

Swansea Channel and Swan Bay Hydraulics, Sediment Transport and Navigation

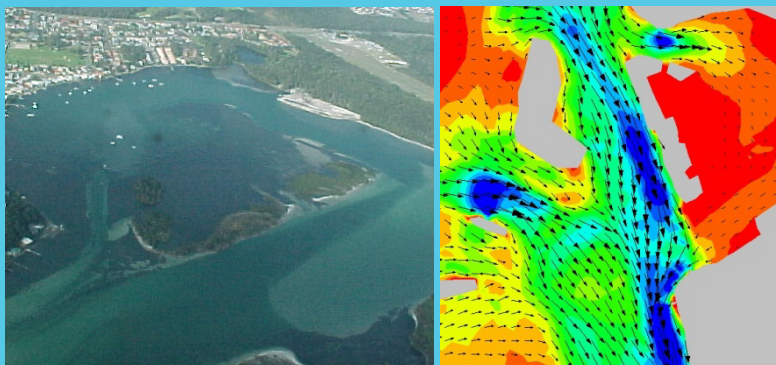
Lake Macquarie is located on the New South Wales coast between Newcastle and Sydney. The Lake is connected to the ocean through Swansea Channel. Swan Bay is a side embayment of Swansea Channel located towards the upstream end of the marine tide delta. Maintenance dredging within Swansea Channel has occurred regularly over the past 50 years. The spoil from dredging operations has been used to create artificial islands including Elizabeth Island and spoil islands located at the mouth of Swan Bay.

The spoil islands have isolated Swan Bay from direct tidal flushing effects of Swansea Channel, which has resulted in a decline in water quality. In response to this, a southern entrance to the bay was created. Sedimentation is now occurring in the mouth of Swan Bay, causing navigation difficulties.

BMT WBM undertook an assessment to address the navigation problems in the northern extents of Swansea Channel. Of particular concern was the southern entrance of Swan Bay, where a 'dog leg' had formed in the navigation channel.

The study involved gaining an understanding of the long and short term hydraulic and sediment transport processes in the upper region of Swansea Channel through detailed numerical modelling. From this investigation, management options were formulated and assessed in order to determine which option will provide the most desirable navigable channel through Swansea Channel.

The study also involved collection of detailed current measurements and associated water levels, which included Acoustic Doppler Current Profile (ADCP) and S4 current and water level recordings.

**Client**

The Office of the Lake Macquarie and Catchment Coordinator

Date

2002

Services & Expertise Provided

Numerical modelling of hydraulics and sediment dynamics;

Formulation of management options to improve navigation;

Project management;

Monitoring of tidal level and velocities using tide boards, probes, Acoustic Doppler Current Profile (ADCP) equipment; and

Preparation of detailed technical reports and community pamphlets.

