

Comments on the Draft South Coast Water Strategy Consultation Paper.

[REDACTED]

May/June 2022

Most of what I had wanted to say about these issues is contained in my comments of December 2020 on an earlier exposure draft.

It is pleasing to see that some of the more ridiculous options (such as a pipeline from Brogo Dam to the Eurobodalla urban water schemes) have been knocked out by rational analysis.

Climate Change Impacts.

It is beyond dispute that temperatures are rising and that this means that evapotranspiration losses will increase between rainfall events. This is likely to result in a decrease in the persistence of low flows during dry periods. As argued in my 2020 submission, historical changes following European invasion and settlement have already impacted the hydrological regime of coastal streams, resulting in an increase in the proportion of stormflow runoff and a decrease in the persistence of baseflows.

The effect of climate change on regional rainfall is less clear.

In March 2011, a flood in the Towamba river came up to the same height at “Heartwood” as the (record) 1919 flood was said to have reached. In the week after the March 2011 flood, a spokesperson for the Met bureau said on local ABC radio that they had expected about 100mm of rain based on the synoptic pattern but that we got in excess of 500 mm on the escarpment because the sea was so warm, putting more water vapour into the atmosphere.

The following week, I attended the South Coast Marine Discovery Centre annual seminar. Dr Matthew Griffiths from the ANU presented information on the interaction of oceans with weather in the context of global warming. He said that the oceans represent 99.9% of the heat capacity of the earth’s climate system because:

- Oceans cover 71% of the earth’s surface
- They are on average 5.8 km deep
- Liquid water has an enormous ability to store and exchange heat compared to air or land.

He said that with global warming, ocean currents have intensified but that the East Coast Australian current had intensified by a factor of 3 or 4 times the global average.

The implication is that, when we do get significant rainfall events, such as those associated with East Coast Lows, we can expect increase rainfall intensity and total volumes. The recent floods in SE Queensland and the Northern Rivers of NSW seem to have borne out this prediction.

Specific comments on the draft summary.

Page 22/134. “Declining catchment and river health”

I generally concur with the analysis presented in this section. The changes in hydrological regime (an increase in stormflow runoff and a decrease in the persistence of baseflows) has probably been

exacerbated by the 2019/2020 fires and subsequent rainfall events on burnt catchments. The rainfall of around 150mm in February 2020 produced a filthy flood flow in the Towamba River with significant gully and streambank erosion.

28/134. "Increased competition for low flows."

This is inevitably going to get worse if the historical changes in flow regime continue to get worse.

30/134. "Growth in harvestable rights dams and water extraction under basic landholders rights may produce additional pressure on low flows"

This is undoubtedly true for an increase in water extraction from streams. How could it not be so?

The evidence that an increase in harvestable rights dams might produce additional pressure on low flows is not presented. Indeed, the reverse may be true. If harvestable rights dams capture mainly rainfall runoff during large rain events and store the water for later use in wetting soils in dry periods, the overall effect might be to reduce peak-flow runoff and increase baseflows. In addition, landholders would be less likely to go to the expense of pumping from streams if gravity-fed water is available from appropriately located farm dams.

31/134. Saltwater intrusion.

A description of streambed erosion in north coast streams with steep escarpment catchments is given in the Ian Mannix book "Flood Stories". Extreme flow events scour out the lower reaches of these rivers and a tidal pool is created, with the bed below sea-level. Saltwater intrusion in prolonged dry periods is inevitable.

Restoring the hydrological regime would seem to be the best way to ameliorate this problem.

37/134 Merimbula Effluent Reuse.

Increasing the proportion of effluent reuse clearly requires storage of effluent produced during cold and wet periods for later disposal by irrigation during hot dry periods. Surface storage of nutrient-rich effluent incurs the risk of the development of toxic cyanobacteria blooms. One solution might be to store the effluent in the disused mine-shafts of the Pambula goldfields. These do not seem to be closely connected to surface groundwater. Another solution, previously suggested, is to use large surface dams with floating macro algae, in order to exclude light and sequester nutrients.

The Merimbula Effluent Options Investigation has been incorporated in the Environmental Impact Statement. This document fails to quantify the on-going cost of pumping treated effluent against the pressure of the ocean at 30 meters depth. This is an appalling omission. To say that increasing the terrestrial disposal of more effluent is likely to be costly without providing any estimate of the comparative cost of ocean disposal is a fundamental flaw in the MEOI and EIS.

43/134 Priority 2 "Equitable"

Equitable between whom? I believe this horse has bolted.

On the eve of a COAG meeting, the NSW Water Minister Craig Knowles made annual water licences in NSW a perpetual property right, at no cost to the existing license holders.

In the lead-up to this decision, committees formed under the water reforms process were encouraged to place an embargo on the issue of new water licences for stressed catchments and to implement volumetric conversion of licences. These seemed like reasonable reforms, although the terms of the volumetric conversion in the Bega water sharing plan were extremely generous to irrigators relative to their previously declared water use. Then an annual license was made a permanent property right, at no cost to the holder and with no public tender process.

Subsequently, the commonwealth government has bought back water entitlements (from willing sellers) in the Murray-Darling Basin. This process has stalled under the influence of the National Party and the irrigation lobby.

I do not favour buying back water entitlements from irrigators who were granted them at no cost, while other citizens had no opportunity to obtain such entitlements.

37/134 Water users not taking up opportunities (to use more water).

Perhaps this is because of the high energy cost of pumping and the cost of reticulation infrastructure in undulating landscapes relative to the potential increase in value of crops/pastures?

Perhaps the existing license holders, who were given this perpetual entitlement at no cost, are happy to sit on this asset and let it accumulate in value? Positional goods increase in price faster than material goods. When the demand for material goods, such as washing machines, hamburgers, cars etcetera increases, the supply soon increases and the price does not go up much. When the demand for positional goods, such as the art works of old masters, lake-front real estate or fresh water entitlements increases, the supply cannot increase and the price rises at a faster rate than general inflation.

The water market is not functioning as envisaged when the water reforms were initiated.

46/134 River recovery program.

I reiterate my earlier comments that programs to revegetate the river corridor are likely to be a waste of time and effort unless the hydrological regime can be restored to something like that which prevailed prior to European invasion and settlement.

Assessment results (long list of options to shortlist)

96/134 Option 13 Increase in harvestable rights.

In assessing the impacts of increasing harvestable rights from 10% to 30% of average annual runoff, it is important to consider which part or parts of the flow regime are likely to be intercepted.

From experience, small rain events (less than, say, 10mm) rarely produce runoff in first and second order streams. The preponderance of runoff likely to be captured will be from the significant rainfall events that might occur 2 or 3 times a year. So the effect of a widespread take-up of the increase in harvestable rights is likely to be to decrease, slightly, peak stormflow runoff in coastal catchments.

If the water stored is used for irrigation as soon as it is opportune, areas of the catchment will be wetter in dry times and thus able to support baseflows for longer.

104/134 New Option: Locate storages as high as practical in the landscape/feeder drains/smart culverts etc.

From experience, such storages may fill and spill 2 or 3 times in a median year, from less than 40% full prior to a significant rainfall event.

Examining the 1:25,000 topographical map sheets for the Bega Valley, for example, there are hundreds of potential sites where dams can be economically constructed because the slope is less than about 1 in 10. The use of feeder drains, directing water away from gullies towards dams located on or near ridges, optimises the utility of the dam as a source of gravity-fed water.

I have no experience with granite soils but serious erosion can be observed along side-cut roads in parts of the Bega Valley, so deep and wide feeder drains should be avoided.

General comment on the Images used in the documents.

These beautiful images all seem to have been taken before the 2019/2020 fires and subsequent erosive rainfall events, or they are of estuarine water bodies of little relevance to a consultation about fresh water resources.

On ABC TV extended news of Sunday 29th May, there was a report on the aftermath of the Northern Rivers floods. It showed shocking images of landslides, washed out roads and stream crossings. These sorts of images would have been more appropriate in the consultation paper because they reflect the challenges presented by the climate emergency.

I will attempt to send some images of eroding banks in the lower Towamba river as a supplementary submission.

Glossary.

It is disappointing that the glossary definition of stormwater has not been changed to reflect the current understanding of stormflow runoff generation in catchments. The glossary definition of stormwater is probably reasonable if one is considering suburban houses with impervious roofs and driveways. It is not appropriate for stormflow runoff in catchments at a landscape scale. I extensively explained the development of this conceptual understanding by hydrologists with extensive references to the literature. It would be helpful if the glossary could include a definition of stormflow runoff informed by an understanding of how catchments work.