

CHANGING CLIMATE CYCLES IN CENTRAL VICTORIA AND THE FAILING IRRIGATION SYSTEMS

By Kevin Long 1.1.2008



Lake Eppalock, Campaspe River
Location: S: 36° 51.22' E: 144° 31.57'

As a Central Victorian resident for 55 years, I have had a lifelong interest in studying the weather patterns and climate variations in this area. I have seen 3 distinct flood periods and 3 distinct drought periods; this has been consistent with the long-term pattern of one major drought period and one flood period every 18 years.

To get a more complete understanding of what's been happening with our climate I gathered numerous sets of rainfall figures and historical weather reports for this area and analysed them carefully.

The trends that have emerged, over 220 years, are profound. In the Central Victoria Region, starting about 1830, there were 44 years of generally above-average rainfall followed by 75 years of generally below-average rainfall. During those 75 years there were five major drought periods. This pattern appears to be repeating itself with approximately, 44 years of generally wetter than average conditions starting in 1952, followed to this point by 15 years of rapidly declining average rainfall (i.e. extended dry period).

This historical evidence suggests that this period of below-average rainfall will continue for the next 60 years, with small respites of wetter weather occurring approximately every 18 years.

The swing from a wet to a dry climate has on previous occasions been spread over 10 years with about 20% decline in average rain. In the past 20% less rainfall equated to about 40% less average stream flows.

However since the year 2000, stream flows have on average reduced by 70% to 90% in central Victoria.

In the dry period of 1876 to 1952, significant stream flows occurred mainly in the La-Nina years, usually 1 year in 4.

In wet periods however, such as 1952 to 1996, most reservoirs received significant inflows usually every second year, and when the major drought periods occurred they typically only lasted 1 to 2 years.

During the wet period 1952 to 1996 authorities evolved a 'water allocation system' demanding that up to 230% allocation be sold in most years. Even in the driest times, such as the last 7 years, no reduction from the 100% Water Allocation is ever considered until the system runs out of water. The Water Allocation's main aim was to help mitigate against floods and use up the excess water as soon as possible. When using this Allocation system during periods of minimal inflow, almost the entire reservoir's capacity is used up during 3 irrigation seasons. That has been the case since the beginning of the year 2001. All systems in Victoria have now failed to be managed sustainable, and most of the irrigation industry is now being destroyed by the current unsustainable allocation rules, known as the "Bulk Water Entitlements" (BE). These entitlements have not been reviewed in spite of the progressive and continuing failures in the whole system during the last three seasons.

The Bulk Water Entitlements do not include a conservation of water policy, and no drought reserve policy.

Central Victorians were saved from catastrophic disaster by a single 3 week rain event in October / November 2000. Without that 227 mm of rain measured at Metcalfe in the middle of catchment, little irrigation would have been possible from then to now.

During April through to the end of August 2003, above-average rain fell for 5 months totalling 372 mm, at Metcalfe. This above average rain period yielded only one third of the normal yield due to catchment change and dry subsoil profiles. That year 2003 was the "first rising Peak Rain year" of this cycle, the "second rising Peak Rain year" is due during 2007 – 2008, coinciding with the La Nina cycle, **again it failed to deliver in central Victoria.**

It now appears the drought will continue, through to 2012 perhaps longer, due to the intensifying Chinese Effect.

To make the rivers run in future we need approximately 300mm of rain in a 3 month period, anything less will mostly be consumed by the dry dams, dry subsoils and the better farming practices now in use.

PREDICTING THE DROUGHT OR THE FLOOD

Recorded rainfall history clearly show uniform patterns. The decline from Peak Rain year to the major Drought year usually occurs over a 9 to 11 year period, while the rise from major drought year to the Peak Rain year of the next cycle predominantly occurs over a 7 to 8 year period. The decline to the last major drought showed 'text-book' uniformity. There was a 3-step decline with Peak years dropping approximately 100 mm every 4 years, 1992 through to 2000, followed by a major drought year in 2002, but this time the climate has continued flat, with another drought period recorded during 2006 - 2007. Followed by another failed La-Nina cycle, the fourth in succession!

This means big trouble, made worse by the unsustainable suicidal water management policies, currently still being applied dogmatically to the failed systems.

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The effect of La Nina / El Nino and The Chinese Effect on Bendigo's rainfall has been as follows:

1992 – 776 mm (Peak Rain year);	1994 – 277mm 1 st drought year;
1996 – 674 mm (2 nd Peak Rain year);	1997 – 416mm 2 nd drought year;
2000 – 542 mm (3 rd Peak Rain year);	2002 – 272 mm 3 rd and Major drought year;
2003 – 570 mm (1 st rising Peak year).	2004 – 400mm 4 th drought year;
2007—460mm (2 nd rising Peak year);	2006 – 320mm 5 th drought year extending into 2007.

During the years 2006 to 2007 the 5th Drought came, at a critical time, with minimal irrigation available.

According to this cycle, Drought years statistically should occur in 1994, 1998, 2002, 2004, 2006 and 2010 (compare what eventuated). The 2nd rising Peak Rain season is due in 2007 to 2008, with luck that year should yield about 500mm of rain in the Bendigo area (we didn't quite make it). The 1st Peak Rain year of the next cycle is due in 2012. A reduced yield of approximately 600mm can now be expected, due to the developing "Chinese Effect". Using this cycle, major droughts can be planned for - several years before the event.

Looking back through history there are 3 periods with consecutive dry seasons. Had we had reservoirs then they would have been empty for 1 to 2 years each time. These periods were, 1901–1902, 1926–1927 and 1944–1946.

If we continue to use our present "Water Allocation plus Sales Allocation" system ...
disaster is knocking loudly at the door!

Some of the factors causing the reduced effective rainfall / runoff, especially in Central Victoria are:-

- Global Warming and the **intensifying** "Chinese Effect" (see explanation below)
- The natural regrowth of large numbers of trees and weeds in the catchment areas, enhanced by the eradication of most rabbits, between 1998 and 2005 (due to Colici Virus).
- The reduced-stocking of the catchment areas due to increased "Life Style" population.
- Improved cultivation techniques that reduce runoff and promote soil moisture retention.
- Improved perennial pasture species now in common use, e.g. phalaris, "now choking most gullies".
- Large numbers of additional small private dams and opportunist pumping from small streams.

The "Chinese Effect", that I have identified and named, is caused by the anthropogenic, unnatural heating of the South China Sea. This has reduced the equatorial atmospheric moisture flow to Australia's East Coast, currently reducing the average autumn and winter rain totals by 40%, and stream flows by 90% in Central Victoria.

The result is rivers such as the Coliban and Campaspe are now drying up in all but the wettest periods.

During 40 days in late April to early June 2007, the Coliban and Campaspe catchments received more than 250mm of rain equal to 300% of average rain for that period, yet only a minuscule amount of water flowed into Lake Eppalock. The total for 2007 was only 10% of the long term average. In most years now, significant rain usually falls for only 1 to 2 months, and then the rainfall returns to about half average for another 4 to 5 months. With this climate cycle dominating our expected weather in the future, it is imperative that Central Victorian reservoirs be managed appropriately. I suggest that from a full reservoir, High Reliability Water Allocation (used to be called "Water Right") be planned for - for 4 years - which means very little Sales Water (now called "Low Reliability Water Allocation") will be available in the future and **significantly less than 100% high reliability water allocation** will become the normal situation. To help avoid zero water allocations in future, when reservoir drop below 33% full, we should use only half of the remaining stored water each year, plus half of that seasons inflows.

The selling of Sales Water when the reservoirs are less than 75% full will seriously expose irrigators and rural businesses to **MINIMAL WATER ALLOCATION for periods of 1 to 3 years at a time** - as is presently occurring across the entire Murray Darling Basin.

The unsustainable allocation of water during the years 2003 / 2004 / 2005 / 2006 consumed all the residual water security. After 2004 all systems became totally reliant on the now fickle winter and spring rains to supply almost all the current season's water. This has resulted in all systems failing, there inherent security level one by one.

Due to the intensifying Chinese Effect there is now a very higher probability of more below average years with little run off to replenish the dangerously low reservoirs. This dire situation is intensified by the now extensive deep drying out of the soil profiles of Eastern Australia and the present Landcare revegetation policies that are also reducing the yield still further year by year.

A major review of the whole Murray Darling Basin's BE is now required to regain water security. New principles need to be employed. The only choice left as I see it is to shift to a management strategy of, **Use Half-Save Half**. This principal is the only safe management strategy in this time of transforming catchments and declining climate. At all times, in order to minimize the effects of drought, reservoirs must be managed to suit the next expected four years climatic conditions, not managed as they were during the wettest time in history 1952 – 1996

Our water supply must not be used as a money bank. **There is no water overdraft available!**