The Basin Plan ignores the reducing Murray flood levels

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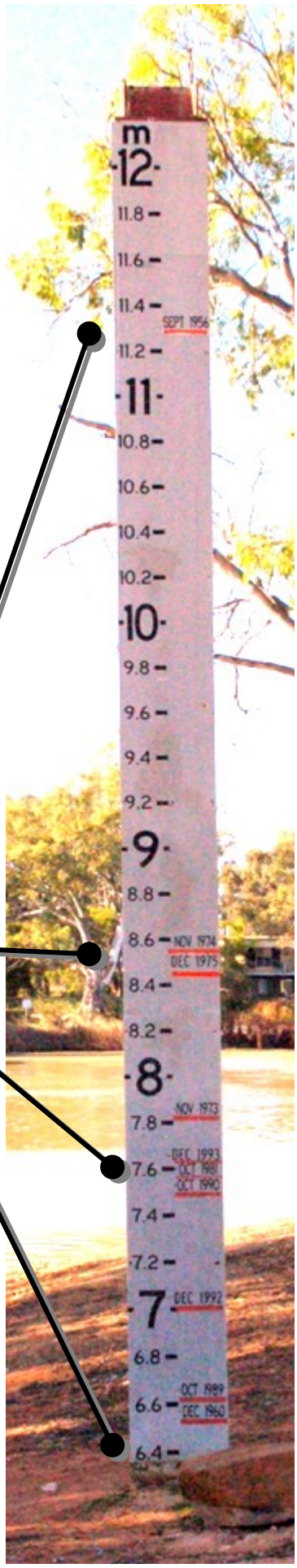
Flood levels in the Murray-Darling River system have been declining for 58 years.

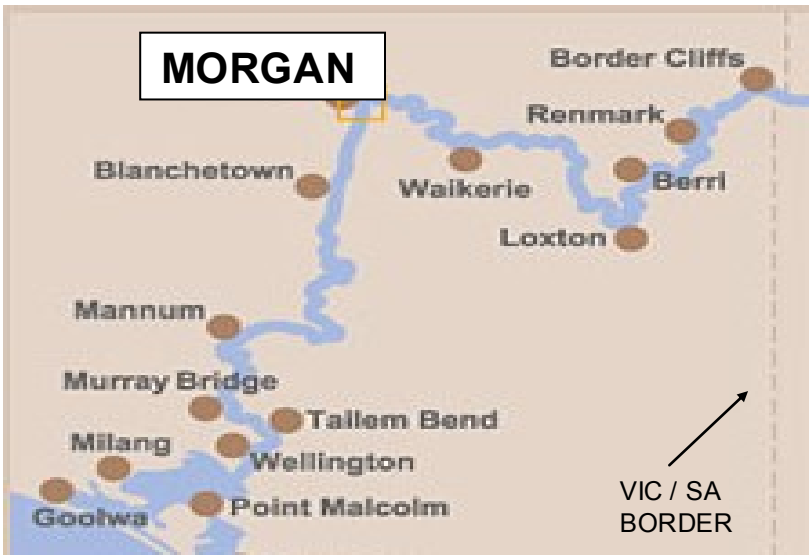
The implications of this have been largely ignored in the current draft Basin Plan which deserves to be scrapped.

The flood staff at Morgan on the Murray River in South Australia tells a very simple story. The river flow trend has been reducing for a long time. This history that has been ignored by the Murray Darling Basin Authority.

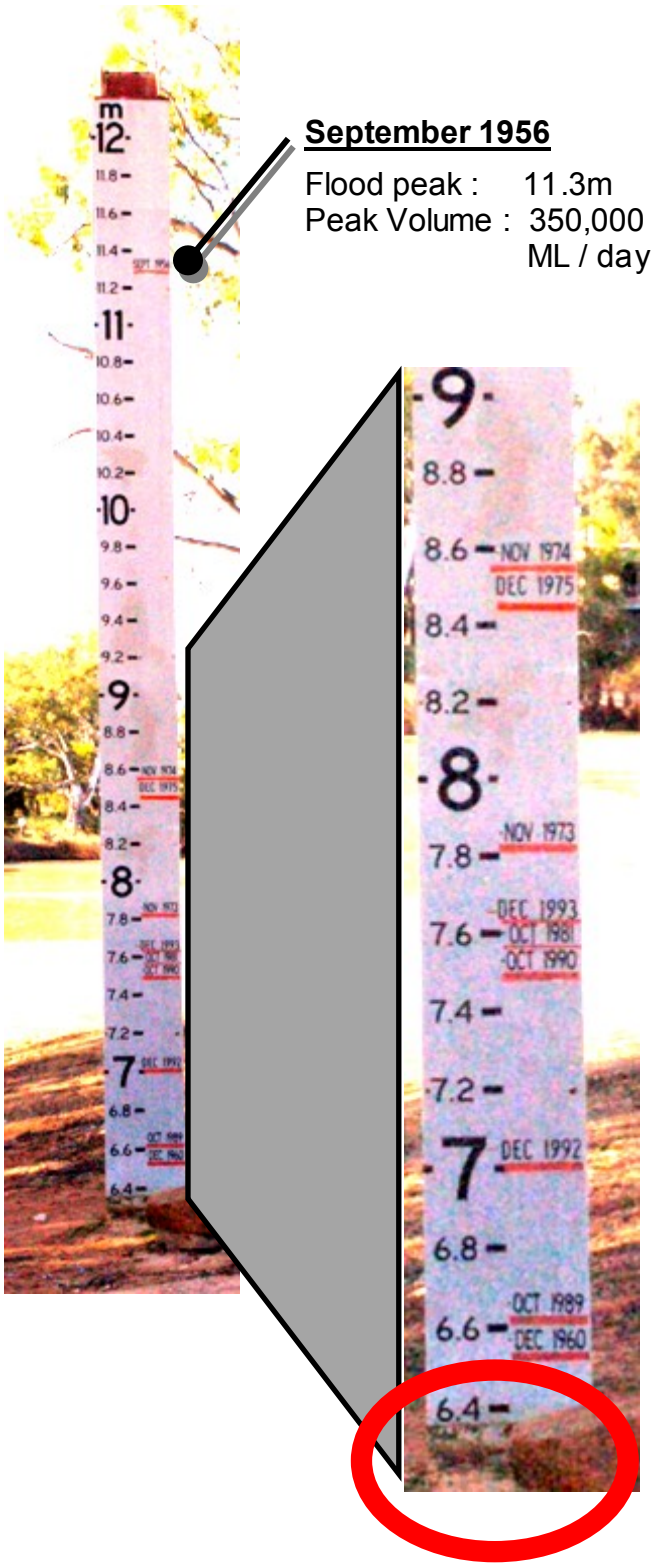
Flood volumes have plummeted by 75% during the last 5 decades. Details are revealed in greater detail later in this document:

Note that in 2011 the largest ever rains across the MDB only left a muddy line at the very bottom of the flood marker during this last flood cycle!





BREAKDOWN OF REDUCING PEAKS AND VOLUMES



September 1956

Flood peak : 11.3m
Peak Volume : 350,000 ML / day

Largest recorded flood peak 1956

1974-1975

Flood peak: 8.5m
Peak Volume: 180,000 ML / day

i.e. 3m lower = 48% reduction in 18 years

Early 1980's and early 1990's

Typical flood levels

1992/3 lunar flood cycle

70% reduction in 36 years

February 2011

Flood peak: 6.4 m
Peak volume: 90,000ML / day

The small muddy mark from 2011 indicates that (despite 2010-11 being the two wettest years on record in the Murray Darling Basin)

... we have a 75% loss of flood volume over 55 years since 1956

LUNAR FORCES DRIVE THE REGULAR FLOOD CYCLES

The photos used in this document reveal that major flood peaks have been occurring at regular intervals approximately every 18 to 19 years. The 18.6 Year Lunar Flood Cycle is the root cause of these regular high flood flows. This dominant cyclic force usually produces at least two years of high river flows during the peak of each Lunar Flood Cycle.

The years 1954/5/6, 1973/4/5, 1992/3 and 2010/11/12 are the periods when these Lunar Flood Cycles have been at peak strength over the last 58 Years. However the long term trend also reveals progressively smaller floods with each cycle. The last cycle of flood flows produced a peak flow with only 25% as much water as the 1956 record flood. This loss of yield is due to many compounding catchment changes and also the fact that the flood rains have been falling about 6 weeks later in the year with the passing of each cycle. This is due to the combined cyclic nature of the 19.86 year synodic planet cycle of Jupiter/Saturn and the 18.6 declination cycle of the moon.

PROGRESSIVE LOSS OF YIELD

The most alarming fact revealed is that during the last four cycles the flood peak flows have progressively reduced, even though rainfall records indicate similar amounts of total rainfall have fallen across the catchments of the MDB during these flood cycles.

It should be noted the BOM records indicate that 2010-11 recorded the highest average rainfall across the MDB, but the peak flows during this flood cycle has been the lowest ever seen after such a big rain events.

This record of reducing flood levels reveals that the yield ratio has been progressively decreasing at an alarming rate over a very long period**,** indicating that **the present irrigation systems are unsustainable going forward. Average river flows have also trended down during those 58 years resulting in the lower lakes almost drying up during the last decade.**

The highest ever recorded river flood occurred at Morgan in September 1956 at an unbelievable level of 11.3 meters. **The flow rate was reported to be a massive 350,000 ML per day.**
The second highest river flood at 8.55 meters was recorded in November 1974, flowing 180,000 ML per day. This level was almost reached again 13 months later during December 1975 at 8.45 meters. The next Lunar Flood Cycle peaked during December 1992 and December 1993, produced several flood flows of between 7 - 7.6 meters, flowing a little over 100,000 ML per day.

The last flood cycle started in January 2010 and is due to finished in May 2012.
This flood cycle has produced many record-breaking flood events throughout the MDB catchment. The flooding rains started early in 2010 in southern QLD. Then in January 2011 it produced the most devastating and most costly floods ever experienced in Central Victoria. Then in March 2012 more record breaking floods occurred in North East Victoria and South East NSW. Even after all these record breaking flood events, the Murray at Morgan has barely reached minor flood level during this flood cycle. The flow rate has averaged approximately 50,000ML per day in the Lower Murray, during 2011 and for the first third of 2012.

The low peak of less than 6.4 meters during February 2011 was the highest river level observed during this last flood cycle, flowing only 90,000ML per day. The 2012 flood flows moving down the river systems are not expected to be as high at Morgan as they were in February 2011.

This represents another massive loss of yield compared to the previous Lunar Flood Cycles. These latest reducing flows represent a massive loss of yield compared to the previous Lunar Flood Cycles; that were typical during the 1950's to 1975. This very consistent declining trend indicates that future irrigation allocations in the MDB are not likely to be sustainable and the system as a whole will have to operate on about **half the water volume that was typical during the last 58 years**

THE COMPOUNDING FACTORS FOR REDUCED RIVER FLOWS

The progressive loss of yield over more than half a century is the result of many compounding catchment changes which are intercepting increasing amounts of the traditional river flows.

- **The building of Dartmouth Dam** back in the 1980's is one of the last big infrastructure projects that have helped to reduce the major flood peaks flowing down the Murray River.
- **The time of the year that the flood rain events have been occurring** is another major factor that has affected the amount of flood water that arrives at the Lower Murray. The trend has been shifting towards more Summer rainfall and less Autumn / Winter or Spring rainfall. The Summer rains produce much less run-off than Autumn, Winter or Spring rains.
- **The average decadal rainfall for eastern Australia has declined progressively** during the last four decades. The official rainfall figures for Bendigo in Central Victoria are a good example of this decline. During the decade of the 1970's, 627mm was the average rainfall (this was the wettest decade during the 149 year record). In the 1980's the average dropped to 574mm and during the 1990's the average dropped again to 536mm. The first decade of this century saw Bendigo record the lowest average decadal rainfall ever recorded, only 418mm average. This long term drying trend has resulted in all the irrigation systems failing to deliver a sustainable irrigation allocation. The end result is that it now takes well above-average rainfall before the reservoirs reach spill level. Thus the average river flows have also been drained down to unsustainable levels.
- **The improved farming practices** which are designed to retain a greater percentage of the rainwater that falls on the farmland in general is another very important reason why the long term trend of the river flows has consistently declined.
- **Reduced rabbit and sheep numbers** during the last decade have also resulted in an explosion of the young forests trees throughout the MDB especially along the river frontages. These extensive new fast-growing forests are the latest big consumers of water which has compounded the overall yield losses.
- **New conservation policies** of not allowing cattle to graze in the national parks have also contributed too many uncontrollable wild fires burning out large sections of the upper catchments during the last decade. CSIRO studies indicate that it takes about 40 years before these recently burnt out catchments will be able to yield normal amounts of runoff again. This represents another massive long-term loss of irrigation and environmental water supplies.

It appears with all these natural and anthropogenic changes to the river catchments, the yield ratios have now returned to those that were typical before the rabbit and sheep infestation. This declining water flow trend means there is now very little run-off, except in the major flood years of each 18.6 year lunar flood cycle and during the occasional strong La Nina years. These better rainfall years usually only occur 2 to 3 times during each cycle.

Ultimately with the continued improved land management and further improved irrigation infrastructure, such as the latest computer controlled water-gates and on farm storage re-use systems, the volumes of water released into the river system in future is expected to decline even further; thus maintaining the declining trend of the last 58 years. Expect less not more.

CONCLUSION

The end result of these improved water management systems and the Landcare principles which are being applied to the MDB mean that in future **there will not be enough water flowing down the rivers of the MDB to keep Lake Alexandrina in a fresh water condition**. I see no effective alternative other than to removing the barrages that were installed in 1941 and return the lower lakes to a natural tidal estuarine system, as was the case during the earlier natural reoccurring dry cycles.

Considering the impacts of the coming lunar drought cycle (centred around 2020-22) which will continue to produce below-average river flows during the next decade, I believe all the irrigation systems in the MDB will need to be wound down significantly - most likely to a level where there won't be enough high-security water to sustain a productive irrigation system, except in the highest value horticultural districts.

The history of this declining river flow trend indicates that many more irrigation districts will need to be permanently closed down (like the Campaspe Irrigation District was in 2010) due to ongoing catchment changes which have resulted in an 80% loss of average inflows during the majority of the last 18.6 year lunar cycle.

The overall demise of the irrigation systems in northern Victoria have been accelerating ever since Goulburn-Murray water was established in 1992. GMW must take a great deal of responsibility for this economic decline. Their new higher irrigation charges, the higher infrastructure charges and the reductions to the channel systems that GMW have been responsible for have decimated the economics of the irrigation regions under their control. These economic losses are spreading across the entire farming community in central and northern Victoria, including much of the dryland cropping industry that used to sell much of their produce to the reliable irrigation farmers of the past. The knock-on effect has resulted in most northern Victorian farming enterprises heading towards bankruptcy. A major injection of government funds is needed very quickly if the rural economies of the MDB are to be saved from this looming fate.

The 2012 MDB Authority Draft Plan - which has just been put forward for sharing out the future future waters of the MDB - has been predicated on the rivers having similar average long-term flows as were experienced during much of last century - mainly the wetter half ! **Their projected river inflows for the next 20 years do not reflect the ongoing rapidly declining trends of the last 15 years.** For this reason I believe this draft plan to be of worthless quality and will not achieve the majority of its objectives. This draft plan is basically the same as the previous draft plan and needs to be burnt just as the last plan was.

It should be very obvious to everybody now that the last half of last century was the wettest and warmest period of the natural long term climate cycle.
Hence the first half of this century is deemed to be much dryer and cooler than that period was, due to the present deepening "Solar Minima" condition. The resultant global cooling that is now taking hold of the global climate will make the first half of this century cooler and dryer than the last half of the last century was.

New dry land districts are the way of the future, populated by very few productive people and producing much less food than was produced during the last half of last century.
This means 100 years of agricultural development in the MDB is heading back to dust and ashes.

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This summary of a BOM report (July 2012) supports the evidence of the above paper.

SUMMARY: http://www.bom.gov.au/climate/enso/history/ln-2010-12/

(FULL 26-PAGE REPORT PDF AVAILABLE FROM SAME BOM WEB PAGE)

Record-breaking La Niña events

An analysis of the La Niña life cycle and the impacts and significance of the 2010–11 and 2011–12 La Niña events in Australia

La Niña events greatly influence Australia's climate.

The 2010–11 and 2011–12 La Niña events were two of the most significant in Australia's recorded meteorological history.

The following pages explore the 'story' and 'background' of these La Niña events. The 'story' section follows the evolution of these extraordinary events and their widespread impacts on the weather of Australia during 2010 through 2012. The 'background' section gives an overview of the physical processes driving La Niña and El Niño events, and outlines the ways in which these events typically alter weather in Australia.

Unless otherwise indicated, all temperature and rainfall anomalies (i.e. departures from average) in this publication are calculated with respect to the 1961–1990 average, as recommended by the United Nations World Meteorological Organization.

At a glance: the impact of these La Niña events in Australia

The successive La Niña events spanning 2010–12 were associated with record rainfall over much of Australia and some of the biggest floods in living memory. This followed years of severe drought in many parts of the country, and while it brought relief to many Australians, it also brought devastation to others.

Some facts about the 2010–11 and 2011–12 La Niña events

- The 2010–11 La Niña event was one of the strongest on record, comparable in strength with the La Niña events of 1917–18, 1955–56 and 1975–76.
- In October and December 2010, and February and March 2011, the Southern Oscillation Index values (a measure of a La Niña's strength) were the highest recorded for each month since records commenced in 1876.

°C	2011 was Australia's coolest year in a decade (2001–2011).
	2010 was Australia's third-wettest calendar year on record.
	The Murray–Darling Basin experienced its wettest calendar year on record in 2010 and Western Australia experienced its wettest year on record in 2011.
	2011 was Australia's second-wettest calendar year (with the wettest year since national rainfall records began in 1900 being 1974 – also a La Niña year).
°C	Ocean temperatures to the north of Australia were highest on record in 2010.
	April 2010 to March 2012 was Australia's wettest two-year period on record.
	Widespread flooding occurred in many parts of Australia associated with the record rainfalls

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