

# Groundwater dependent ecosystem pictorial conceptual model 'Petrie Formation along the shoreline of Moreton Bay'

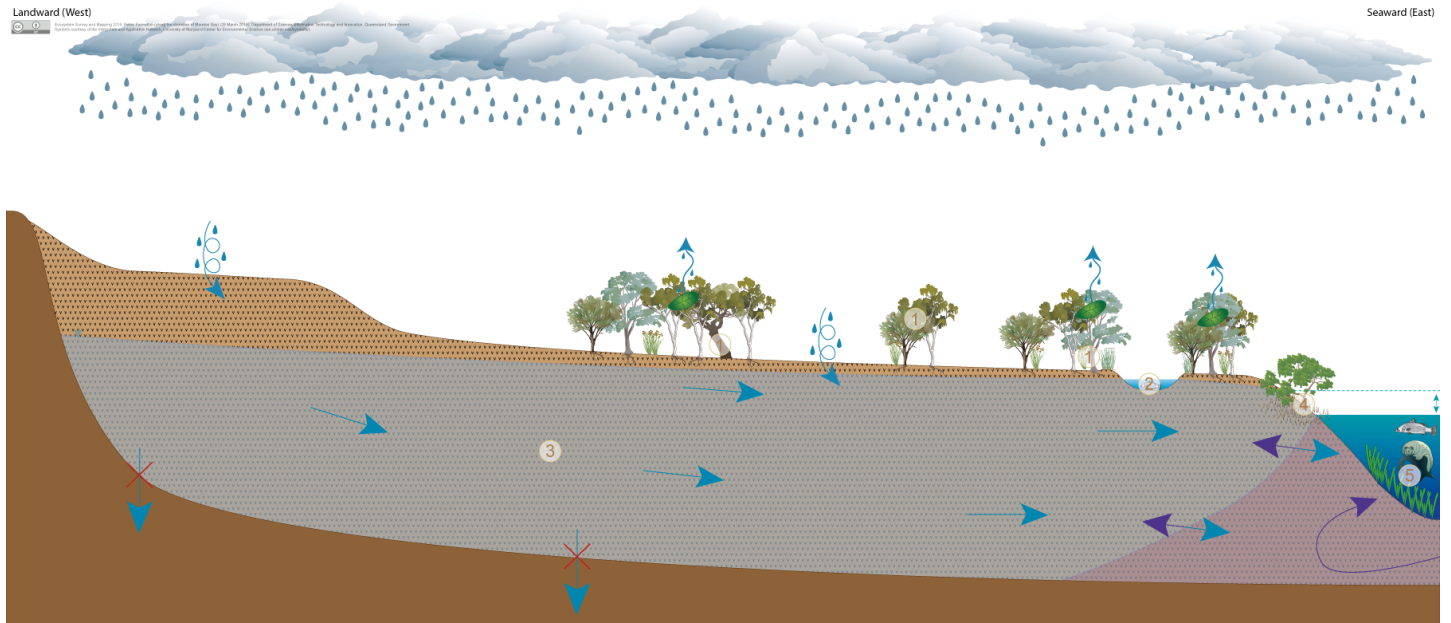
Version 1.5

## Petrie Formation along the shoreline of Moreton Bay

Weathered basalt of the Petrie Formation in coastal areas (Redland basalt) is moderately to highly permeable and may form aquifers which store and transmit groundwater through vesicles, fractures and weathered zones. Vertical groundwater movement from a basalt aquifer is often restricted by underlying unweathered bedrock which may have lower permeability. While groundwater will often continue to leak through the less permeable rock to some degree, typically groundwater moves laterally and can be discharged to the surface or offshore along the contact between weathered basalt and underlying less permeable rocks. Where deeply weathered Petrie basalt occurs along the shoreline of Moreton Bay it usually supports a shallow water table, and groundwater often discharges into near-shore marine environments of Moreton Bay.

A range of ecosystems may depend on groundwater within these unconfined, basalt aquifers to support their plant and animal 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 may depend on the surface expression of groundwater resulting from very shallow water tables within these weathered rock aquifers.
- Terrestrial vegetation may depend on the subsurface presence of groundwater in these weathered rock aquifers where groundwater is typically accessed through the capillary zone above the water table.
- Weathered rock aquifers may also support ecosystems within the aquifer itself, which sometimes is indicated by the presence of stygofauna.



### Geology legend



Basalt  
Deeply weathered basalt of the Petrie Formation



Basement of the model

### Groundwater hydrology legend



Basalt (unsaturated)



Basalt (saturated with marine water)



Basalt (saturated with groundwater)



Basement of the model (unsaturated)



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



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



*Acacia* spp.



*Cladium* spp.



*Corymbia* spp.



*Eleocharis* spp.



*Eucalyptus* spp.



*Melaleuca* spp.



Mangrove



Seagrass



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

## Fauna legend



*Dugong dugon*



Fish

## 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 'Petrie Formation along the shoreline of Moreton Bay': version 1.5*, Queensland Government, Brisbane.