Dr. Bill Johnston
Former landholder and grazier
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Bemboka
NSW 2550

Current address:
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Dear Mr David Owens and Professor Mary O'Kane,

Re. NSW Independent Expert Inquiry into the 2019-20 bushfire season

I welcome the opportunity to contribute to the independent expert inquiry into the 2019-2020 bushfires that devastated large areas of southeastern Australia extending from Gippsland in Victoria to Queensland's Gold Coast Hinterland. My submission focuses on the overarching role of the climate in shaping the disaster and provides personal recollections and experiences whilst being a landholder in the Bega Valley from 2000 until 2015, and since December 2019, resident of Port Macquarie.

About:

I was a Senior Research Scientist with the former NSW Department of Natural Resources and its predecessor organisations: in Wagga Wagga from 1971 to 2000 and Queanbeyan from 2000 to 2005. My main research interests were agronomy, catchment hydrology, ecology and soil science and throughout my 34-year career I maintained an abiding interest in Australia's contemporary and historic climate. From 2000 to 2015 my Wife and I conducted cattle-grazing enterprises at Numbugga and Bemboka, near Bega and we retired from Canberra to Port Macquarie in December 2019. I was awarded a BSc(Agr) from the University of New England in 1971; MSc from Macquarie University in 1985 and PhD from the University of Western Sydney in 2002.

Summary and recommendations:

1. Causes and contributing factors

Section 1 of this submission shows the community is misinformed about the nature and likely direction of climate changes by a polarised scientific debate that focuses on 'anthropogenic' factors to the detriment of understanding the role of unpredictable phase-changes in rainfall and more importantly, the water balance, on the likelihood and severity of bushfires

Section 2 used rainfall data for multiple sites and a monthly water balance to demonstrate how rapid drying of the landscape following runs of favourable years considerably elevates the risk of wildfire. The role of the climate and phase-changes are quantifiable using simple tools such as water balances and visualisations (percentile distributions and cumulative deviations from dataset means). Stream discharge is also diagnostic of drought conditions and its effect on the landscape (Section 3).

The climate is phasic and non-stationary – rainfall occurs as runs of wet and dry years of varying duration, turning points are stochastic and therefore temporally unpredictable. There is no evidence in any of the more than 40 climate datasets studied that anthropogenic factors have impacted on climate trends or from a climate perspective, the risk or intensity of bushfires.

Simply stated, runs of wet years are conducive to fuel accumulation; while runs of dry years set

the stage for the accumulated fuel to burn.

Section 4 and **Section 5** discuss impediments to effectively managing emerging risks, including a lack of appreciation of local climate drivers which in NSW are different from south to north; over-belief in climate change rhetoric, particularly by the green-lobby which, resists effective action; and most importantly contradictions within the *Rural Fires Act (1997)* that place greater emphasis on *principles of ecologically sustainable development* than on pre-emptively protecting the environment, property and persons from foreseeable risks.

Section 6 presents a personal account of trying to get action on hazard reduction burns in 2013 and how institutional bottlenecks and complacency contributed directly to the recent catastrophe

From Gippsland to the North Coast of NSW and southern Queensland, irrespective of whether fires were deliberately lit or not, it can be fairly said the calamity of the so-called Black-summer bushfires resulted from a lack of appreciation of the emerging 'big-picture' problem; and of government policy and bureaucratic failures, not the climate.

Overall recommendations

That the Rural Fires Act (1997) be re-cast so that protection of the environment, property and persons has precedence over *principles of ecologically sustainable development*.

Yours faithfully,

Dr. WH (Bill) Johnston

22 May 2020

1. Climate the overarching factor

Since the earliest days of settlement and especially after systematic meteorological observations commenced at Port Macquarie (1840 to 1852, then from 1871) and Melbourne and Sydney Observatories (1855; 1858); and Australia's longest continuous daily rainfall record commenced at Bukalong Station near Bombala in 1857, it has long been recognised that, (i), rainfall across Australia and Tasmania consists of runs of dry and moist years, which may persist for decades; (ii), that most climates are strongly seasonal; and, (iii), that even in high rainfall months the likelihood of rain is highly variable.

Across eastern Australia rainfall has irregularly changed from generally dry to generally moist and vice-versa, on at least four occasions over the instrumental record (Figure 1) and the claim by lobbyists, fear mongers and some scientists that such changes are related to anthropogenic influences feeds a narrative that is spurious and misleading.

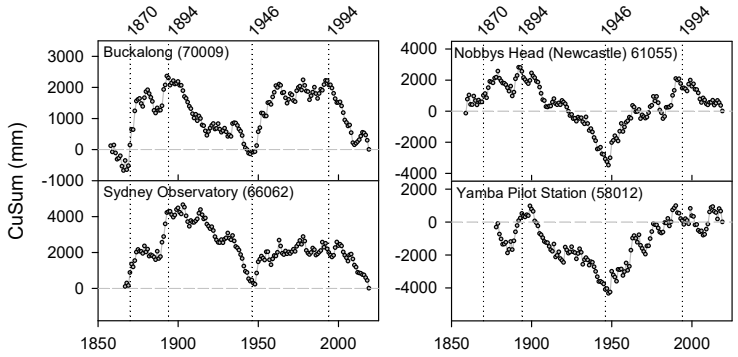


Figure 1. Graphs of cumulative deviations from dataset means (CuSum or residual mass curves) identify sequences or runs of years when rainfall is cumulatively below average (the curve declines), above average (the curve ascends), or near average (it is horizontal). Foley (1957) [1] used cumulative deficiencies/excesses to calculate the relative severity and length of droughts for regions and sub-regions across Australia to 1955. Although there are differences from south to north, statistically significant changepoints in annual rainfall at Buckalong Station near Bombala align loosely with those at other sites. Since the 1870s, the longest and most severe drought occurred from 1938 (or earlier in some places) to 1949 and from then to 1994 conditions remained relatively benign. Further, there is no evidence that phase-changes could be related to anthropogenic factors.

The 1877 report by NSW Government Astronomer HC Russell entitled *Climate of New South Wales: Descriptive, Historical and Tabular*, described on Page 164 the variability of climatic conditions in the Tumut district – the great drought of 1839; favourable years until 1849; dead and dying livestock along the banks of the Murrumbidgee River in 1852; that in June that year 96 people perished when a great flood swept-away the town of Gundagai; another serious drought in 1868 ... Foley (1957) mentioned that in Victoria "A day of humiliation and prayer was proclaimed in December (1865) to avert the consequences of the protracted drought" (p. 19); that drought prevailed across Gippsland from November 1880 to September 1886 ... and "that an overall [rainfall] deficiency [which became known as the Federation drought] occurred from September 1901 to April 1905" (p. 21).

Post-1900 rainfall deficiencies/excesses at Gabo Island Lighthouse several kilometres east of Mallacoota on the NSW-Victoria border also shows runs of relatively wet/dry years interspersed by time-random changepoints[2] (Figure 2). While most fluctuations were part of the 'signal' and were

[1] Foley JC (1957). Droughts in Australia: Review of Records from Earliest Years of Settlement to 1955. Bureau of Meteorology, Bulletin No. 43 (September 1957).

[2] Analysis assumes that data are unaffected by station changes including that a building was demolished in 1977, exposure of the raingauge changed in March 1981 and a tipping-bucket gauge installed in August 2007 was replaced in October 2011.

not indicative of data discontinuities, an objective statistical test detected significant step-changes in mean-rainfall in January 1949, May 1999 and October 2016.

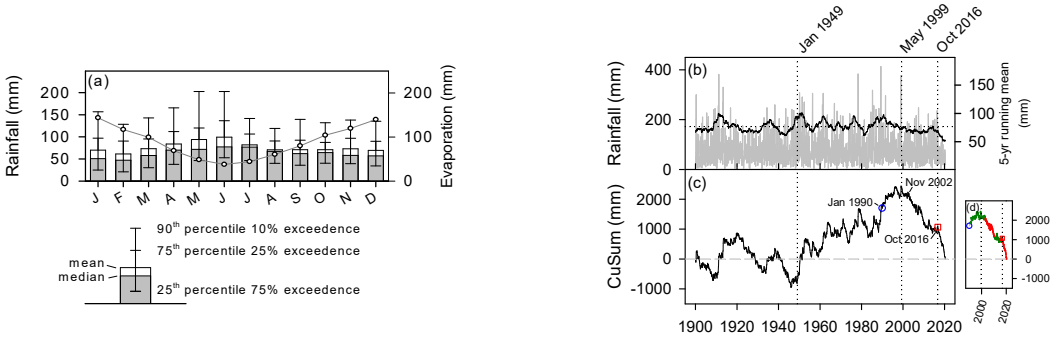


Figure 2. Although rainfall at Gabo Island Lighthouse (Bureau of meteorology ID 85016) is highest in May and June (a), percentile distributions show variability is high also. In (b) decadal-scale variation is highlighted by the 5-year running mean (right axis). The CuSum [(c) and (d)] shows runs of below average rainfall years (the curve descends), above average (it ascends) or about average (it is horizontal). Dotted vertical lines align with statistically significant (P <0.05) step-changes in mean rainfall; rainfall increased from January 1949 and declined from May 1999 and from October 2016. Note that the re-scaled CuSum mean is zero (dashed line). Drying of the landscape since November 2002 and average to above average rainfall from 2012 to 2016, the downward trend since October 2016 (d) set the stage for the 2019-2020 bushfires that isolated Mallacoota and burnt large tracts of native dry sclerophyll forest north towards Eden. Fuel build-up following the 1980s drought to 1996 combined with the drying trajectory since 1999 and low rainfall from August to December 2000 resulted in an increasing risk of wildfire. Data from January 1990 to December 2019 are highlighted in (d).

While due to its exposure to low-pressure troughs and associated frontal systems originating in the Southern Ocean rainfall at Gabo Island increases from March to July (Figure 2); 55 km north at Eden, NSW, rainfall is essentially non-seasonal (Figure 3). However, variability indicated by percentile ranges increases markedly from November to June.

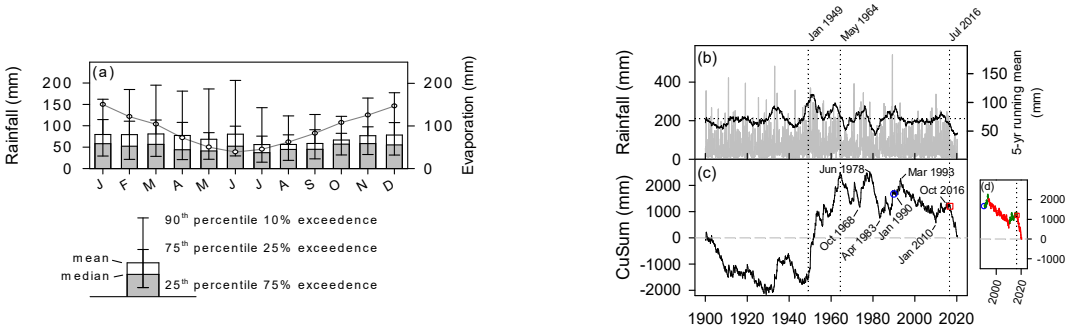


Figure 3. Monthly rainfall at Eden (BoM ID 69015) from 1900 is highly variable from November to June (a). Inter-annual variability indicated by the 5-year running mean (right axis in (b)) is less during low rainfall epochs before 1930 and after 1993. Significant step-changes (dotted vertical lines) show the climate experienced unpredictable phase-changes and is therefore non-stationary. In (c), rainfall was cumulatively low from January 1900 to May 1912 (the Federation drought), March 1920 to May 1930, September 1939 to November 1947 (the WWII drought), August 1964 to October 1968, June 1978 to April 1983 (the 1980s drought), March 1993 to January 2010 (the Millennium drought) and from October 2016. The most significant climate change event was 1949 when rainfall changed from being generally dry to generally moist. Data from January 1990 to December 2019 are highlighted in (d).

The rainfall CuSum plots for Gabo Island and Eden show drought is a recurring theme and from failed seasons to decades, from the earliest years of settlement its effect on South Coast communities was often brutal [Foley, 1957; and newspaper reports available in the National Library of Australia's Trove database (https://trove.nla.gov.au/newspaper/) some of which are summarised in Appendix 1]. Furthermore, paleoclimate reconstructions of the El Niño-Southern Oscillation show the region was likely more-often dry than not (Figure 4). The climate is unpredictable and

subject to irregular phase-changes and claims that the modern-day climate is behaving differently compared to those of the past are unsupported empirically, anecdotally and by paleoclimate reconstructions.

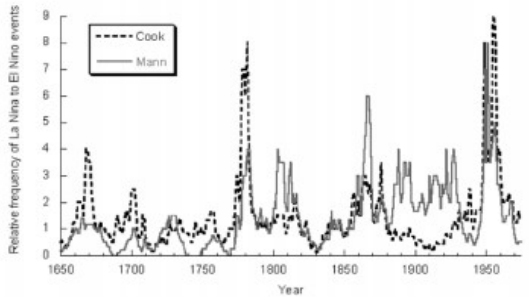


Figure 2. Fifteen-year moving window of relative La Niña to El Niño event frequency.

Figure 4. Reconstructed frequency of La Niña relative to El Niño years from 1650 indicates that southern Australia experienced relatively dry conditions up to about 1770, then from 1840 to 1870; 1890 to 1940 and after 1970 (Figure 2, from: Verdon D.C. and Franks S.W. (2006): Long-term behaviour of ENSO. Interactions with the PDO over the past 400 years inferred from paleoclimate records. *Geophysical Research Letters*, 33, L06712, doi:10.1029/2005GL025052.)

Rainfall observations commenced at Bemboka Post Office in 1889, sufficiently early to provide some insight into the development of the Federation drought and its aftermath (Figure 5). Considering that with little respite (notably from 1934 to 1937) dry conditions prevailed from 1904 to 1949, only by ignoring or re-writing history could it be claimed that recent droughts were unprecedented in the modern record.

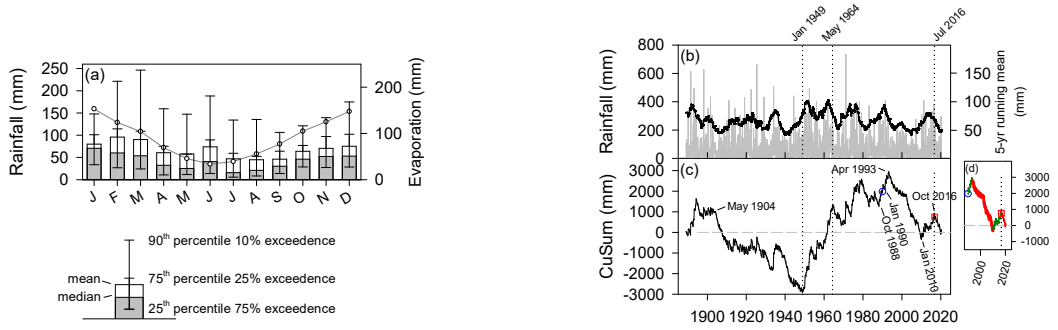


Figure 5. Being closer to the escarpment, sheltered from the north and deep within the winter rain-shadow cast by the Snowy Mountains, monthly rainfall at Bemboka is generally less than Eden and Bega with a more pronounced decline from April to October (a). Although average rainfall is highest in February and March, variability is highest also. Bemboka is a relatively dry and risky environment and prior to the commencement of the Federation drought in about 1900 the local economy was buoyed by seasons of generally above-average rainfall (b). However, by January 1949 the countryside was worn-out, dried-out and burnt-out and the situation was dire. Although for some places drought ended earlier (later) than in 1948, since European settlement, never has there been a drought as long and damaging as that which ended in 1949 (c). Data from January 1990 to December 2019 are highlighted in (d).

Effects of cumulatively dry conditions from 1895 to 1903 and 1938 to 1949 were disastrous and widespread. Every aspect of life was touched upon and it's surprising that in the context of the economic consequences of climate change, so much has been forgotten. Summarising from Foley (1957) and newspaper reports of the day:

El Niño years from 1895 to 1903 caused the most intense Australia-wide drought thus far experienced in our post-European history. Most of the country experienced between 7 and 9 relentlessly dry-years in a row. The decade from 1890 was remarkable also for its number of

extreme and damaging events: brief floods, cyclones, hurricanes, gales, hailstorms and snowstorms, and extended periods of exceptional heat. The Antarctic ice-shelf also broke-up endangering southern sea-lanes, altering ocean currents and disturbing climates around the world.

Heatwaves were endemic; wildfires raged. Inland shade-temperatures repeatedly hovered around 40 to 50^{o}C for weeks and 40^{o}C was not uncommon along Australia's coasts. Drought killed some 50 million sheep (50% of the national flock), 5 million cattle (40% of the national herd), and tens-of-thousands of horses. By 1902, the Murray-Darling Basin (MDB)'s driest rainfall-year since 1900, major rivers ceased to flow. The Darling ran low and was dry at Menindee for 364 days. Across the country, grass turned to dust. Shifting sands filled dams, blocked dry-creeks, buried fences and roads. Iconic poems and ballads were penned. Depression was endemic; families walked away from farms devastated and broken. Stories in newspapers and reports of the day told of intense suffering. Australia's economy was badly hit; unemployment was rife and men marched off to war. From the late 1800's until an abrupt and well-known climate-shift in 1947, rainfall across Australia was drier generally than since that time.

Ignoring local droughts, from about 1939 culminating with the 1947 shift, widespread drought and heat enveloped the countryside again. Temperature records were again broken; millions of sheep and cattle again died and men again marched-off to war. BoM data for the MDB shows its driest 5 to 15 years (since 1900) ended between 1944 and 1947. By 1945 Hume Dam (built in 1936) was empty; Burrinjuck (1927) almost so. The Namoi stopped flowing at Gunnedah and other major NSW rivers, the Castlereagh, Macquarie and Lachlan were out of water; again.

By April 1945 Victoria's then-main storages, Coliban, Lake Lonsdale, Pykes Creek, Melton, Eildon, Waranga and Laanecoorie were also empty. Cars parked on the bed of Eildon 25 metres below its then top-water level. Lake Wendouree was a puddle. Flows in the upper-Murray, Kiewa and Mitta Mitta Rivers, which drain the MDB's alpine-country, were the lowest recorded to that time. Near their sources, the Loddon stopped flowing; the King was dry and the Goulburn was a trickle. The Murray ceased flowing at Echuca and the Campaspie was dry there for 4-months. That briefly accounts for most major MDB donor-rivers, and from one end to the other, the "food-bowl" was again desolate, eroded and burnt-out.

By August 1940, Sydney's Nepean Dam was also empty; Cataract was dangerously low. In 1942, Sydney's water-quota was reduced from 100 to 70 litres per household per day. By December 1944, the Hunter River ceased to flow along most of its length. By January 1945, the Hawkesbury was dry at north-Richmond and other coastal rivers including the Tweed were fast drying-up. Other States fared little better.

Drought is never pretty close-up, but during recent droughts while television audiences watched commentators watching farmers watch paddocks shrivel and their livestock die, dropping-in keywords like global-warming and climate change and deliberately stirring fear, the scale of droughts they were talking about were factors less than the Federation and WWII droughts that they had conveniently forgotten.

2. Water balance basics

Rain falling on the landscape evaporates on contact; soaks into the soil to the limit of an antecedent water deficit where it is stored to be later transpired by plants; runs off to streams and rivers either as surface or sub-surface flow; or it seeps beyond the reach of plant roots to local or regional water-tables. While the processes are physical and complex, interactions between rainfall and the landscape are conveniently explored using a mass-balance approach that partitions rainfall into its several pathways of expenditure and loss.

As water-balance or bucket models have been around in various guises since the 1960s and there is ample literature (e.g. http://www.eoc.csiro.au/aciar/ book/PDF/Monograph _84_Chapter_01.pdf), a detailed description of their workings and applications is not warranted here.

The monthly soil water balance is commonly expressed as:

Soil water balance (SWB) = antecedent SWB + rainfall – (evapotranspiration + surplus)

Where: antecedent SWB is the sign-preserved (+/-) balance passed from the previous month;
Evapotranspiration = direct evaporation + transpiration by plants; and,
Surplus = runoff + deep-drainage.
Units are mm rainfall equivalent/month (= litres/m^2)

Assumptions:

- Water is stored to the limit of a soil's available water holding capacity (AWC), which optionally may be varied but is typically 100 mm rainfall equivalent in the surface 1.2-m depth. Runoff and deep drainage are accounted for as a lumped surplus.
- If SWC exceeds 50% of AWC, evapotranspiration occurs at the rate of 0.8 times free-water evaporation estimated by an A-pan evaporimeter (Epan).
- Evaporation reduces step-wise from 0.8Epan to 0.4Epan when SWC is between 50% and 40% of AWC; and from 0.4Epan to 0.2Epan when SWC is between 40% and 20% of AWC; otherwise water stored for the month reduces to zero (and the balance carried-forward is -100 mm).

Daily PatchPoint (SILO) data for specific BoM rainfall stations (and some grid cells) were obtained from https://www.longpaddock.qld.gov.au/silo/point-data/, checked for consistency with BoM raw data and aggregated by years and months using the statistical package R[1]. Water balances were calculated interactively using Excel 2000.

Average water-balance components, and changes through time for Eden are shown in Figure 6.

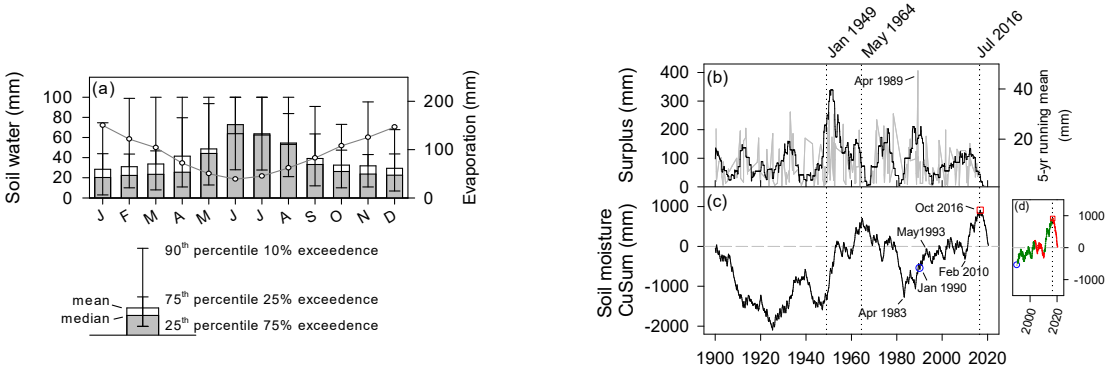


Figure 6. Estimated average soil water content during the warmer months at Eden (BoM 69015) is reduced considerably by rapidly increasing potential evaporation from September (103 mm) to January (150 mm) (a). Although in more than 75% of years rainfall accumulated by June is sufficient to alleviate the generally dry autumn, plant growth is severely constrained by reduced daylength and low temperature from May to September. Water surpluses (b) occur as runs of wet years with peaks exhibiting a spectral frequency of 18.9 years (*P* <0.001) reminiscent of (but not necessarily in-phase with) the lunar nodal cycle of 18.61 years. Step-changes in January 1949, May 1964 and July 2016, which parallel rainfall changes, were associated with amplitude differences but not periodicity. Curiously, the steady decline in rainfall from March 1993 shown previously in Figure 3 was not reflected by an equivalent decline in the soil water balance (c). Data from January 1990 to December 2019 are highlighted in (d).

Referring back to Figure 3, in contrast to the 1980s and post-2016 droughts where annual rainfall was consistently less than the 1st quartile of 667 mm, during the Millennium drought mean rainfall at Eden was only slightly less than average (767 vs. 800 mm). Thus while aforementioned droughts

[1] R Core Team (2016). R: A language and environment for statistical computing. R Foundation for Statistical computing, Vienna, Austria. URL https://www.R-project.org/.

were caused by sharp reductions in rainfall the Millennium drought was one of attrition – there were few sustained surpluses; annual rainfall exceeded the 3rd Quartile (984 mm) only in 2001.

Rainstorms in summer, which is the usual growing season failed to eventuate year after year and potential evaporation dominated the summer water balance. Because natural and native pastures are unresponsive during the cooler months, rainfall sufficient to alleviate soil water deficits from April to October offered little respite. Thus as there was no sustained runoff or deep drainage farm-dams emptied, streams ceased to flow, watertables declined, growth of forests, woodlands, grasslands and pasture was constrained and accumulated fuels desiccated as the landscape progressively dried.

While the Millennium drought was certainly stressful and possibly the worst in 'living memory', the water balance for Bemboka from 1889 (Figure 7) showed the duration and intensity of droughts up to 1949 were longer and more intense.`

Runs of favourable years from before 1895 engendered confidence; land was cleared, sheep and cattle numbers increased and the port of Tathra was busy sending produce, timber and passengers by coastal steamer to Sydney. **Then it all came crashing down.** Drought is ugly and by 1903 it was ubiquitous. The *Sydney Morning Herald* reported on the 5th February 1903 that over 16 million sheep had perished in NSW (41.5% of the flock), numbers of horses declined by 13.5% and of cattle by 21%. Foley (1957) reported that from August 1904 the South Coast suffered a prolonged dry spell until November 1910. The Hunter River ceased to flow; it was the driest season known at Byron Bay and September 1905 was the worst month ever experienced at Batemans Bay where the county was a "waste". There was great mortality of cattle for want of water and Cooma and Nimmitabel suffered one of the driest periods for more than 50 years.

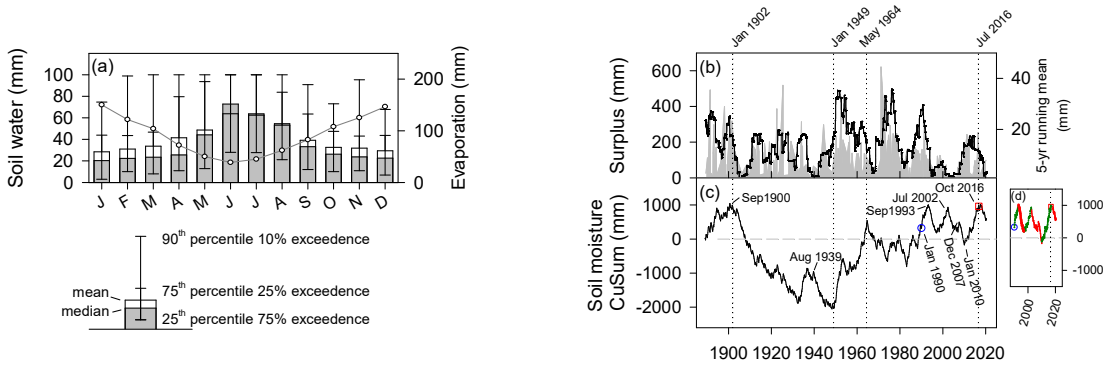


Figure 7. The soil water balance at Bemboka from 1889 shows that following a run of favourable years, conditions deteriorated rapidly with the onset of the Federation Drought in about 1902. Conditions were dry generally from 1900 to July 1933 and also from 1936 to 1949 (the WWII drought). Data from January 1990 to December 2019 are highlighted in (d).

3. Drought and water balance effects on stream discharge

Discharge for the mainly forested catchment of Tantawanglo Creek above the gauge at Tantawanglo Mountain integrates the combined effects of rainfall, evaporation and time-lags and shows the instrumental record dominated by droughts of varying duration and severity (Figure 8).

Occurrence of runs of dry years and their effect on stream-flow is stochastic and their extent and intensity is unpredictable. While drought from 1993 intensified gradually over a period of 17 years, the most recent drought from July 2016 to January 2020 was not dissimilar to that from October 1985 to March 1988, or earlier from June 1962 and February 1956. As they are an embedded feature of the long-term climate droughts will inevitably re-occur. Data shows no trend, no increase in 'severity' and no change attributable to any other factor.

The record for Tantawangalo Creek commenced after the 1949 rainfall shift and so provided limited understanding of longer-term climate changes. Like other coastal streams, the catchment is relatively short and steep; there are little in-stream or within-landscape storages to buffer against

abrupt rainfall changes and stream-flow manifests as pulses followed by rapid recessions. Further, since commencement of the record in March 1951, while there have been eight low-flow periods, prolonged near-average flows occurred on only three occasions most notably from January 2010 to July 2016.

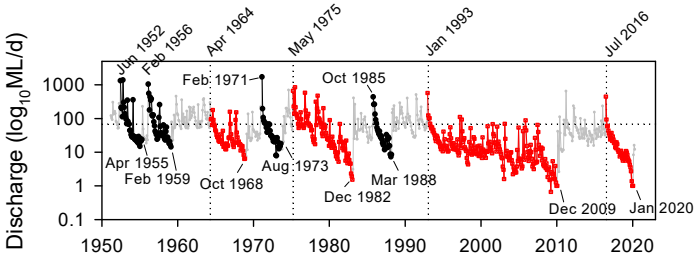


Figure 8. Average monthly discharge for Tantawangalo Creek at Tantawangalo Mountain from March 1951 (NSW Water, Gauge No. 219006; catchment area 83 km^2), showing lengthy and short-term droughts (red squares and filled circles). The stream is unregulated above the gauge. While low discharge from April 1964, May 1975 and July 2016 were due to generally low rainfall; that from January 1993 resulted from 'drawdown' – rainfall was insufficient to replenish catchment moisture reserves. (The log transformation adjusts for skew in the original data so they are more 'normal' or symmetrical about the re-scaled mean (dotted horizontal line.)

Rutherford Creek at Brown Mountain (Gauge No. 219001) is also unregulated; although data commenced in May 1924, possibly due to runoff being below the gauge height there was a break in the record from August 1931 to May 1948. Also, discharge for April 1950 was spuriously high.

Water balance components were calculated for the nearest SILO grid-cell (centred on Latitude –36.60, Longitude 149.45) and taking account of seasonality as $\text{Month}_{\text{factor}}$, average monthly discharge (ML/day) was analysed with the following predictor variables: rainfall plus lags thereof of up to 5-months previous; rain summed over the same time intervals (up to 6-months); components of the water balance (SWB alone and (SWB + surplus)) and the running 3-point SOI. Cases with missing values were removed and those remaining were randomised to disrupt time-dependencies (autocorrelation) prior to multiple linear regression analysis using R and the *Rcmdr* package[1].

Significance of predictor variables (P), the Akaike information criterion (AIC) and proportion of variation explained (R^2_{adj}) were used to select the most parsimonious of alternative models (that which best explained discharge without over-fitting). As they were highly skewed, discharge and rainfall data were normalised by transformation to logarithms and Type-II analysis of variance was used to test significances (Table 1). The best-fitting model was then used to predict data points and their 95% prediction intervals for the interval where data were missing (Figure 9).

Partitioning the total sum of squares between significant components (Table 1) showed antecedent rainfall of up to 6-months previous and the total water balance, which indexes wetness of the landscape were the most influential predictors. Significant remaining variables including seasonality contributed little additional explanatory power.

The reconstructed record from May 1924 showed the pattern of drawdown preceding the climate shift in 1949 was similar to that from the start of the Millennium drought in 1993 to the end of 2009. Although it's unlikely that the gauge and rating tables remained the same during the break, smoothness of the transition between the predicted segment and remaining data did not suggest data in-filling was the cause of the mid-century step-up.

[1] Fox J (2005). "The R Commander: A Basic Statistics Graphical User Interface to R." *Journal of Statistical Software*, **14**(9), 1–42. http://www.jstatsoft.org/v14/i09.

Table 1. Analysis of variance for the multiple linear regression model used to predict monthly discharge as a function of rainfall, the total water balance (SWB + surplus), month of the year and estimated water stored (SWB) together with proportional contributions to the total sum of squares. The model explained 71.1% of variation in discharge overall (R^2_{adj} = 0.711)

Response: log10(0.5 + MeanDischML)

	Sum Sq	Proportion (%)	Pr(>F)
log10(0.5 + $Rain_{Sum6}$)	30.081	28.05	< 2.2e-16
WB_Total	14.196	13.24	< 2.2e-16
$Month_{factor}$	5.568	5.19	4.82E-14
SOI_3Pt	0.364	0.34	0.01468
Water stored[1]	0.206	0.19	0.06597
Residual	56.813		
TOTAL Sum Sq.	107.228		

[1] Although possibly not significant, deletion from the model caused AIC to increase from 55.11 to 56.54.

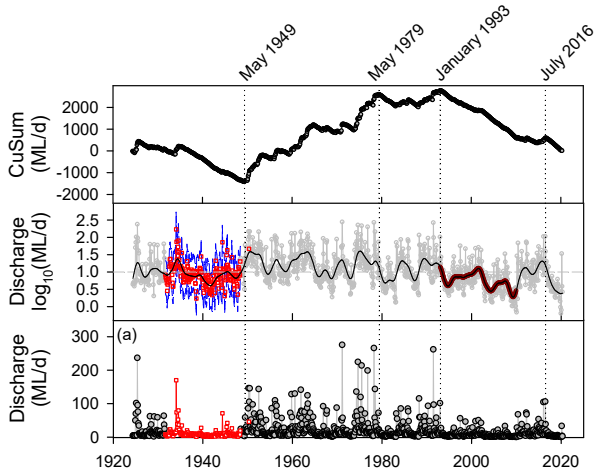


Figure 9. Monthly discharge for Rutherford Creek near the crest of Brown Mountain (bottom panel) is skewed by infrequent high values. Conversion to logarithms (centre panel) rescales the data so they are more normally distributed (symmetrical) about their re-scaled mean (horizontal dotted line). Values between August 1931 and May 1948 (red squares) were predicted by multiple linear regression (Table 1) and are shown back-transformed in the lower panel and with 95% prediction intervals (dashed blue lines) in the centre panel. The spline curve fitted *post hoc* using PAST[1] tracks stochastic multi-year changes in discharge due to sustained changes in rainfall (the period from January 1993 to December 2009 is highlighted). The CuSum (top) shows discharge was cumulatively below the mean from the start of the record in May 1924 to the break in May 1949; above the mean until May 1979 before levelling off then reducing again from March 1992 and continuing from July 2016 (turning points were determined by-eye).

Over the last several decades the community at-large has been grievously misinformed about the nature, causes and likely direction of past and future climate changes. The idea that government policies could control the weather: prevent droughts and floods and bushfires for example, is patiently both naïve and absurd.

Multiple lines of evidence (anecdotal, climatic, water balance and streamflow) show the climate of the South Coast and elsewhere (Appendix 2) has always been changeable and that due to sustained phase-changes, most notably in about 1900, 1949, 1964, possibly 2010, and 2016 the climate is non-stationary - attributes such as averages, measures of variability including percentile ranges and possibly seasonality may not be the same across epochs. Changepoints are random in the long-term

[1] Hammer, Ø., Harper, D.A.T., Ryan, P.D. 2001. PAST: Paleontological statistics software package for education and data analysis. Palaeontologia Electronica 4(1): 9pp. http://palaeo-electronica.org/2001_1/past/issue1_01.htm

and possibly related to some natural phenomenon; however, there is no empirical evidence they are related to anthropogenic factors. Furthermore, by far the most trying periods of low rainfall leading to sustained soil moisture deficits occurred during the first half of the 20th century not post-1993.

Dry forests have always burnt – that is why they are dry forests and well adapted to irregular fires. Cursory examination of newspaper reports and manuscripts showed periods when fires were more widespread and severe than at other times and in general those corresponded with changes (sometimes quite brief) from seasons that were generally moist to ones that are successively dry. The 1880s, for example; 1939, the 1960s, 1980s, 1990s and now following a decade of average to above average rainfall, 2019/20.

It stands to reason that forest-fuels accumulate during runs of years of above-average rainfall and that successive years of low rainfall are conducive for them to burn.

4. Bushfire management in a non-stationary climate

From a fuel and area perspective, the risk of contiguous wildfire is highest for inaccessible, unmanaged public land and on the South Coast, provided rainfall in February or March is sufficient to reduce flammability and other factors such as wind, relative humidity and air temperature pose low to moderate risk, the window for 'cool' burns **opens in April after the wet season finishes and closes in mid to late June** before the onset of dry, gusty to strong, southerly and south-westerly winds in July, which may persist until September.

Winters are cloudy, cold and dry and failing to reduce fuel-loads year-on-year invites catastrophes of the kind recently experienced on the South Coast and elsewhere, including in November and December 2019 on the central and north coast of NSW, where at Wingham for instance (BoM ID 60036), rainfall in 2019 (378.8 mm) was the lowest since records commenced in 1889 (Figure 10). [As the closet continuous dataset, Wingham is representative of the situation for areas in the vicinity of Johns River, where one person tragically perished after the village was surrounded by fire in November 2019.]

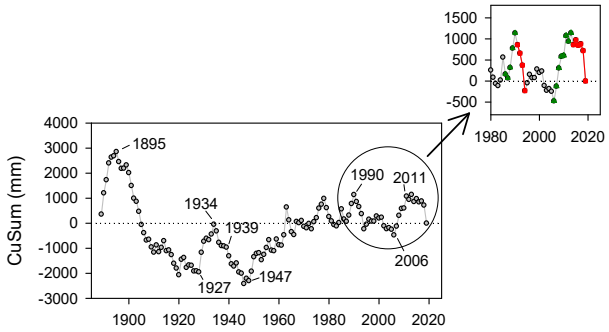


Figure 10. Annual rainfall at Wingham was cumulatively above average from the start of the record in 1889 to 1895 when conditions turned dry (the Federation drought). Rainfall remained cumulatively below the average until 1927. Following a brief respite to 1934, continuing low rainfall until 1947 became known as the WWII drought. Except that 2019 was the driest year on record (see insert), conditions since the well-documented mid-20th century climate-shift have remained relatively benign. Rainfall is stochastic and episodic and despite irregular runs of above and below average years, there is no evidence that it is declining systematically due to an unnatural factor.

Issues that contributed to the severity of the 2019/20 fires were:

- **<u>Complacency</u>: belief that after the drought broke in 2010, the worst had past and that favourable conditions would persist.**
- **<u>Failure</u> to appreciate the role of soil water balances on fuel build-up in national parks and reserves, and the potentially devastating impact on flammability when conditions turned dry.**

- **<u>Convergence of factors</u>. Although different by degrees, as drought took hold along the eastern seaboard in 2016, CuSum curves for the >40 datasets analysed (Appendix 2) showed antecedent conditions were broadly similar from Victoria to Queensland. Irrespective of ignition sources, following drying from the decade or so of forest growth was primed to burn.**

If it were just the South Coast or the North Coast, fires would have been less extensive. However, as conditions changed in unison resources were stretched beyond the limit of perceived risk. The scientific debate has been hijacked; for reasons already explained, there is zero possibility that the extent or ferocity of recent fires were unprecedented or related to anthropogenic factors. The simple formula is that successive wet years are conducive to photosynthesis, which accumulates carbon in the landscape while dry years promote carbon oxidation.

It's a simple cycle:

In wet years CO_2 + water = biomass;

In dry years biomass + fire = CO_2 + water.

The distinction between bushfire and wildfire is determined by the degree of intensity of the burn, which is related to antecedent conditions and fuel-load. **Royal Commissions, inquests, reviews; papers by former CSIRO experts and state government research groups and briefing papers produced by parliamentary library services (e.g. https://www.aph.gov.au/ About_Parliament/Parliamentary/Departments/ Parliamentary_Library /Publications Archive/CIB/cib0203/03Cib08) have repeatedly concluded that although bushfire occurrence (frequency) won't necessarily decline; managing fuel loads especially in the vicinity of settlements reduces fire-intensity so fires do less damage and are more likely to be controllable.**

Exemplified by rainfall and water balance data for Wingham (Figure 11) the situation on the central and northern coast of NSW is somewhat different to that in the south. Evaporation declines rapidly from February, but rainfall from December to March is higher and more dependable. In most years, soils accumulate moisture from March to June before declining through spring.

So while the window of opportunity for targeted cool-burns in the south is from April to June, climatic and water balance analysis indicates spring (from August to October) may be more opportune in the north. The situation is of course dynamic and dependent on specific circumstances; however, as stated over and over, the goal is to reduce fuel levels pre-emptively before the fire season, especially in the proximity of settlements.

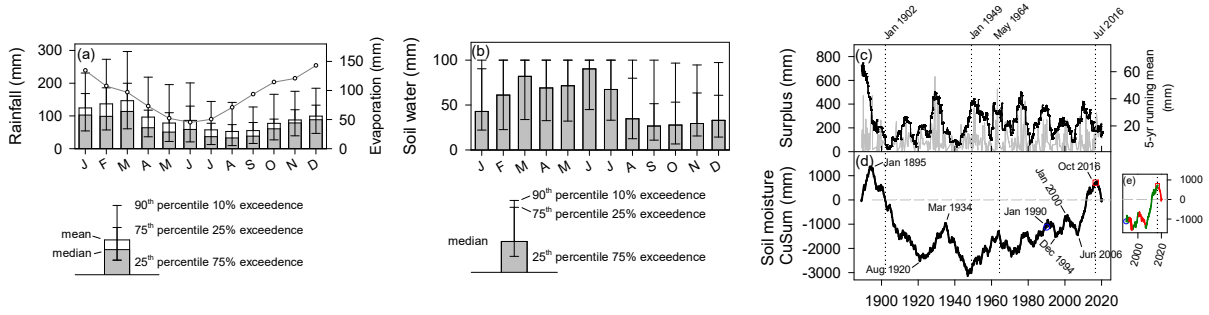


Figure 11. Monthly rainfall (a) and estimated soil water status statistics (b) for Wingham from 1889. Runs of above and below average rainfall years result in considerable variation in the generation of surpluses (c), while the CuSum graph (d) shows phase changes consistent with the climate being non-stationary. While the longest drought was from January 1895 to August 1920, anecdotally, the most serious and consequential drought was from March 1934 to January 1949. Favourable conditions from January 2006 to about October 2016 were conducive to fuel build-up in native forests, woodlands and pastures.

5. Legislative provisions and bottlenecks

There exist major legislative hurdles to the implementation of pre-emptive fire control strategies. According to Smith (2002) (**https://www.parliament .nsw.gov.au /researchpapers /Documents/bushfires/05-02.pdf** p. 5) while "land managers in NSW such as government agencies, local government and private landowners have the legislative responsibility for undertaking hazard reduction activities", "environmental requirements of the Rural Fires Act (1997) have made hazard reduction burning more difficult, and hence there has been less of it".

The crux of the problem is the incompatibility of the legislated requirement to reduce hazard *vs*. the legislated requirement to take account of vaguely defined "principles of sustainable development".

Neither objective sits comfortably with the other.

At one extreme, not undertaking hazard reduction vastly increases the risk of intense uncontrolled wild-fire capable of decimating ecosystems when landscapes dry-out; at the other, taking account of *principles of ecologically sustainable development* vastly increases the complexity of doing something, which minimises the likelihood of undertaking hazard reduction action in the first place. In addition, in the context of hazard reduction activities 'principles of ecologically sustainable development' are not specified or outlined in the *Rural Fires Act* (1997), but are defined in section 6 (2) of the *Protection of the Environment Administration Act* (*1991*), which makes the workings of the former Act unwieldily or even uninterpretable for local decision-makers, volunteers and landholders.

Smith (2002) further states on p. 13: "The (Rural Fire) Service is to have regard to the principles of ecologically sustainable development in carrying out any function that affects the environment, which can be interpreted to mean any function they undertake. Services defined in the Act include: services for the prevention, mitigation and suppression of fires in rural fire districts; the protection of persons from dangers to their safety and health, and property from destruction or damage, arising from fires in rural fire districts (section 9)." **This implies that if it were not 'ecologically sustainable', protection of persons and property would be illegal under provisions of the *Protection of the Environment Administration Act* 1991.**

Also on p.17 Smith pointed out that "the Act requires the Bushfire Co-ordinating Committee and the Bushfire Management Committees" [of which there are substantial numbers of members representing many organisations, some of which are not directly involved in a operational sense (p. 14)] "to have regard to the principles of ecologically sustainable development in carrying out any bushfire management activities which may affect the environment." Smith goes on: "R. Conroy of the NSW National Parks and Wildlife Service states that the [numerous] approving authorities must ensure that the environmental impacts are mitigated in undertaking or permitting fire prevention activities (such as prescribed burns; clearing of fuel; or fire trail construction; and wildfire suppression activities such as the use of fire retardant and foam and the construction of wildfire control lines)."

Little wonder nothing gets done. While the NSW *Rural Fires Act* (1997) compels the RFS, which is staffed by volunteers, to protect persons and property; due to onerous 'sustainable development' provisions it could be illegal for them to do so. From the bottom up the sign-off and approval process seems insurmountable. For example, given that decisions are made site-unseen, which of the organisations involved in the approval process have the power of veto and on what basis?

It is also sobering that on pp. 26 and 27 Smith (2002) quoted the President of the Rural Fire Service Association as writing: "*Why is [hazard reduction] too hard? Simply the level of bureaucracy involved is such that there is too large a burden on volunteers and the amount of environmental legislation that needs to be coped with too extensive. **People have literally 'given up'**!* [unquote]; also that: "The NSW Legislative Council Committee Inquiry into the Service [in 2000] also

received submissions and evidence that the environmental provisions of the Act are making hazard reduction burns more difficult."

From the community's viewpoint it is simply disgraceful that after considering submissions and evidence the Committee stated in its report that it "does not support any amendment to the Act that would weaken its environmental provisions." **So the problem lays with the green-lobby not the volunteers or the victims and it is up to the Parliament to untangle the mess**.

It is an absolute priority that Commission of Inquiry sorts out the conundrum by recommending the law be changed.

6. Setting the stage for the 2018 Tathra fire and recent fires on the South Coast – a personal perspective

Farmers and hands-on natural resource manages including foresters are well aware of relationships between seasonal rainfall, forage and biomass accumulation and future risks, including that of fire.

In the vicinity of Bemboka it was obvious by 2013, that following drought-breaking rains in February and May 2010, biomass accumulation in nearby forests and woodlands was reaching potentially cataclysmic levels. Rain had stirred germination and regrowth; ground-cover biomass had increased to an estimated 5 to 7 tonnes/hectare and the district was so relieved that drought ended, that people were unprepared for the prospect of a dry summer in 2014.

As a landholder, I informally approached the Captain of the Bemboka RFS and the district (BVSC) Fire Control Office in February and March 2013 expressing concern at the situation and requesting hazard reduction be implemented in forests on the eastern fall of the range south of the Snowy Mountains Highway by way of a cool autumn burn. I had been in there through my neighbours property and observed the problem first-hand.

It was all too difficult: paperwork would need to be done by local RFS volunteers; approvals would be necessary from Bruce Leaver's NPWS Far South Coast Regional Advisory Committee and NSW State Forests whose nearest Officer was Bombala and who were hostile to the idea; there were biodiversity considerations; potential aboriginal sites of 'cultural significance'. Due to the barrage of climate-change rhetoric from well-organised greenies in Bermagui and Tathra, the Bega Valley Shire Council were also not supportive.... finally a submission (with attached recommendations) would need to go up to Greg Mullins' (NSW Fire Commissioner's) office where it would have to do the rounds of the various 'stakeholders' and there was little hope that it would be approved. **It was February 2013, conditions for a cool-burn were excellent and I was mindful that the time-window closed in mid to late June.**

The administrative and bureaucratic roadblocks made the prospect of achieving hazard reduction before the 2014 bushfire season and subsequent summers, impossible in all respects. **From that time, it was not a matter of *if* but of *when* calamity would strike.**

I wrote several letters to the Editor of the local newspaper, the *Bega District News* outlining the issues and pointing out the importance of reducing the bushfire hazard in advance of the next dry summer. Some of my letters, which were routinely rebuffed by local greenies are attached (Annexure 3). **It was not climate change; rather it was failure of the hopelessly over-coordinated bureaucracy to take timely action to reduce the hazard**.

Furthermore, years of above-average rainfall have an additive impact on 'hazard'. Germinating seedlings become whipstick brush, then trees, then mature trees and likewise for all classes of undergrowth. Before tapering-off at a level that can be described as a site's carrying capacity, biomass accumulates exponentially. If unchecked, hazard increases in proportion until the point is reached that the situation is impossible to mitigate without undue risk and undesirable consequences.

As rainfall is episodic and non-stationary and it was predictable that biomass would continue to increase at least as long as rainfall remained favourable; stymied by greentape the community was unprepared for what happened after dry conditions re-established in 2016.

Although we had left the Bega Valley by the time it occurred, the Tathra fire on 18 March 2018 was a harbinger of what was in store as the landscape continued to dry. Although ignition was due to failing electricity infrastructure, its ferocity and the damage it wrought was directly related to the build-up of fuel in surrounding forests since the drought broke in 2010. It was a wake-up call but no one was awake, especially in the top echelons of the RFS – the Commissioner and all the various 'stakeholders' that were essentially in the way of pre-emptive fuel reduction that I called for in 2013.

Based on an analysis of local climates such as outlined in Figure 2, Figure 3 and Figure 5; water balances (Figure 6, Figure 7 and Figure 11) and landscape responses to drying (Figure 8 and Figure 9) rules of thumb can be devised to assist risk assessment and the planning of mitigation strategies.

For the Bega district:

- Indicated by a running cumulative sum of deviations from the mean, as the landscape commences a drying cycle and summer rainfall fails to materialise (i.e. rainfall is around or below the 25th percentile - about 25 mm/month from December to March), weather is likely to remain warm into autumn and due to the rainfall pattern and likelihood, the risk of fire **the following January** increases exponentially. The window for mitigation (which could be hazard reduction burning, slashing of roadsides, preparing fire trails and breaks etc.) is from April to June **of that year** (i.e. early in the drying cycle).
- In the absence of effective rainfall in March, upper-quartile rainfall in February (greater than about 100 mm) is exhausted by evaporation by the end of April. However, the same rainfall a month later likely provides soil moisture until June. Rainfall less than the lower-quartile (25th percentile) in February with no follow-up in March is the precursor to a dry and difficult winter, with the next useful rains not likely before November. It is this scenario that causes the landscape to dry and forest fuels to build-up.

  So timing of the 'last' significant rainfall in summer is a critical benchmark for forward planning for winter when plant growth, including that of grasslands and forests is least.
- If nothing gets done routinely; if villages are not protected, depending on the timing of ignition the likelihood of fire will increase from year to year going forward until commencement of the next dry-cycle, when the risks will escalate again.

From Gippsland to the North Coast of NSW and southern Queensland, irrespective of whether fires were deliberately lit or not, it can be fairly said the calamity of the so-called Black-summer bushfires resulted from a lack of appreciation of the emerging 'big-picture' problem; and of government policy and bureaucratic failures, not the climate.

Dr. WH Johnston

22 May 2020

Appendix 1

Bushfires in the Bega Valley: An historical context

NSW Meteorologist Mr. Newman said a heatwave covered the southern half of Australia and the temperature over great areas of Victoria, South Australia and New South Wales exceeded 40 degrees. There were many bushfires, with record March Temperatures in all states except Queensland. Melbourne experienced five consecutive days of around 40 degrees; Adelaide, 6. Bega reached 40 degrees; drought conditions prevailed over all of NSW, except for the North Coast. It was the 12 March 1940.

On Thursday 12th January 1939, Mr Underhill died in the Bega Hospital from burns. In the district, 11 homes, a school and 3 churches were wiped out. Fire fighters saved the farms and homes of Jack Hergenham and Les Hetherington in Coopers Gully. The Pericoe School and Post Office were destroyed; women and children sheltered in the bed of the Towamba River. Bourke experienced 27 days over 40 degrees. Canberra's official temperature was 42.5 with 5 days over 40; Queanbeyan reported 43.3 degrees.

Except that 46.1°C was reported officially on 11 January in Bega; 1939 was a re-run of the 1866; 1875 and 1884 fires.

(In 1875, two cyclones were reported off the Western Australian coast that were so intense they were tracked from 2000 km away by seismographs - sensitive instruments, usually used to detect earthquakes. The cyclones eventually bought a welcome change in the weather in that State.)

The 1939 fires in Bega were also a re-run of the 1929 fires that destroyed the village of Numbugga, its school; teacher's residence and Post Office; and thousands of acres of farmland.

In 1940, it repeated again. There were fires around Cobargo; 5 houses and a general store were burnt in Tathra; a police car was destroyed; many residents escaped by sitting in the sea and under the wharf.

In 1946, 200 people fought desperately to save Wolumla from a fire that had been raging in the hills for a fortnight. They won. On January 7th Sydney experienced the hottest night in its then history; hundreds camped on beaches up and down the coast; 3 people died and 40 collapsed.

On January 25th 1952, fanned by strong, hot westerly winds, flames came out of the mountains to the north and almost burnt-out Bemboka. Some people still remember fighting those fires (https://www.begadistrictnews.com.au/story/3525894/wind-roared-as-bushfires-ravaged-bega/).

The 1952 fire claimed four lives including the Otton Sisters of Upper Brogo. Hundreds of people fought to save the Bega Hospital. At least ¾ of the farmland in the Bega district was burnt out. Butter production was suspended for months.

There have been others in-between, but then most recently came 2013 when we all remember being advised to exercise our "fire plans" in January.

The common theme of these disasters was a year-or-three of good forest and pasture growth; another-or-two of average to below average rainfall; followed by a protracted dry winter-spring and summer.

Under slow-moving high pressure cells that sit over Alice Springs for days and weeks, searing temperatures radiate from a dry landscape larger than half of Europe. As they move slowly east, southeastern Australia is exposed to dry, strong, hot westerly and southwesterly winds that fan out into the Tasman Sea into a trough.

That basically is the recipe for fire-disasters on the South Coast.

Putting out fires is high risk and no fun. The time to act is not after the systems form, but well before. Its one thing to lock up millions of hectares in order to "protect" it; its quite another to

manage the risk so it doesn't turn into a summer fire-ball, which decimates everything as it has so many timed in the past.

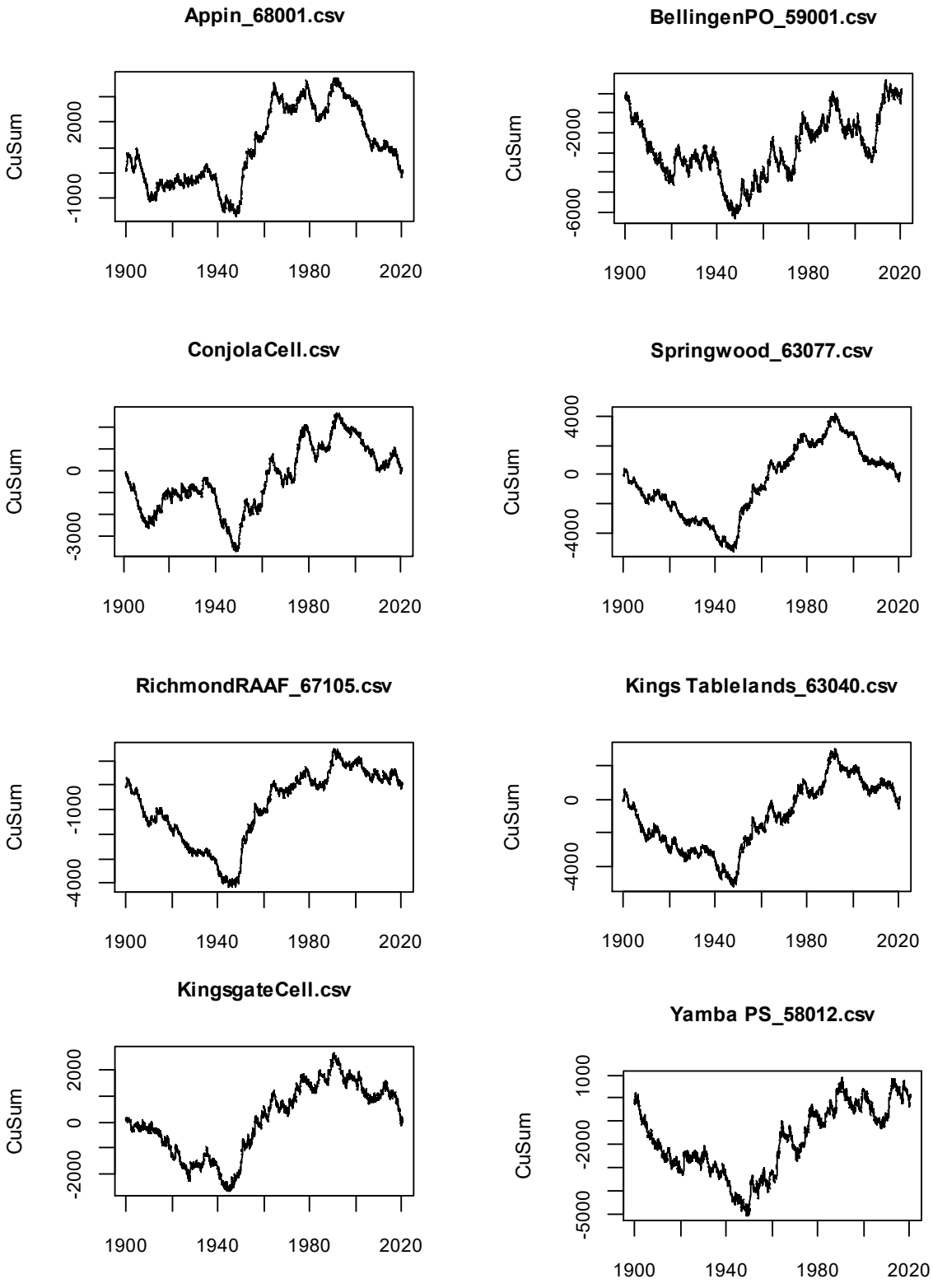
Carbon won't stay "locked up" in our forests. We have till August to reduce fuel loads right along the eastern escarpment from north of Brown Mountain to Victoria or we face a heightened potential for disasters to unfold all over again in 2014.

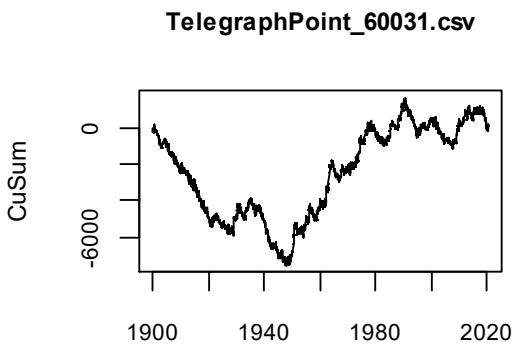
Bill Johnston

Original dated 23 March 2013

Appendix 2.

Cursory examination of cumulative deviations from long-term rainfall averages for selected coastal-fringe rainfall stations in NSW.

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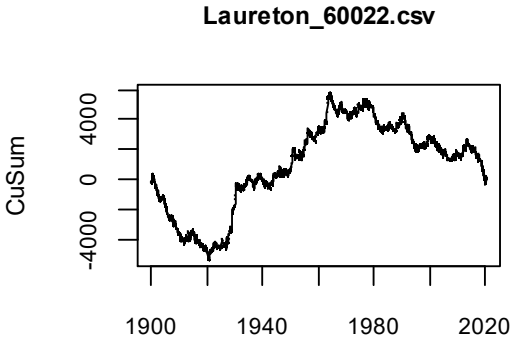
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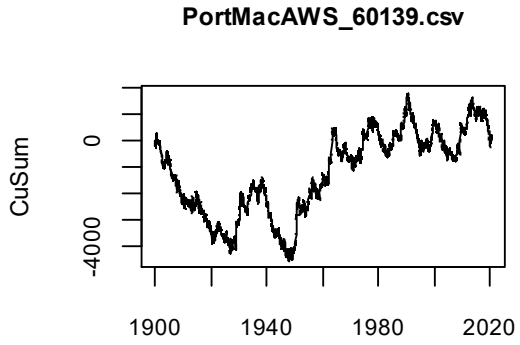
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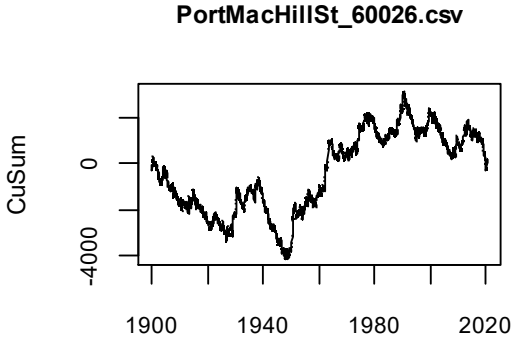
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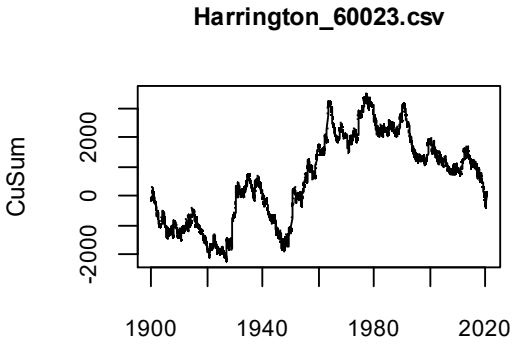
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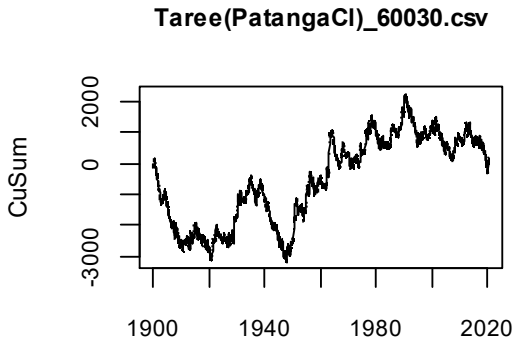
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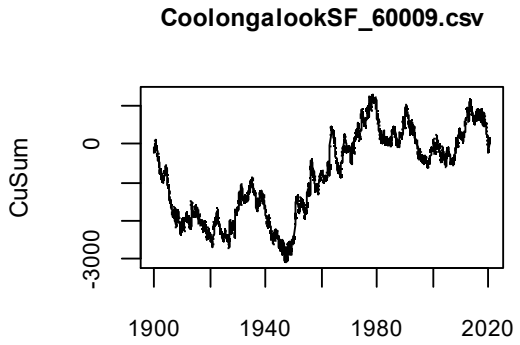
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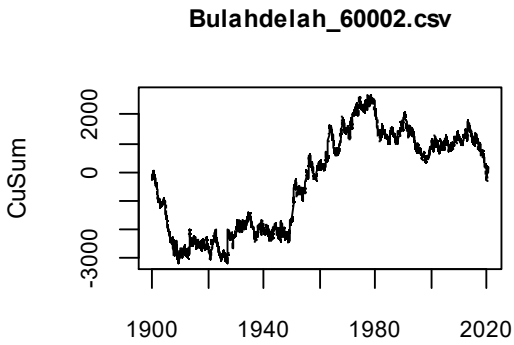
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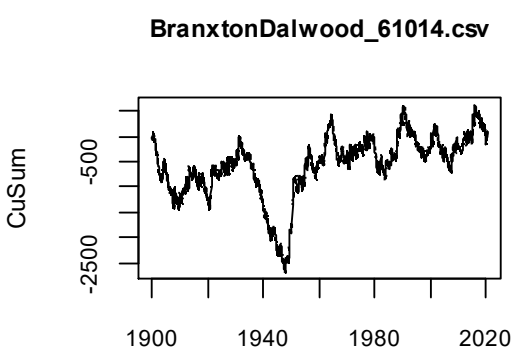
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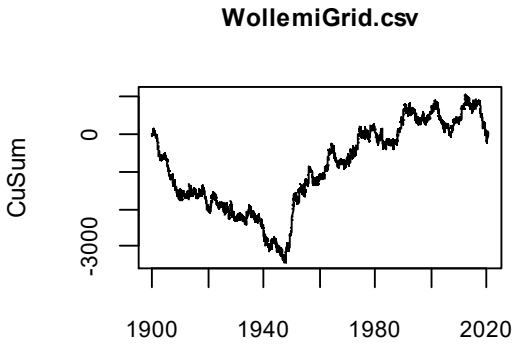
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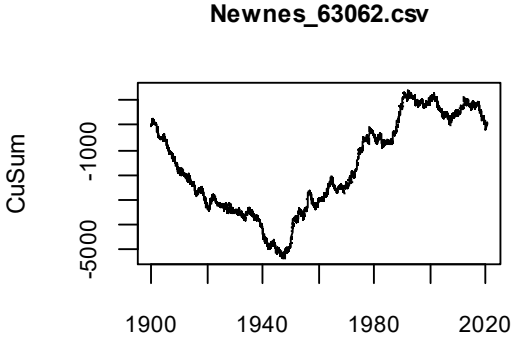
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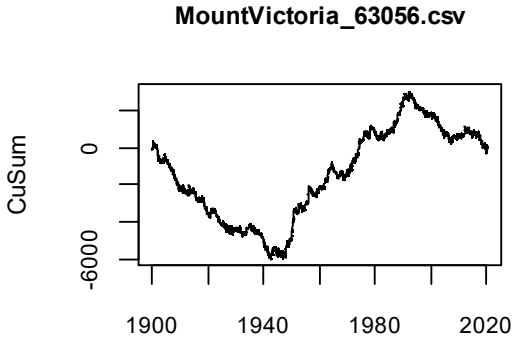
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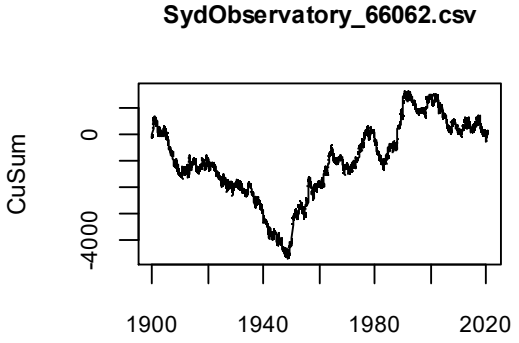
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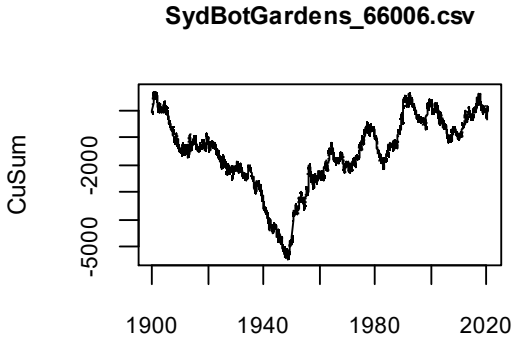
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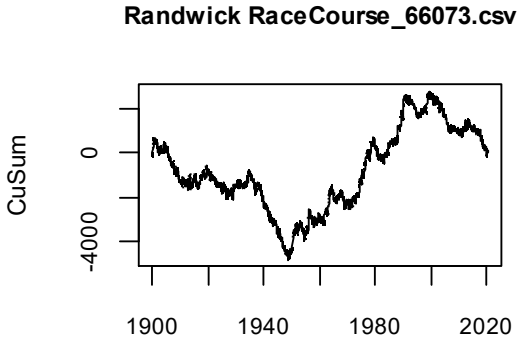
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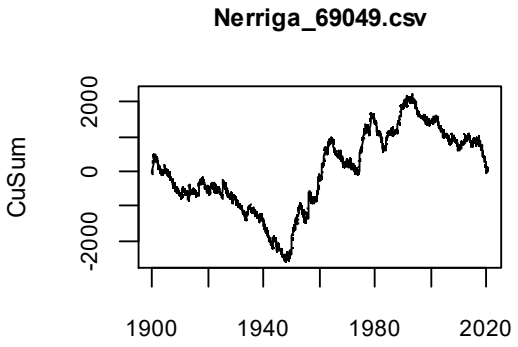
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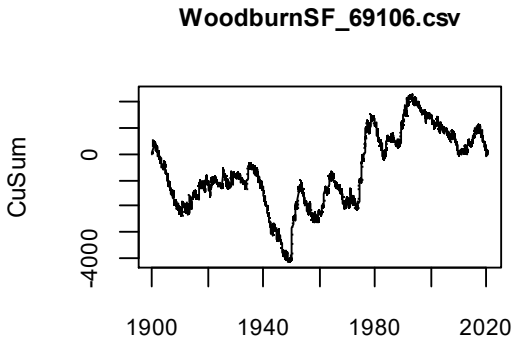
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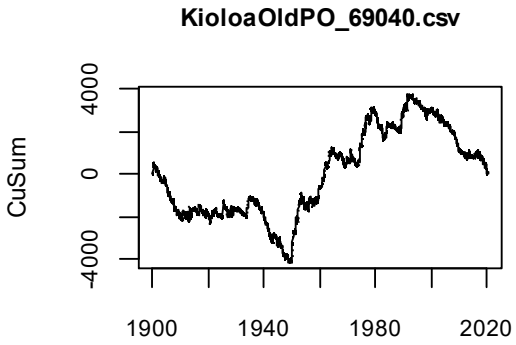
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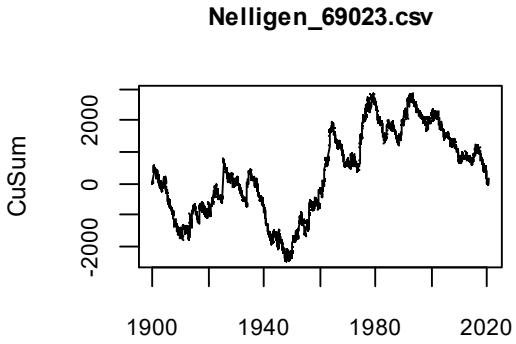
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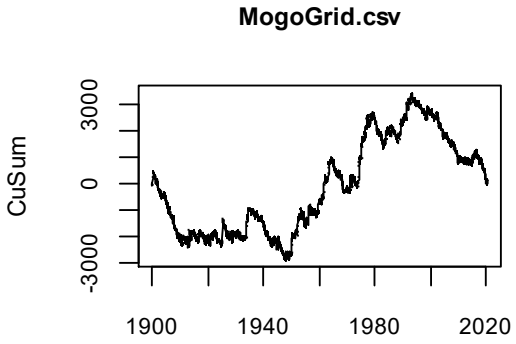
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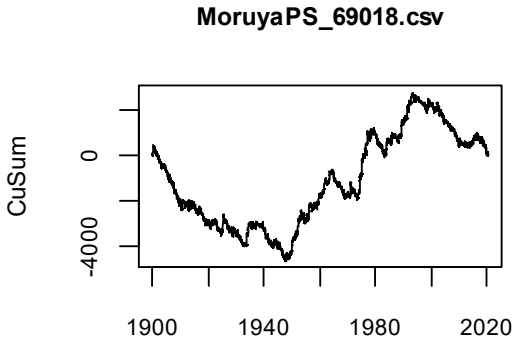
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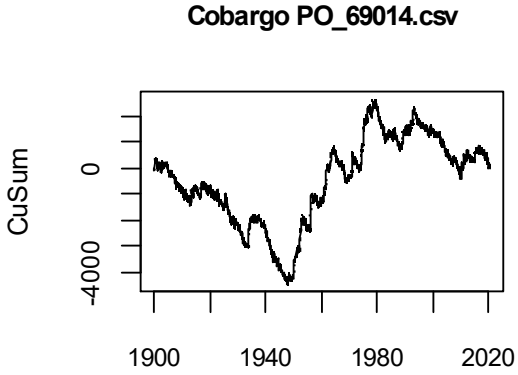
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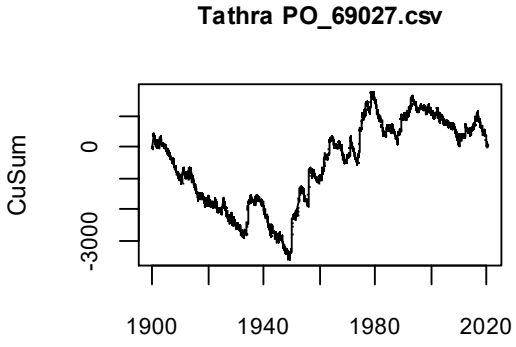
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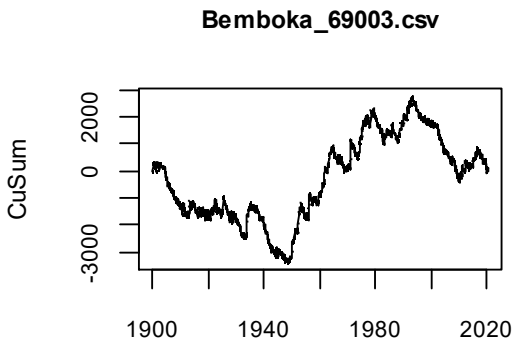
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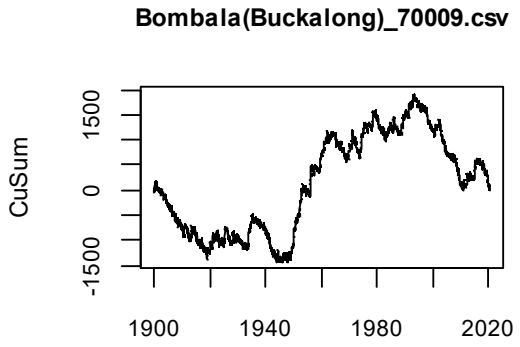
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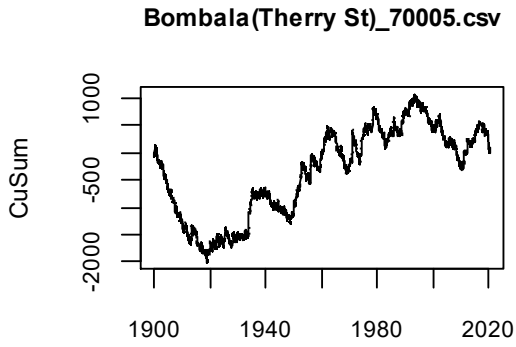
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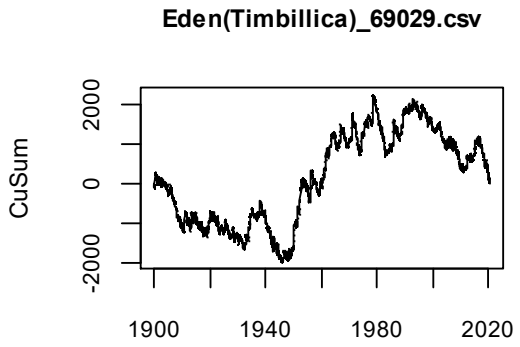
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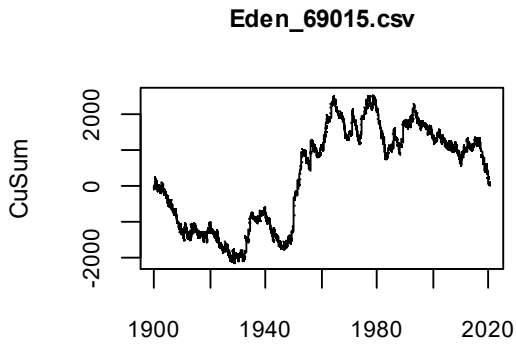
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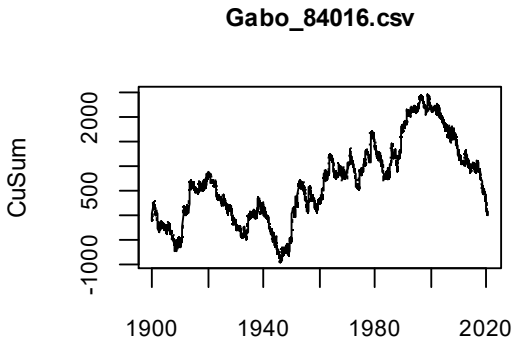
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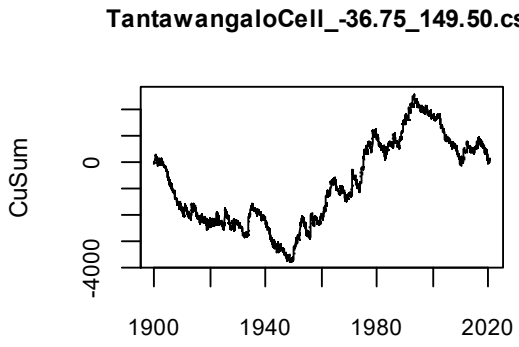
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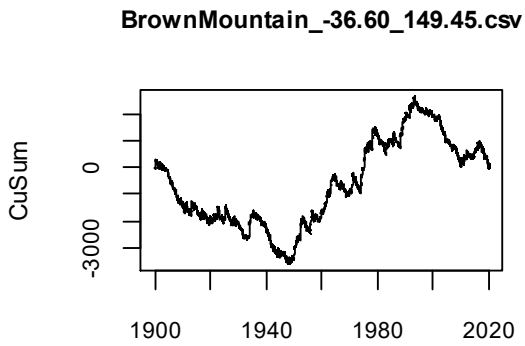
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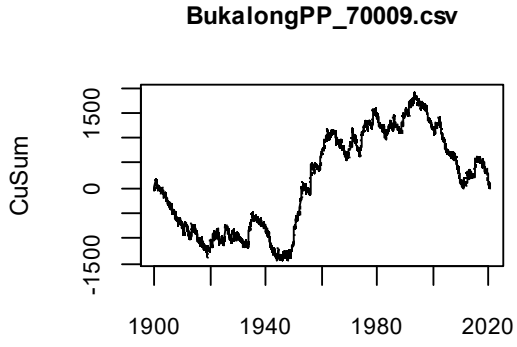
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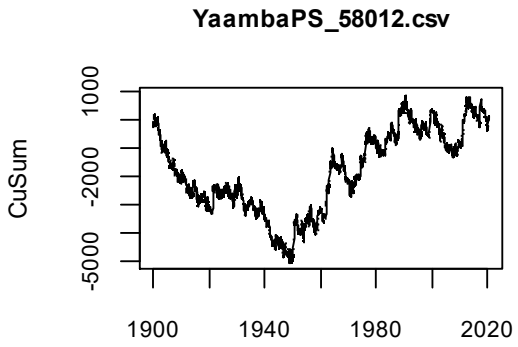
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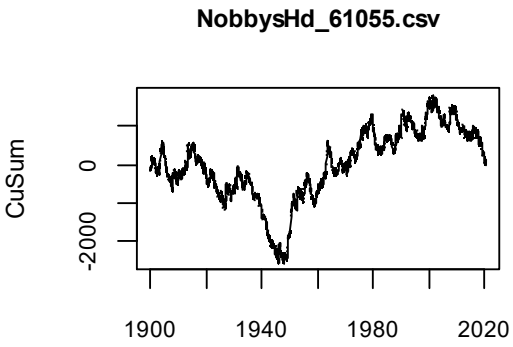
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Appendix 3.

A sample of letters published by the Bega District News (https://www.begadistrictnews.com.au/)

Letters to the editor (Bega District News)

January 22 2013 - 9:25AM

Propensity to burn (Johnston)

Jo Dodds and Matthew Nott (BDN, 11/1), most of Australia becomes hot, dry and flammable in summer.

The technology of firefighting has vastly improved, but the propensity for the landscape to burn has not changed.

The First Fleet settlements at Sydney Cove and Parramatta were almost wiped out by bushfires and an El Niño that occurred from 1789 to 1799.

Drought and fire struck again in 1809-1811 and 1813 to 1815.

Right up to today, conditions through the 1820s to '40s were the most extreme since European settlement.

Lake George dried up in 1827.

In 1829 Charles Sturt found the Darling River reduced to scattered saline pools and that many of the local Aborigines had perished from heat and lack of drinkable water.

By 1839, the Murray River ceased to flow near Moama and the Murrumbidgee went dry between Gundagai and Wagga Wagga.

On Black Thursday, February 6, 1851, mid-morning temperature in Melbourne reached around 47 degrees Celsius.

By that afternoon, driven by gale-force north-westerly winds, the whole colony had exploded into a cauldron of fire, falling ash and debris.

In Devonport, Tasmania, the sun went out in the mid-afternoon and charred fragments fell thickly. Many thought it was the end of the world.

The period from the 1820s to the mid to late 1830s experienced the highest frequency of El Niño events since 1400 - the heat and droughts were relentless and fires unstoppable.

Around 100 years later, in December 1938 and January 1939, the calamities repeated.

From early January 1939, Wagga Wagga recorded more than 20 days over 38 degrees.

Many western towns experienced over 30 continuous days with temperatures in the mid-40s.

On Black Friday (January 13) fires burnt in inner Sydney, the Blue Mountains, west to Bathurst, the Southern Tablelands and the South Coast (Bega was surrounded).

Victoria also burned and there were fires around Adelaide.

Later in January, Tasmania was burnt.

Compared to the 1820s and '30s today's climate seems benign.

For data I've looked at, although risks have not abated, there is little evidence the frequency of extreme events has increased, or that recent climate events are unprecedented.

Jo and Matthew instead of jerking your knee every time you come across some biased information that feeds your climate-warming fantasies, try reading some history.

I've referred to "Burn – the epic story of bushfire in Australia" by Paul Collins (Allen & Unwin), 2006. Also, "Droughts in Australia" Bulletin No. 43; Bureau of Meteorology, 1957.

Bill Johnston

Bemboka

March 8 2013 - 8:57AM

A take on history (Johnston)

To Matthew Nott, Doug Reckord and Paul Collins, (BDN, February 15, 19 and 26).

Paul your book "Burn – the epic story of bushfires in Australia" convincingly supports the long-known link between natural climate changes and recurrent bushfires.

The El Niño seesaw of floods and droughts drives the endless cycle. La Nina grows the fuel; El Niño sets the stage for it to burn.

February 7, 2009, Melbourne: by 10am, sand-blasted St Kilda Beach was intolerable; in the shade it was 46 degrees. By 11, it was deserted. By 2pm the sun blacked-out.

The west to south-westerly force 7-8 wind carried a furnace-load of years of inland drought.

It was El Niño doing what it's always done not climate-warming - and I was there.

Web-available "A climate reconstruction of Sydney Cove from 1788 to 1791 …." tells of food shortages and starvation caused by drought and the disastrous loss of the former First Fleet flagship and intended supply vessel HMS Sirius at Kingston, Norfolk Island in 1790.

Sydney's summer temperatures back then, approached and often exceeded 40 degrees in the shade. Summer days in 1790 and 1791 were so parched and hot, that birds and bats fell out of the sky stone-dead.

At Rose Hill, Governor Arthur Phillip recounted that more than 20,000 dead bats could be observed in the space of a mile.

In another book, eight scorching droughts between 1788 and 1830; early ones led to a desperate search for land to grow food and encouraged crossing of the Blue Mountains in 1813.

It refers also to a "great drought" suspected to have ended some 40-years before settlement that "killed the deepest-rooted trees".

History stares down the fantasy that our climate has measurably warmed; that climate change is unnatural; its effects peculiar to our time; and, that it would be "controlled" by a tax.

A long cold shower is called for.

By the time I'd read the factual side of Paul Collins' excellent account the wheels had already fallen off CSIRO's global-warming battlewagon.

Drought had ended, dams predicted never to fill again were overflowing, and within just a month or two the Murray-Darling Basin was brimming with "health".

Years of disaster marketing, lead mainly by WWF and its related Wentworth Group, was made redundant overnight by nature's naturalness.

The sternest message from our climate history is that scenes from the past will certainly revisit. Despite Paul Collins' personal views, the issue of controlled burning of all our forests needs to be firmly on our local agenda, or in 2014 we'll likely see 1938 and 1952 all over again.

It won't be climate change it will be green-washed institutional stupidity.

Bill Johnston

Bemboka

Lies and statistics (Dodds)

Interesting that Bill Johnston should ask about dishonesty (BDN, 19/2) because it seems that he's been misrepresenting the arguments of his quoted sources. Why Bill, can't you find any "facts" that suit your purposes?

Jo Dodds

Bega

May 21 2013

History a click away (Johnston)

Jo Dodds (BDN, 16/4), data and social commentary from the earliest days of European settlement is just a click-away.

Information of all kinds is freely available online (TROVE); and if that is not enough, in our National Library and other archives.

You could visit, research, deepen your understanding and broaden your horizons.

In this country, observing has been a national pastime - weather, tides, ship-movements, postal deliveries, the price of butter, divorces and deaths.

From all over the place happenings and data were telegraphed away; many were reported the next day in newspapers across the land.

Data is instantly accessible.

Daily rainfall for Bemboka (from 1889), Candelo (1887) and Bega (1879); tide levels for Eden, Bermagui and Port Kembla; temperature data for Newtown Road, Bombala and Moruya to name a few.

Climate did not start in 1910. Historical data and commentary from all over the place disputes the Climate Commission's conga-line of chattering professors.

The commission relentlessly marketed the long-hot 2002-2010 El Niño drought as global warming.

Since it ended, their theme has switched to climate change.

Both are fantasies.

A historical lesson for us is that we could again experience around 700mm of rain in four days like in 1898; or another 15-or-so years of drought like in the 1940s; or another overwhelming gale, like the May 1898 Maitland gale; or another bushfire like in 1952.

For elsewhere, it could be blizzards like in 1898-1903. Cyclone Sigma wrecked Townsville in 1896. In 1974, cyclone Tracey hit Darwin destroying 80 per cent of the houses. Rainfall records were broken all over the place. Another cyclone hit Mackay in 1918; Bowen in 1918 and 1970. The tornado at Nevertire in 1876 blew the place apart and even knocked horses off their legs.

For more than 100 years the 1852 flood at The Crossing Place (Gundagai) was Australia's most devastating natural disaster.

The 2011 flood-height in Brisbane was only the seventh highest since 1840.

From time to time hailstorms have devastated all our major cities.

Since the day records began, floods, tornados, wind and hail have cut swathes of destruction across all states.

Unfortunately for the Climate Commission, history exists and it contests most of what they claim.

Bill Johnston

Bemboka

April 16 2013 - 8:49AM

Other priorities (Dodds)

Sorry Bill, I got caught up absorbing the recent data coming out of the Climate Commission that indicates, among other things, "climate change is already increasing the intensity and frequency of many extreme weather events, adversely affecting Australians".

And "climate change is making many extreme events worse in terms of their impacts on people, property, communities and the environment".

And even "the climate system has shifted, and is continuing to shift, changing the conditions for all weather, including extreme weather events".

So, I haven't got around to addressing your request that I apologise for suggesting you'd mislead me.

Sorry.

Now, I understand that you have a significant academic qualification and I'm going to presume (let me know if I'm wrong) that you understand the concepts of peer-reviewed science, empirical facts and "straw man" arguments (misrepresenting someone's argument to make it easier to attack).

Paul Collins, the author of the book you suggested I read, presumably (again, let me know if I'm wrong here) because you were suggesting it supported your claims against climate change and increased bushfire risks, wrote to this paper absolutely contradicting your reading of his work.

Which gets us back to - you guessed it - you were misleading me!

And before you get all huffy again, you did call me a knee-jerking climate change fantasist not that long ago.

And I took that on the chin.

If you want to read the full report from the Australian Government's Climate Commission, it's available here: climatecommission.gov.au/wp-content/uploads/Extreme-Report-Key-Facts.pdf.

Jo Dodds

Bega

January 21 2014 - 7:00AM

OPINION: Get real on fire, remove hazard reduction green tape

Bill Johnston, Bemboka

THANKS to Carr's Labor-Green government, NPWS owns 116,000ha of South-East forests, much of which was Forestry Commission lands. Much is also dry-forest occupying some 100km of rugged escarpment.

While local squeaky-greens selfishly think it's all about their narrow prescriptive views, including that former forests and associated fire trails ought to decay into disuse, they'll be the first through the exits when something seriously goes wrong.

Drought ended in 2011 with a run of good summer seasons.

Now we are entering a critical time.

Fire risk in our valley is escalating.

Escarpment forests are full of regrowth and fine fuel and we don't need much dry grass in surrounding paddocks to create a firestorm.

From a historical and science perspective, it's unarguable that fuel reduction across NPWS lands should have been implemented last winter and spring.

While authorities and professors run amok, flapping on about records, risks and fire plans, in our area NPWS seemed to have planned not to have a plan.

Together with the grass that's grown, a situation of little rain before mid to late-February (which Bemboka's rainfall record shows is not unusual), leaves us landholders close to the range facing issues that are rightfully NPWS's problem.

A lightning strike, a searing-hot day and a strong westerly wind could spell disaster for all of us.

Decisions about hazard reduction should not involve mountains of green tape.

They should be common sense, routine, strategic and targeted and we should not be in a position where, for most part, hazard in forests along the range has not been reduced for over 20 years.

Bruce Leaver, chairman of the regional advisory committee, should resign and take his committee with him.

They failed to exercise their hazard reduction duty of care.

We can't vote you out, so why not go all by yourselves.

Get out of the way and leave hazard reduction to the professional people in NPWS and RFS.

May 29 2018

Action on bushfires (Johnston)

Years ago I wrote to the editor of the Bega District News about the lack of hazard reduction burning and the complex web of green-approvals necessary before anything is done. Now everyone and their dog has a plan but still hardly anything is done.

The plans I've looked at ignore that rainfall around the Bega Valley is unequivocally episodic: episodes of a few good years followed by decade or two of average to dry conditions and a generally dry winter. January rain can be heavy (and is a blessing) but it makes up for lack of rain in spring and is quickly evaporated.

It takes about 100mm to fill the soil profile and as a rule-of-thumb if rainfall is less than (or around) 50% of the average for February and March (50% of 100mm/month at Bemboka, Candelo and Bega) winter will be tough. The next statistically likely month is June; however, from the end of March to September, days are too short and the sun too far north that except for fireweed nothing much grows. Excluding a chance storm or two the next likely and important month is February and so the cycle repeats.

After four or five good years understorey is thick but the bush is now drying out. July and August are windy, which reduces opportunities for pre-emptive fire management. While everybody has their plans, nothing gets done during the small windows of opportunity that may open and quickly close. The climate hasn't changed there are just too many meddlers peddling too many beliefs and not enough doers.

History will likely repeat after evaporation soars in December and hot westerly and northerly winds arrive on time in January. It's a fearsome prospect that there will likely be more fires than all the committees; peddlers and planners can poke a match at.

Dr Bill Johnston, ex-Bemboka

February 4 2020 - 7:30AM

Long-held concerns (Johnston)

As a landholder in the Bega Valley, I wrote to the editor (BDN, 21/1/2014) expressing my concerns about the lack of hazard reduction burning during small windows of opportunity mainly in autumn when cool burns were possible. I was rebuffed by loony greens from Bermagui and Tathra, in charge of the mountains of trash accumulating in parks and forests, in the naive belief it would change the climate. So they continued to sit comfortably on their hands and did nothing.

After a short visit to the Valley, I warned again of impending catastrophe in January 2018 and again in May, and despite the Tathra fire in March they still sat on their hands and did nothing.

These people and councillors lobbied into place by the Greens and their mates are culpable. Together with what remains of NPWS and Forestry they are responsible for the greatest disaster in living memory; probably since 1959 when much of the Valley was razed. Having done nothing to mitigate the problem they are suddenly into moving-forward, while the State Government who put in place the native vegetation laws 20 years ago wants everyone to look over there and blame someone else.

The shameful spectacle of the Prime Minister being abused in Cobargo instead of Bega Valley councillors and Andrew Constance, who are constitutionally responsible, beggars belief.

Bill Johnston, Port Macquarie, ex-Bemboka