

25 August 2017

To: Environment, Natural Resources and Regional Development Committee

Re: Inquiry into the Management, Governance and Use of Environmental Water

Dear Committee Members

As part of your public enquiry into the "Management, Governance and Use of Environmental water" I would like to provide the following feedback specifically to its role in "blackwater events".

1. There is a distinct differentiation between "blackwater events" and "hypoxic blackwater events". A "blackwater event" refers to the mobilisation of carbon from a dry environment (floodplain or dry river channel as examples) into the aquatic environment. I have argued in the scientific literature that this is an important process in the functioning of lowland river ecosystems. I have appended a paper that fully articulates this position. Briefly, the carbon mobilised in blackwater events is a critical source of energy to sustain river ecosystems; ultimately becoming food for large predators such as Murray Cod. The lack of natural floods, as a consequence of river regulation, has resulted in the reduction of this energy subsidy from the floodplain to the river system.

2. Hypoxia (low dissolved oxygen) occurs when flooding of floodplains or dry river channels occurs during warmer periods. In south eastern Australia, under natural flow conditions, flooding would have occurred following snow-melt in spring. Under regulated flows, this initial flush is now captured by human-constructed reservoirs; high flows in our river systems now coincide with irrigation flows during warmer months. If there are unseasonal summer rains, such as occurred in 2010, this can result in hypoxia (see attached paper). The 2010 hypoxic event, which affected most of the southern-connected Murray-Darling Basin, was as much driven by river regulation as unseasonal rainfall.

3. Environmental flows represent only a relatively small proportion of the regulated flows in our river systems (compared to flows managed for irrigation purposes). There is a robust scientific understanding of the drivers of hypoxic blackwater events and how they relate to different flow regimes. In my experience, at least in recent years, river managers have understood those relationships, and have used that knowledge when developing environmental flows to maximise environmental outcomes, and minimise perverse outcomes such as hypoxia.

I would be more than happy to explore this with the Committee if they would like further information.

Dr Darren Baldwin B.Sc.(Hons I) B. Legal S. PhD.
Principal *Rivers and Wetlands*

