



Hydrology of North Stradbroke Island

North Stradbroke Island can be likened to a sponge sitting on a hard shelf of about the same physical area. The sponge is partly saturated, with some of the water leaking out and running over the edges of the shelf.

This is a generalised model of the island's groundwater system. The sponge represents the sand of the island and the shelf that of the sandstone and volcanic bedrock.

Recharge, or replenishment, of the groundwater occurs via rainfall directly onto the sands. The rainwater percolates through the sand eventually reaching a zone called an aquifer where it is stored as groundwater. The level to which the groundwater rises in the aquifer is the watertable.

Under the influence of gravity, the groundwater gradually moves from a central mound and exits the island under the coastline. The groundwater mound exerts pressure on the seawater, keeping the interface between fresh and salty water away from the coast. (See Figure 1)

Surface water runoff occurs in various creeks and gullies around the island. Some runoff is a direct result of rainfall and either flows to the sea or collects in lakes and swamps. Other runoff comes from the seepage of groundwater at springs.

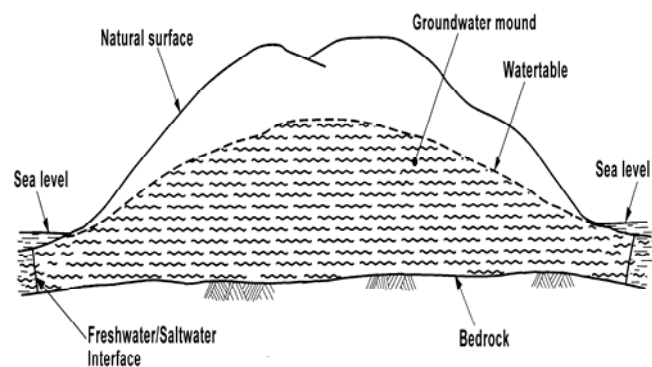


Figure 1—Generalised cross section of groundwater on North Stradbroke Island

Formation of lakes

Window lakes

The groundwater lies mostly beneath the surface of the island's sand. However, in some locations the surface dips below the watertable and the groundwater is exposed, thus forming a lake. This feature is often referred to as a window in the watertable. Blue Lake near

the eastern coastline is one example of this feature. (See Figure 2).

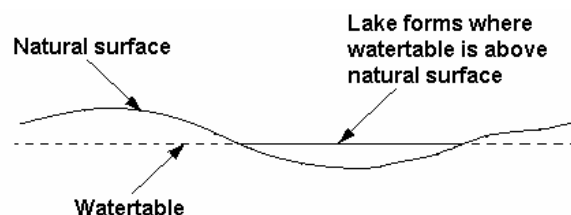


Figure 2—Diagram of a Window lake

Where the watertable and the surface intersect at a low angle, a freshwater spring can develop. An example of this is Myora Springs to the north of Dunwich. (See Figure 3).

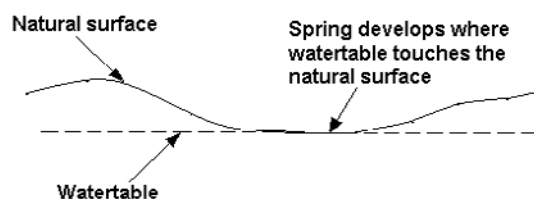


Figure 3—Diagram of a spring

Table 1 summarises estimated flow rates from various lakes and streams on the island.

Table 1

Creek or lake	Flow rate (million litres per day)
Blue Lake Outflow	17
Myora Springs	2.4
Aranarawai Creek	7.2
Eighteen Mile Swamp (above junction with Blue Lake Outflow)	20



Perched lakes

Perched lakes can occur in depressions where an impermeable layer has formed in the soils near the surface. These layers develop as a result of chemical reactions between the soil and water and gradually precipitate organic and inorganic matter in the soil profile.

The precipitated matter eventually forms an impermeable layer, preventing water from percolating to the watertable. The depression will then retain rainfall and runoff and a lake will form that is 'perched' above the watertable.

Brown Lake is an example of a perched lake.

During dry periods perched lakes may diminish in size or evaporate completely. Figure 4 shows the distribution of some areas of perched water on the island.

Monitoring

A network of water level observation bores is monitored on a monthly basis. From measurements, a record of water levels is accumulated. The data is used to calculate groundwater fluctuations and responses to rainfall and water use.

Water samples are regularly collected and sent to the Queensland Health Scientific Services for testing to check for changes in water quality.

Further information

For more information on the island's water resources or other fact sheets, phone the Department of Natural Resources and Water on (07) 3224 2923.

Acknowledgement

This fact sheet has been produced in collaboration with Redland Water and Consolidated Rutile Limited.

References

Chow, V T (ed.) 1964: Handbook of Applied Hydrology McGraw-Hill Inc. New York.

Laycock, J T (1975): North Stradbroke Island—Hydrogeological Report. Rep. No.88 Geol. Surv. Qld.

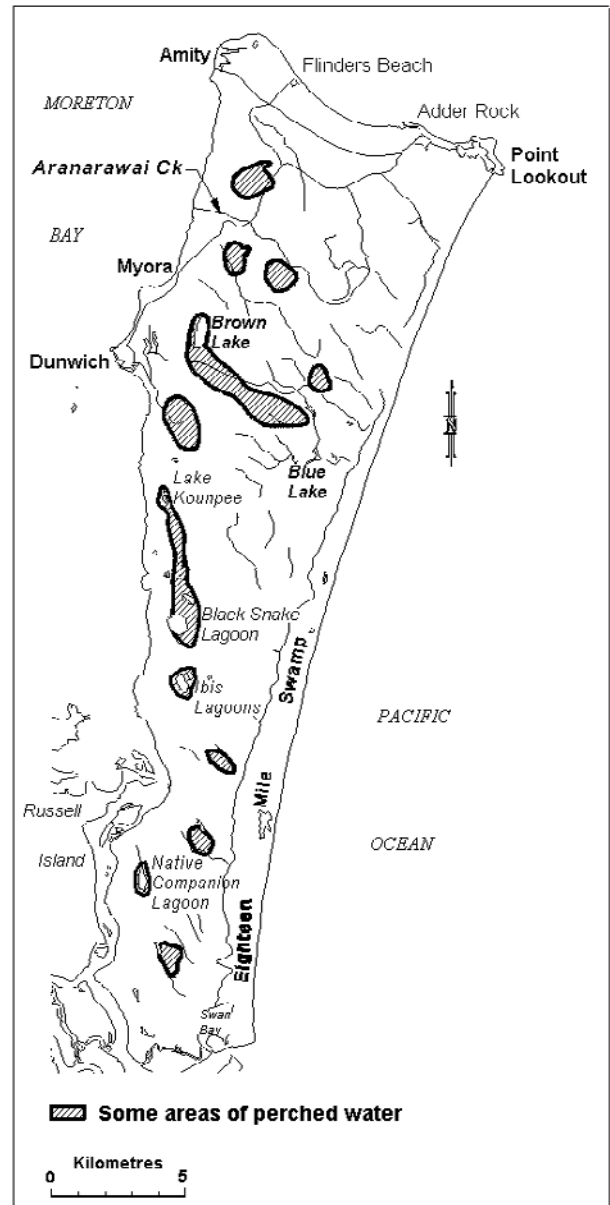


Figure 4—Some areas of perched water

March 2006

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For further information phone 13 13 04