NATIONAL WATER REFORM SUBMISSION TO DRAFT REPORT

From Alan Rothacker 25/3/2021

I Would like to thank the productivity commission for the opportunity to make a submission to this draft report and wish them well in showing sound judgement in their recommendations to government, and for government to have the courage to implement recommendations.

The PC report on page 5 and 6 suggests 6 overarching reform principles;
1 - Strong capacity to deal with droughts, floods,and shocks to adapt to a changing climate
2 - Fit for purpose management and regulation
3 - Use of the best available information in decision making
4 - Innovation and adaptive management
5 - Effective community engagement
6 - Information provision that enables that engagement

Those principles should form the basis of water management in every basin throughout Australia and i urge the PC to adhere to those principles.

As a former irrigator in Victoria and a Water Services Committee representative with Goulbourn Murray Water i shall concentrate mostly on water management in northern Victoria and the Murray Darling Basin.

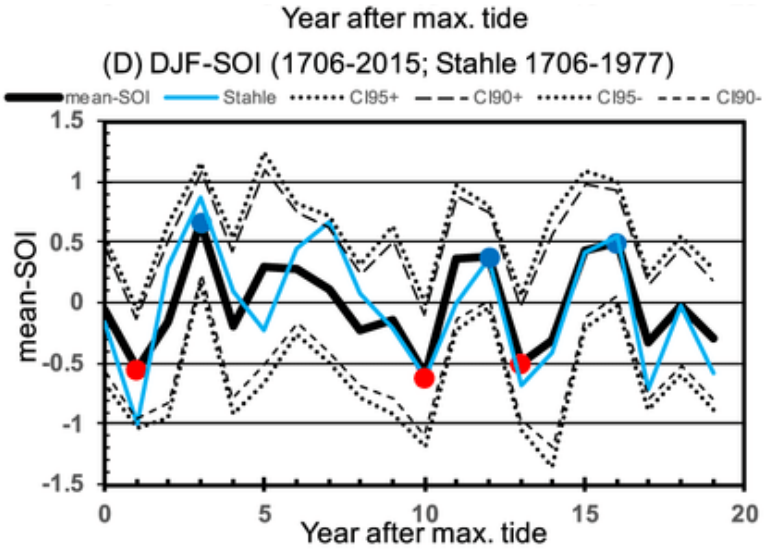
Between pages 21 and 39 the PC has drawn on data published in State of the climate(BOM and CSIRO 2020).

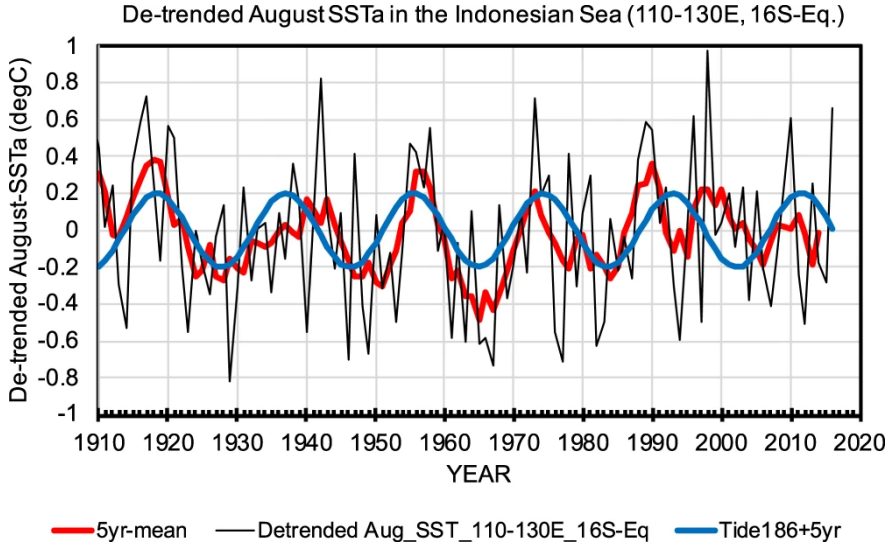
Using homogenised data and cherry picking facts to create a narrative do not provide solutions to the water management challenges facing Australia. It was once believed that climate and weather on planet earth were controlled by a sun producing varying amounts of energy onto a planet that orbits. rotates and tilts with other planets around that sun. Earth has its own moon which also rotates and orbits around earth in different cycles. These cycles, variations and vagaries result in a land with drought and flooding rain with its beauty and its terror (D. McKellar 1906). In 1987 B Woodley and D Newton wrote “i am Australian” Which had the lines” Im the drought and flooding rains”, and” The rivers when they run”. Atmospheric CO2 is now believed by many to be the major climate driver.

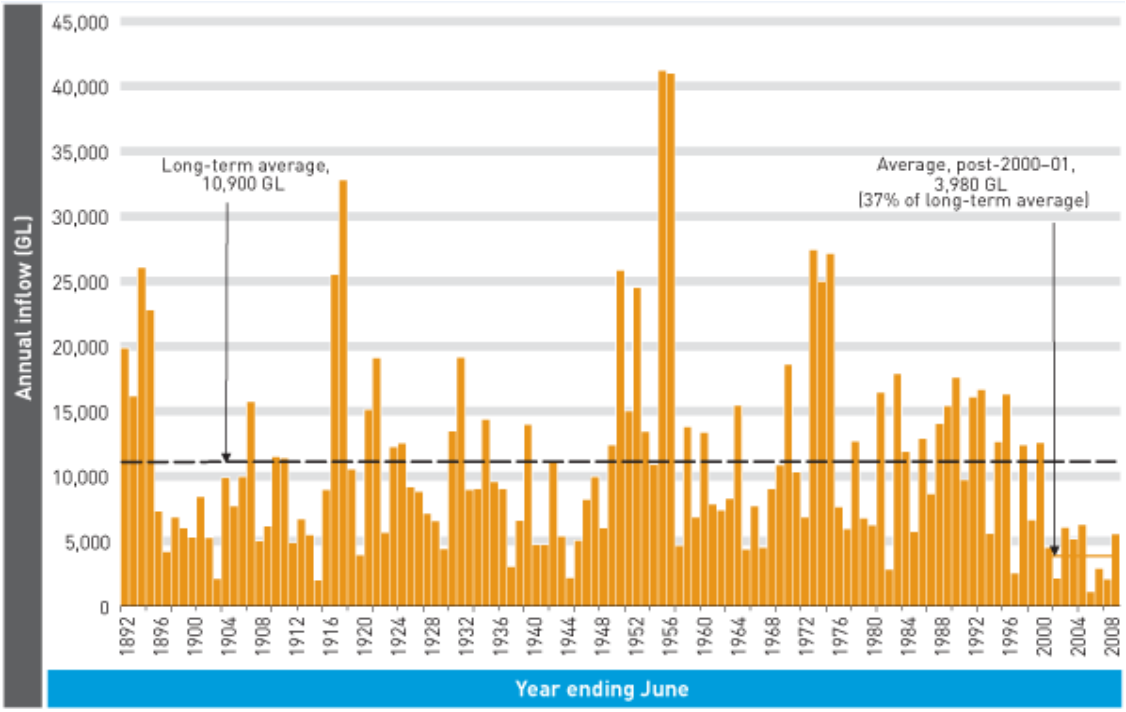
Observation and research over many centuries of the 18.6 year lunar cycle has noted recurring climatic patterns on earth. The moons orbital tilt varies from 18 degrees to 28 degrees to the earths axis and back again over this cycle. A 2018 paper by Japanese researcher Ishiro

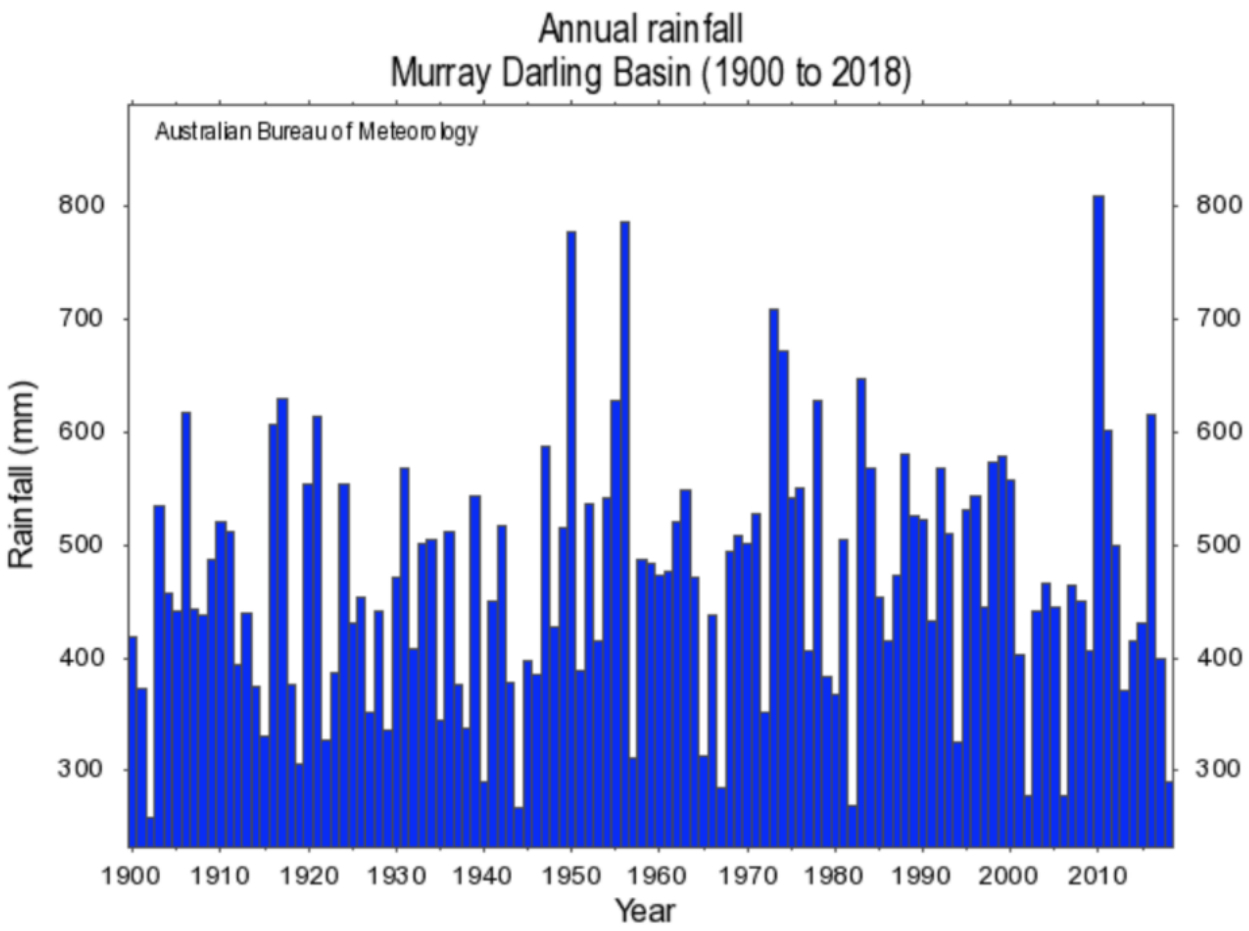
Yasuda uses 300 years of South American data and notes the cyclical appearance of El-Nino Southern Oscillation (ENSO) with the lunar cycle .El Nino is a phenomenon that sea surface temperatures (SST) in the equatorial Pacific east of 180 degrees is warmer than usual, wheras during La-Nina the SST is colder than usual. Coupled with this variability in SST, fluctuation in Sea Level Pressure (SLP) anomaly between east and west develops driving moisture laden air currents.This coupled air-sea phenomena is referred to as ENSO. The theory is that variations in the lunar tide causes variations in ocean mixing and thus influence oceanic and climate variability.The author noted the Cylical appearance of El-Nino (negative SOI) often occur around the1st, 10th and 13th year and La-Nina (positive SOI) at the 3rd, 12th and 16th year in the 18.6 year lunar cycle. The cycle begins at maximum tide and we are currently near year 16. These observations need to be adapted to Australia and similar studies undertaken using Australian data.

The second graph presented on detrended August SST in the Indonesian Sea has high correlation with the 18.6 year lunar cycle. The peaks coincide with periods of high MD basin inflow and the troughs with low inflow. The lunar cycle will continue to influence Australian climate and weather. Water management needs to be attuned to these cycles. The great danger for water managers is that a cycle (eg) around the mid 1930s or 1900 fails to deliver dam filling rainfall over 2 or 3 years then it can be over a decade before the cycle repeats.With current irrigation, environmental and urban demands a crisis could soon develop, Conversely a period with above cyclically average inflow (eg) mid 80s may lead to overconfidence in current management practises. When something goes wrong climate change is the current deflector of criticism.






Annual inflow (GL)
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Long-term average, 10,900 GL
Average, post-2000–01, 3,980 GL (37% of long-term average)
1892
1896
1900
1904
1908
1912
1916
1920
1924
1928
1932
1936
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Year ending June


Annual rainfall
Murray Darling Basin (1900 to 2018)
Australian Bureau of Meteorology
Rainfall (mm)
800
700
600
500
400
300
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
Year

Variations in the Indian Ocean Dipole measurement note that moisture laden air can be driven both into and away from australia. Example in 2016 a strongly negative IOD drove moisture into Australia and the MD basin had well above average rainfall and inflows. This event refilled storages that had been depleted to critically low levels post the 2010-12 seasons of storage filling inflow. In 2018/19 a positive IOD and el nino modoki (JAMSTEC) coincided with a period of near record low rainfall and subsequent bushfires through much of the MD basin and eastern Australia. At the same time parts of Africa were having above average rainfall and locust plague as moisture was driven into Africa with subsequent rainfall.. In sunday school i can remember that locust plagues were happening when Jesus was around. These cycles have been happening for a very long time. The cycles change and the eastern Australia has experienced above average rainfall from early 2020.

In Victoria rain bearing fronts from the south can deliver rainfall and inflow into storages . For example in Victoria during the Millenium drought southerly fronts delivered little rainfall and inflow. In 2019 good rainfall occurred in southern and central Victoria and sufficient inflows to give partial allocation in most basins, while NSW missed these rain events.
These are just some of the varied drivers of climate and weather in Australia.These cycles will interact and repeat and you can learn more from history than making projections into the future. The relevance of these comments and data is that principles 1 and 2 need to be adopted to adapt to rainfall and inflow variability. The cycles which give this variability will keep on occurring . Floods and sequential droughts and low inflow will keep on occurring The use of averages in determining stakeholder releases is a high risk strategy when average inflows do not occur as expected .All stakeholders in river basins will need to be subject to adaptive management(principle 4). This currently is not occurring. For most of my period as a WSC representative GMW used a criteria of prioritising storage water as Stock and Domestic, minimal environmental flows, and then entitlement holders received allocation dependant on trigger points related to storage volume.Larger environmental flows occurred if inflows were above certain levels. The phrase “or natural “ was inserted in rules and regulations. This policy ensured storages did not run down too quickly by restricting irrigation and larger environmental releases where appropriate. The system was designed and managed to have storage water available in sequential droughts for S and D., minimal environmental flows and minimal entitlement allocation when it is most needed. The MD basin has had 6 periods of low sequential inflow of between 5 to 7 years. 1897 to 1906, 1913-18, 1926-31, 1938-49, 1963-69 and 2002-2009. The period between 1971 and 2000 was exceptional for above average inflow and no periods of low sequential inflow. It can be statistically argued that this period was an aberration and the last 20 years inflows are more similar to the period between1895 and 1950.

Water management in many basins has been changed as different entities have replaced previous water management and bought in new philosophies,priorities, rules and regulations and risk profiles. Page 30 of the draft report noted the fish deaths in the darling river and the low water storage levels in 2019 through NSW. It needs to be remembered that the strong negative IOD in 2016 and subsequent rainfall and inflow filled Minindee to over 90% in November 2016. By mid April 2017 the storage was at 47% .Similarly most NSW storages filled or near filled during 2016, but were at crisis levels at mid 2019. Principles 1,2,3 and 4 need to be put in place

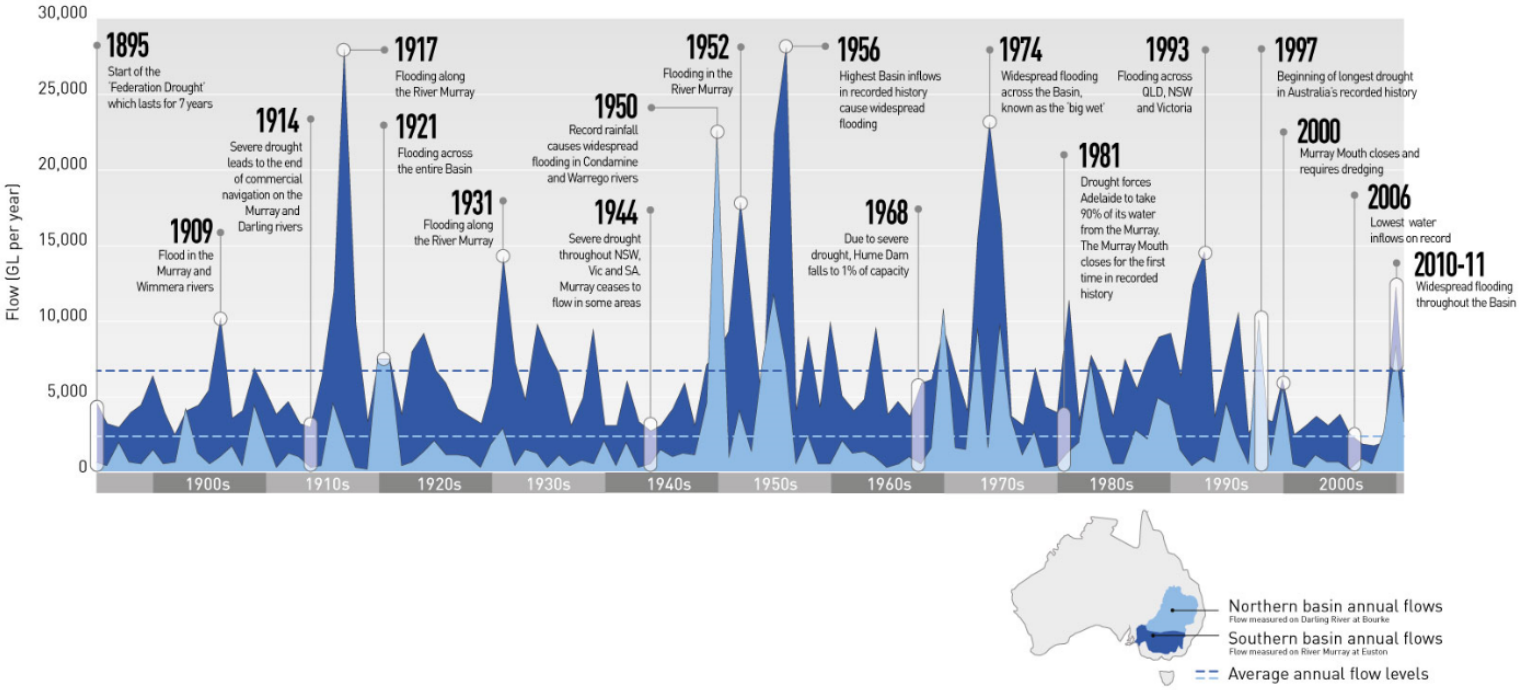
asap to avert what maybe well intentioned management releases being high risk with unwelcome outcomes if average or expected rainfall does not occur. Australia is a land of drought and flooding rain and extreme events are not extreme probability that they will not occur.The lunar cycle will continue to happen. To repeat ,history shows sequential periods of 5 to 7 years of below average rainfall does happen.Floods Happen.To blame climate change for high risk management strategies that occasionally fail is nonsense.Climate change is the new default position rather than planning for climate variability, Some new entities that manage water through the MD basin have little accountability to stakeholders.There seems to be a self sustaining circle of enquires and reports that reinforce the new status quo. Stakeholders need to be able to question the recommendations of such enquiries and there needs to be appropriate processes and forums to question and challenge those recommendations which then lead to the rules and regulations of water management.Some stakeholders believe that there is now a closed loop. I thank this commission for having the courage to engage in public discourse and debate to hopefully achieve outcomes consistent with the PC role. Principles 5 and 6 are effective community engagement and information provision. I believe that it is critical that these principles need to be expanded with unambiguous proposals and recommendations of how that is going to be achieved. An Example of this is the flooding of the Barmah forest through 2019.This resulted in carp eating away at banks, high water flows then eroded the banks and the soil was deposited in close proximity to the Barmah choke. All this while Victorian irrigators had low entitlement and NSW general security irrigators had nil allocation. A management system that designs such an outcome is disrespectful to other stakeholders. The fact that there is no accountability for such outcomes is system failure. This commission needs to recommend to government the immediate implementation processes whereby those who make such decisions are accountable to other stakeholders.Regular public forums need to be held to question decision makers. The current process of enquiry, report and government implementation of enquiry recommendations is a closed loop that is failing water management in Australia. The assumption that politicians and the bureaucrats tasked with producing better policies and outcomes for the long term benefit of the Australian community are doing that job and are not making compromises is open to question.

The millennium drought between 2002 and 2009 was the first severe sequential drought in 40 years.The lack of rainfall and inflow bought into focus the way water management occurred throughout Australia. The possibility of having periods of rainfall similar to the past was not planned for. Desalination plants, pipelines and other projects were scrambled to avert disaster.. Planets and the moon shift,cycles occur, the drought breaks and we have increased rainfall that can partially or fully fill storages.
The millenium drought bought political involvement at a federal level into water management. The MDBA was established and stakeholders were invited to participate in formulating policy. The option of removing the barrages between Lake Alexandrina and the ocean,building Lock 0 at Wellington and saving 860,000 Ml of water every year lost in evaporation, i thought would have been part of MD basin water management going into the future.Domestic politics ruled that out of consideration in the plan that was passed by parliament in 2012 . Royal commissions, the Keelty report have all avoided this issue. The 2016 senate select committee report into refreshing the MD Basin Plan is instructive into the conclusions reached by politicians and their

recommendations and the actions taken from that senate report. That self sustaining circle on full display.The status quo remained This PC draft report fails to mention or consider any case for or against barrage removal.To repeat, that is 860,000 Ml of fresh water lost in evaporation every year from a man made lake.To continue having that lake full and sending more fresh water down the Murray River to wash the sand away from the barrage should be a priority discussion point for water management into an unknown future.I perfectly understand the reluctance of the PC to even mention this issue as the reaction that would follow even discussing barrage removal, let alone recommending barrage removal would overshadow other recommendations made in this report.

There is no environmental case for the barrages to remain.30,000 Ml of tidal water would flow in and out of the lakes every day. Currently barrage releases are 10GL per week. Fish would complete their breeding cycles, Transitory and wading birds cannot feed and rest in tidal estuaries that now dont exist and the Coorong could drain fresh water into the lake rather than directly out to sea. Currently freshwater at 0.82m above sea level is sent uphill into the Coorong.That ecosystem was adapted to seawater going inland to Blanchetown in periods when the Murray stopped flowing.By removing the barrages the lower lakes can act as a safety valve in severe sequential droughts by using that lost fresh water to supply urban populations,keep permanent plantings alive and environmental uses such as mechanically watering forests. It is too late to have the discussion at the end of a sequential drought.. The millennium drought exposed deficiencies in water management.Before and since the MD basin plan there has been approx 1,500,000Ml of entitlement water(page 92) made available to environmental water holders recovered via various mechanisms.Federal government rule changes has allowed irrigation development of permanent plantings requiring summer irrigation downstream of the Barmah choke of many hundreds of thousands of Megalitres. There has been little long term thought by government and bureaucracy of how these competing demands on a system that was already over committed in relation to historical inflows. .Is there any questioning by anyone on how consistent
allocation can be delivered against entitlement?. Has the new release patterns of water now distributed being modelled against a millennium drought?. Is permanent cold water pollution a problem for native fish, and if so, how will it be overcome?. Victoria once had a highly reliable irrigation system that was conservatively and sensibly managed with respect to historical inflows.The change of basin management has led to the proactive destruction of approx 30% (guess) of Victorias irrigation customer base as water entitlement has shifted to environmental use and away from the gravity system to alternate uses mostly downstream of the Barmah choke.This larger use of entitlement every year has destabilized the water trading market and caused increased temporary and permanent water entitlement prices to levels unaffordable to many current and prospective new irrigators.Not every irrigator has the financial backing of a pension fund or other entity to purchase temporary water in low or nil allocation season. There have been many more losers than winners across the southern basin communities.It has redistributed the wealth that water can bring from a massive geographical area in the southern basin to small concentrated pockets. The corporate model may look good in desk top theory but it is creating communities that are losing population and their critical mass.

The graph of southern basin inflows measured at Euston and northern basin inflows measured at Bourke is a graph with thought provoking data.



Up to late 1940s northern basin inflows were mostly under 2000 GL per year.A period between the late 40s and the late 1990s delivered good inflows. After that inflows have reduced. This maybe compromised by the building of offtake storage dams for irrigation.eg Cubbie station.The tables on page 33 do not make any compensation for these unmeasured inflows that previously occurred. The table of MD basin rainfall shows the last 20 years has not reduced to the extent of inflows Selective presentation of data may cause incorrect conclusions be made from the way data is presented. Northern basin flows at Bourke averaged only 2000GL per year. Flows at Bourke are a long way from Lake Minindee, which is still a long way from Darling River flows at Wentworth.River distance from Bourke to Wentworth is 1400km. Is there an estimate of water loss?. Similarly the average southern flow at Euston is approx 6500GL per year.The River distance between Euston and entrance to Lake Alexandrina is approx 1000 km. What are evaporation and seepage losses ?. The PC needs to tabulate losses that occur between storages and the Murray mouth.It is deceptive of the MDBA to tabulate inflows but not losses.. The commentary with that table notes river Murray peak flows of 1917 1931,1952,1956,1974,1993 and 2010. The three dry periods were 1895-1902, 1940-48 and 1998-2010.These correlate with the table on indonesian sst and the 18.6 year lunar cycle. Sequential droughts will occur in the future whether driven by the amount of CO2 in the air, natural cycles or a combination of both. Decision makers need properly tabulated data to see where rainfall runoff goes, where losses occur, and which stakeholders are using that stored water. The data supplied in this report fails to do that, so properly considered conclusions and recommendations may not be made.