Review of Clare Valley PWRA WAP, 2009

Overview of hydrological monitoring and data

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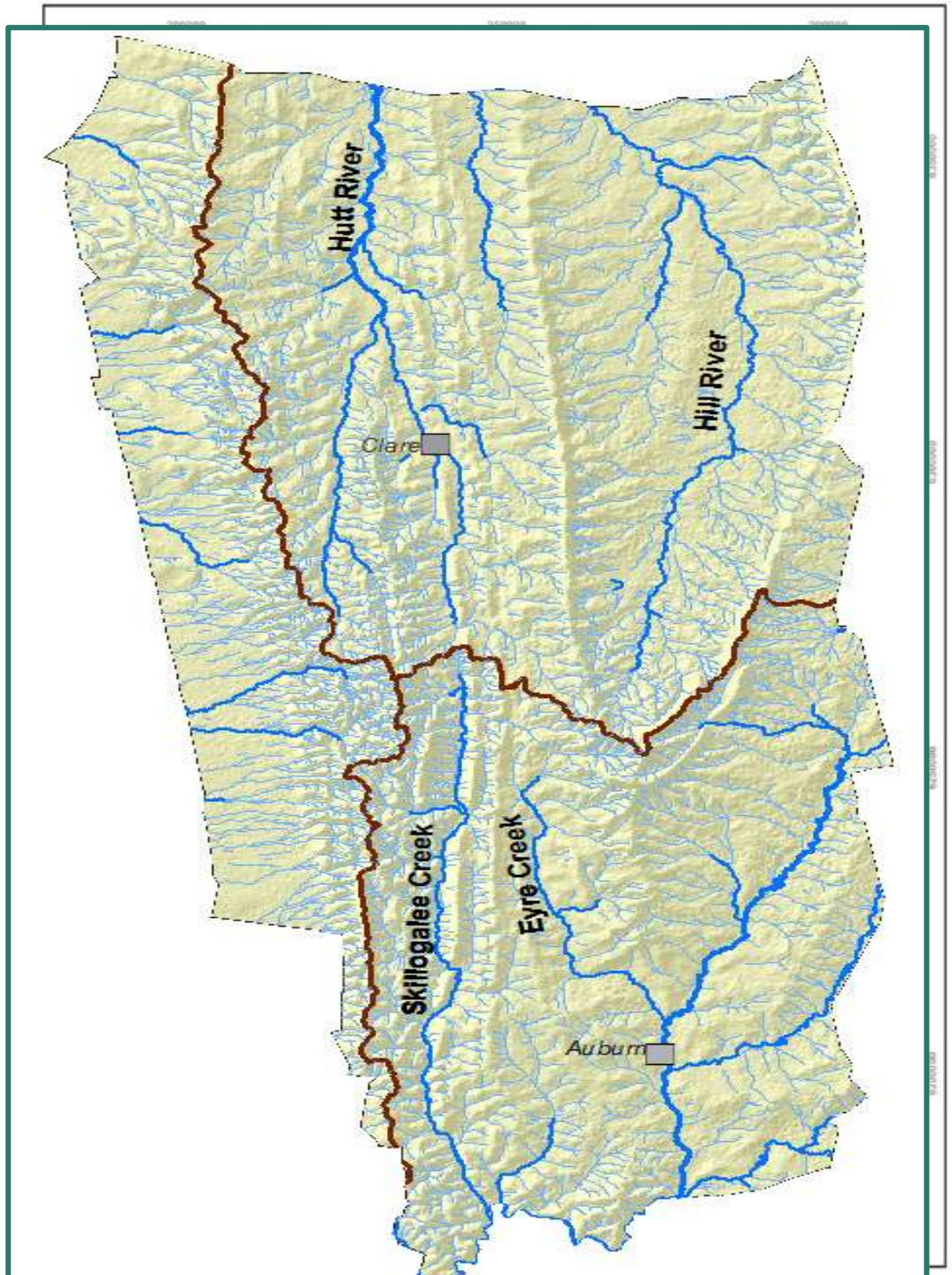
PWRA Catchments

- **<u>Northern half of PWRA</u>**
  - part of the <u>Broughton river</u> catchment, which drains to the Spencer Gulf near Port Pirie.
  - <u>Hill River</u> and <u>Hutt River</u>, both ephemeral stream, drain north.

- **<u>Southern half</u>**
  - part of the <u>Wakefield river catchment</u> draining south to the Gulf St Vincent near Port Wakefield.

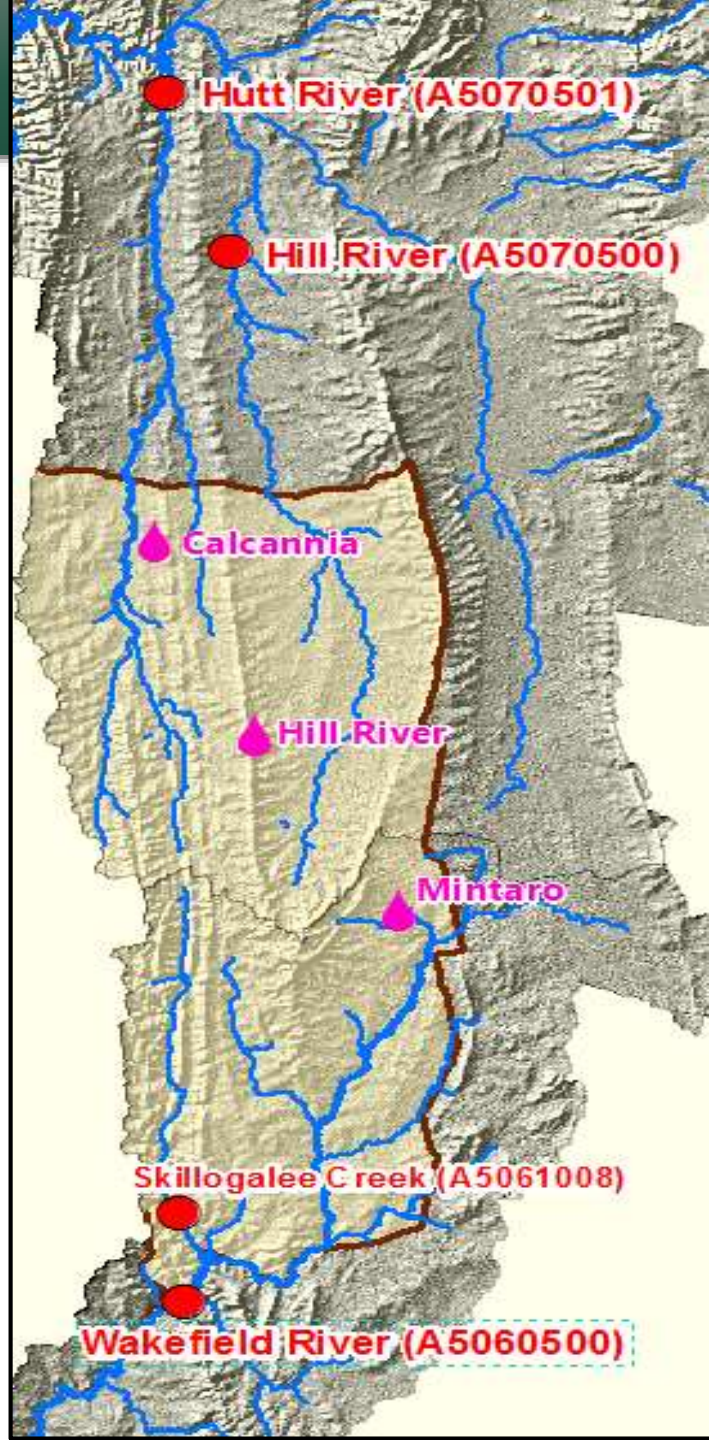
- Permanent pools, primarily sustained by GW occur along ephemeral watercourses.



Monitoring sites

Rainfall stations	Long-term average (*1970 onwards*)
Calcannia (BoM 21075)	540 mm
Hill River (BoM 21025)	630 mm
Mintaro (BoM 21033)	590 mm

Stream flow stations	Long-term average (*1970 onwards*)
Hill River (A5070500)	3,820 ML
Hutt River (A5070501)	5,920 ML
Wakefield River (A5060500)	7,700 ML
Skillogalee Creek (A5061008)	New



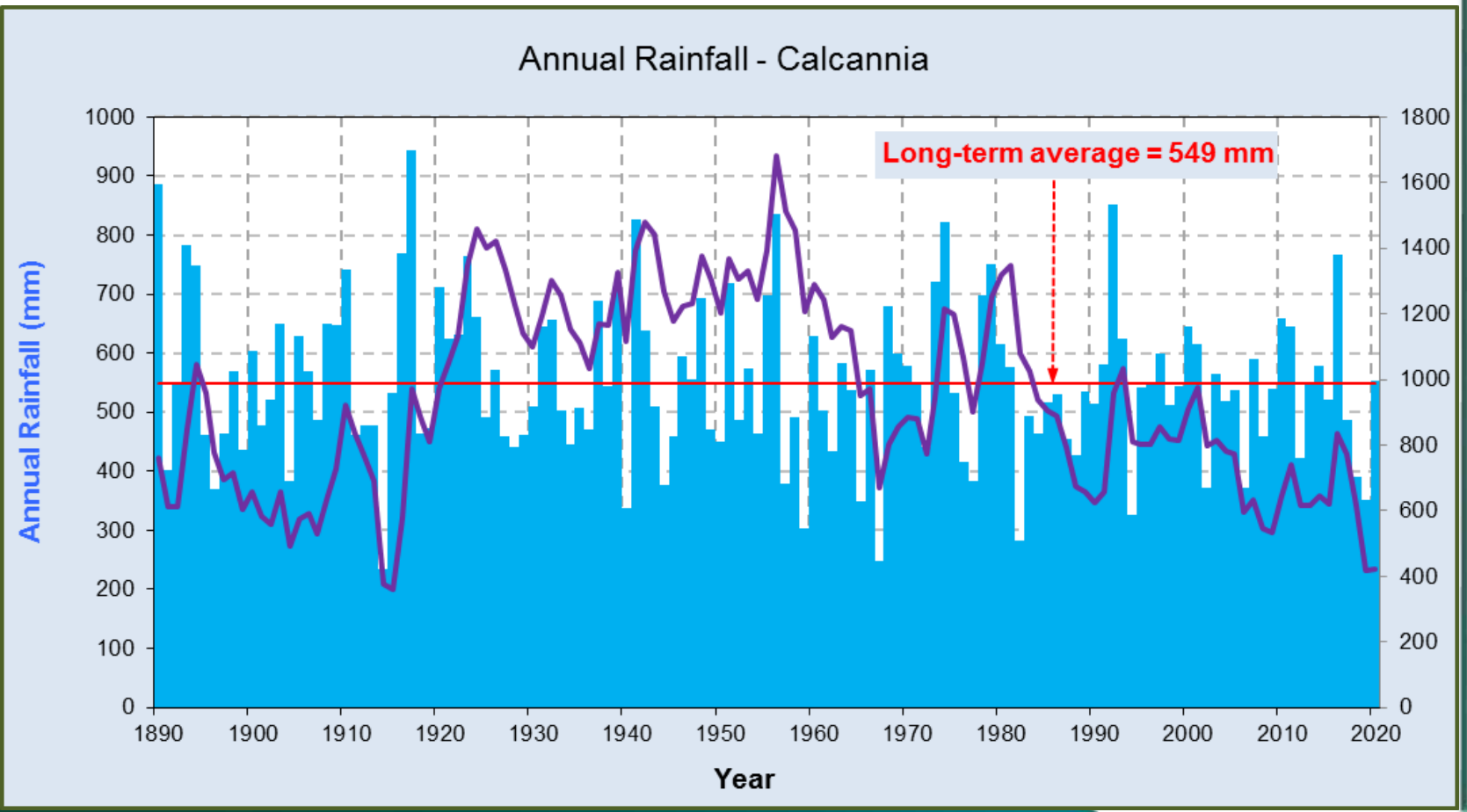
Rainfall - Calcania

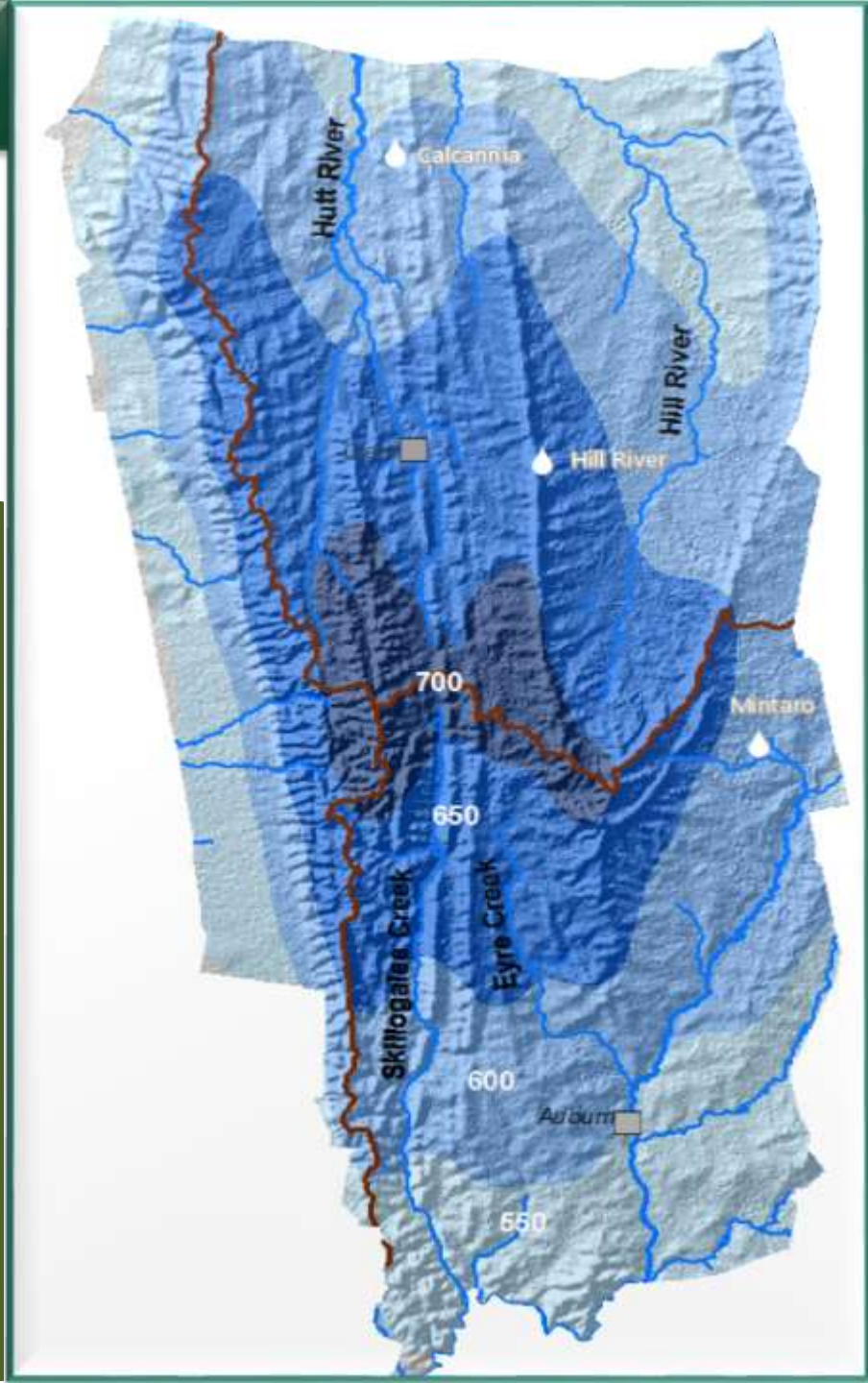
Annual rainfall – *long term average*

- **700** mm/y in the ridges

  To

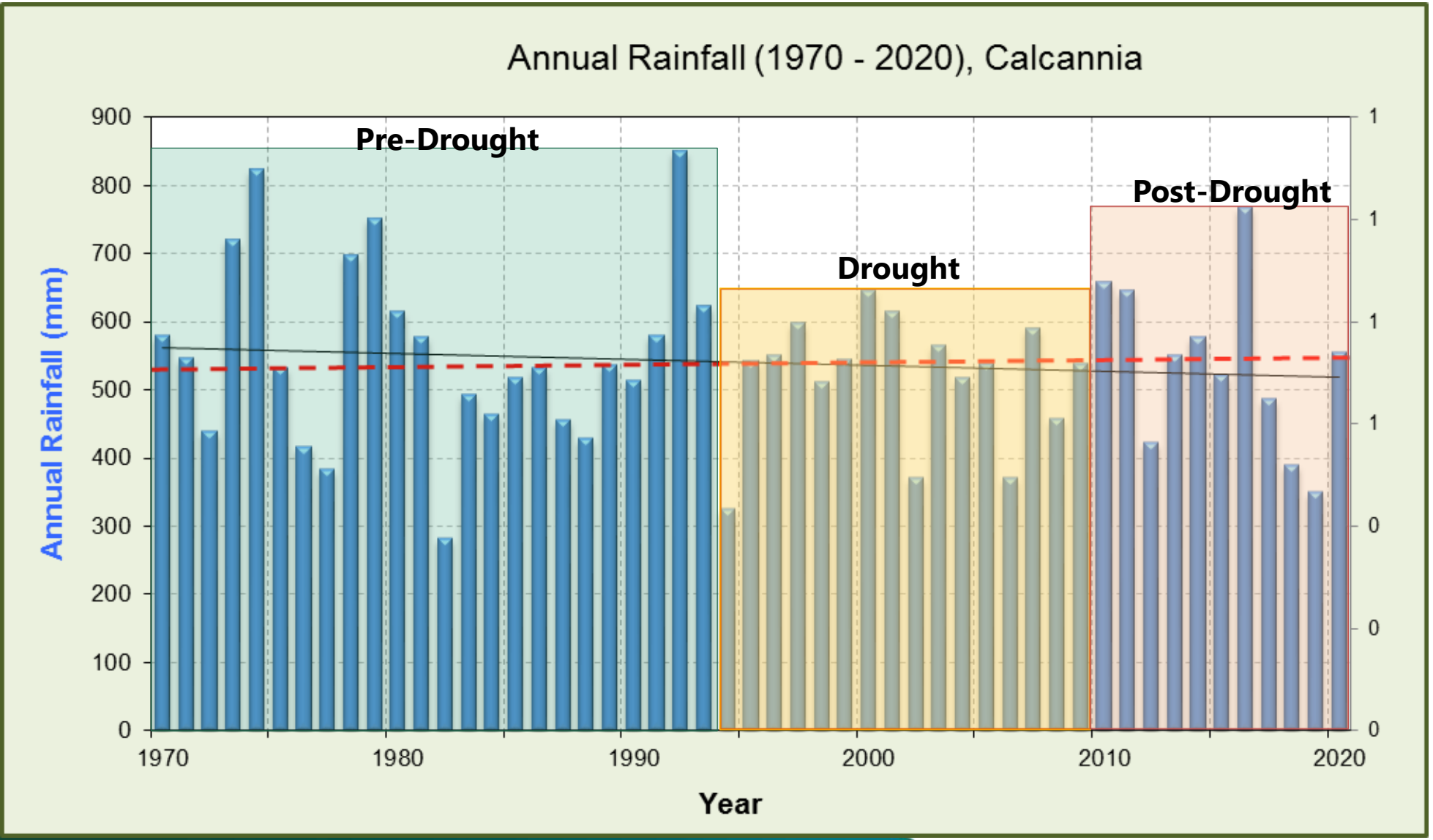
- **500** mm/y in the north & south





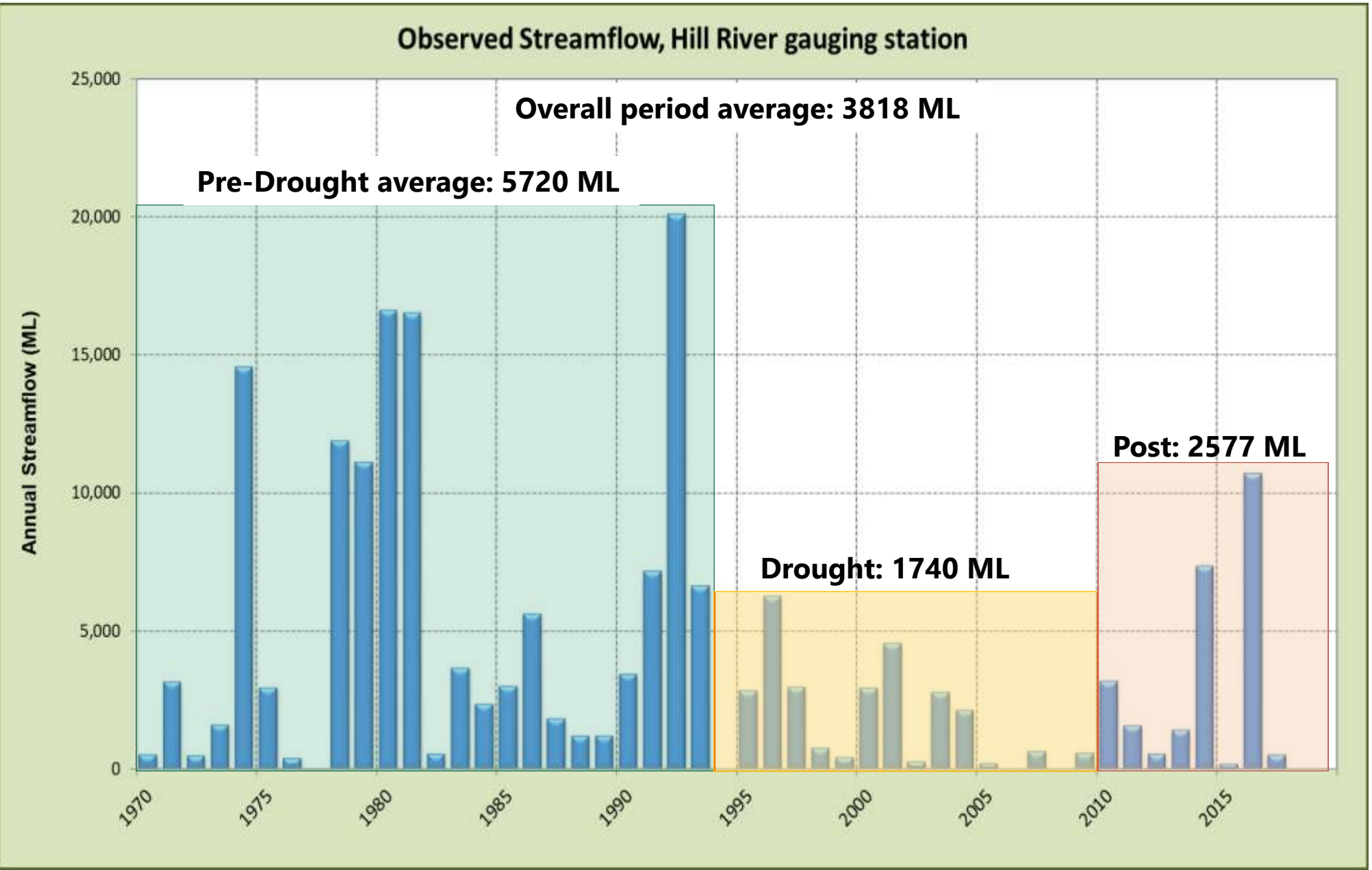
Rainfall (1970 to 2010)

Stream flow data : 1970 onwards; Rainfall chosen for the same period



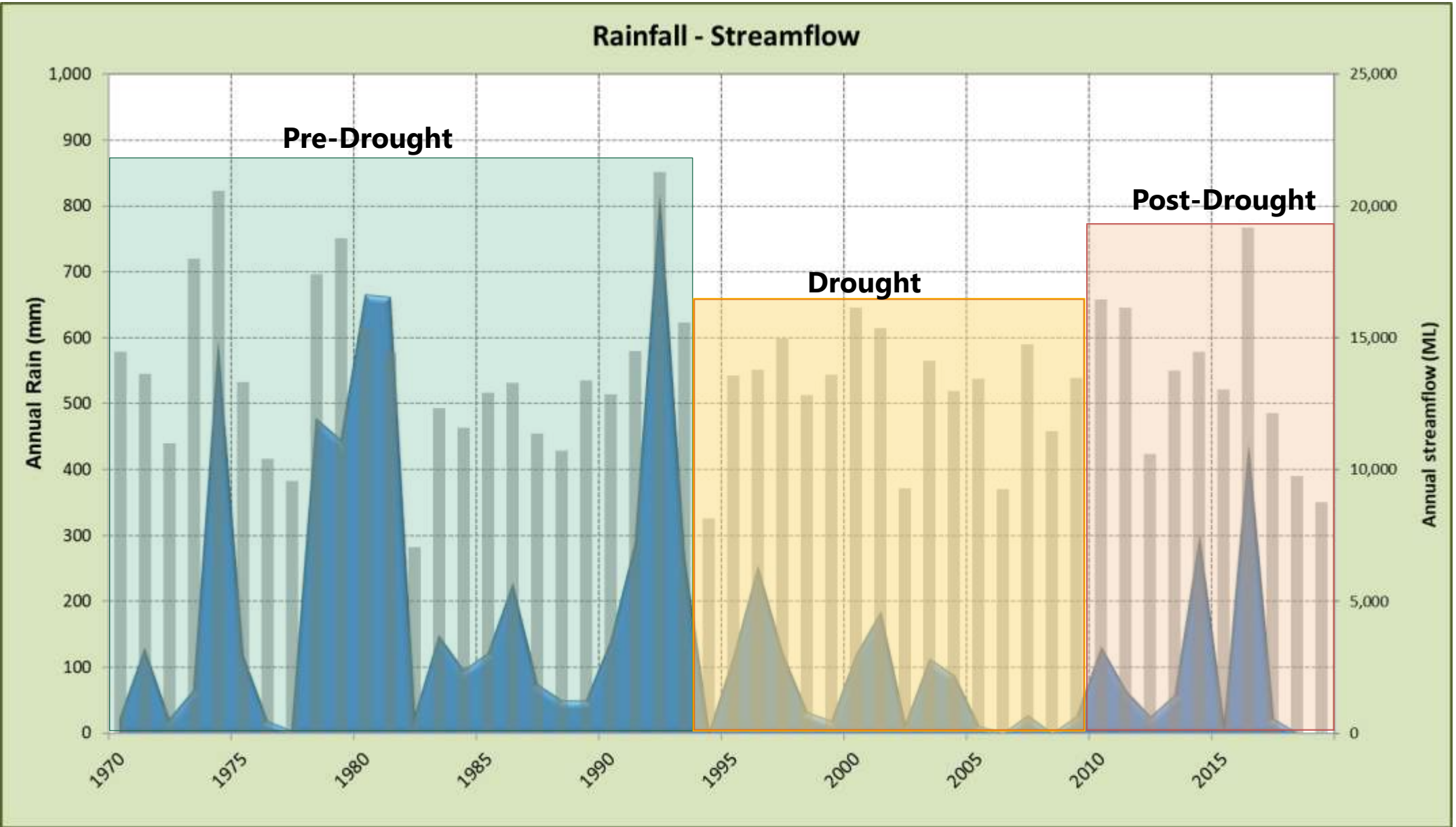
- **Calcannia**: Long-term average annual rainfall = 552 mm
- Slight **decline** in long-term rainfall trend (1970-2020)
- **Post-drought** (2010 onwards) – Rainfall back to Pre-drought conditions ??
- 2021 rainfall (January-July) = 284.3 mm

Streamflow – Hill River



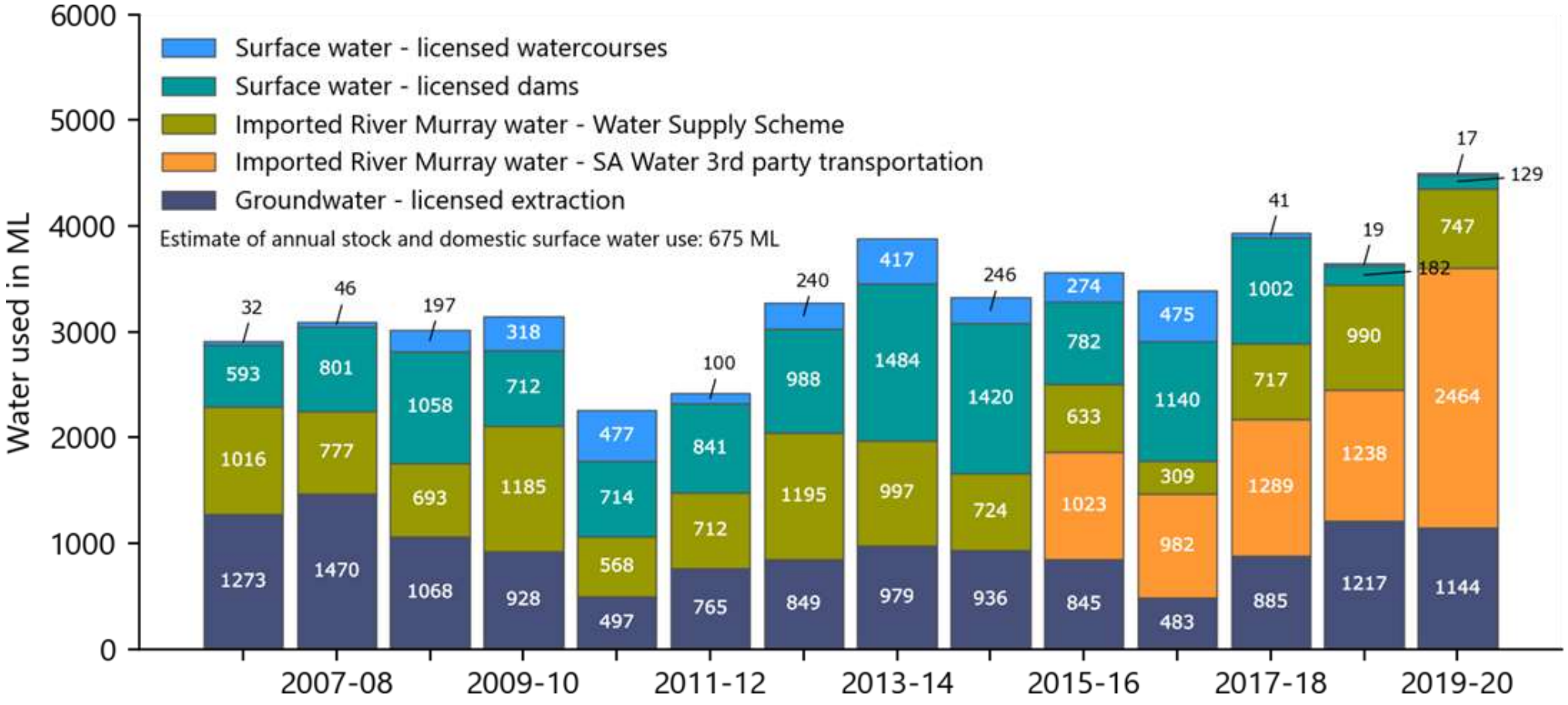
- Monitoring station is located outside the PWRA to the north (A5070500)
- Only 2 (2014 and 2016) of last 15 years had above-average flows.
- Declining trend Long-term average annual streamflow = 3743 ML.
- Pre-Drought: 5721
  Drought: 1740 ML
  Post-Drought: 2577
  Full period: 3818

Rainfall - Streamflow



- Has catchment behaviour changed after the drought?
  - Lesser runoff for the same amount of annual rainfall?
  - Rainfall seasonality changed?
  - Higher temp. & higher evap.??

Water Use


Surface water - licensed watercourses
Surface water - licensed dams
Imported River Murray water - Water Supply Scheme
Imported River Murray water - SA Water 3rd party transportation
Groundwater - licensed extraction
Estimate of annual stock and domestic surface water use: 675 ML
Water used in ML
6000
5000
4000
3000
2000
1000
0
2007-08
2009-10
2011-12
2013-14
2015-16
2017-18
2019-20
32
46
197
318
240
417
246
274
475
41
19
17
129
182
593
801
1058
712
477
714
568
841
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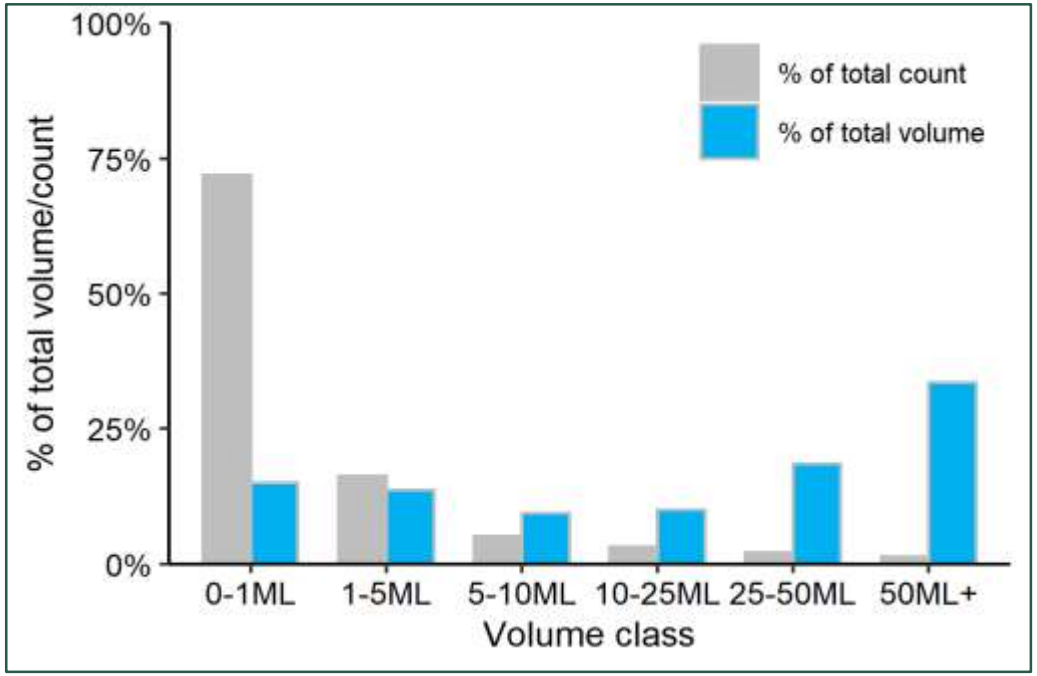
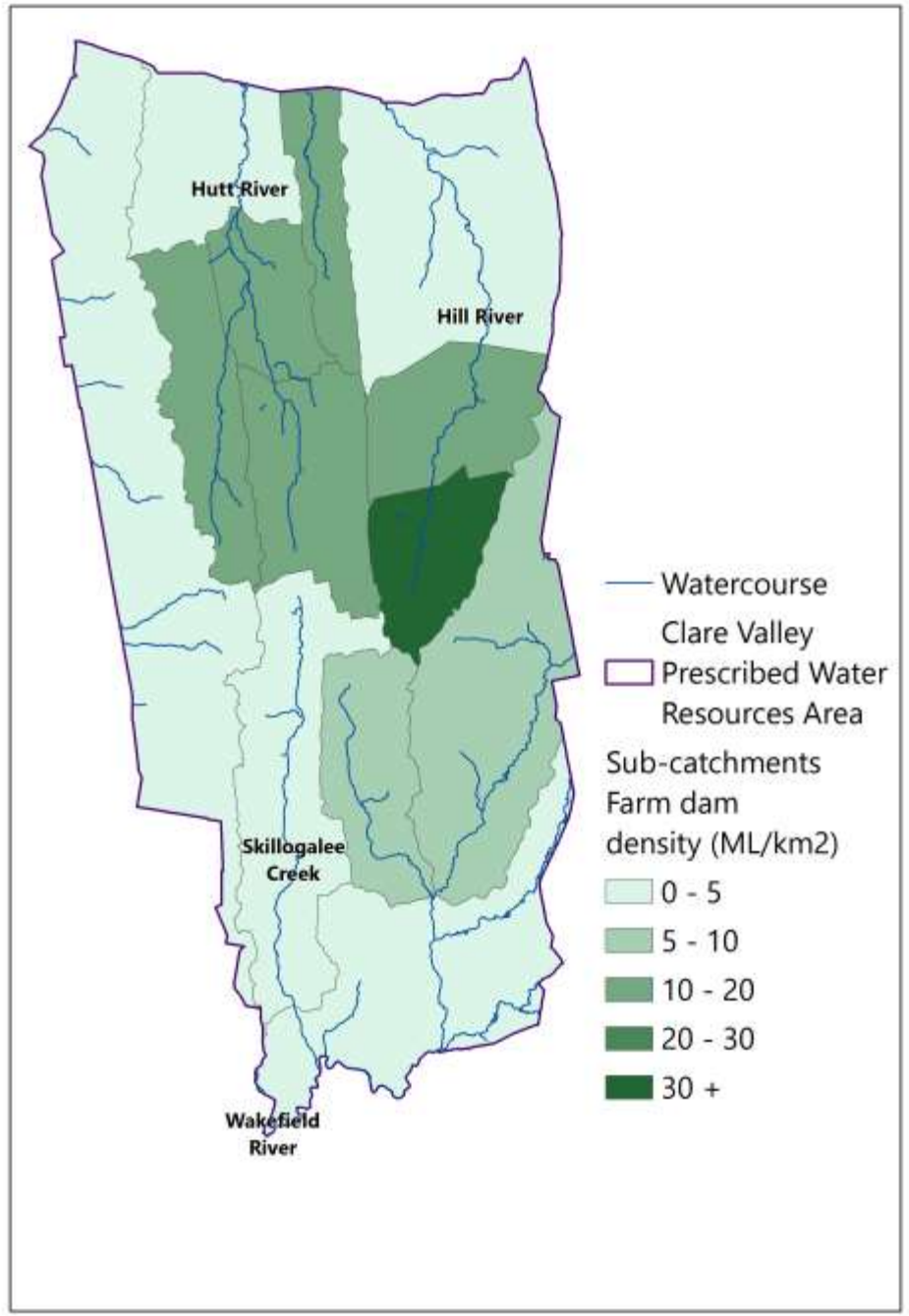
1144

Farm dams



- ~ 1560 dams with total capacity of ~ 5,380 ML
- Smaller dams (0-5 ML) - 90% of number but 30% of capacity
- Larger dams (5 ML +) – 10% of number but 70% of capacity



Summary – Surface water

Rainfall:

- Since 1970 (and longer-term), indication of **decreasing** trend in annual rainfall across the PWRA.
- ***Post*** Millennium-Drought **Drier** than **Pre** Millennium-Drought ??
- Changing Climate, Seasonality !!

Streamflow:

- Since 1970, indication of **decreasing** trend in Hill, Hutt and Wakefield
- Last 15 years: **Above-average** - **2** years (Hill & Hutt) and **3** years (Wakefield)
- Changing Climate, Seasonality & **Step-change in catchment behaviour post MD??**

- **Water use:** Surface water use follows rainfall/streamflow pattern, with drier years recording higher use and vice versa

- **Future investigations:** Any recent changes in seasonal pattern of rainfall, streamflow, salinity and water use to be further investigated.
  - Analysis of recent aerial imagery to look at farm dams.
  - Step-change in catchment behaviour??

Data links

- **Rainfall:** Bureau of Meteorology http://www.bom.gov.au/climate/data/index.shtml?bookmark=136
- **Streamflow:** Waterconnect https://www.waterconnect.sa.gov.au/Systems/SitePages/Surface%20Water%20Data.aspx
- **Status reports:** Waterconnect https://www.waterconnect.sa.gov.au/Systems/GSR/Pages/Default.aspx
- **Clare Water Allocation Plan, 2009**: https://www.landscape.sa.gov.au/ny/water/water-allocation-plans/clare-valley-wap

Thanks….

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