

Time for South Australia to act on the Murray River

NSW Politician Recommends Letting in the Sea!

On Wednesday 18 June 2008 Adrian Piccoli MP, Shadow Minister for Water in the NSW Parliament, issued this Press Release, outlining his solution for the current problem facing the Lower Lakes, Coorong and Murray Mouth.

Calls by the Australian Conservation Foundation to 'save' the Murray's lower lakes would be answered if the barrages that hold the sea back from entering the lower lakes were removed according to the NSW Shadow Minister for Water Adrian Piccoli.

The ACF had responded to a leaked Federal Government report outlining environmental problems faced by the Murray Rivers lower lakes.

Mr Piccoli said water could be immediately delivered to the lower lakes if the barrages that divide the Coorong and the mouth of the Murray from the lower lakes were removed to allow seawater to enter the lakes

"This solution however is strongly opposed by the South Australian government because of their strong desire to retain the freshwater status of the lakes so that surrounding landholders can pump irrigation water," Mr Piccoli said.

"The South Australian barrages were built earlier last century to divide Lake Alexandrina and Lake Albert, located at the mouth of the Murray river, from the sea in order to keep the lakes as fresh water lakes.

"With the barrages in place, and the lake levels dropping as a result of South Australian irrigators pumping the lakes dry, there is now essentially a reverse dam in place that holds the seawater back from entering the lower lakes.

"This means that the lake levels are about one and a half metres below sea level.

"In natural conditions seawater would have entered and kept the lower lakes at significantly higher levels than is currently the case, consequently eradicating the acid sulphate problem that is starting to develop.

"These lakes alternated from freshwater to seawater depending on the climate but since the barrages were constructed these lakes have remained freshwater.

"It is up to the South Australian Labor Government to take some steps of its own to solve the water issues along the Murray rather than just demand that other states make more and more concessions.

"It is also up to South Australian Senator and Minister for Water Penny Wong to put pressure on her home state to make some necessary changes to river management.

"If the ACF believe there should be more water in the lower lakes then they should be arguing for the barrages to be removed.

"Simply demanding more water from the river, when no water exists because of the ongoing drought is plainly ridiculous and at this stage of the drought, impossible," he said.

This amazing mixture of fact and fiction has demanded a response which has its basis in science and history rather than political rhetoric and this has been provided by Dr Kerri Muller who has expert knowledge of the Lakes and Coorong.

Response from Dr Kerri Muller

Opening the barrages will not save the Lakes it will kill them – a river system needs to flow from its head to the sea not the other way around. Opening the barrages is akin to trying to feed yourself through your anus.

The barrages were built to hold back the sea because by the late 1880s NSW and Victoria were pumping so much water out of the system that the river could not sustain its flow against the Southern Ocean. At that time NSW and Victoria had sharing rules in place that enabled each state to take 50% of the water flowing past each pumping station on their shared portion of the River. The river was then topped up by each tributary and then pumped out again at the next pumping station, leaving much reduced flows for the lower part of the system. Within 50 years of European settlement the Lakes ecosystem had started to be adversely affected hence the need to build the barrages.

The Lakes have been fresh since 5,500BC (7,500 years) and have withstood many droughts and floods in that time. We know that the natural state of the lakes was to be fresh with SHORT LIVED sea water intrusions (days to weeks not months and definitely not years as would be case if the barrages were opened now because of overallocation of the River Murray). The River Murray itself would have dried to a series of pools in severe drought conditions but the Lakes would have continued to provide freshwater out of the Murray Mouth at a rate of at least 2,000 ML per day. Otherwise the Mouth would have closed over and been filled with sediment to a level that even large floods could not have cleared it.

Would Sea Water Save the Lakes?

The Mouth closed for the first time since 5,500 BC in 1981 and would not have been cleared by the 1956 flood, it required dredging and was followed by medium to high River Murray flows.

Sea water intrusions under natural conditions did not extend past Goolwa Channel nor past Point Sturt. There would be evidence of that in the freshwater wetlands of the Eastern Mount Lofty Ranges and in the Lake sediments if it were the case. The Lakes were not subjected to regular sea water intrusions as routinely argued by those in favour of continued exploitation. There is no evidence that the Lakes had regular sea water intrusions before Federation Drought, in fact the only evidence shows that the Lakes were fresh prior to European development of the basin. The building of the barrages in the 1930-40s was the first indication that irrigation extraction was unsustainable (see Fresh History for details).

Under natural conditions the Lake levels were between +0.3 and +0.6 mAHD that is between 30 and 60cm above sea level. Therefore the sea did not compensate for river flows during drought periods because the lakes were always higher than sea level. The current situation is man made not because the barrages are there but because River flows are not.

Letting in the sea would kill off the remaining freshwater biota of the Lakes including small native fish that have reproduced in the system at least every five years for at least the last 10,000 years, a time when the Yarra River and the River Murray were connected at lower sea levels. These fish are now extinct in the wild and are being held in captivity in Adelaide awaiting return of River flows.

Letting in the sea is not a reversible decision. It would irreversibly damage the Ramsar values for which the site

holds status as a Wetland of International Importance and in so doing irreversibly damage Australia's reputation as a "clean and green" producer.

Letting in the sea may neutralise the acid that has been generated from exposure of acid sulfate soils in the areas it could reach but it would bring with it a fresh supply of sulfate ions ready to be converted to sulfuric acid again and would mobilise toxic heavy metals causing deoxygenation of the water column and widespread fish kills. Seawater by introducing a large source of sulfate will help promote the production of sulfide minerals. These toxic minerals may pose enhanced future risk during drought periods unless they remain permanently inundated.

Seawater will significantly impact benthic and other lake ecosystems since the lakes have historically been fresh (or occasionally brackish), especially since the construction of barrages.

Seawater will recharge the underlying sediments. Subsequent flushing of this water will take considerable time if the system reverts to being fresh. This is especially the case where the underlying soils/sediments have a high clay con-

tent. Field observations by CSIRO indicate a) that fresh groundwaters (in some cases fresher than the lakes) are present, undoubtedly recharged from the lakes, and b) that connectivity between the lakes and underlying soils is very variable, largely dependent on soil type.

The chemistry of seawater is likely to be significantly different than that of the water within the lakes and underlying soils. The concentrations and proportions of cations present on exchange sites of the soils will move towards a new equilibrium. It is likely, for example, that Calcium will be desorbed and replaced by sodium and magnesium and there is a potential for adsorbed acid ions to be displaced and mobilised.

There is a possibility that the introduction of seawater may also change the surface chemistry properties of clay minerals in the Lake bed, making them increasingly sodic. Initially, the salinity of seawater should flocculate clays in the Lake, clarifying the water column and allowing for increased growth of algae (most aquatic plants will be killed by the high salinity). Subsequent freshening may result in the dispersion of these clays affecting turbidity and the transmissivity of underlying clayey sediment.



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Evaporation of seawater will lead to the precipitation of salt around the margins of the Lake and salinity levels in the water that exceed the thresholds of many species, tending towards the very poor condition that exists in the Coorong presently.

The tidal signal at the barrages is approximately 20cm therefore the tide is unlikely to be able to transfer enough energy to create a flushing effect in the Lakes nor inundate the whole Lake area, leaving vast areas of acidified wasteland. Sea water would enter on high tides in winter and then would not completely exit on low tides leaving a massive salt load in the Lakes to become concentrated through evaporation and further contribute sulfate to generation of fresh acid. Salt crusts would form around the Lakes edge and highly offensive odours would be released.

Although it is true that the lakes ecosystem is converting to a more saline one, the rapid conversion to salinities of sea water or greater as evaporation occurs, as would be case if the barrages were opened, would be beyond the adaptive

capacity of any species and the lakes system would become devoid of life expect for very simple organisms like algae and bacteria.

It would not become the fishing or boating paradise extolled by those with little or no ecological knowledge. It would be a contaminated site of some 100,000 ha that would be effectively uninhabitable requiring the permanent retiring of productive land, both irrigated and dryland, and possible evacuation of lakeside communities.

The problems of the Lakes and Coorong have been created by overallocation of water resources across the whole basin and it will take a whole of basin approach to rehabilitate the wetland system. It is not possible for SA to do this alone it will require national leadership to deliver 350 to 400GL of freshwater to the site by spring 2008. This volume of water is available and is all that stands between collapse of the system, failure to meet International obligations, widespread loss of species as well as loss of access to sustainability-savvy markets (like Sainsbury's and Tesco's perhaps). No-

one that is informed by facts would advocate for the opening of the barrages on the grounds of avoiding social, ecological and economic collapse. The reverse is, on the face of the evidence, true. The Mouth of the Murray speaks a thousand words about the health of its catchment and its capacity to provide us with the ecosystem services we take for granted. The death of the Lakes and Coorong will not be the end of this tragic saga, the cancer will spread up to Lock 1 then above Lock 1 then....?

If any proponent of letting in the sea has any evidence that it was a natural process (i.e. occurred prior to European settlement) or that it will ecologically, physically or chemically improve the lakes environment then let's hear it and examine it. All we hear is ill-founded opinions of people with vested interests in continuing the exploitation or who are unable to face the difficult fact that we have to change.

Dr Kerri Muller, Lakes and Coorong expert 0428 211 271