

Flooding in Western Australia

Since the mid-1960s Western Australia has been experiencing below average annual rainfall and has had relatively little major flooding especially in the more populated areas of the south-west.

Floods

Flooding along a river or stream occurs when sufficiently heavy or prolonged rainfall produces runoff which overflows the banks of the watercourse. Low-lying land adjacent to coastlines and estuaries may be flooded as a result of extremely high tides or storm surges accompanying severe storms.

Flood problems arise because settlement has taken place in floodprone areas along rivers and coastlines. Historically, these areas were favoured as they provided sources of fresh water, food, means of transportation and waste disposal.

Floodplains continue to be under pressure from more intensive uses despite the significant flood risk. This pressure is increasing as desirable underdeveloped land becomes scarce, especially in the urban areas. Severe floods do not happen often, so the extent of flooding and its consequences, including the loss of life and damage to property, are usually forgotten with time.

Floodplain

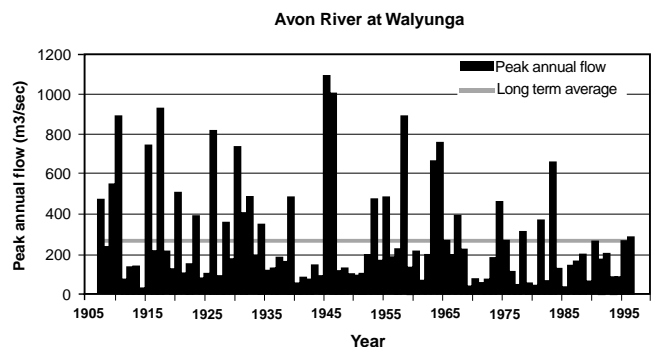
The portion of a river valley next to the river channel which is covered with water when the river overflows its banks during major river flows. The term also applies to land adjacent to estuaries which is subject to inundation during flooding.

The last flood of moderate magnitude in the Swan/Avon River occurred in 1983 and was a 10 year average recurrence interval (ARI) event. 100 year ARI floods and greater have occurred in the State and include the towns

of Pinjarra (1862), Perth (1872), Bunbury (1964), Nannup (1982), Tambellup (1982) and Moora (1999).

Average recurrence interval (ARI)

A statistical estimate of the average period in years between the occurrence of a flood of a given size or larger (e.g. floods with a discharge as big as or larger than the 100 year ARI flood event will occur on average once every 100 years). The ARI of a flood event gives no indication of when a flood of that size will occur again.



Flood damage

The average annual flood damage cost for Australia is \$350 million of which Western Australia's share is \$17 million. Western Australia's average annual flood damage cost is modest compared to the other states as the average annual damage cost for both New South Wales and Queensland is over \$270 million a year. Our low figure reflects a smaller population and a more benign flooding regime.



Flooding at Robinson Street in Carnarvon in 1951 prior to levees being built.

Historical river flooding

The following table indicates the years of major river flooding throughout the State and their estimated annual recurrence interval. For example, a 120 year ARI flood is much larger than a 15 year ARI flood, but will occur less frequently. The table is not considered to be complete.

Flooding is more likely to occur in certain seasons of the year. Floods in the north-west of the State are more likely to occur in the summer cyclone season while floods in the south-west are more likely to occur in winter. The impacts of land clearing, urbanisation, high groundwater levels and saturated soil can lead to increased levels of flooding.



PINJARRA - St John's Church during 1945 Murray River flooding.
(Photo courtesy of Mr Ronald Richards)

SWAN RIVER Perth		MURRAY RIVER Pinjarra		COLLIE RIVER Collie		PRESTON RIVER Bunbury	
1862	60 year ARI	1862	120 year ARI	1945	10 year ARI	1964	150 year ARI
1872	100 year ARI	1945	30 year ARI	1963	10 year ARI	1974	10 year ARI
1910	25 year ARI	1964	15 year ARI	1964	40 year ARI		
1915	15 year ARI	1982	7 year ARI	1974	10 year ARI		
1917	25 year ARI	1996	7 year ARI	1982	25 year ARI		
1926	20 year ARI						
1930	15 year ARI						
1945	40 year ARI						
1946	30 year ARI						
1958	25 year ARI						
1963	15 year ARI						
1964	20 year ARI						
1983	10 year ARI						

BLACKWOOD RIVER Nannup		GREENOUGH RIVER Greenough Flats		GASCOYNE RIVER Carnarvon		FITZROY RIVER Fitzroy Crossing	
1955	15 year ARI	1888	170 year ARI	1951	12 year ARI	1983	70 year ARI
1963	20 year ARI	1927	40 year ARI	1960	50 year ARI	1984	12 year ARI
1964	50 year ARI	1934	15 year ARI	1961	30 year ARI	1986	10 year ARI
1982	125 year ARI	1953	60 year ARI	1974	8 year ARI	1991	27 year ARI
		1961	15 year ARI	1980	15 year ARI	1993	17 year ARI
		1963	20 year ARI	1989	7 year ARI	2000	8 year ARI
		1970	15 year ARI	1995	11 year ARI		
		1971	30 year ARI	1999	8 year ARI		
		1988	15 year ARI	2000	25 year ARI		
		1999	15 year ARI				





COLLIE - Same view when Collie River not in flood.



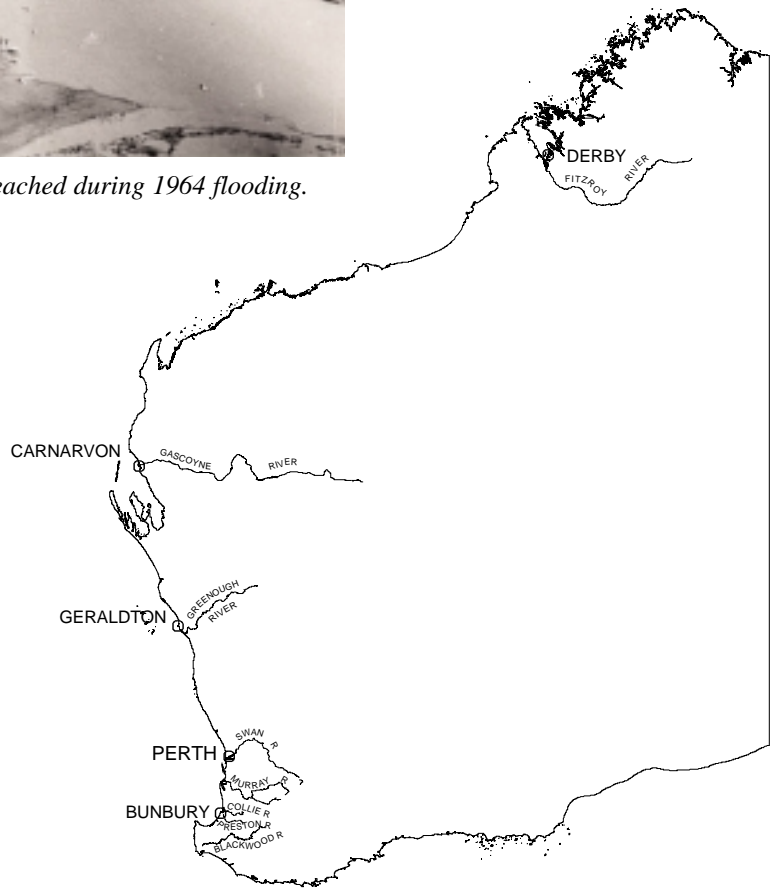
*COLLIE - Medic Street during 1964 Collie River flooding.
(Photo courtesy of Collie Camera Club)*



BUNBURY - Preston River levees breached during 1964 flooding.



CARNARVON - Looking upstream from Brown Range during 1980 Gascoyne River flooding.



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