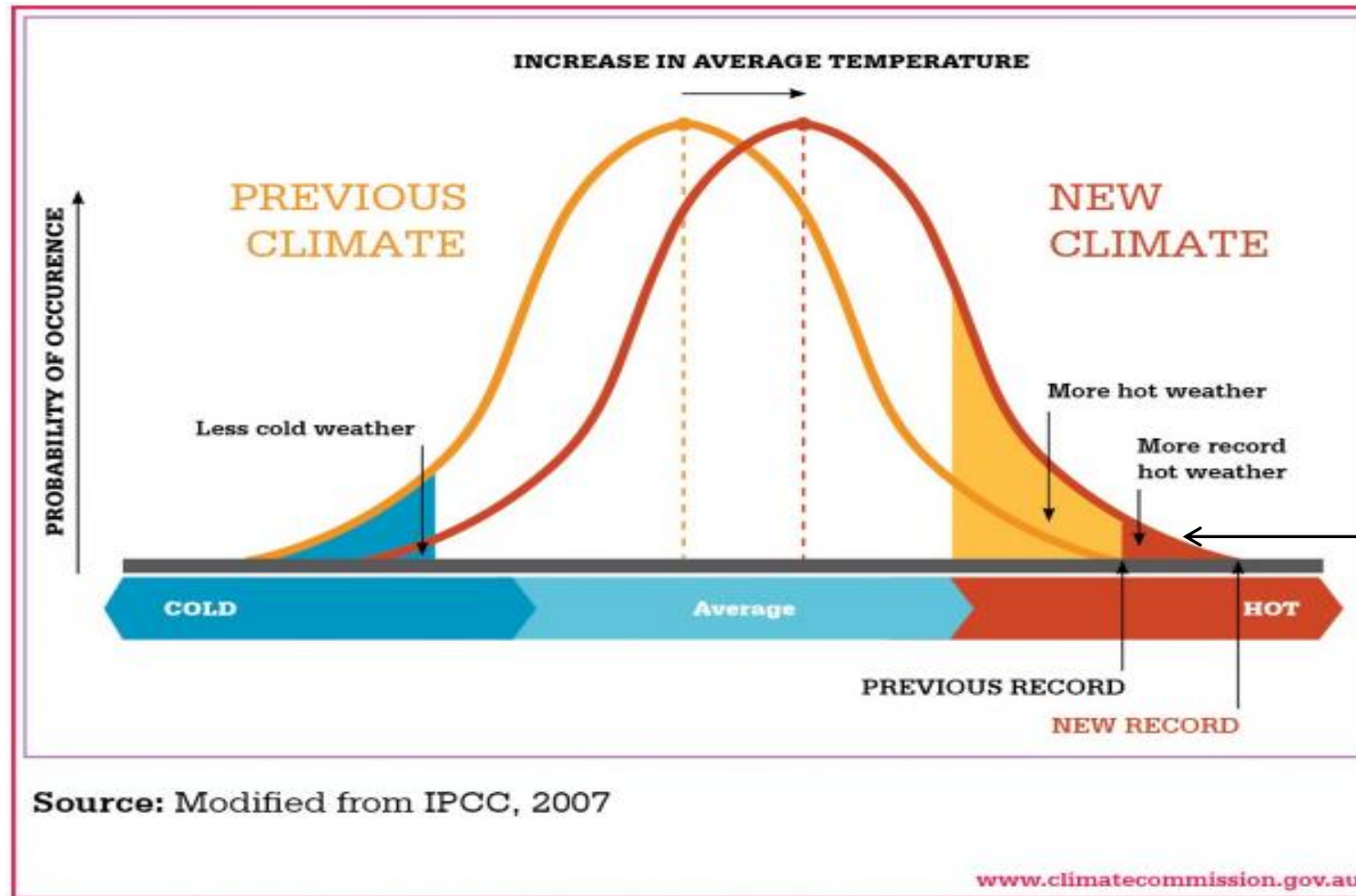


Australian Actuaries Climate Index v2.0

Some comments on extremes



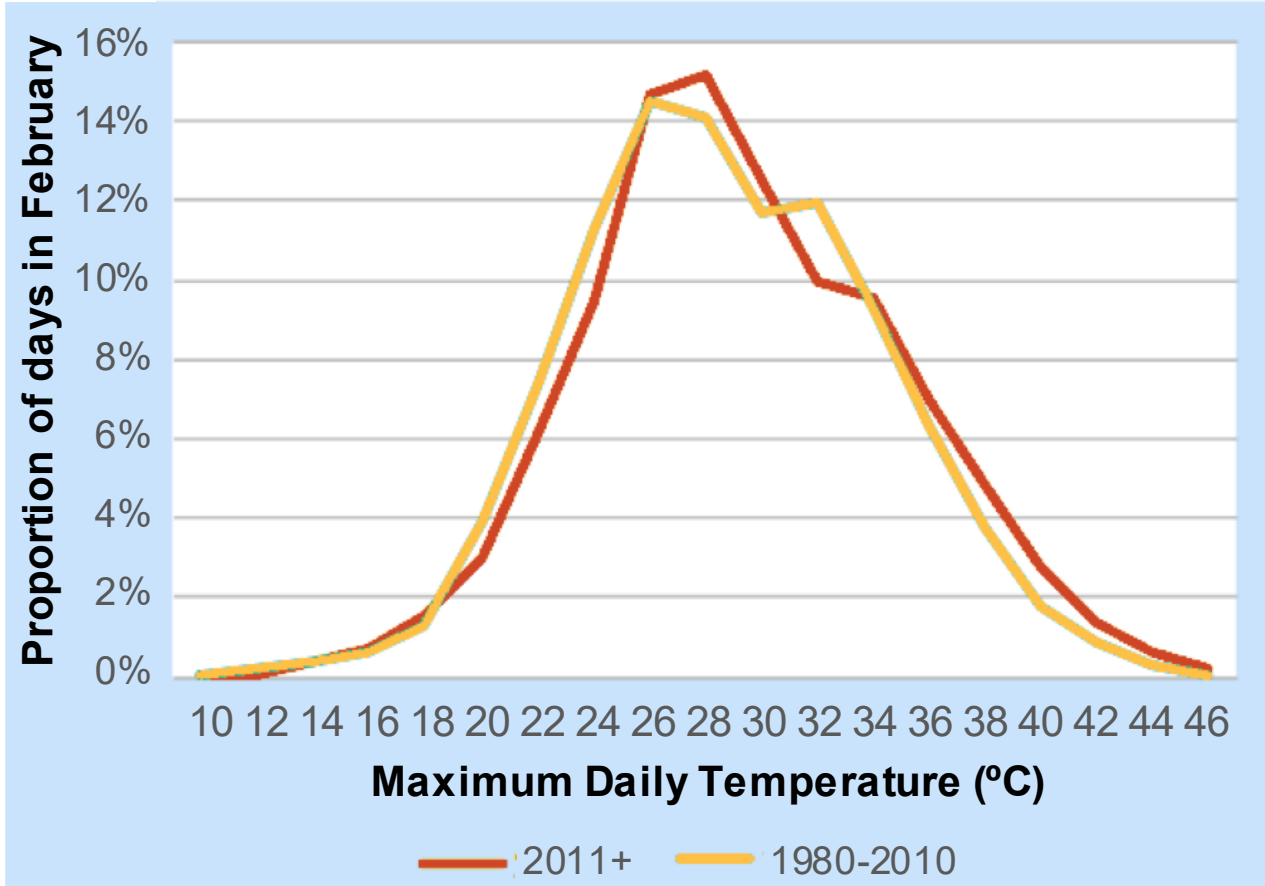
Extremes – in theory



Higher thresholds subject to proportionately greater increase

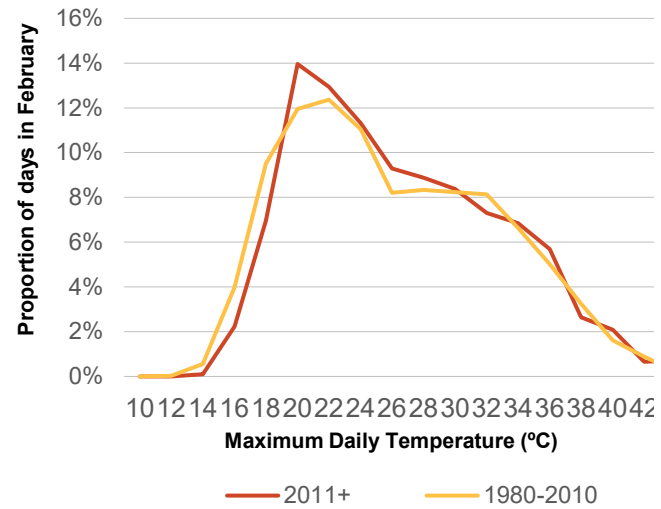
Extremes – in reality

NSW



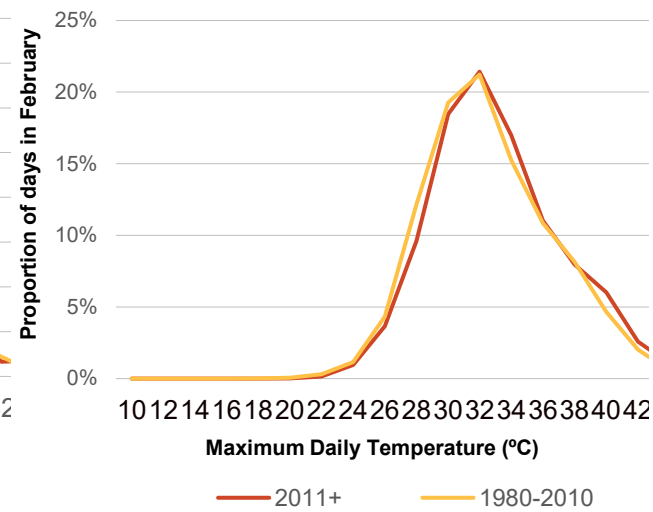
Temp. (°C)	2011+	1980-2010	Relativity
20	97.2%	97.4%	100%
22	94.2%	93.4%	101%
24	88.1%	86.0%	102%
26	78.6%	74.7%	105%
28	63.9%	60.2%	106%
30	48.7%	46.0%	106%
32	36.2%	34.3%	106%
34	26.3%	22.4%	117%
36	16.8%	13.0%	129%
38	9.8%	6.7%	146%
40	5.0%	2.9%	169%
42	2.2%	1.2%	190%
44	0.8%	0.3%	314%
46	0.2%	0.0%	

VIC



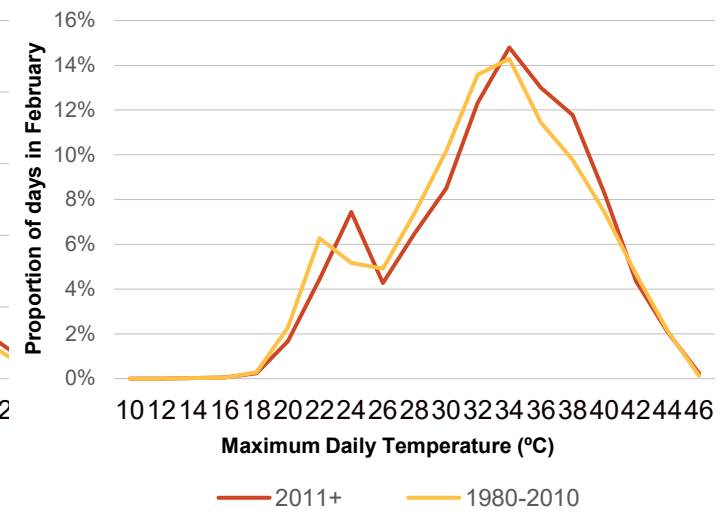
Temp. (°C)	2011+	1980-2010	Relativity
20	90.7%	85.9%	106%
22	76.8%	74.0%	104%
24	63.8%	61.6%	104%
26	52.5%	50.6%	104%
28	43.2%	42.4%	102%
30	34.3%	34.0%	101%
32	25.9%	25.8%	101%
34	18.6%	17.7%	106%
36	11.8%	11.0%	107%
38	6.1%	6.0%	101%
40	3.5%	2.8%	125%
42	1.4%	1.2%	119%
44	0.7%	0.3%	268%
46	0.0%	0.0%	

QLD



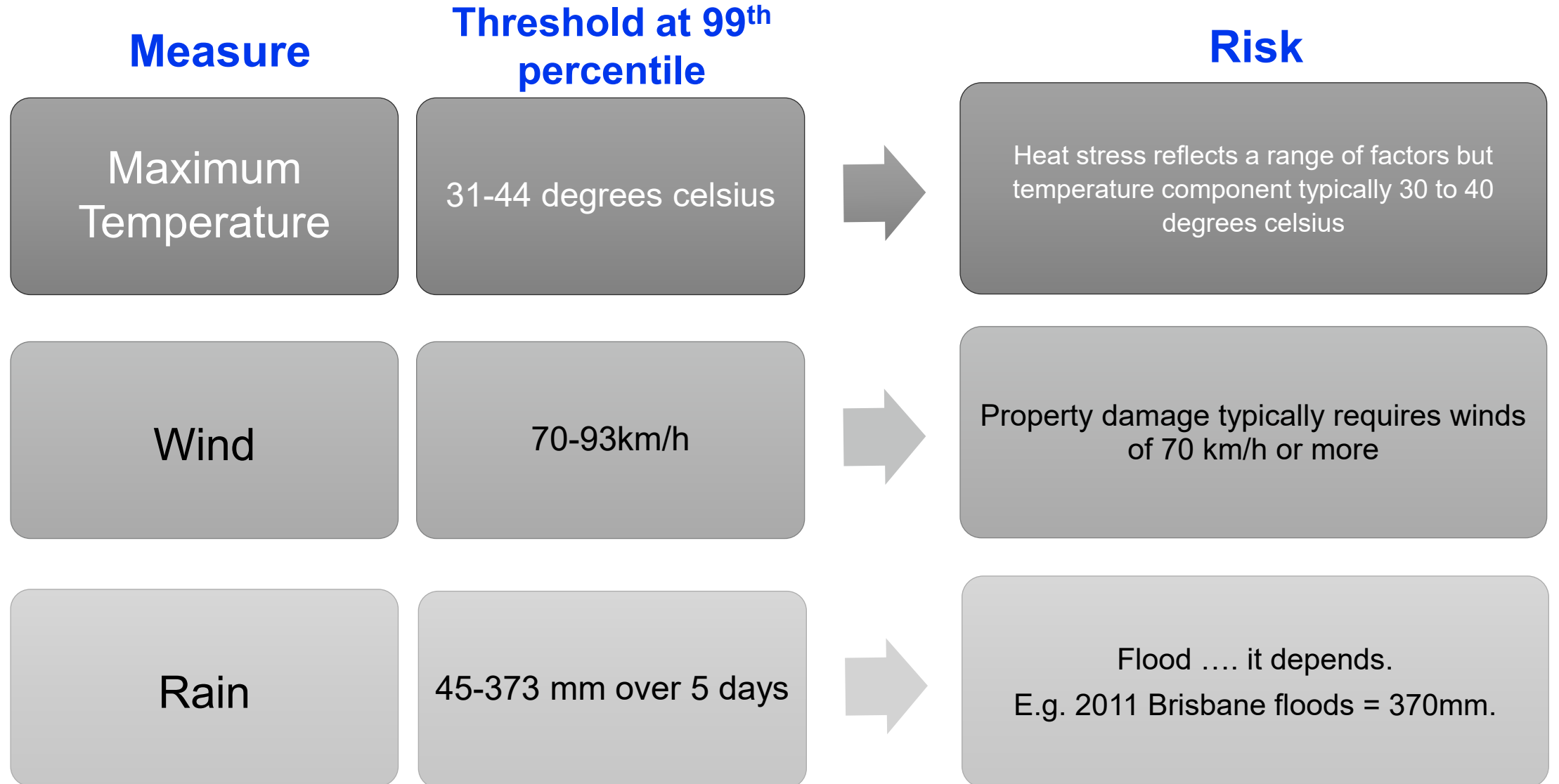
Temp. (°C)	2011+	1980-2010	Relativity
20	100.0%	100.0%	100%
22	100.0%	99.9%	100%
24	99.8%	99.6%	100%
26	98.9%	98.5%	100%
28	95.2%	94.2%	101%
30	85.6%	82.0%	104%
32	67.1%	62.7%	107%
34	45.7%	41.5%	110%
36	28.7%	26.2%	109%
38	17.7%	15.4%	115%
40	9.7%	7.2%	134%
42	3.7%	2.6%	143%
44	1.1%	0.5%	203%
46	0.1%	0.0%	

WA



Temp. (°C)	2011+	1980-2010	Relativity
20	99.7%	99.7%	100%
22	98.0%	97.4%	101%
24	93.6%	91.1%	103%
26	86.1%	85.9%	100%
28	81.8%	81.0%	101%
30	75.4%	73.6%	102%
32	66.9%	63.5%	105%
34	54.5%	49.9%	109%
36	39.8%	35.6%	112%
38	26.8%	24.2%	111%
40	15.0%	14.4%	104%
42	6.7%	6.9%	96%
44	2.3%	2.3%	103%
46	0.2%	0.1%	

Link between extremes and risk

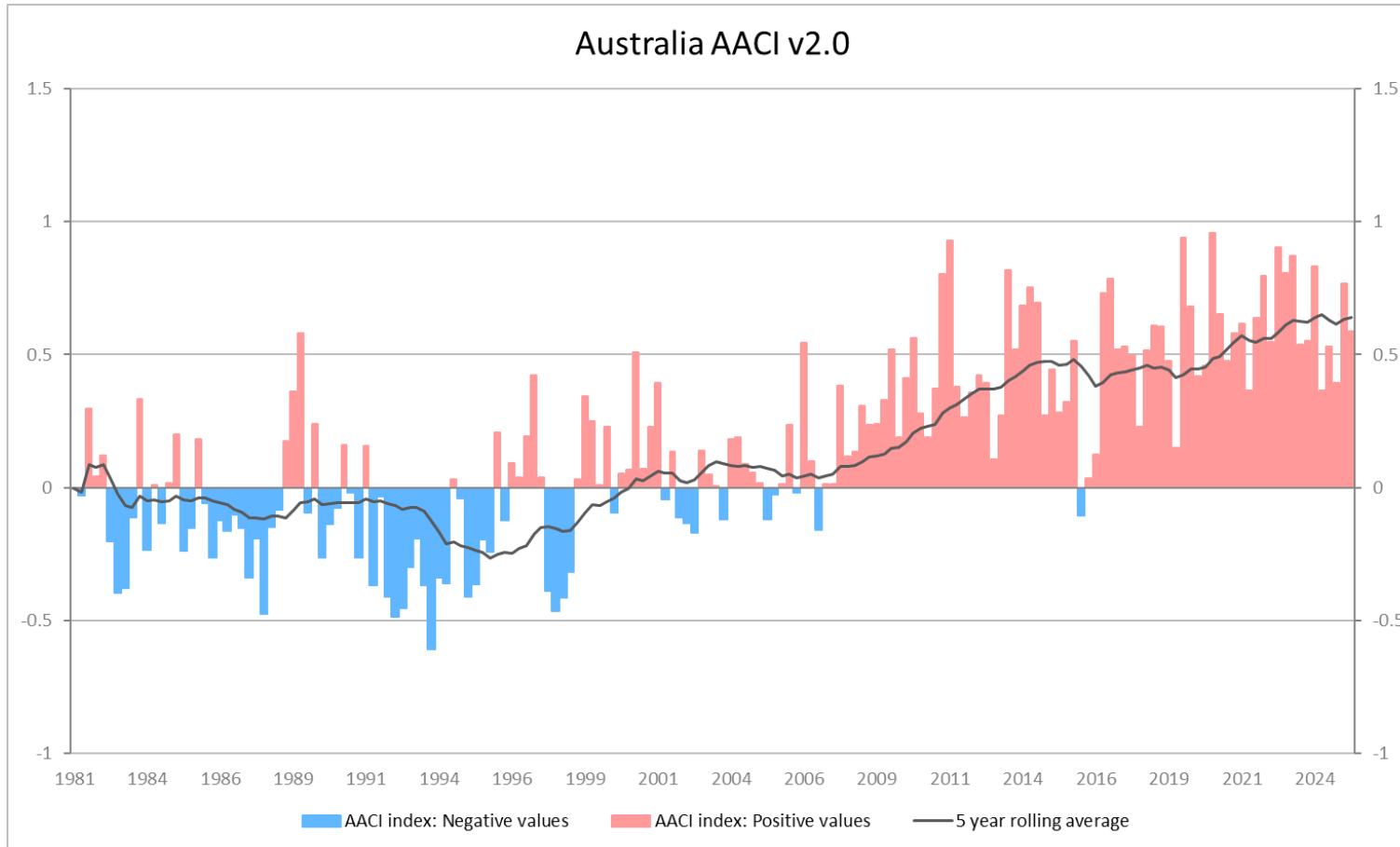


Example Results of the Index

All available via the website



AACI v2.0 – Composite index

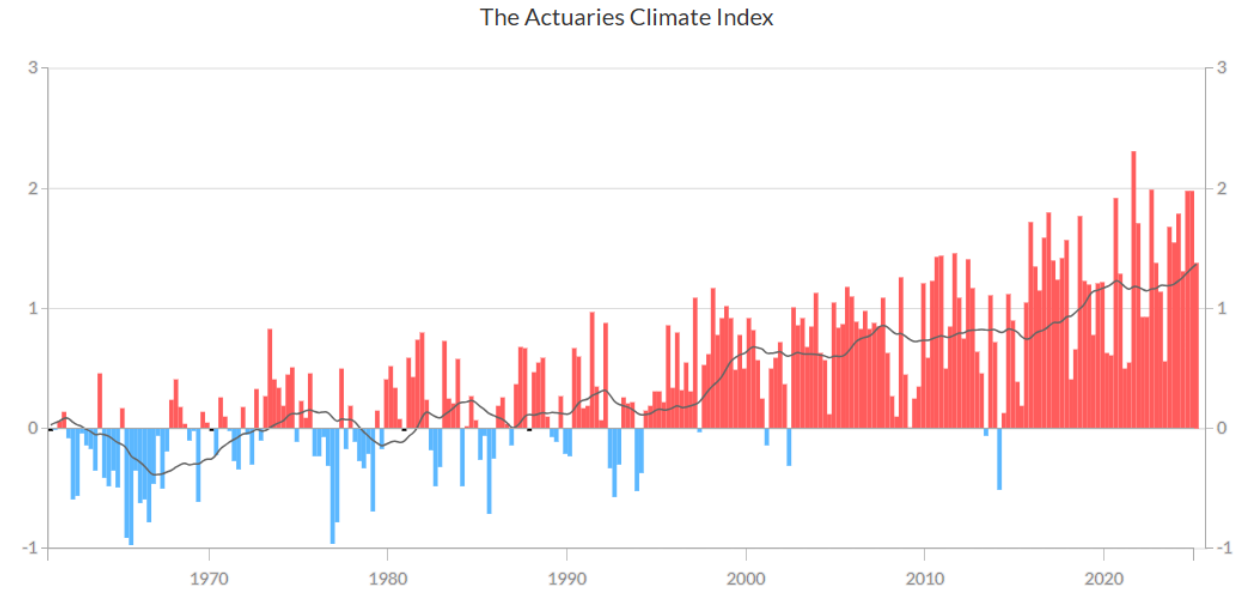
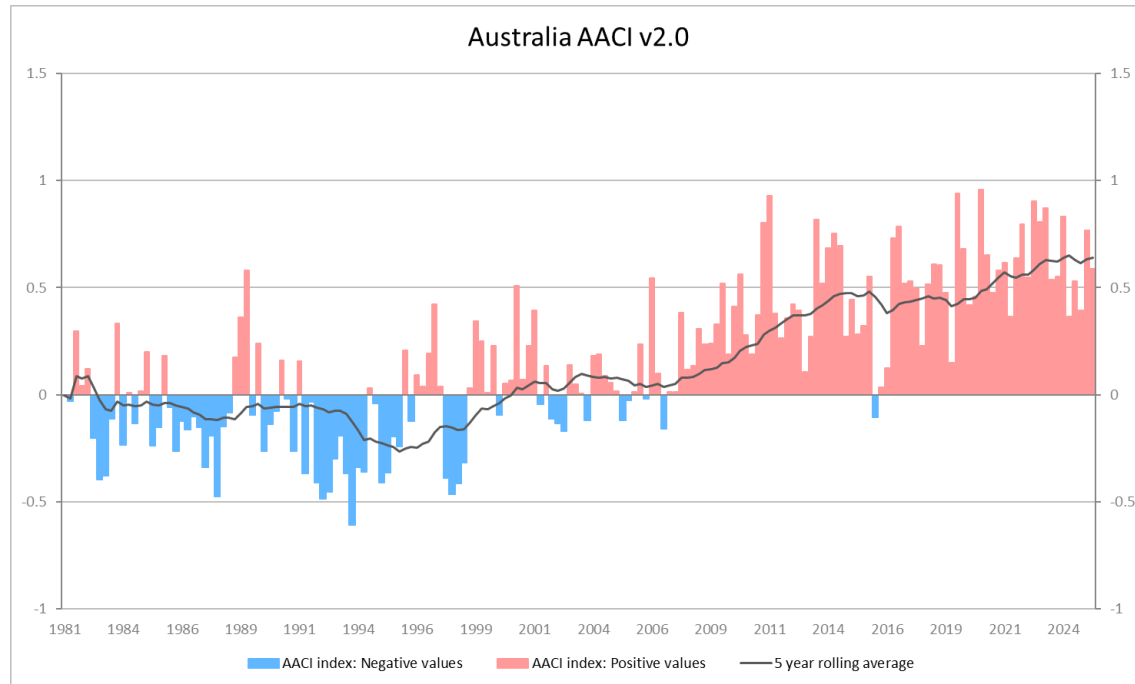


A positive value for the index represents an increase in the relevant climate extremes since from 2011 onwards relative to the reference period of 1981 to 2010.

The value is expressed as a standardised anomaly. This means that an index of 0.5 means the component indices (of warm temperatures, rainfall, sea level and wind) have increased on average by 0.5 standard deviations.

The AACI shows climate extremes in Australia have become more frequent, compared with the reference period of 1981-2010.

AACI v2.0 – Comparison to North American Index

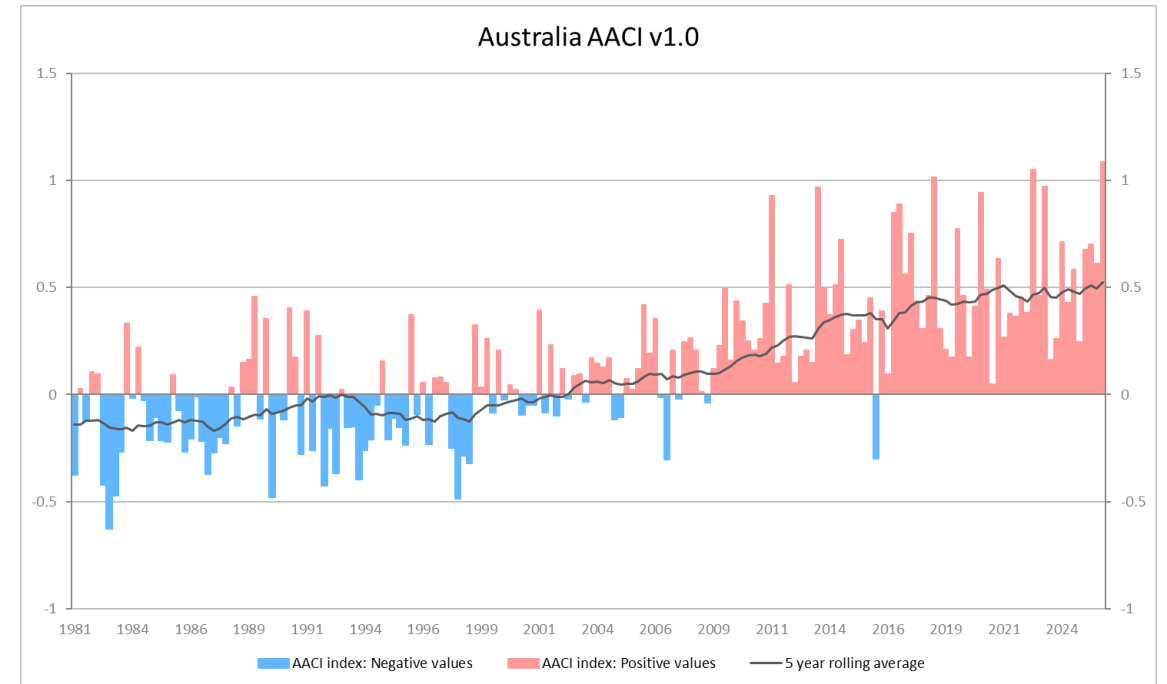
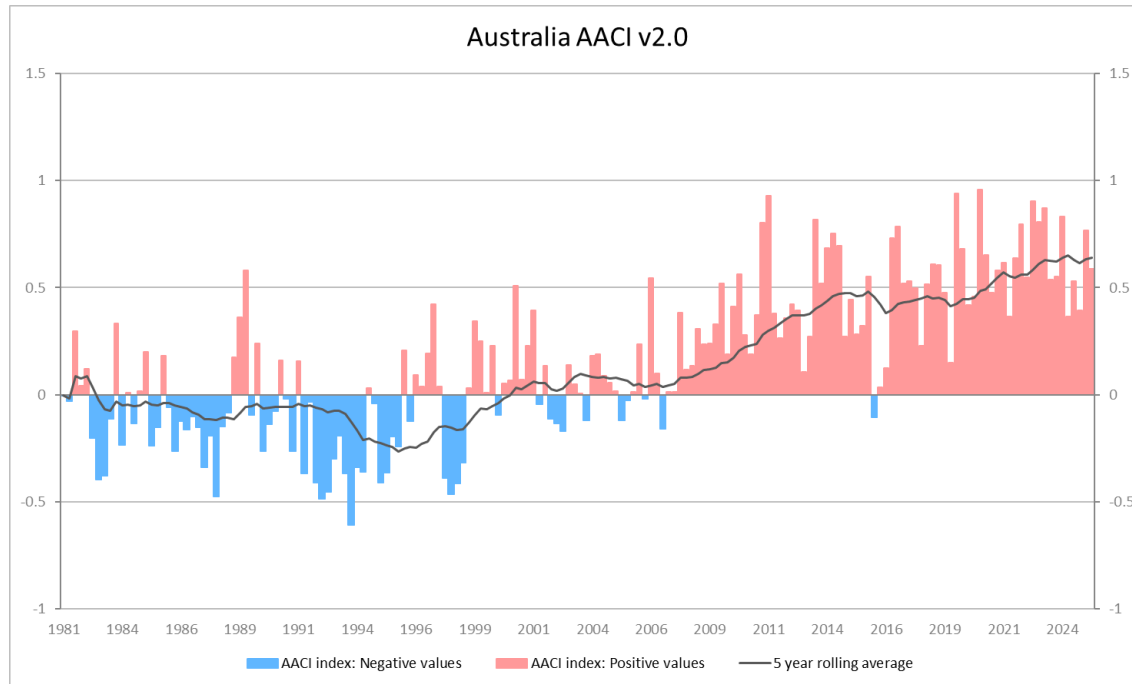


The North American Climate Index (ACI) shows higher values in recent years, indicating that climate extremes have become more frequent compared with its reference period (1961–1990).

This is not a like-for-like comparison since North America's reference period ended 35 years ago, while Australia's reference period ended only 15 years ago. As a result, Australia would be expected to show lower index values.

The component measures included in each index and exceedance thresholds used also differ, further limiting direct comparison.

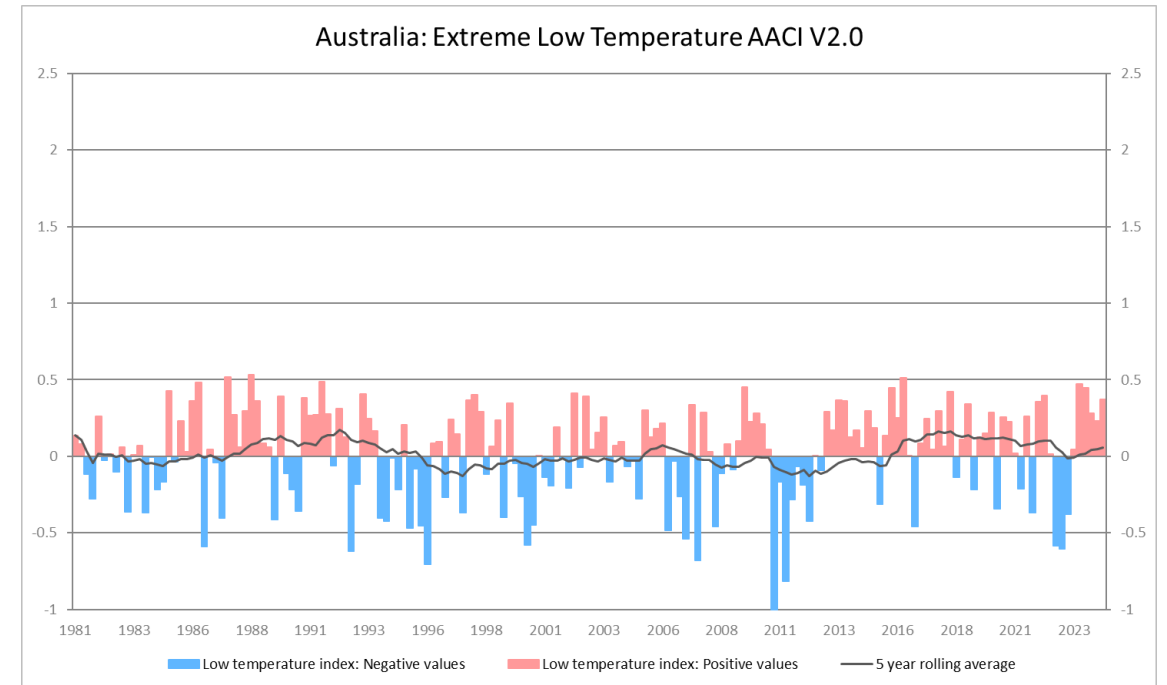
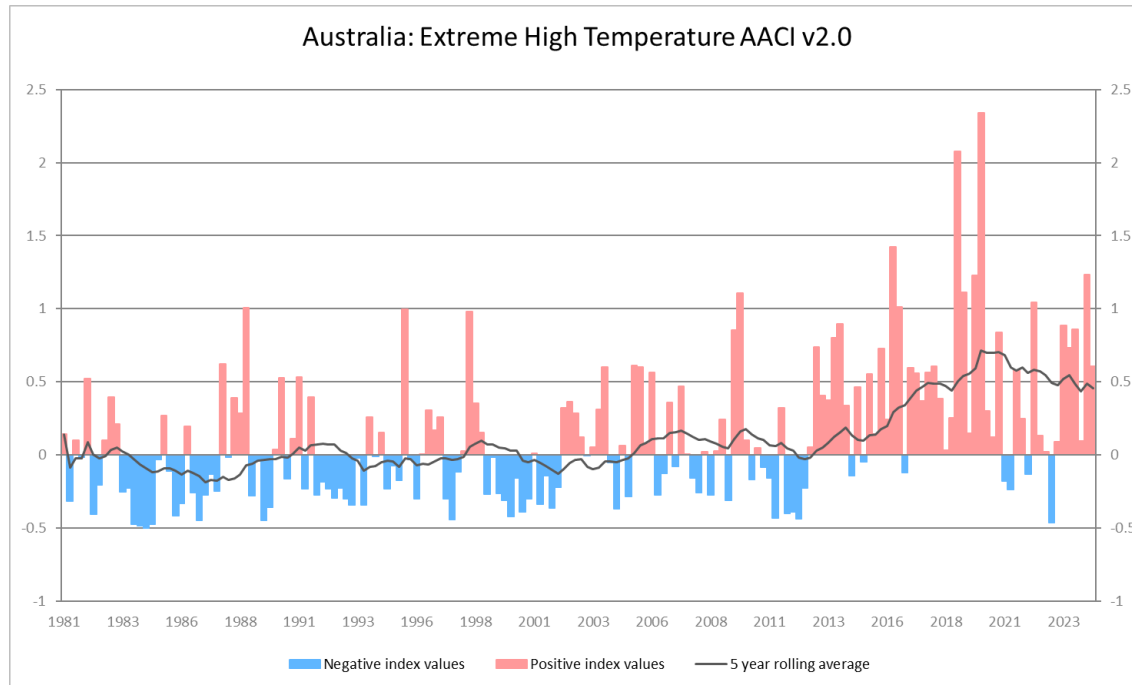
AACI v2.0 – Comparison to AACI v1.0



There is a strong relationship between the AACI v1.0 and AACI v2.0. The AACI v2.0 shows more consistently high values in recent years.

Note that the AACI v2.0 composite index includes the wind index, while the AACI v1.0 composite index does not.

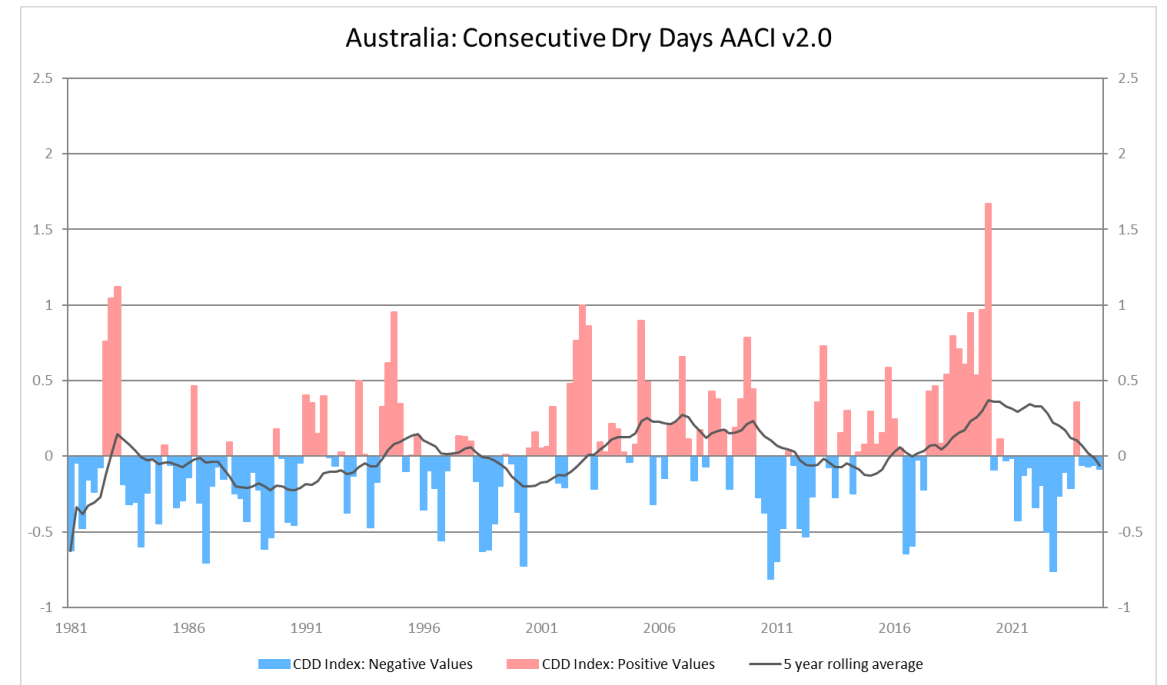
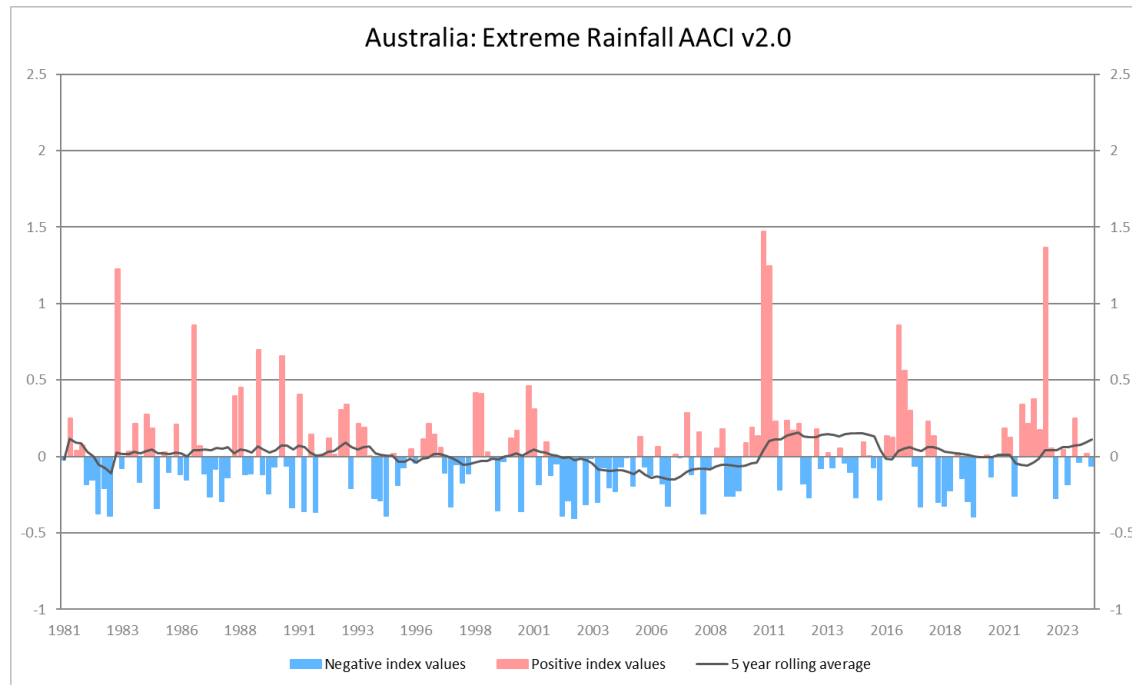
AACI v2.0 – Component Indices: Temperature



The high temperature index shows positive trends, indicating that the frequency of extreme high temperatures has increased relative to the base period.

The low temperature index does not show a strong trend at the national level.

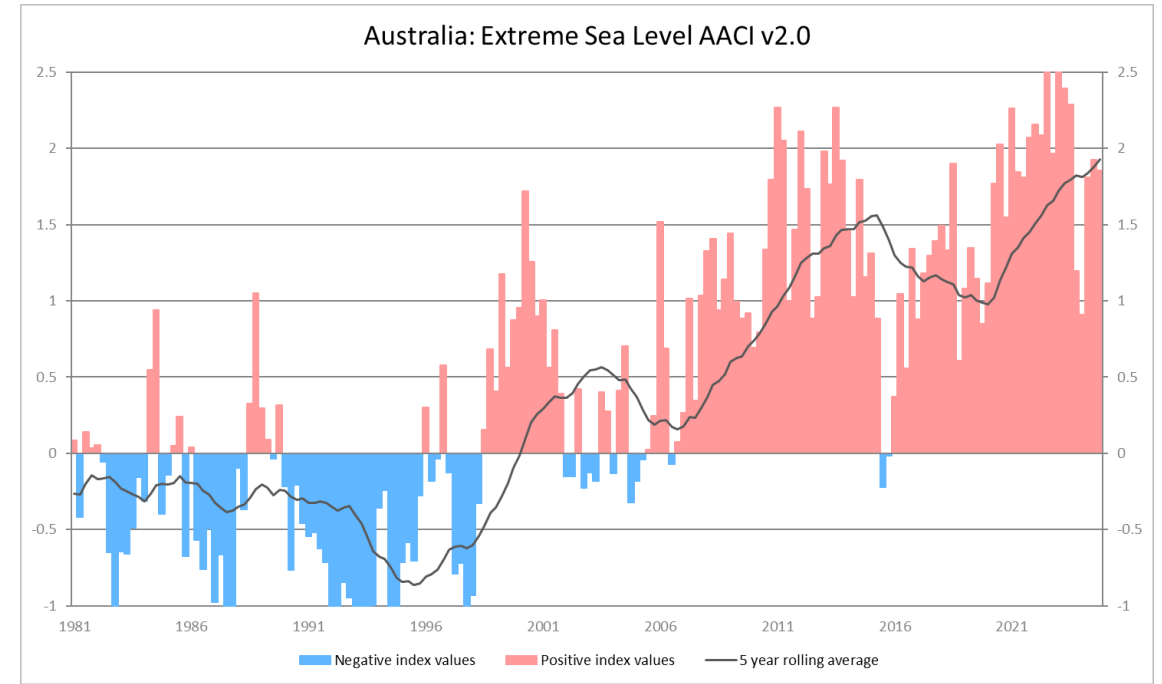
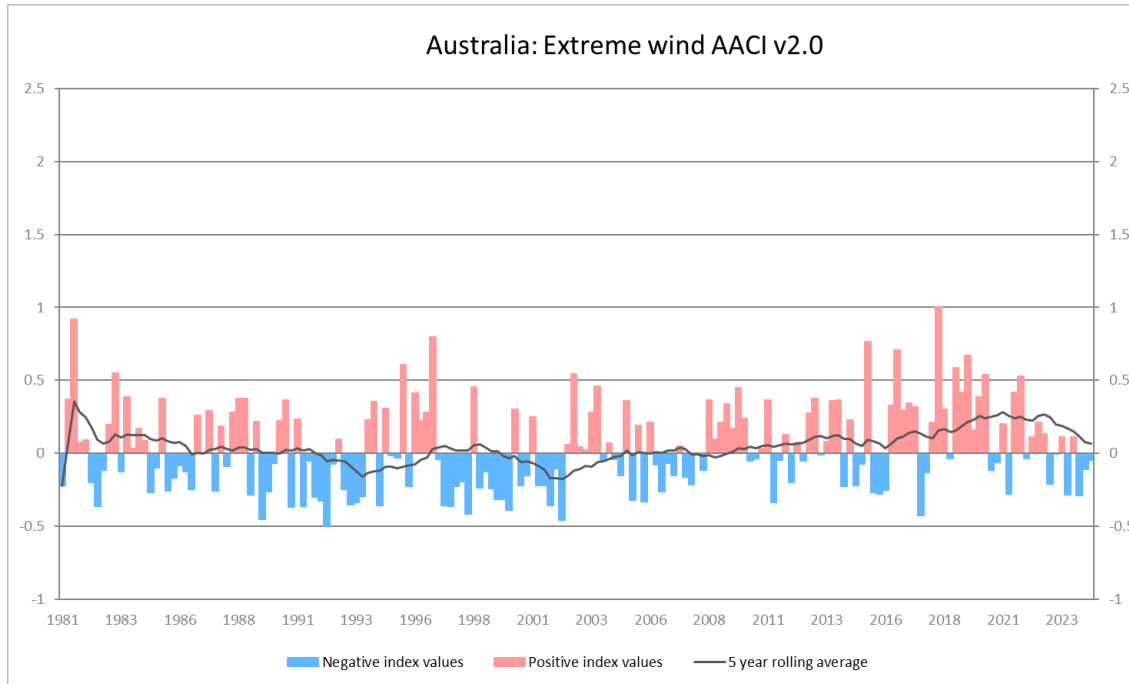
AACI v2.0 – Component Indices: Rainfall & Consecutive Dry Days



The rainfall index does not show strong trends at a national level. The impacts of the El Niño Southern Oscillation (ENSO) weather system can be seen in the results of this index, with La Niña periods often resulting in positive values.

The consecutive dry days index shows a slight positive trend at a national level, indicating that droughts are becoming more common over time.

AACI v2.0 – Component Indices: Wind & Sea Level



The wind index does not show a strong trend at the national level.

The sea level index shows very strong positive trends, indicating that sea levels have risen significantly since the reference period.

Further information

actuaries.asn.au/climate-index

