

# The Channel and Water Quality

Contrary to popular belief, increasing tidal exchange in Swansea Channel would have very little effect on water quality in the Lake and cause other serious negative consequences.

Lake Macquarie is really a large barrier lagoon rather than a true Lake, which means that the material that washes in from the catchment with stormwater run-off stays within the Lake.

Due to people witnessing a deterioration of water quality in the Lake over the years, there have been calls to enlarge or duplicate the channel entrance.

In the first half of the last century, similar engineering approaches were used elsewhere to improve estuaries that were stressed due to accelerated sediment and nutrient stormwater runoff. In most cases, however, the result has been very disappointing and at times disastrous. Such a large intervention on a complex system results in many negative flow-on consequences.

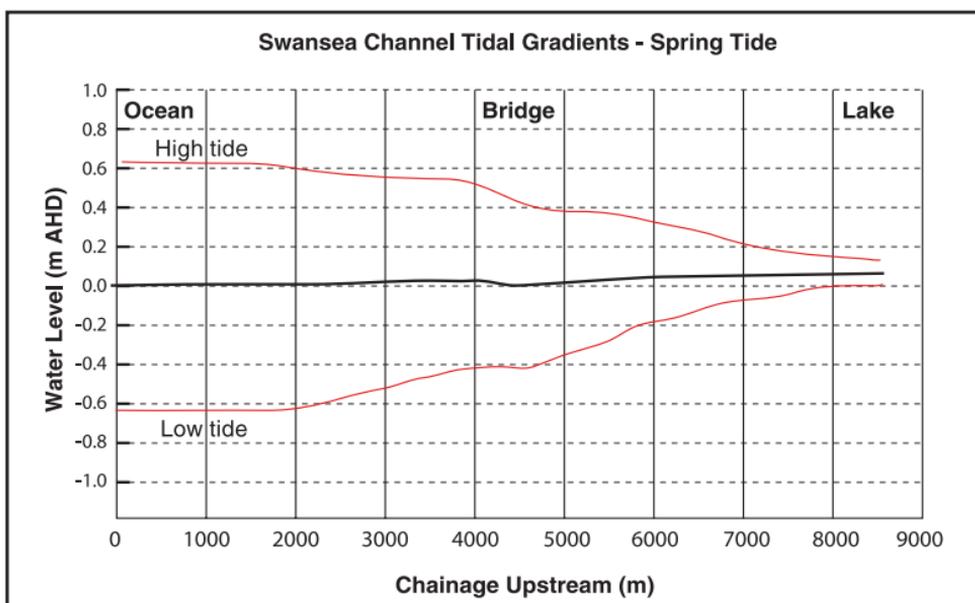


**Aerial view of Swansea Channel**

Because the Lake contains such large volumes of water, increasing the tidal exchange would have very little impact on water quality and would in fact cause more environmental and social problems than it solved.

To increase the tidal exchange in the Lake, the entrance would need to be made wider and deeper, but the benefits would not be significant. For example, modelling has shown that if the entrance of the Lake was enlarged in size by 20% the increase in the tidal exchange would only be 0.2% due to the size of the Lake.

When compared with the ocean, Lake Macquarie has a very small difference between high and low tide (atmospheric air pressure also impacts on water levels). The difference in the tides, as illustrated by the graph, is only about 100mm in the Lake. In contrast, the graph also shows that the variation between water levels in the ocean can be greater than one metre during a spring tide.



During high tide the Lake water level is lower than the ocean, if the entrance to the Lake were to be made larger it would also allow high seas to penetrate the Lake more easily and create a number of negative impacts. The major problem would be the increase in frequency of flooding in many low lying areas, including Marks Point, Swansea Flats and Belmont South.

For this reason, the Lake Macquarie Improvement Project is concentrating on projects that address the problems of sediment and nutrient loads before they even enter the Lake.