50,000 GL each year of renewable freshwater resources including 11,000 GL held in dams and 37,000 GL of inflows in run-off and deep drainage.

We manage the state's water through 52 groundwater and 22 surface water management areas

Department of Water
Government of Western Australia

The Department of Water provides services across the State of Western Australia through a network of 15 regional and district offices.

Department of Water

Head office

The Atrium
168 St Georges Terrace Perth
Western Australia
P O Box K822 Perth
Western Australia 6842
Phone: (08) 6364 7600
Fax: (08) 6364 7601
www.water.wa.gov.au

Water science, salinity and water resource recovery
Level 4 Septimus Roe Square
256 Adelaide Terrace Perth WA 6000
Phone: (08) 6364 7800
Fax: (08) 6364 7888

Regional offices

Swan Avon region

Victoria Park regional office
7 Ellam Street Victoria Park
Phone: (08) 6250 8000
Fax: (08) 9361 9311

Water measurement office
105 Kew Street Welshpool
Phone: (08) 9355 6237
Fax: (08) 9361 9311

Northam district office
254 Fitzgerald Street Northam
P O Box 497 Northam
Western Australia 6401
Phone: (08) 9690 2600
Fax: (08) 9622 7155
Kwinana Peel region

Kwinana Peel regional office
Marine – Operations Centre
17 Breakwater Parade Mandurah
P O Box 332 Mandurah
Western Australia 6210
Phone: (08) 9550 4222
Fax: (08) 9581 4269

South Coast region

Albany regional office
5 Bevan Street Albany WA 6330
P O Box 525 Albany
Western Australia 6331
Phone: (08) 9842 5760
Fax: (08) 9842 1204

South West region

Bunbury regional office
35–39 McCombe Road Bunbury
P O Box 261 Bunbury
Western Australia 6231
Phone: (08) 9726 4111
Fax: (08) 9726 4100
bunburyadmin@water.wa.gov.au

Busselton district office
Suite 1A 72 Duchess Street Busselton
P O Box 269 Busselton
Western Australia 6280
Phone: (08) 9781 0188
Fax: (08) 9726 4100

Geocatch network centre
Suite 1A, 72 Duchess Street Busselton
P O Box 269 Busselton
Western Australia 6280
Phone: (08) 9781 0111
Fax: (08) 9754 4335
geocatch@water.wa.gov.au

Warren Blackwood district office
52 Bath Street Manjimup
Phone: (08) 9771 1878
Fax: (08) 9771 8108

Mid West Gascoyne region

Geraldton regional office
81 Forrest Street Geraldton
P O Box 73 Geraldton
Western Australia 6531
Phone: (08) 9965 7400
Fax: (08) 9964 5983

Carnarvon district office
211 Robinson Street Carnarvon
P O Box 81 Carnarvon
Western Australia 6701
Phone: (08) 9941 6100
Fax: (08) 9941 4931
Gascoyne@water.wa.gov.au

Pilbara region

Karratha regional office
Lot 4608 Cherratta Road Karratha
P O Box 836 Karratha
Western Australia 6714
Phone: (08) 9144 2000
Fax: (08) 9144 2610
Karratha@water.wa.gov.au

Kimberley region

Kununurra regional office
27 Victoria Highway Kununurra
P O Box 625 Kununurra
Western Australia 6743
Phone: (08) 9166 4100
Fax: (08) 9168 3174
Kununurra@water.wa.gov.au

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Water resource use:

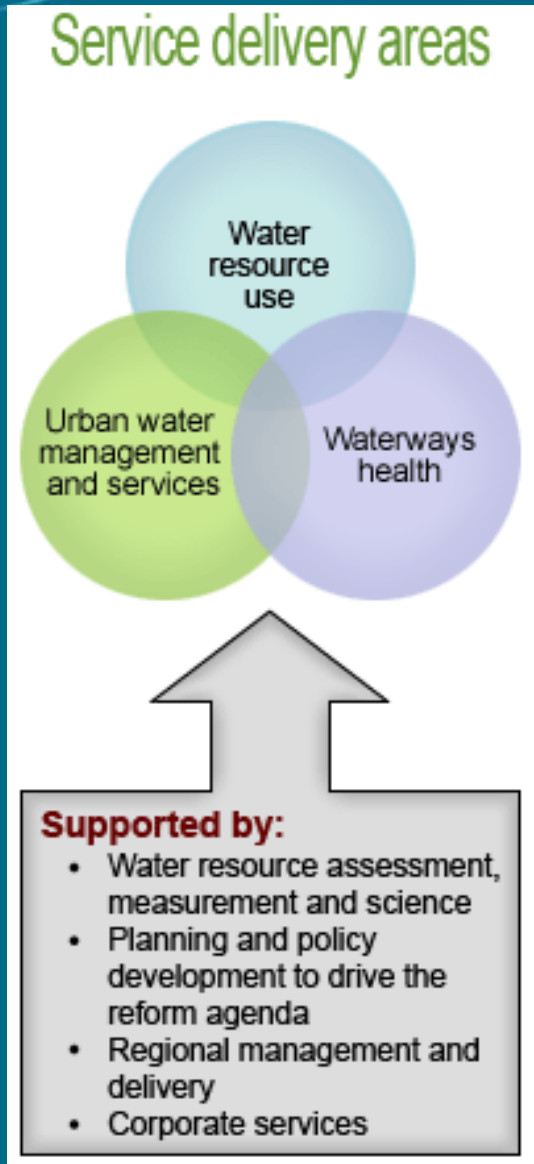
- *Evaluates water availability and then licenses its extraction for consumption or other uses.*

Urban water management & services:

- *Includes water drainage, drinking water source protection, planning, water efficiency and recycling, as well as policy and regulation of water services.*

Waterways health:

- *Focuses on the adequate protection of the state's waterways and catchments, including salinity management, river management and recovery programs.*



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Department of Water - Overview

Priorities

To meet our strategic objectives over the next five years, the department will be pursuing the following 10 priorities.

1. **Within sustainable limits allocate water to support economic development;**
2. **Optimise water use through improved management;**
3. **Move Perth towards a 'Water Sensitive City';**
4. **Protect and recover public water supplies;**
5. **Facilitate a competitive and innovative water industry;**
6. **Protect waterway health &recover priority waterways;**
7. **Support water resource management & state development;**
8. **Ensure the state has a strong strategic approach;**
9. **Modernise water legislation, policy and technologies;**
10. **Establish market-based mechanisms to release water and support enhanced water trading.**

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Department of Water - Overview

Water resource assessment, measurement and science

This service is critical in supporting the delivery of all three primary services. It involves building on our knowledge of the availability and quality of the state's water resources through investigation, assessment, review, and monitoring. This improved knowledge contributes, informs and underpins all water resource management functions within the department including water regulation, water planning and waterways protection.

WATER INFORMATION

Maps and atlases:

We provide a range of maps, spatial data and online atlases.

www.water.wa.gov.au/Tools/Maps+and+atlases/default.aspx

Monitoring and data:

The Department of Water operates numerous surface water and groundwater monitoring sites throughout Western Australia

www.water.wa.gov.au/Tools/Monitoring+and+data/default.aspx

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WHAT WE MEASURE

FLOW

GROUNDWATER DEPTH

RIVER HEIGHT

WATER QUALITY

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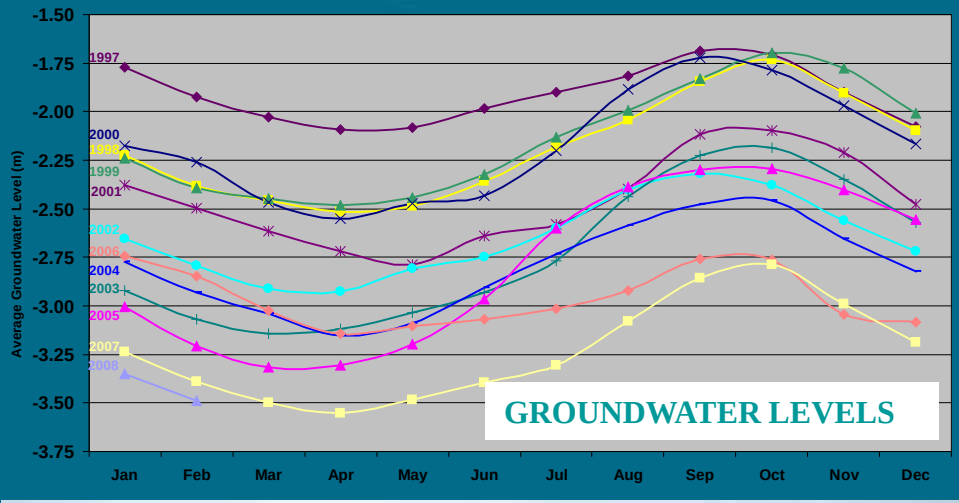
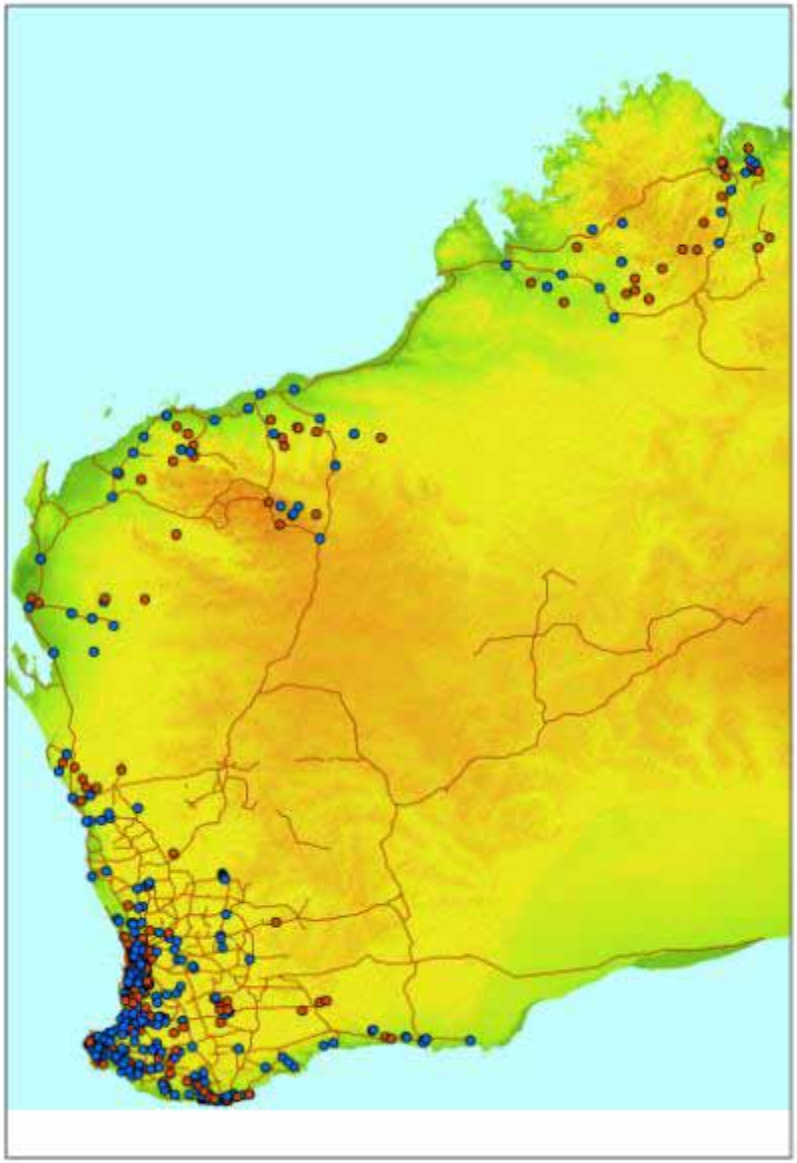
WHY WE MEASURE

- **WATER AVAILABILITY**
  - Water Sources
  - Environmental Management
  - Economic Growth - $1.092 billion worth of projects in 2009
  - Recreation
  - Water Allocation
  - Water Assessment
- **PROJECT SUPPORT**
- **FLOOD WARNING**
- **CLIMATE CHANGE**
- **MODELLING**



GROUNDWATER LEVELS


FLOOD WARNING



Reference network

Gauging Stations

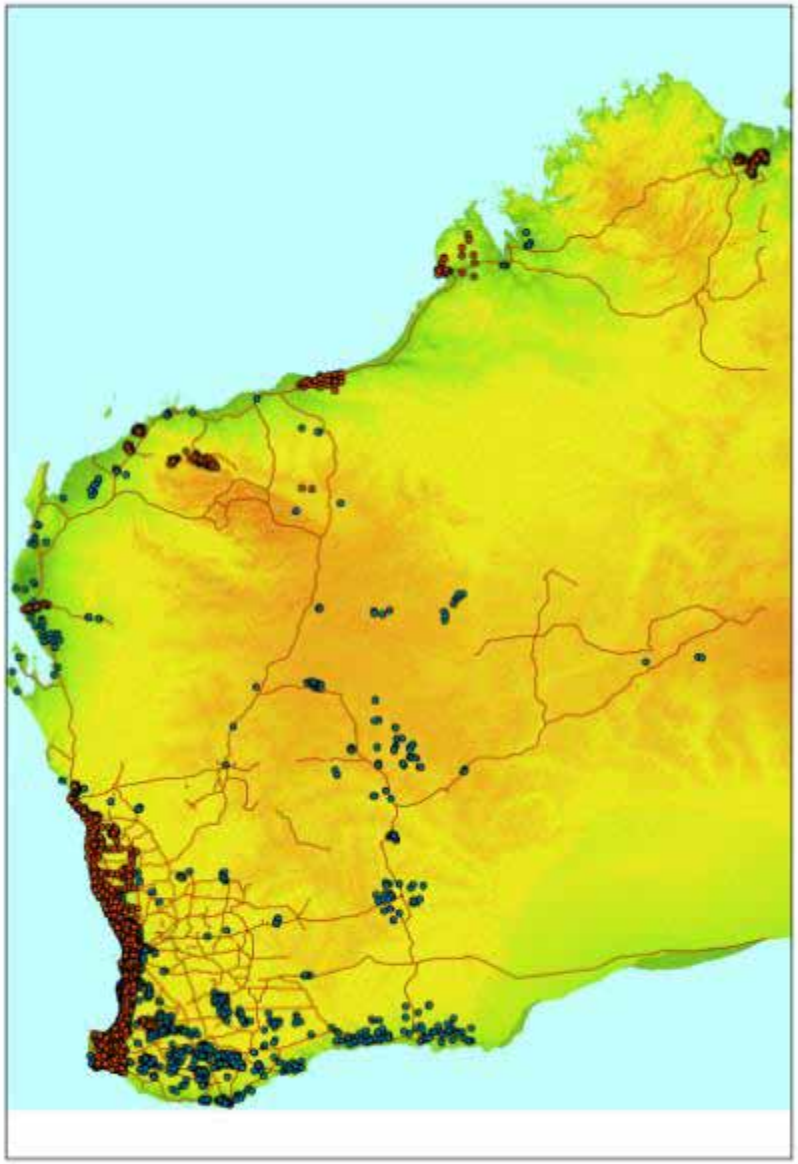
~ 350 open

~ 400 total

Rainfall sites

~ 182 open

~ 220 total



Reference network

Network bores

~ 2800 open

~ 3600 total

Project bores

~ 3200 open

~ 6000 total

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Databases

WiN WATER INFORMATION SYSTEM

Discrete:

- Project and site
- Water Quality
- GW information

KISTERS hydstra

Time-series:

- Stream flow
- Water Quality
- Meteorological data

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Hydstra

32,000	Years
3,800	Ratings
27,200	Gaugings
3,500	Sections
Value:	> $120,000,000

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WIN

130,000 sites
(82% ground, 12% surface, 4% met, 1% other)

3 million samples

15.2 million readings

61,000 bore logs

Contextual information
(why, how, by whom, quality)

Value > $200,000,000

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Readings in WIN

Detailed Lab chemistry agreed stds and formats

Instrument downloads

Field observations

Water levels

Metering

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New Initiatives

Capture of accession reports into WIN

Biological capability

National Groundwater Information System

Data delivery to BoM

The team

Data Provision section

- **Works closely with Data Management section**
- **People you are likely to deal with:**
  - Jo Gregory – senior DMO
  - Rose Lerch – DMO
  - Tanya Brown – DMO
  - Suzanne Stevenson – DMO
- **Others on the team**
  - **Jeanette Bray – GW Information Officer**
  - **Christopher Frick – technical support**
  - **John Argus – team leader**

Data and Information we provide

- Flow data
  - rivers/streams
- Level data
  - rivers, streams, bores, lakes & wetlands
- WQ Sample data
  - rivers/streams, bores, lakes, estuaries
- Construction Details
  - bores

Data and Information we provide …

- Bore hydrogeology
  - Aquifers, stratigraphy, lithology, geophysical logs
- Site Details
  - rivers/streams, bores, lakes & wetlands, estuaries
- Maps - showing:
  - site location, rivers/streams, bores, lakes & wetlands, estuaries

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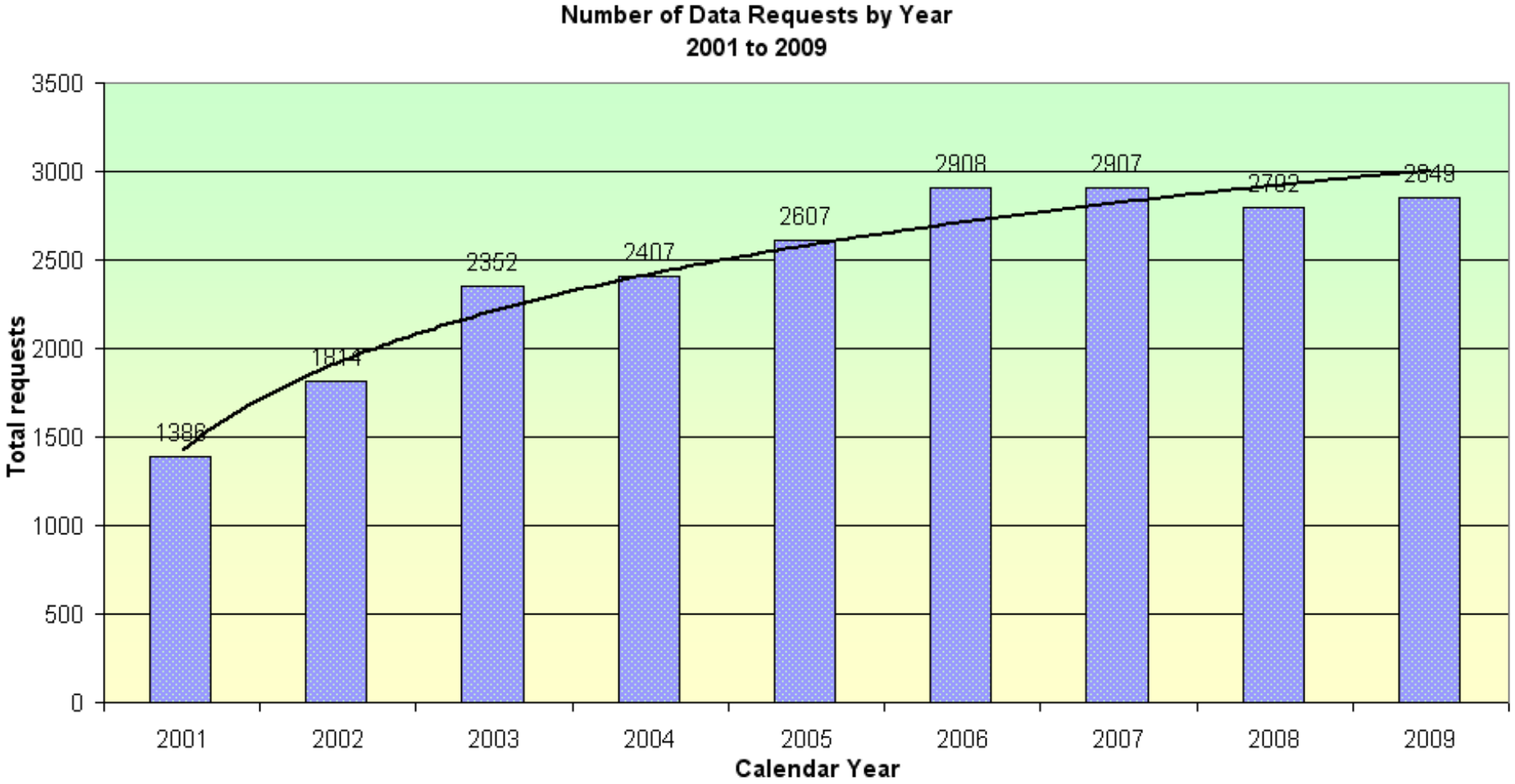
Demand



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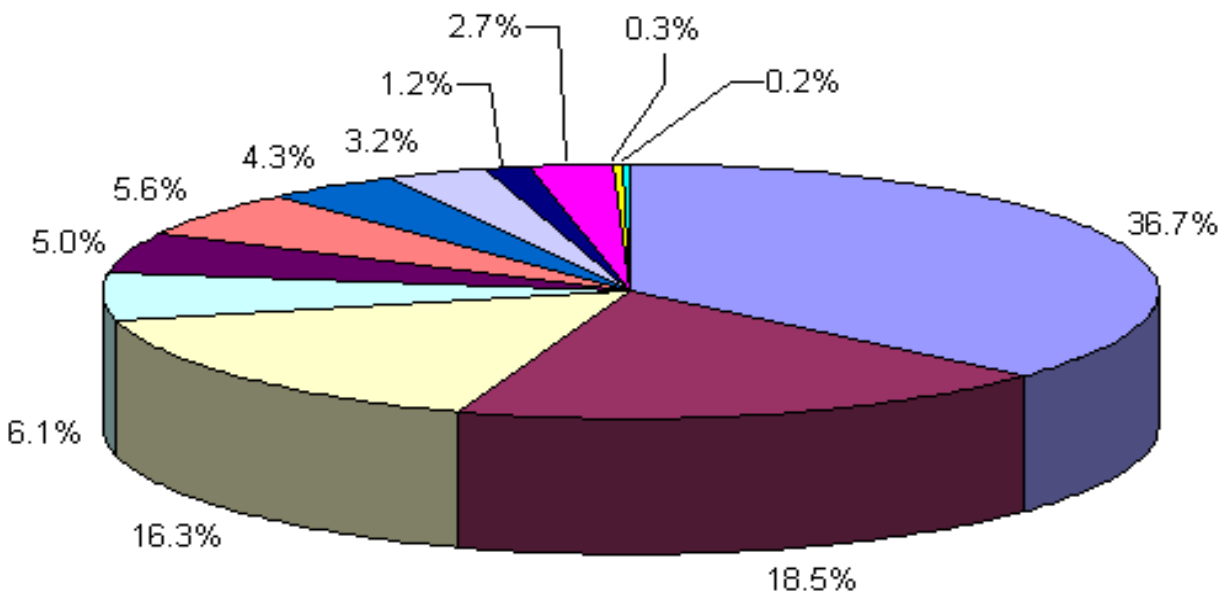
Clients

Water data requests by organisation type
1 Jan 2009 - 31 Dec 2009



Org type	No.	%	Org type	No.	%
Consultants	1,283	36.7%	Oil & Mining Co's	149	4.3%
DOW **	648	18.5%	Universities	111	3.2%
DOW	570	16.3%	Local govt	42	1.2%
State govt (WA)	212	6.1%	Cwealth govt	95	2.7%
Private	176	5.0%	Non govt orgs	9	0.3%
Other Co's	196	5.6%	State gov (non-WA)	6	0.2%

** indicates self-extraction of data - all others via Data Provision group

Clients

Non-commercial

- BOM
- CSIRO
- Swan River Trust
- Water Corporation
- Dept of Agriculture and Food WA
- Department of Environment
- Western Power
- Main Roads Western Australia
- Department of Mines & Petroleum
- Local governments - Statewide
- Universities:
  - Uni WA
  - ECU
  - Murdoch
  - Curtin
  - Interstate
- Schools
- Catchment management groups
- Landowners

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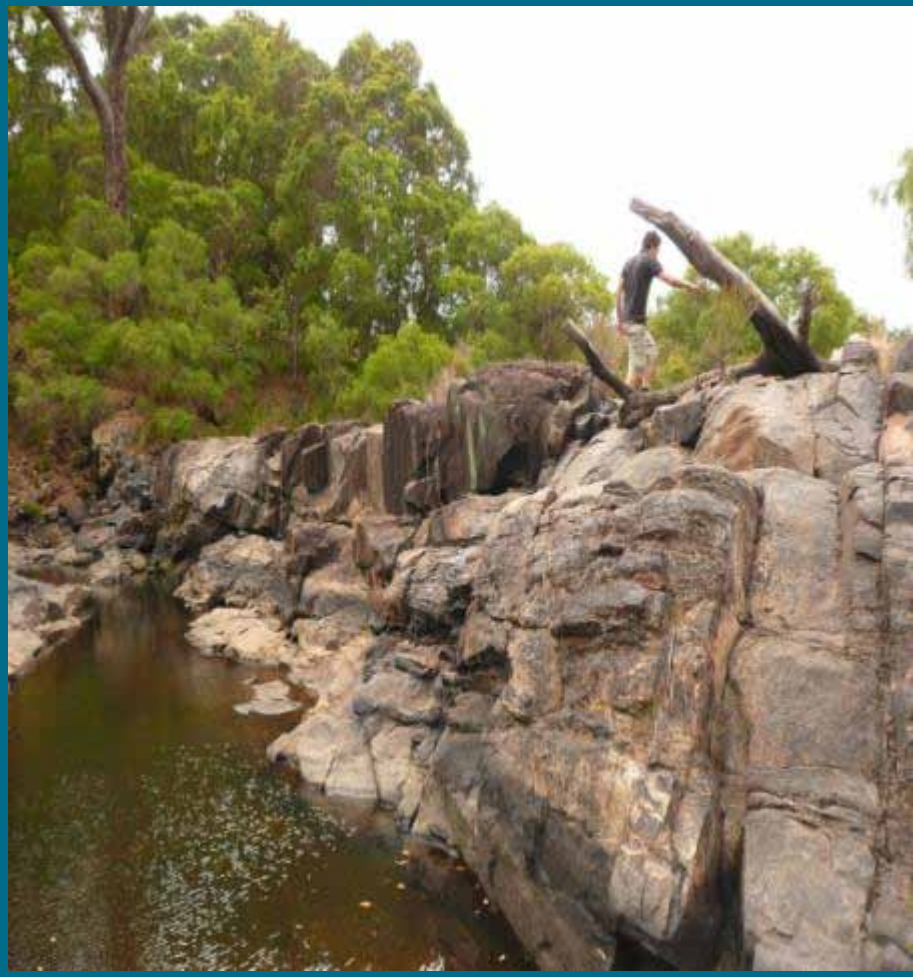
Obtaining data

Request by:

- **Phone**
  - 6364 6505
- **Data Request form**
  - Fax
    - 9426 4821
  - Email
    - waterinfo@water.wa.gov.au



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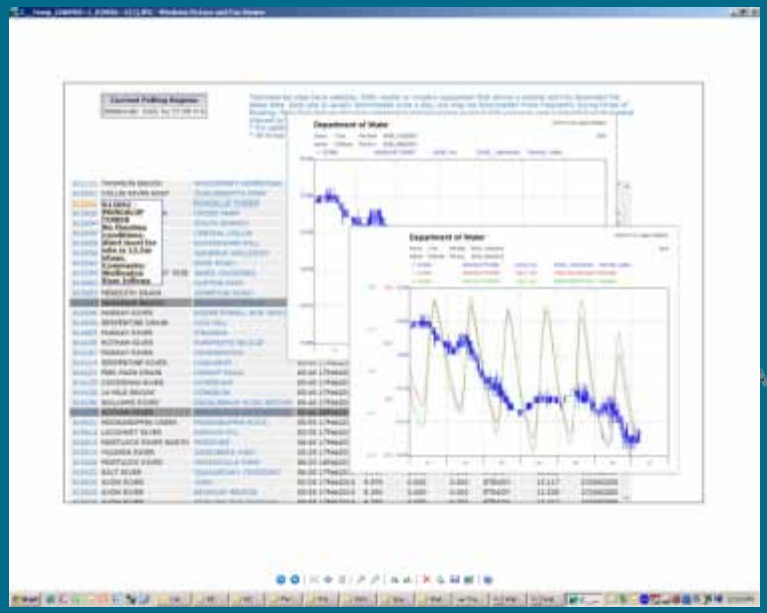
Obtaining data

Website:

- www.water.wa.gov.au
- **Tools | Monitoring and data**
  - Data request form
  - River level monitoring
  - WRIC catalogue
  - WRData
- **Tools | Maps and atlases**
  - Geographic Data Atlas
  - Hydrogeological Atlas
  - Perth Groundwater Atlas



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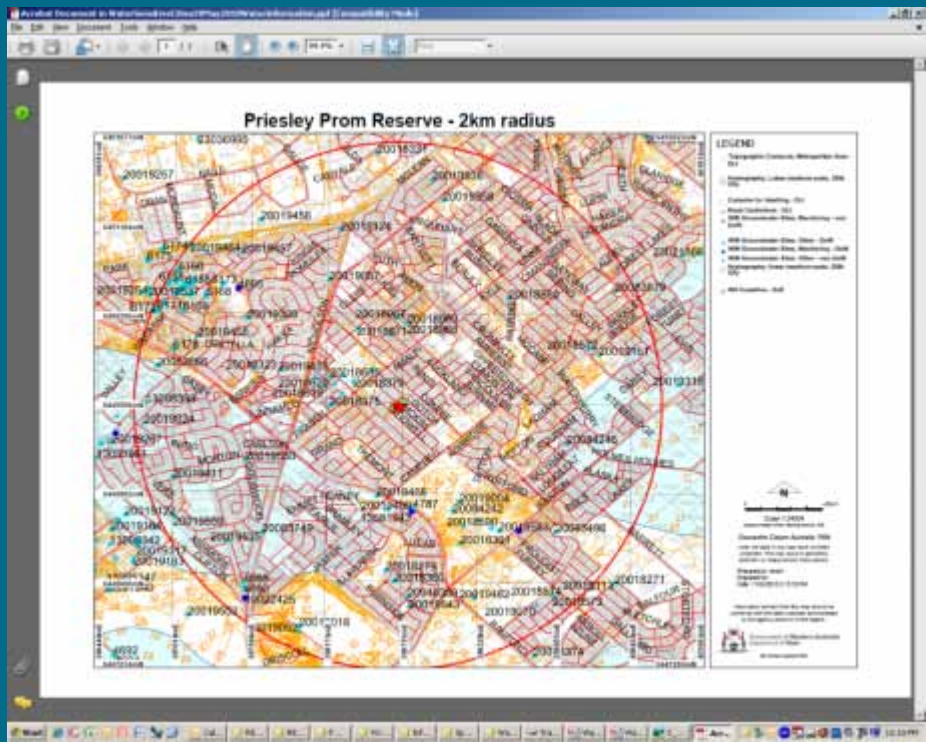
Data delivery

- Formats:
  - **Excel spreadsheets**
  - **Plots**
  - **Basic maps**
    - Delivery by:
      - **E-mail**
      - **FTP site**
      - **CD / DVD**
      - **Verbal**
      - **Post**



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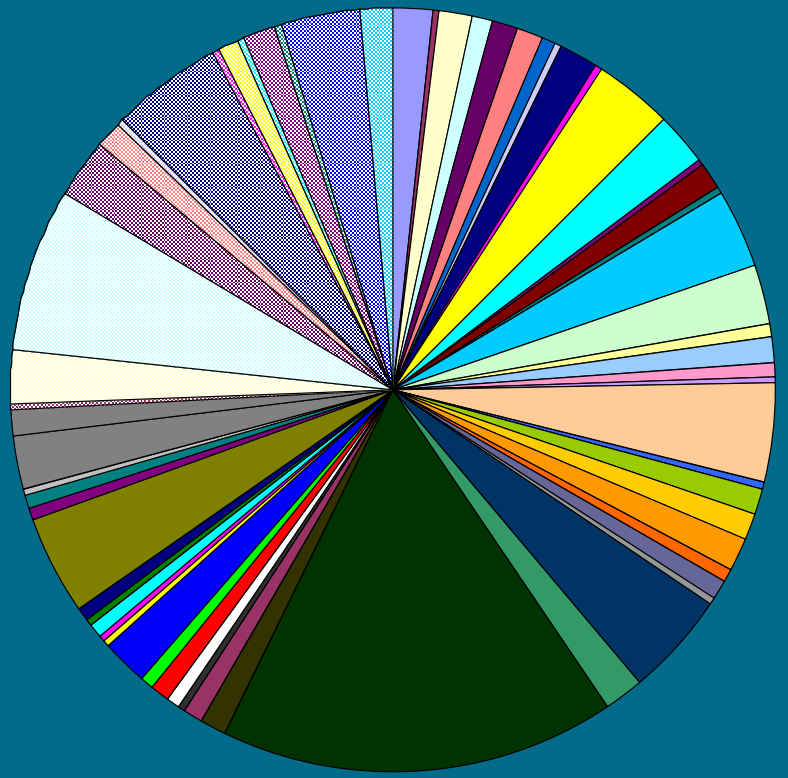
Spatial Information

- 613 requests in 2009 split:-
  - 51% Commercial
  - 27% Consultants
  - 22% Government
    - State
    - Local
    - CSIRO



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Spatial Data – 555 datasets including:-

- LIDAR – Swan Coastal Plain
- Floodplain Management
- Catchments
- Groundwater Management Areas
- Depth to Groundwater
- Aquifers
- Rivers, Reservoirs and Wetlands
- Boundaries, etc

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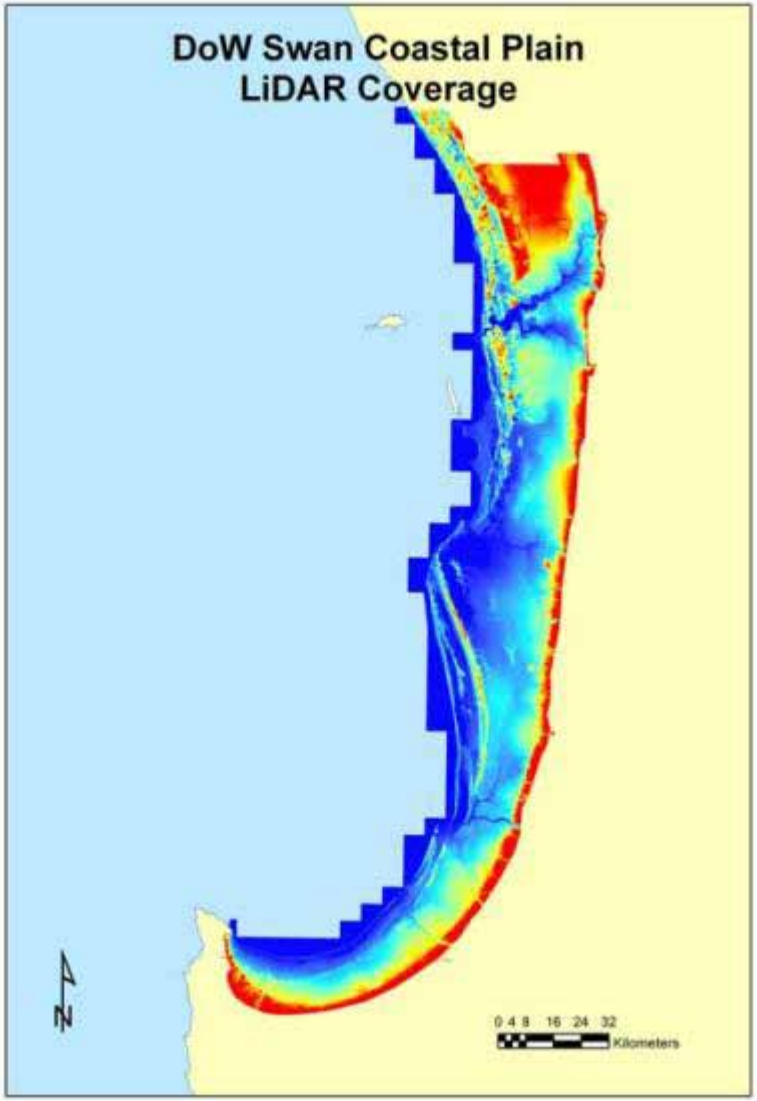
LiDAR

This dataset is an elevation model.

- **Horizontal Resolution 1m x 1m, with a horizontal accuracy of 0.6m.**
- **Vertical accuracy of 0.15m AHD.**
- **Swan Coastal Plain, some areas of Pilbara and Kimberley along water courses.**



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Vector Datasets

- The vector datasets mapping waterways and other water related data are available for contractors and many are available for commercial use.
- The Department holds approximately 80 vector datasets.
- The primary datasets concern monitoring stations, floodplain mapping, and water courses.
- Various licensing and regulatory datasets also exist within the Department.

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For any spatial data requests contact:

spatial.data@water.wa.gov.au

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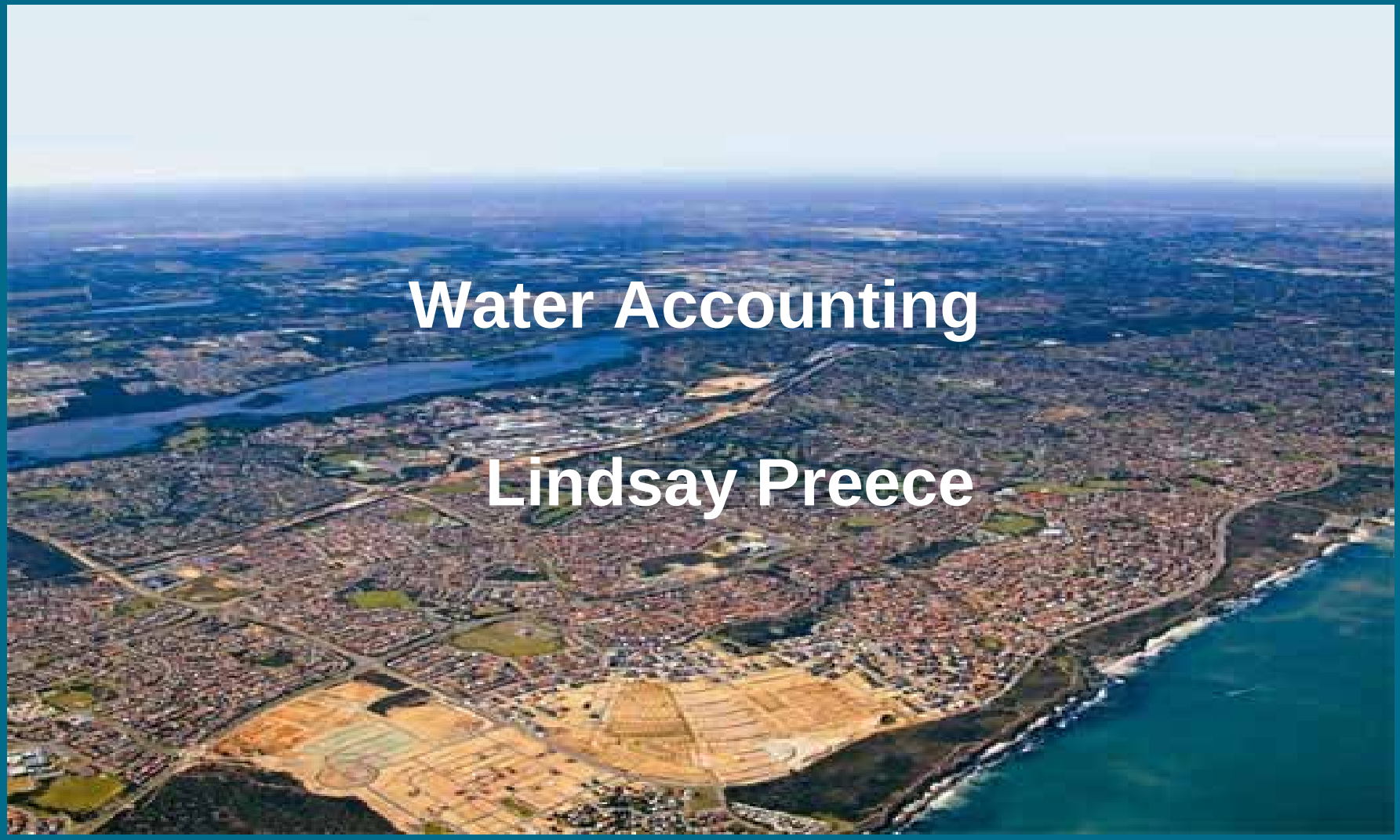


Water Accounting

Lindsay Preece

National Water Initiative

The NWI provides key guidance on the intention, purpose and objectives of water accounting. One of the high-level objectives of the NWI (under Clause 23 (vii)) states the need for:

> "water accounting which is able to meet the information needs of different water systems in respect to planning, monitoring, trading, environmental management and on-farm management."

In the NWI it is further agreed under Clause 80:

> "...that the outcome of water resource accounting is to ensure that adequate measurement, monitoring and reporting systems are in place in all jurisdictions, to support public and investor confidence in the amount of water being traded, extracted for consumptive use, and recovered and managed for environmental and other public benefit outcomes."

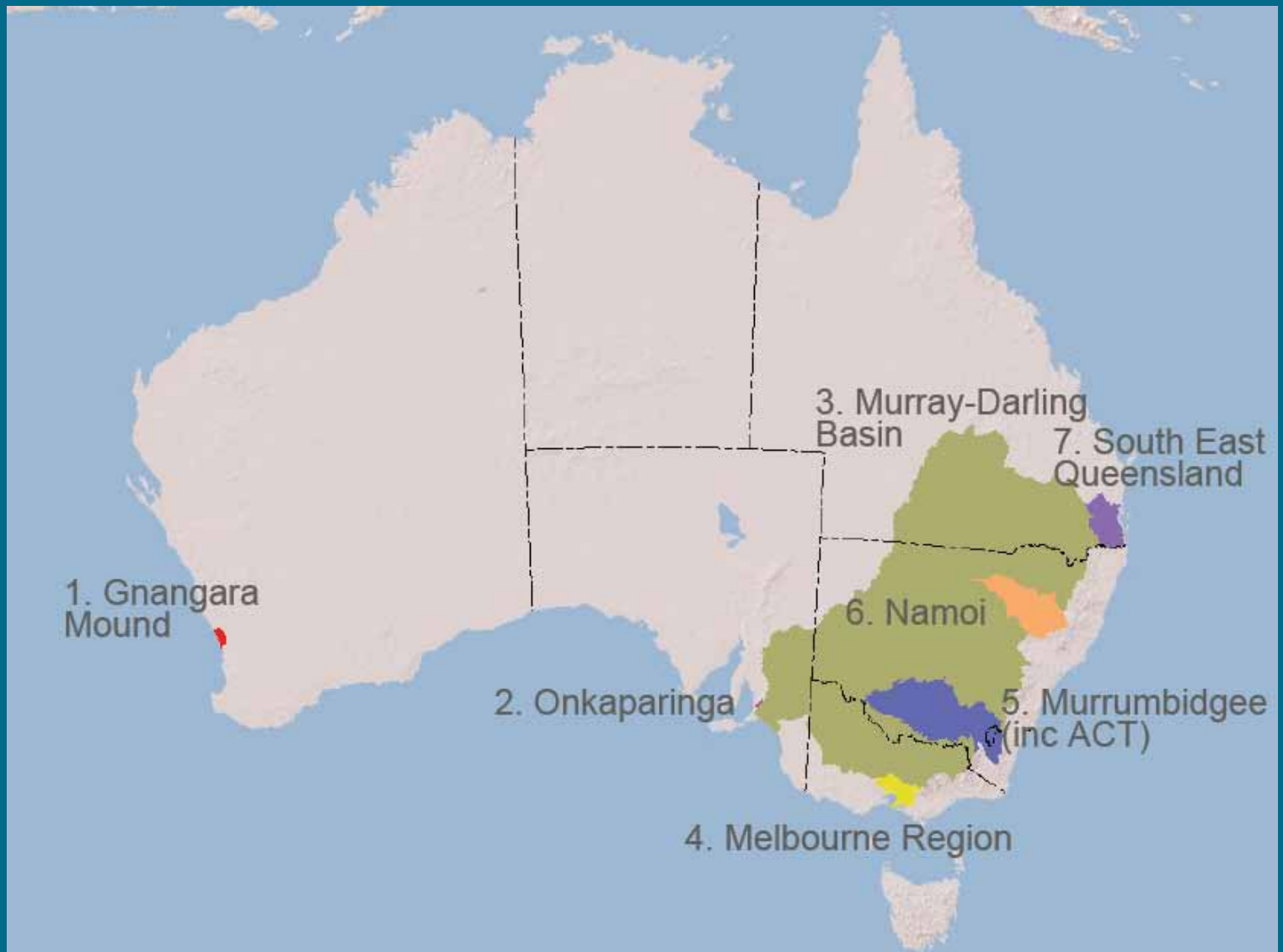
National Water Account

At its November 2008 meeting, COAG agreed on a number of steps to accelerate national water accounting, including the immediate establishment of a National Water Account Committee (NWAC), chaired by BOM, to prepare a roadmap for the production of the first NWA and to oversee the production of the NWA in the future.

COAG agreed that a pilot version of the NWA be published in December 2009 and a comprehensive version of the NWA be published in December 2010 and annually thereafter, as required under the Commonwealth *Water Act 2007*. The NWA pilot will draw heavily on State-based understanding of the water systems they manage.

Background

Methods Pilot National Water Account 2009 – sub-account areas



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Background

NWI and DoW water accounting work

- Preliminary Australian Water Accounting Standard
- Carnarvon and Carabooda pilot water accounts
- Water Accounting Data management project – 28,000 of 74,000 meter readings imported to WIN

BoM National Water Account (NWA)

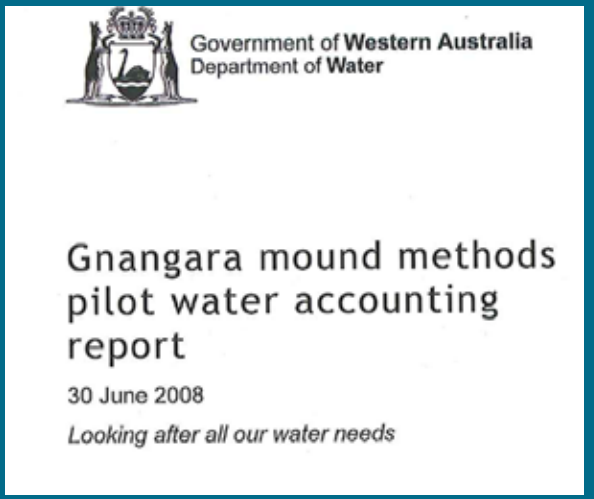
Fed Water Act 2007 – NWA, Methods Pilot NWA 2009

Methods Pilot NWA 2009 Scope – 7 sub-accounts across Australia

Finalisation by December 2009

Background

3. DoW approach for preparation of Methods Pilot Gnangara water account:
    - Based on PRAMS water balance
    - DoW water balance framework
    - DoW Chart of Accounts
    - Prepare DoW Gnangara Mound water account report
    - Multidisciplinary Team
        - Water Professional (engineer)
        - Accountant
        - Groundwater Modeller
        - Data professional



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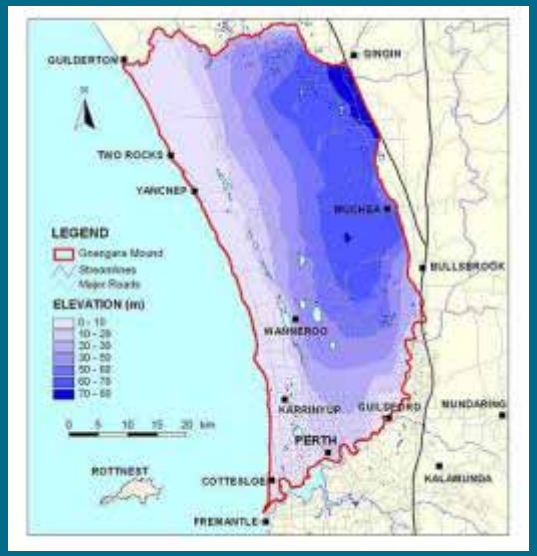
Water Accounts

Contents of the Water Account:

1. Contextual Statement
2. Water Accounts
3. Note Disclosures
4. Assurance Statement



3 Water accounts

3.1 Statement of water assets and water liabilities

	Note	2,008 ML	2007 ML
WATER ASSETS			
Surface water assets	2a	0	0
Groundwater assets			
Unconfined aquifer storage - Superficial aquifer	2b	0	0
Confined aquifer storage - Leederville aquifer	2b	14,000	14:000
Confined aquifer storage - Yarragadee aquifer	2b	12,000	17:000
Total Groundwater assets		26,000	31:000
TOTAL WATER ASSETS		**26,000**	**31:000**
WATER LIABILITIES			
Provision for allocation - scheme supply	2c	40,718	34:380
Provision for allocation - self supply	2c	50,403	50:579
Borrowing from unconfined aquifer contingent water storage	2c	211,000	232:000
TOTAL WATER LIABILITIES		**302,121**	**316:959**
NET WATER ASSETS		**-276,121**	**-285:959**
Net water assets at the beginning of reporting period		-285,959	-74:146
Change in net water assets	2g	9,838	-211:813
NET WATER ASSETS AT THE END OF THE REPORTING PERIOD		**-276,121**	**-285:959**

WATER TRADING BY AQUIFER

Aquifer	VOLUME of Trades within Gnangara Mound Area (ML) 2007-08	NUMBER of Trades 2007-08	VOLUME of Trades within Gnangara Mound Area (ML) 2008-07	NUMBER of Trades 2008-07
Leederville	130	3	94	4
Mirrabooka	36	3	0	0
Superficial	1568	72	580	16
Superficial - Swan	952	8	200	3
Total	**2686**	**84**	**884**	**23**

WATER TRADING BY AREA

Area	VOLUME of Trades within Gnangara Mound Area (ML) 2007-08	NUMBER of Trades 2007-08	VOLUME of Trades within Gnangara Mound Area (ML) 2008-07	NUMBER of Trades 2008-07
Adams	57	4	41	3
Ballajura	9	1	0	0
Beermullah Plain	67	1	145	3
Carabooda	356	19	139	1
Carramar	0	0	0	0
City of Perth	3	0	0	0
Deepwater Lagoon	67	3	7	1
Eglinton	2	1	0	0
Guilderton Sth	829	2	0	0
Gwelup	20	1	0	0
Henley Brook	29	3	12	1
Joondalup	32	1	12	2
Lake Gnangara	180	8	10	1
Lake Mungala	0	0	90	1
Landsdale	0	0	120	3
Mangimup	189	12	0	0
Nowers	0	0	0	0
Noorabup	412	4	200	2
North Swan	9	2	0	0
Nowergup	80	3	6	1
Pirgar	27	1	0	0
Quinns	50	4	2	1
South Swan	125	18	0	0
State Forest	50	1	0	0
Swan confined	130	3	95	4
Whitfords	20	3	54	1
Total	**2,686**	**84**	**884**	**23**

Source: Department of Water

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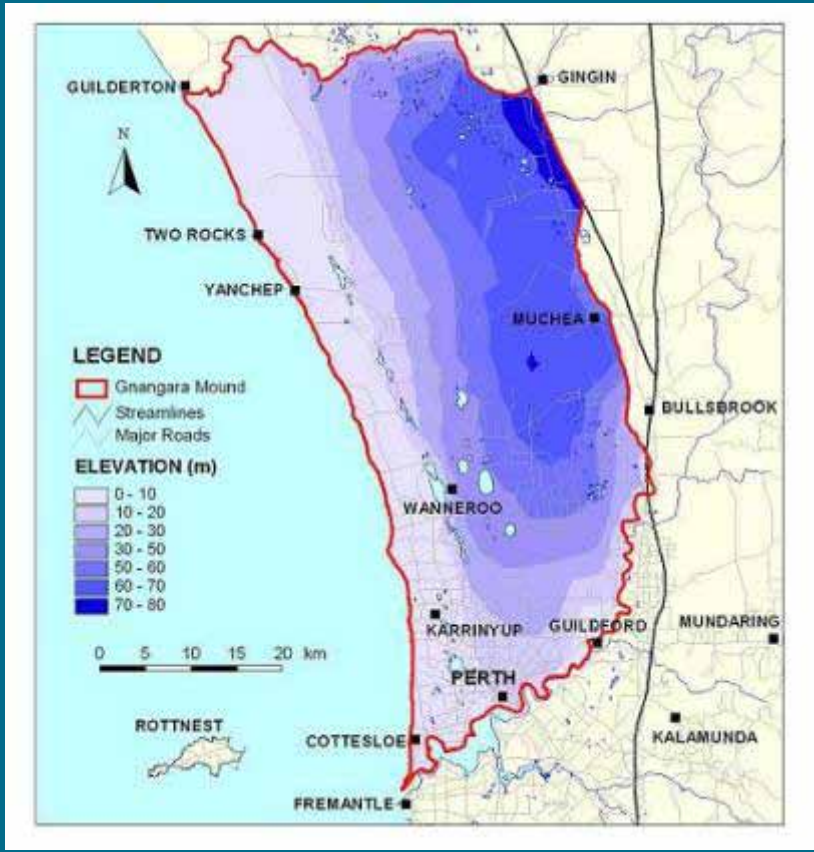
Contextual Statement



Physical information

- Description of water report entity
- Gnangara Mound groundwater system
- Wetlands and rivers/steams
- Urban scheme water supply system
- Urban wastewater system
- Urban drainage system

Administrative information

- Water resource management instruments

Water management bodies

- DoW
- WC
- EPA

Environmental water management

Climate and rainfall

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Balance Sheet

Statement of Water Assets and Water Liabilities

Water Assets

Surface Water Assets

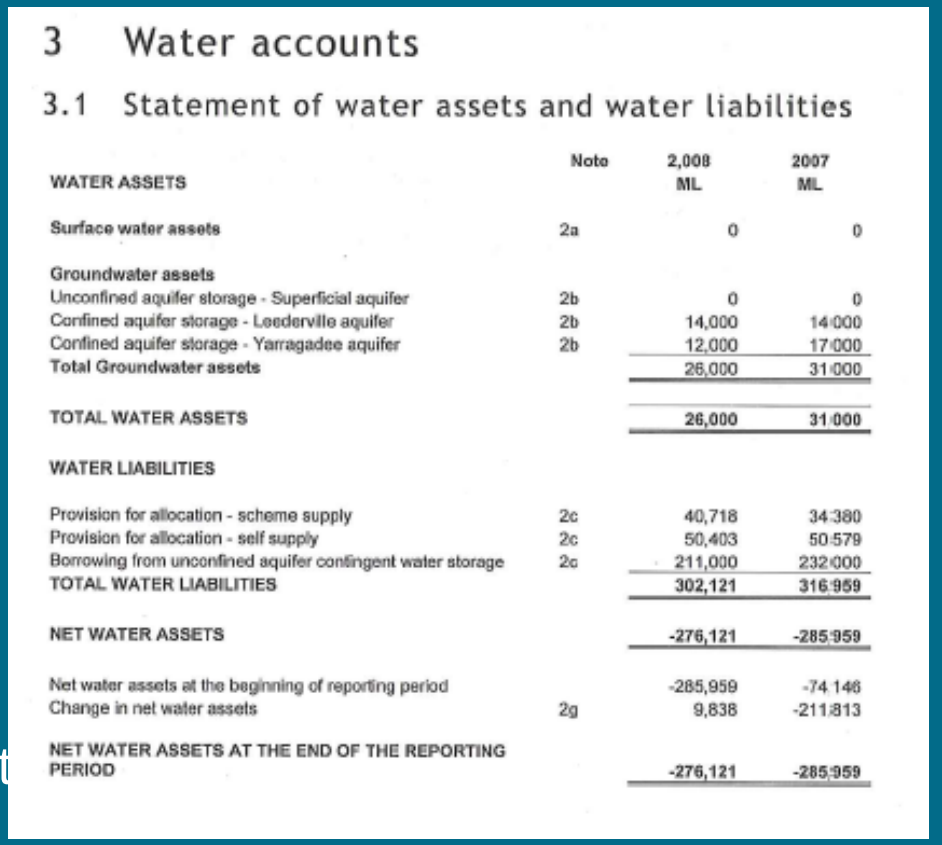
Groundwater Assets

Soil Moisture

Water Liabilities

Licenses in force at balance dat

Borrowings from unconfined aquifer contingent water storage



3 Water accounts

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Confined aquifer storage - Leederville aquifer	2b	14,000	14 000
Confined aquifer storage - Yarragadee aquifer	2b	12,000	17 000
Total Groundwater assets		26,000	31 000
TOTAL WATER ASSETS		**26,000**	**31 000**
WATER LIABILITIES			
Provision for allocation - scheme supply	2c	40,718	34 380
Provision for allocation - self supply	2c	50,403	50 579
Borrowing from unconfined aquifer contingent water storage	2c	211,000	232 000
TOTAL WATER LIABILITIES		**302,121**	**316 959**
NET WATER ASSETS		**-276,121**	**-285 959**
Net water assets at the beginning of reporting period		-285,959	-74 146
Change in net water assets	2g	9,838	-211 813
NET WATER ASSETS AT THE END OF THE REPORTING PERIOD		**-276,121**	**-285 959**

Water Accounts

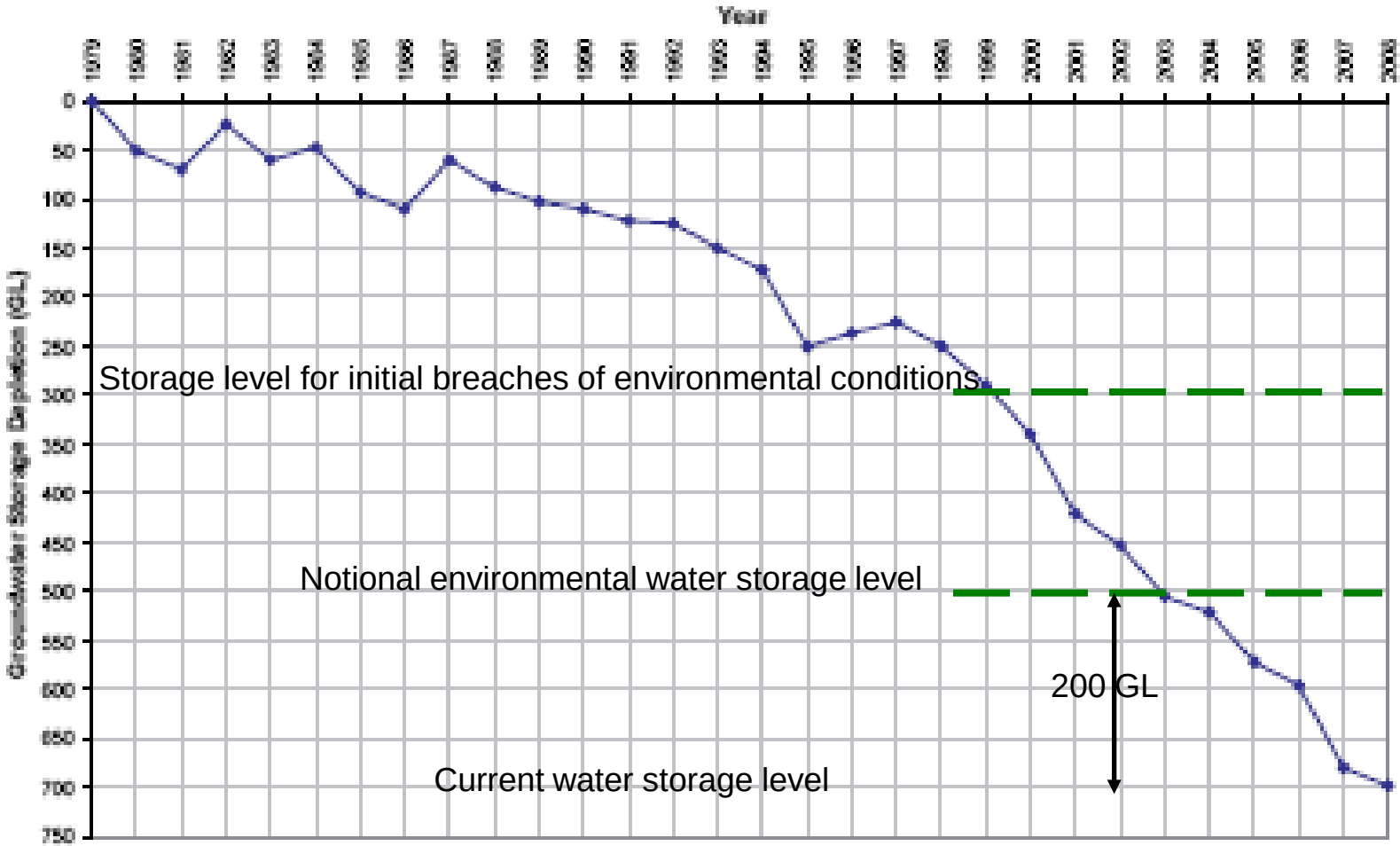

Figure 5
Groundwater storage decline in the Superficial Aquifer for the period 1979–2008

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Profit and Loss

- Statement of Changes in Water Assets and Liabilities
- This is an ‘accrual based’ accounting statement (includes forward provisions for water liabilities) similar to a ‘Profit and Loss’ statement.
- Virtually the same as the ‘Statement of Physical Water Flows’ (which is ‘cash accounting’ based) except for water liabilities provisions.

3.2 Statement of changes in water assets and water liabilities

	Note	2008 ML	2007 ML
INCREASES			
Surface Water Increases	2d		
Precipitation		1,859,000	1,195,000
Scheme supply system inflow transfer		22,000	28,000
Inflow to scheme supply system from groundwater extraction		134,000	162,000
Inflow to wastewater from urban scheme supply system		71,000	70,000
Total Surface Water Increases		2,086,000	1,455,000
Groundwater Increases	2e		
Recharge to unconfined aquifer		585,000	376,000
Horizontal inflows to unconfined aquifer		29,000	29,000
Vertical leakage to Leederville aquifer		79,000	80,000
Horizontal inflows to Leederville aquifer		22,000	23,000
Vertical leakage to Yarragadee aquifer		26,000	25,000
Horizontal inflows to Yarragadee aquifer		24,000	24,000
Total Groundwater Increases		765,000	557,000
TOTAL INCREASES		2,851,000	2,012,000
DECREASES			
Surface Water Decreases	2f		
Rainfall interception and evaporation		149,000	96,000
Rainfall runoff		45,000	45,000
Rainfall recharge to unsaturated zone		1,660,000	1,053,000
Scheme supply system outflow transfer		36,000	70,000
Scheme water supply use		111,000	110,000
Scheme water supply system leakage		10,000	10,000
Outflow and use of treated wastewater		66,000	65,000
Septic tank leakage and unaccounted wastewater		4,000	5,000
Total Surface Water Decreases		2,081,000	1,454,000
Groundwater Decreases	2g		
EVT from unconfined aquifer		88,000	90,000
Extraction from unconfined aquifer		214,304	228,504
Discharge from unconfined aquifer to rivers and drains		31,000	25,000
Horizontal outflows from unconfined aquifer		193,000	197,000
Vertical leakage to Leederville aquifer		67,000	67,000
Extraction from Leederville aquifer		62,765	63,609
Horizontal outflows from Leederville aquifer		17,000	17,000
Vertical leakage to Yarragadee aquifer		26,000	25,000
Extraction from Yarragadee aquifer		50,093	50,700
Horizontal outflows from Yarragadee aquifer		5,000	5,000
Total Groundwater Decreases		754,162	768,813
TOTAL DECREASES		2,835,162	2,222,813
CHANGE IN NET WATER ASSETS	2h	15,838	-210,813

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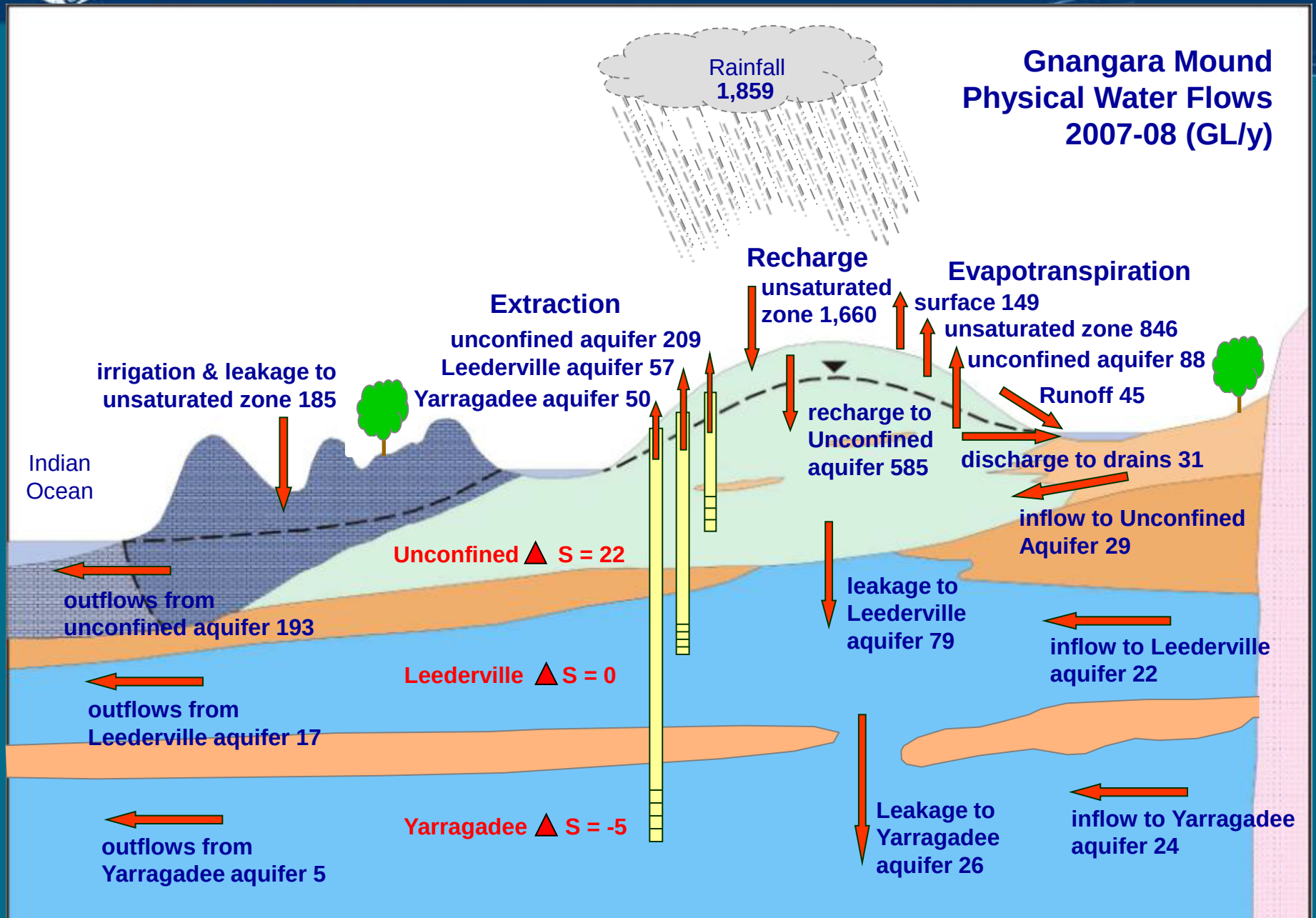
Water Flow Statement



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Note Disclosures

Note 1: Significant water accounting policies *(*limitations of the use of modelled and estimated information)

Note 2: Information supporting the items *presented in accounts* (clarifying and explanatory info on accounts values)

Note 3: Quantification approaches

Note 4: Water for environmental and social/cultural purposes

Note 5: Water rights and use on the Gnangara mound

Note 6: Water trading activity on the Gnangara mound

WATER TRADING BY AQUIFER

Aquifer	VOLUME of Trades within Gnangara Mound Area (ML) 2007-08	NUMBER of Trades 2007-08	VOLUME of Trades within Gnangara Mound Area (ML) 2006-07	NUMBER of Trades 2006-07
Leederville	130	3	84	4
Mirrabooka	36	3	0	0
Superficial	1588	72	580	16
Superficial - Swan	952	6	209	3
Total	2686	84	884	23

WATER TRADING BY AREA

Area	VOLUME of Trades within Gnangara Mound Area (ML) 2007-08	NUMBER of Trades 2007-08	VOLUME of Trades within Gnangara Mound Area (ML) 2006-07	NUMBER of Trades 2006-07
Adams	57	4	41	3
Ballajura	9	1	0	0
Beermullah Plain	57	1	145	2
Carabooda	356	10	136	1
Carramar	0	0	0	0
City of Perth	0	0	0	0
Deepwater Lagoon	67	3	7	1
Eglinton	2	1	0	0
Guilderton Stn	829	2	0	0
Gwelup	20	1	0	0
Henley Brook	29	3	12	1
Joondalup	32	1	12	2
Lake Gnangara	180	8	10	1
Lake Mungala	0	0	56	1
Landsdale	0	0	120	3
Mariginiup	139	12	0	0
Neaves	0	0	0	0
Neerabup	412	4	200	2
North Swan	9	2	0	0
Newegup	80	3	6	1
Pinjar	27	1	0	0
Quinns	50	4	2	1
South Swan	125	18	0	0
State Forest	56	1	0	0
Swan confined	130	3	99	4
Whitfords	20	3	54	1
Total	2,686	84	884	23

Source: Department of Water

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The Future

There are currently 250 named organisations in the regulations to the Water Act 2007.

Potential to expand the named organisations to include Mining Companies and other big water users.

The Bureau of Meteorology has the power to set and enforce standards and reporting requirements.

Alignment of Water Accounting and Licensing reporting requirements.

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Thank You