LOWER LAKES WATER QUALITY REPORT

Report 1, March 2009

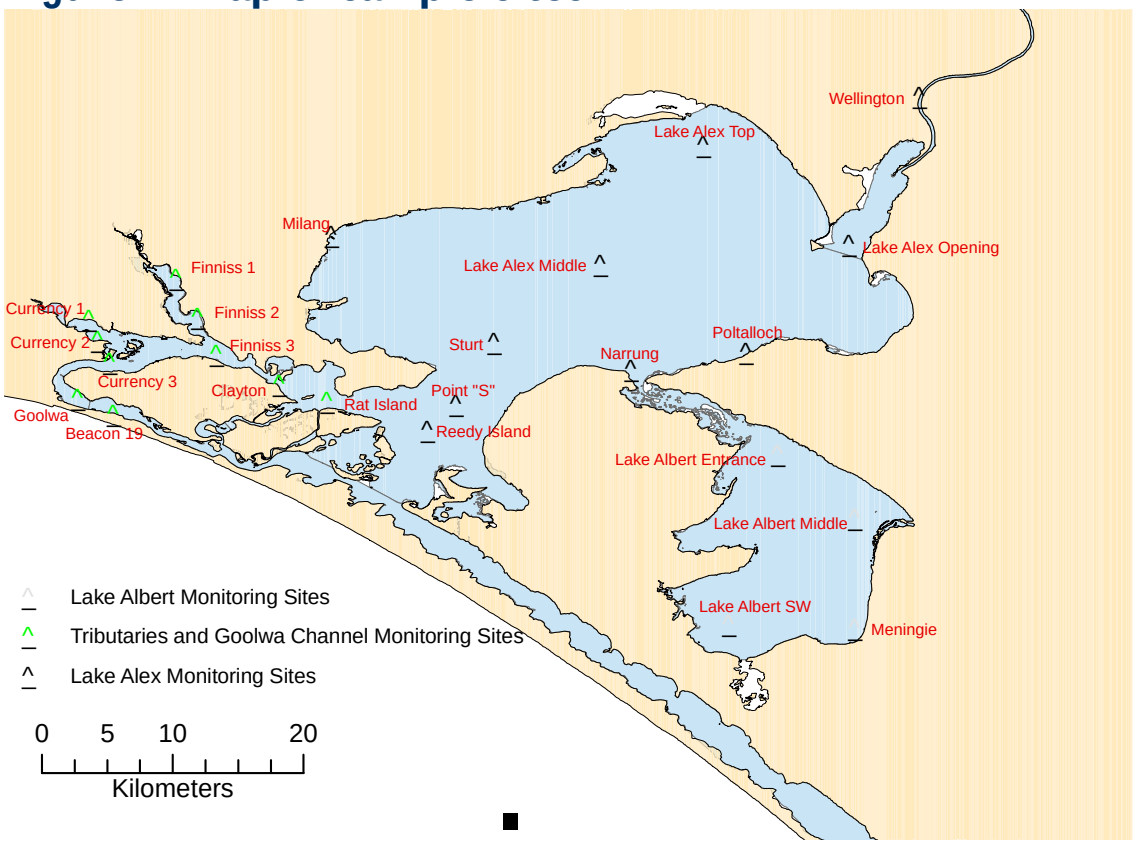
Observations at a glance

- pH and alkalinity levels are stable and within guideline and management trigger levels (satisfactory)
- Salinity levels have increased due to summer evaporation and low River Murray inflows

Background

The Environment Protection Authority, South Australian Murray–Darling Basin Natural Resources Management Board, Department of Water, Land and Biodiversity Conservation are monitoring to assess potential water quality impacts associated with water level decline and the exposure of acid sulfate soils (ASS) in the Lower Lakes. Fortnightly grab samples have been undertaken since August 2008 at 20 sites in Lake Alexandrina, Goolwa Channel, the Currency Creek and Finniss River tributaries, and four sites in Lake Albert (Figure 1).

Figure 1 Map of sample sites



Summary

A wide range of water quality parameters are being analysed for each of the sites. The key parameters at this time are alkalinity, salinity, pH and turbidity. Water quality results are shown below for selected sites and parameters in Lake Alexandrina (Figure 2), the Finniss and Currency tributary region (Figure 3) and Lake Albert (Figure 4). The full water quality dataset is available for download on the EPA website.

- **Alkalinity** is at high levels and stable for all sites in the main areas of Lakes Alexandrina and Albert, ranging between 170 and 250 milligrams per litre (mg/L) as calcium carbonate or $CaCO_3$ (Figures 2A and 4A), despite several months of water level decline. All values are above the state government trigger values for increased monitoring (100 mg/L) or management action (25 mg/L as $CaCO_3$).

  Prior to their drying, some decreases in alkalinity levels occurred at Currency 1 and 2 sites (Figure 3A). This may have been due to some entry of acid from the surrounding soil areas during the drying process. Levels of alkalinity in the Finniss area remain high (Figure 3A).

  Alkalinity is a measure of the buffering capacity of water, or the capacity of the water to neutralise acids.

- **pH** levels are stable at approximately 8 – 8.5 for all sites (Figures 2B, 3B and 4B). This is within the Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines (pH>6.5) for protection of aquatic ecosystems.

  pH is a measure of acidity or alkalinity. Pure water has a pH of 7, acidic solutions have lower values and alkaline solutions have higher values.

- **Salinity** levels (as measured by conductivity) are high compared to historical levels in the Lakes and increased over the summer months due to evaporative concentration (Figures 2C, 3C and 4C). The Goolwa and Clayton conductivities are increasing more rapidly as they are also affected by seawater leakage through the Goolwa Barrage. The level of salinity in Lake Albert is higher than Lake Alexandrina as being shallower, the effects of evaporation are more pronounced.

  Salinity is a measure of the amount of dissolved salts in the water. Saline water conducts electricity more readily than freshwater so electrical conductivity (EC) is routinely used to measure salinity.

- **Turbidity** levels are quite variable and influenced by wind activity on the shallow lakes (Figure 2D, 3D and 4D).

  Turbidity is a measure of how much suspended material (e.g. phytoplankton, silt, clay) is in the water. The more suspended material, the greater is the water's turbidity and the lower its clarity.

Figure 2 Lake Alexandrina

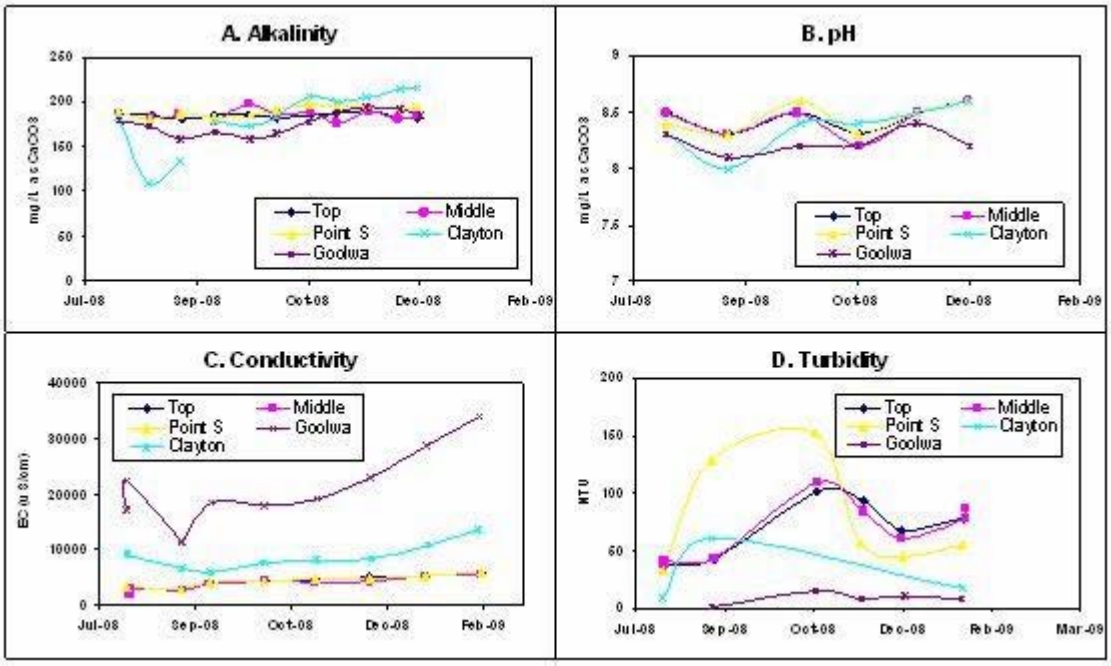


Figure 3 Finniss River and Currency Creek tributary region

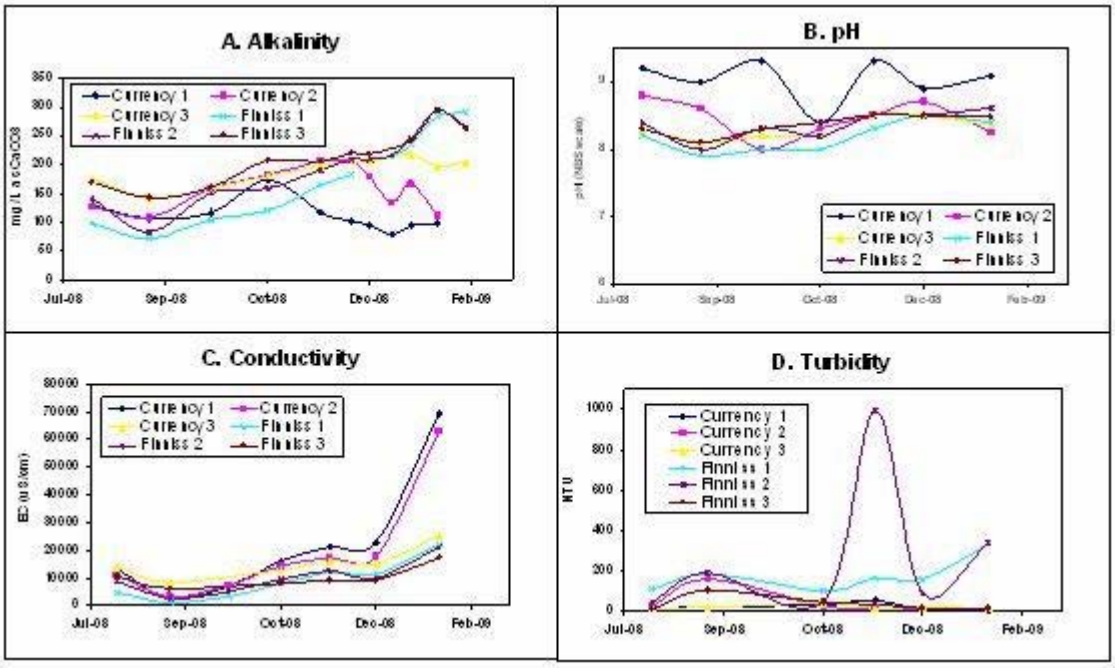
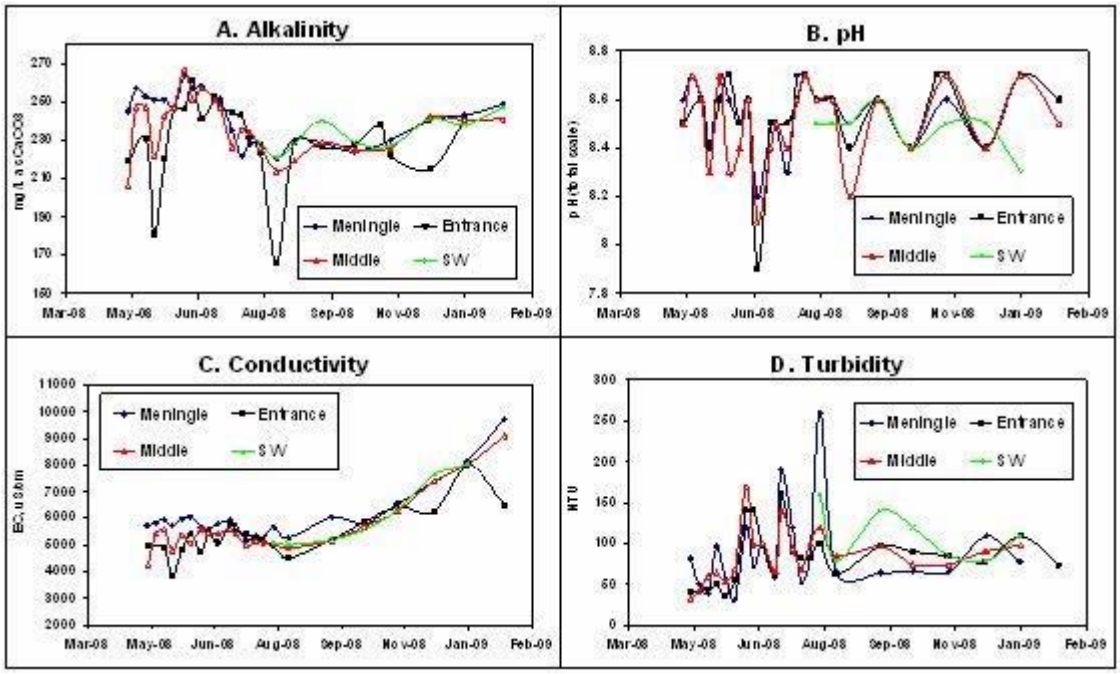


Figure 4 Lake Albert



Further information on water quality and quantity can be found on the following websites:

- **River Murray Data** http://data.rivermurray.sa.gov.au/ (real-time data)
- **Environment Protection Authority** www.epa.sa.gov.au
- **Department of Water, Land and Biodiversity Conservation** www.dwlbc.sa.gov.au
- **South Australian Murray–Darling Basin Natural Resource Management Board** www.samdbnrm.sa.gov.au
- **Murray–Darling Basin Authority** www.mdba.gov.au
- **Waterwatch** www.waterwatch.org.au