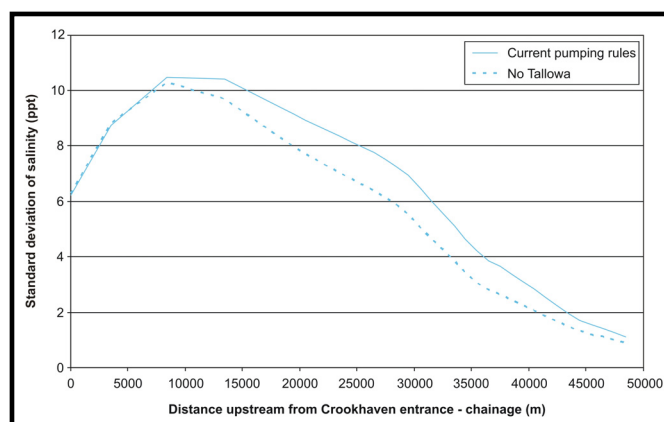
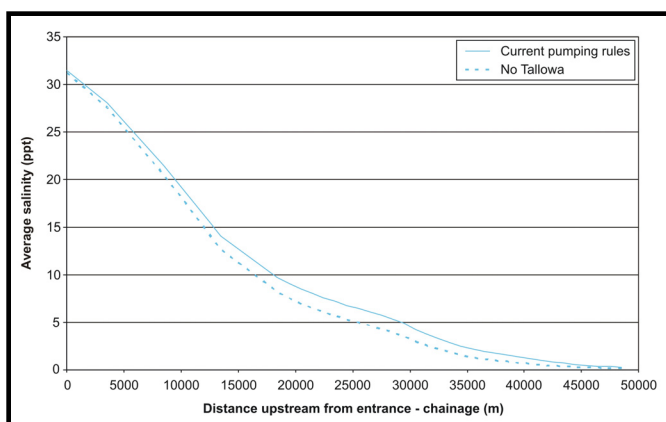
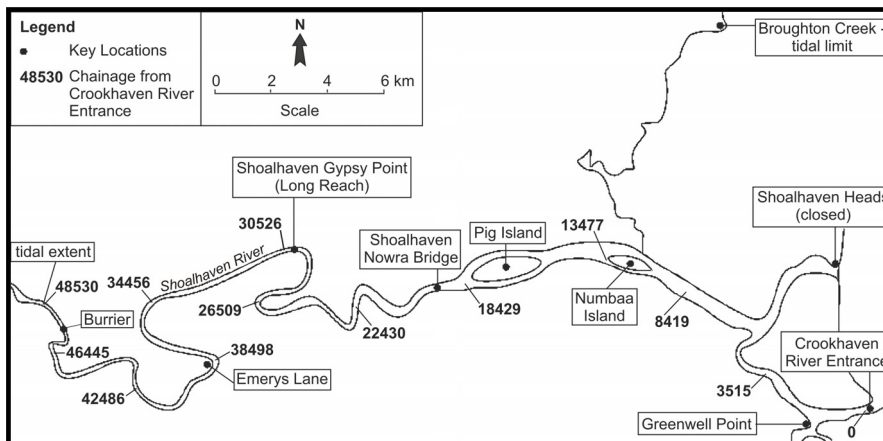


Saline Dynamics of the Shoalhaven River



The NSW Government's Metropolitan Water Plan 2006 included the action to investigate options for increased transfers of water from Tallowa Dam to Sydney, and the development of a new environmental flow regime for the Shoalhaven River downstream of Tallowa Dam. A calibrated numerical model was required to systematically quantify the changes to estuarine saline conditions associated with reduced fresh water inflows. WRL was commissioned by the NSW Department of Natural Resources (DNR).

One dimensional hydrodynamic and salt dispersion RMA models were established. Excellent model calibration was achieved against recorded water level, discharge and salinity data. This required a well defined model mesh and careful consideration of internal and external parameters. A decade of salinity records was available for model verification. Modelling was undertaken for many different freshwater inflow scenarios, each of 96 years duration. To quantify the changes in saline dynamics between two scenarios, it is necessary to compare the statistics of the saline structure of long duration numerical model simulations. Differences in saline dynamics were assessed

based on the probability of exceedence of salinity thresholds at various river locations (chainages), chainage statistics for various salt thresholds, and the duration of salt intrusion events at selected chainages. Changes in this structure provided a quantitative basis for understanding the effects of altering freshwater inflows.

The results of salinity modelling can be assessed in terms of a comparison of how salinity varies at a particular location, or how chainage (and habitat availability) varies for a particular salinity threshold. To quantify the changes in saline dynamics between scenarios, an assessment can be made of the:

- salinity statistics at various sites (chainages);
- chainage statistics for various salinities;
- variability in salinity along the estuary; and
- duration of saline intrusion events.

The model finding allowed the NSW Government to determine a set of pumping rules (duration, volume and cease to pump limit) which minimised the adverse impacts of extreme saline intrusion during dry periods.