

# Groundwater dependent ecosystem pictorial conceptual model 'coastal sand masses (beach ridges)'

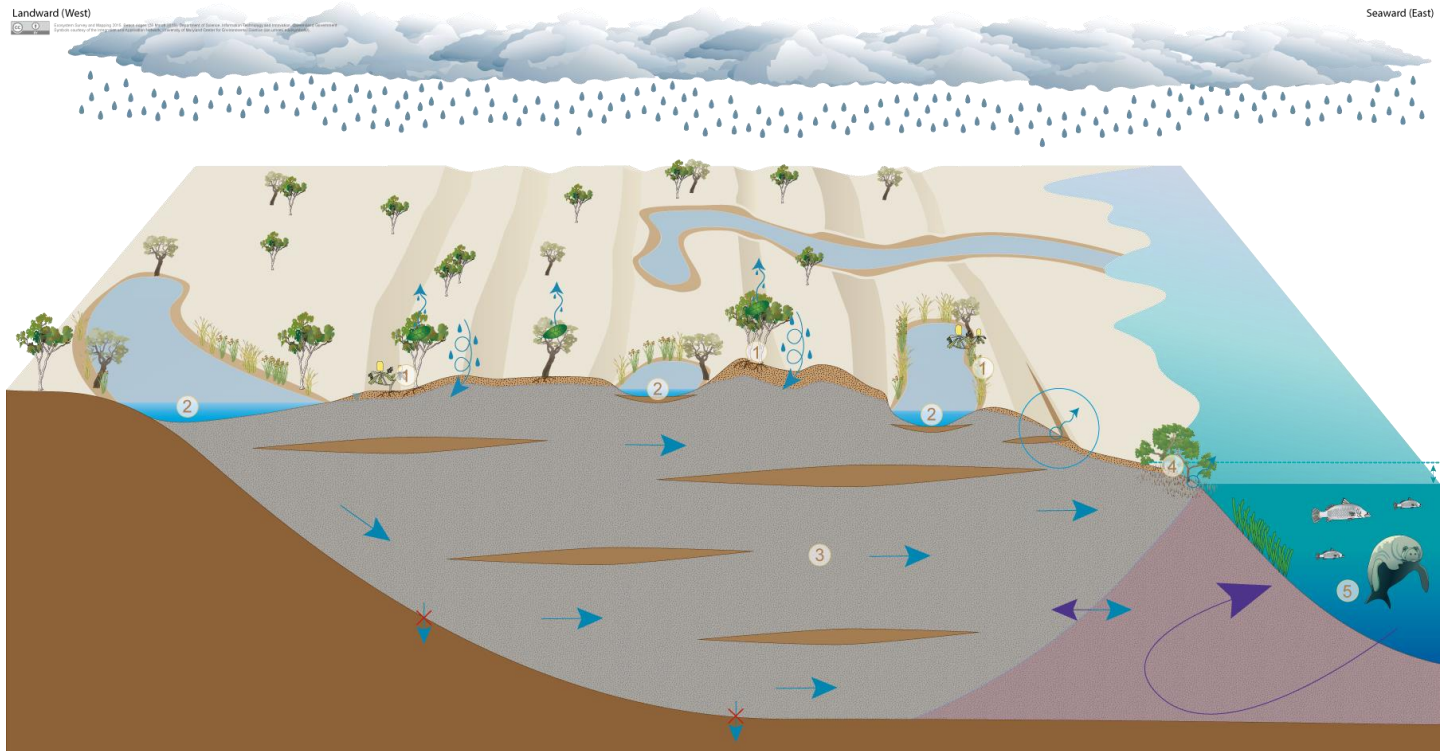
Version 1.5

## Coastal sand masses (beach ridges)

Beach ridges have developed along the Queensland coastline. They are largely comprised of coastal sands and typically support a single, unconsolidated sedimentary aquifer, where groundwater forms a freshwater lens in the intergranular voids of the coastal sand mass. Perched aquifers may also occur over low permeability layers within the sand mass.

Unconsolidated sedimentary aquifers in sand masses may provide a wide range of ecosystems with water required to support their fauna and flora communities, ecological processes and delivery of ecosystem services.

- Palustrine (e.g. swamps) and lacustrine (e.g. lakes) wetlands and riverine (e.g. streams and rivers) water bodies on coastal sand masses may depend on the surface expression of groundwater from these unconsolidated sedimentary aquifers.
- Terrestrial vegetation on coastal sand masses may depend on the subsurface presence of groundwater in these unconsolidated sedimentary aquifers where groundwater is typically accessed through the capillary zone above the water table.
- Unconsolidated sedimentary aquifers may also support subterranean ecosystems within the aquifer itself, sometimes is indicated by the presence of stygofauna.
- Estuarine and near-shore marine ecosystems located adjacent to coastal sand masses may depend on the discharge of groundwater from these unconsolidated sedimentary aquifers.



### Geology legend



Sand



Basement of the model



Low permeability rock  
Indurated sand layers and peat layers

### Groundwater hydrology legend



Sand (unsaturated)



Sand (saturated with marine water)



Sand (saturated with groundwater)



Low permeability rock (unsaturated)



Basement of the model (unsaturated)



Infiltration and percolation  
Rain infiltrates through the soil to recharge the aquifer below



Spring  
A hydrogeological feature by which groundwater discharges naturally to the land surface or cave



Groundwater table



Direction of groundwater movement



Negligible groundwater movement



Direction of marine water movement



Groundwater and marine water interface  
The position of the interface will vary temporally



Tidal range

## Flora legend



*Banksia* spp.



*Cladium* spp.



*Corymbia* spp.



*Melaleuca* spp.



Mangrove



Sedge



Seagrass



Evapotranspiration

Process whereby plants draw water up through their roots and move it out through their leaf pores

## Fauna legend



Stygofauna  
Aquatic fauna that live in groundwater



*Dugong dugon*



Fish

## Focal elements legend



Outcropping low permeability rock  
Low permeability rocks, such as beach rock, can outcrop along beach ridges. These outcropping low permeability rocks may cause the expression of groundwater at the land surface.

## Groundwater dependent ecosystem legend



1 Terrestrial GDEs  
Regional ecosystems and riverine wetlands may depend on the subsurface presence of groundwater within the capillary zone for some or all of their water requirements.



3 Subterranean GDEs  
Aquifer and cave subterranean wetlands may depend on the subterranean presence or expression of groundwater for some or all of their water requirements.



5 Surface expression GDEs (near-shore marine systems)  
Near-shore marine wetlands may depend on the surface expression of groundwater for some or all of their water requirements. This sub-type of GDE is not currently mapped in the Queensland GDE Mapping.



2 Surface expression GDEs  
Lacustrine wetlands, palustrine wetlands and riverine water bodies may depend on the surface expression of groundwater for some or all of their water requirements.



4 Surface expression GDEs (estuarine systems)  
Estuarine wetlands may depend on the surface expression of groundwater for some or all of their water requirements. This sub-type of GDE is not currently mapped in the Queensland GDE mapping.

## Citation

Queensland Government (2017) *Groundwater dependent ecosystem pictorial conceptual model 'coastal sand masses (beach ridges)'*: version 1.5, Queensland Government, Brisbane.