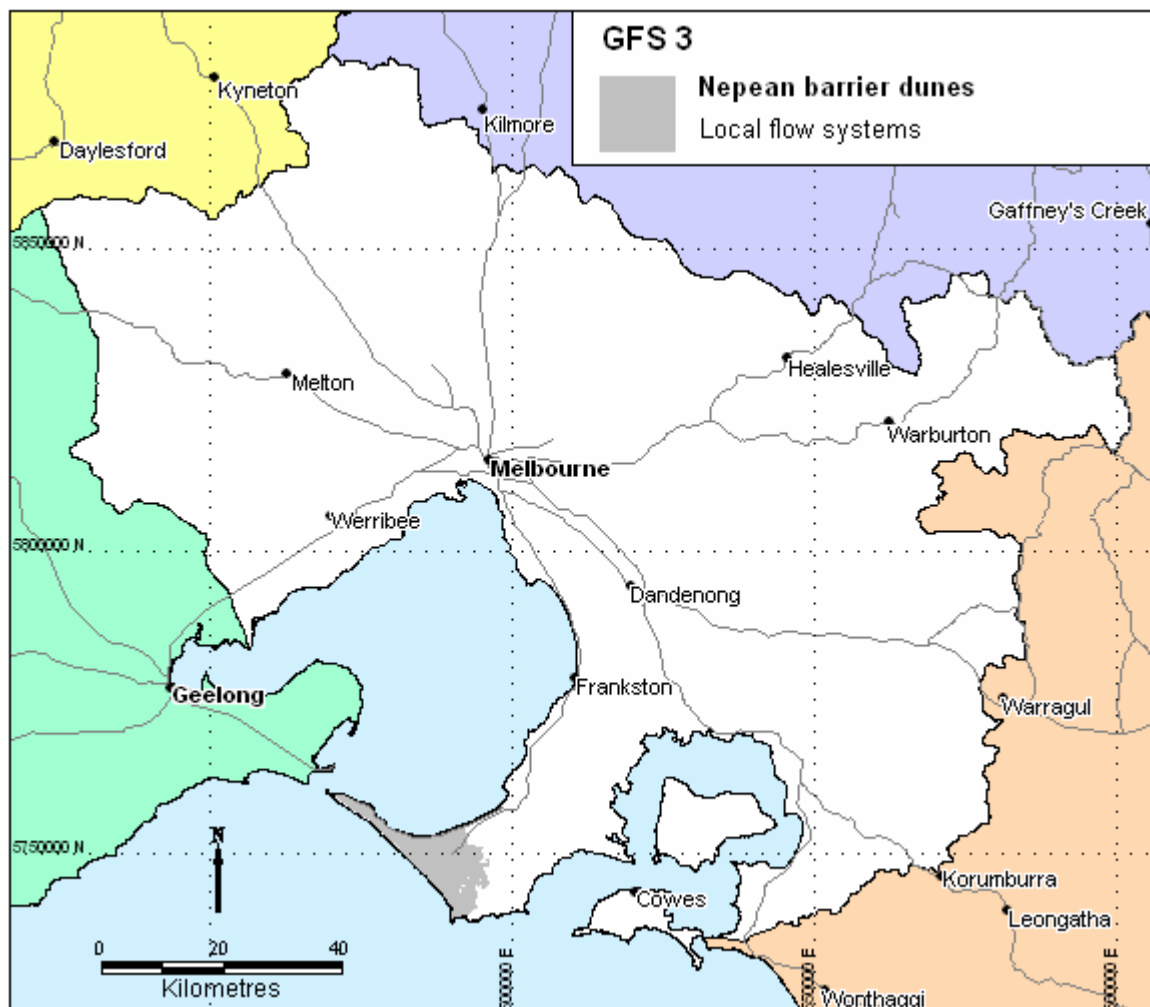


Local flow systems in the Nepean barrier dunes

Region: Southern central PPWP CMA region (Nepean Peninsula)

Type areas: Rosebud, Portsea, Boneo

Brief description: The Nepean Bay Bar is a complex feature comprising chiefly calcareous aeolian dunes and interbedded palaeosols, marine and beach deposits. The thick sediments (up to 145m) were accumulated as a series of dune ridges and foredunes deposited during a progressively retreating sea in the Pleistocene. The material has been cemented to form aeolianite (calcarene), although non-calcareous ferruginised sands are present in places.



Problem statement: The Nepean Bay Bar forms a classic freshwater lens over a deeper saltwater (seawater) system. No salinity has been mapped on the Nepean Peninsula, and much of the land is reserved as a National Park. Into the future, groundwater should be managed to ensure that saltwater intrusion does not become a problem.

Landscape attributes

Geology: Quaternary aeolian coastal and inland dunes, dune sand and minor swamp deposits (Qrd), aeolian calcareous dune deposits (Qpd), floodplain deposits (Qpw) and alluvium (Qra).

Topography: To the west, a thin peninsula of undulating sand hills, merging into a gently undulating sand plateau to the east.

Land Systems:

Predominantly:

South Victorian Coastal Plains

8.5 *Barrier Complexes – Discovery Bay, Gippsland Lakes*

With some:

South Victorian Uplands

3.3 *Moderate Ridge – Mornington Peninsula*

Regolith: Complex mixtures of unconsolidated beach sands, weakly cemented calcarenite, calcrete, calcareous breccia, unconsolidated palaeosols (loams), silts and clays, estuarine organic clays and ferruginised sands.

Annual rainfall: 600 mm to 900 mm

Dominant mid-1800s vegetation type: Scrub and Forest

Current dominant land uses: National Park, urban development, rural residential, recreational parks (especially golf), tourism parks.

Mapping method: Outcrop geology

Hydrogeology

Aquifer type (porosity): Unconsolidated sand, silt and clay (primary porosity), Calcareous aeolianite, brecciated calcrete and limestone, ferruginised sandstone (primary and secondary porosity).

Aquifer type (conditions): Unconfined.

Hydraulic Conductivity (lateral permeability): In the range of 5 m/d to 30 m/d.

Aquifer Transmissivity: Generally less than 1,000 m²/d.

Aquifer Storativity: Estimated to be from 0.1 to 0.3.

Hydraulic gradient: Generally low, with local mounds under the dunes and moderate gradients near the coast.

Flow length: Generally short, but can range up to a kilometre.

Catchment size: Generally small (<1 Ha to 100 Ha).

Recharge estimate: Probably 20% to 30% of rainfall.

Temporal distribution of recharge: Seasonal (winter and spring), with more recharge in wetter years. Extensive periods of soil waterlogging may add to local recharge.

Spatial distribution of recharge: Catchment wide.

Aquifer uses: Considerable groundwater use for domestic, stock, irrigation, recreational, commercial and industrial uses.

Salinity

Groundwater salinity (TDS): 300 mg/L to 1,200 mg/L.

Salt store: Low

Salinity occurrence: None mapped

Soil Salinity Rating: Low

Salt export: None known

Salt impacts: None known

Risk

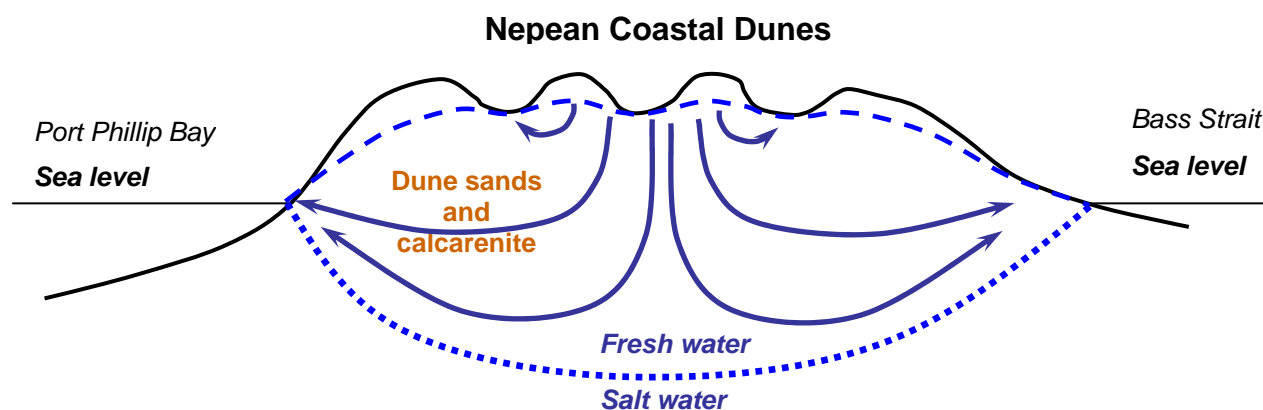
Soil salinity hazard: Low

Water salinity hazard: Low

Assets at risk: None known

Responsiveness to land management: Should be high. Groundwater use needs to be properly managed to prevent saltwater intrusion.

Conceptual model



Management Options

There are no current land salinity issues to be managed. However, into the future, groundwater should be managed to ensure that saltwater intrusion does not contaminate the locally useful stock and domestic groundwater resource.