

wg

WOLLONGONG

Marine



Landscape—beaches and coastal foredunes on marine and aeolian sands. Beach plains with relief <10 m, slopes <3%; foredunes with relief <15 m and slope gradients <35%. Spinifex grassland/herbland to closed-scrub on foredunes.

Soils—deep (>200 cm) Calcareous Sands (Uc1.11) on beaches, Siliceous Sands (Uc1.21) on foredunes, localised Humus Podzol/Podzol intergrades (Uc2.21) in low lying areas.

Limitations—extreme wind erosion hazard, non-cohesive, highly permeable soils, very low soil fertility, localised flooding and permanently high watertables.

Topography

Beaches. Gently inclined to gently undulating plains from <50 m up to several kilometres long. As beaches are geomorphically active, the topography is subject to continuous alteration in response to changes in wave energy and tidal dynamics (Short 1984).

Foredunes and minor swales. Moderately inclined to steep rises from <150 m wide up to several kilometres in length. Relief ranges 2–15 m. Slope may be 10–35% on blowout edges and seaward erosion scarps but is more commonly <10%.

Vegetation

The beach has no vegetation. The original herbland/grassland of the foredunes has been extensively disturbed, but many of the foredunes are currently being revegetated to stabilise the sand with community plantings of marram grass (*Ammophila arenaria*), hairy spinifex (*Spinifex sericeus*) and native dune shrubs.

Colonising vegetation on foredunes includes hairy spinifex (*Spinifex sericeus*), knobby club-rush (*Isolepis nodosus*) and beach pennywort (*Hydrocotyle bonariensis*). In relatively sheltered areas on dunes, coastal heath (*Monotca elliptica*) and scrub occur. In disturbed areas bitou bush (*Chrysanthemoides moniflora*) often dominates.

LOCATION

Mainland beaches exposed to ocean swell and associated windblown foredunes on the Coastal Plain. Examples include Warilla, Kendalls and Easts Beaches.

LANDSCAPE

Geology

Quaternary (Holocene) well-sorted marine, predominantly coarse quartz sands with well-sorted, coarse sand sized, abraded shell fragments.

Land Use

Beaches are used for recreation. Foredunes have been developed for residential purposes, caravan parks and golf courses—for example, at Windang Peninsula.

Existing Erosion

Wind erosion can be extreme on foredunes, especially where stabilising vegetation cover is absent or disturbed. Wind erosion on foredunes is characterised by blowouts.

Extreme wave erosion occurs during high seas. Many beaches in the mapped region—for example, Currarong and Shellharbour—are being eroded by wave action. This problem appears to have been increased by the construction of breakwaters.

SOILS

Dominant Soil Materials

wg1—Loose yellow shelly sand (topsoil and subsoil)

Colour	pale yellow (10YR 8/6)
Texture	sand
Structure	apedal single-grained
Fabric	sandy
pH	7.0–9.0
Stones	nil (fragments of shell, pumice and organic matter)
Roots	nil

wg2—Loose pale brown siliceous sand (subsoil)

Colour	pale brown (10YR 7/4) to dark brown (10YR 5/3)
Texture	sand
Structure	apedal single-grained
Fabric	sandy
pH	7.0–9.0
Stones	nil
Roots	nil

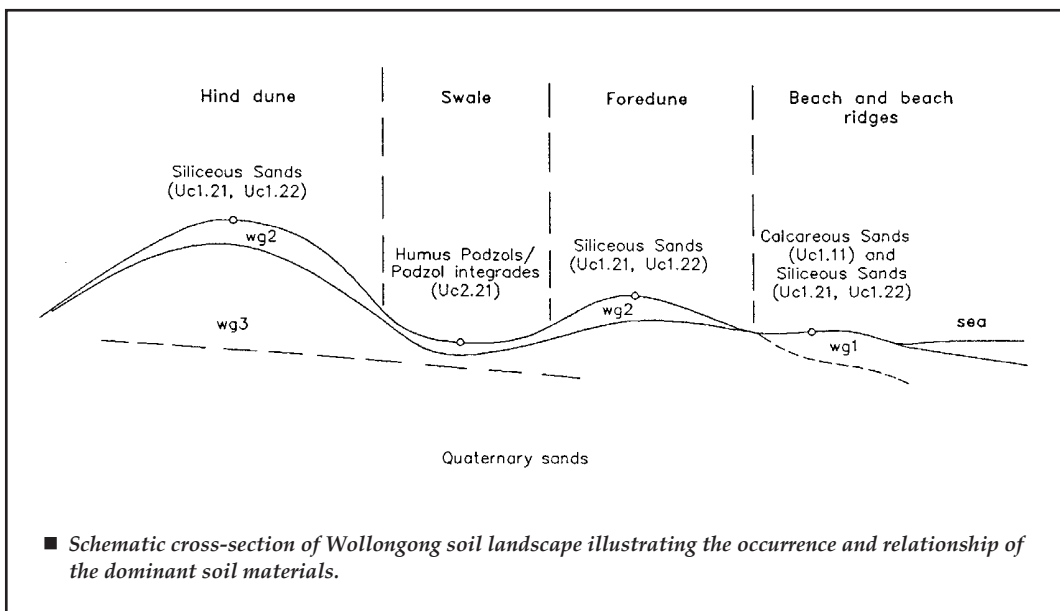
wg3—Yellowish brown mottled sand (subsoil)

Colour	yellowish brown (10YR 5/8) to dull yellowish brown (10YR 5/3) with faint orange mottles at depth (50%)
Texture	sand
Structure	apedal single-grained
Fabric	sandy
pH	5.5–7.0
Stones	nil
Roots	nil

Occurrence and Relationships

Beach. Generally >200 cm of loose pale yellow shelly sand (**wg1**) occurs over the entire beach [Calcareous Sands (Uc1.11, Uc1.12)]. Some beaches contain fewer shell fragments [Siliceous Sands (Uc1.21, Uc1.22)].

Foredune. More than 200 cm of loose pale brown siliceous sand (**wg2**) occurs over all foredunes. In some sheltered situations where vegetation has not been disturbed, surface soil texture may approach that of loamy sand and have a slight accumulation of organic matter [Siliceous Sands



(Uc1.21, Uc1.22) and occasional Calcareous Sands (Uc1.11, Uc1.12)].

Minor Swales. Up to 30 cm (**wg1**) overlies >30 cm (**wg2**). (**wg3**) occurs below (**wg2**) usually at the level of the capillary fringe of the watertable. Boundary is gradual. Total soil depth exceeds 100 cm [Humus Podzol/Podzol intergrades (Uc2.21)]^{*}.

LIMITATIONS TO DEVELOPMENT

Soil Limitations

wg1 *

wg2 High permeability
Low available water-holding capacity
Very low fertility

wg3 Low available water-holding capacity
Very low fertility
Salinity (localised)

Fertility

The general fertility is low. The soils are often strongly saline with low organic matter content, low available water-holding capacity, very low CEC and very low nutrient status.

Erodibility

The soil materials have very low erodibility. They consist of well-drained, loose, coarse sands. As

loose material these soils are easily entrained by concentrated water flows.

Erosion Hazard

The erosion hazard for non-concentrated flows is slight to moderate. Calculated soil loss during the first 12 months of urban development ranges up to 15 t/ha for topsoil and 15 t/ha for exposed subsoil. Soil erosion hazard for concentrated flows, wind erosion and wave erosion is extreme.

Surface Movement Potential

The sandy soil materials are stable.

Landscape Limitations

Wave erosion hazard
Wind erosion hazard
Waterlogging (beach)
Non-cohesive soil

Urban Capability

Generally high to severe limitations for urban development.

Rural Capability

Generally high to severe limitations for regular cultivation or grazing.

* Beaches in this region have disturbed topography because of foredune reshaping following destruction of bitou bush (*Chrysanthemoides monilifera*) and replanting with marram grass and spinifex.