

# Wetland Salinity: Predicting the ecological consequences

## Fact Sheet No. 6 Accumulation of salts in wetland sediments

### Question

Do salts accumulate in the sediments of wetlands exposed to saline water?

### Background

- Saline water in wetlands affects the germination of aquatic plants and the hatching of zooplankton from wetland sediments.
- There is potential for the salts from saline water to accumulate in wetland sediment.

### Methods

- Sediments from seven wetlands were wetted with water at five salinities: <800, 1500, 3000, 4500, 7500 EC units (1500 EC = 1000 mg/L).
- Sediment was wetted so it was either damp or flooded, to mimic edge and flooded locations in wetlands.
- At the end of the experiment the sediments were removed from each pot and analysed for major ions ( $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$  and  $\text{Cl}^-$ ). The amounts of salts in the sediments were calculated.

### Results

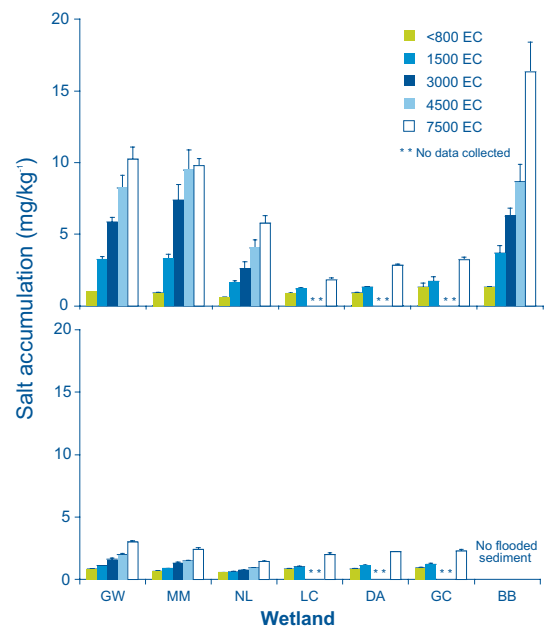
- All wetland sediments had accumulated salts from the saline water treatments (Figure 1).
- Except in the sediment from one wetland (Lake Cowal), more salt accumulated in damp sediments than in flooded sediments.

Under freshwater conditions in natural wetlands we can expect that:

- Salts may accumulate in the sediments due to:
  - a) evaporation from the exposed soil surface,
  - b) plants growing at the edges of wetlands drawing salts into their root zones as they take up water.
- There will be a raised concentration of salts in the root zones of aquatic plants, which may have an impact on the plants' growth and survival.
- A raised concentration of salts in sediment will potentially affect the viability of the seed and egg banks of aquatic plants and zooplankton.

Figure 1. Concentrations of major ions in wetland sediments at a range of salinities and damp (top graph) or flooded (bottom graph) conditions.

(GW = Gingham-Gwydir Wetlands, MM = Macquarie Marshes, NL = Narran Lakes, LC = Lake Cowal, DA = Darling Anabranch, GC = Great Cumbung Swamp, BB = Billybung Lagoon)



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### How can this information help?

1. By assisting communities to set, revise and deliver on current and future salinity targets and associated management actions.
2. By increasing our knowledge of the interactions between salinity and hydrology within wetlands.