**Groundwater in Coastal Region**

Groundwater will flow from a region of higher pressure (higher water table elevation) to a region of lower pressure (lower water table elevation).

The rate of groundwater flow (or leakage) is essentially determined by the difference in groundwater elevation between two points and the characteristics of the material through which the water is moving. At the regional scale, fresh groundwater tends to discharge at the coast via several natural mechanisms. These include evapotranspiration, mixing with saline groundwater to form a subsurface region of brackish water; and direct seepage through wetlands, springs, tidal rivers and the ocean floor. At the local scale, the flow of groundwater near a waterbody may vary. Groundwater levels and resulting groundwater flow vary in response to natural factors such as rainfall and the rise and fall of the tides, waves, and human factors such as groundwater pumping and irrigation. Where groundwater interacts with brackish waters, such as within a wetland, the density difference between fresh and saline waters will also help to drive groundwater flow, with fresher water tending to move over the top of more saline waters.

**The influence of tides and waves**

A groundwater system and its connected water bodies can be somewhat influenced by the action of ocean tides and waves, similar to an estuary or tidal creek. The action of tides and waves tends to cause cyclic and irregular flows of water through the groundwater system and any other connected inland water bodies.

At low tide, the water table within the surrounding groundwater system may be higher than the water level within the connected water bodies, and therefore groundwater will discharge into and through the banks and base of the water body. At high tide, the water level within the water body may exceed the surrounding groundwater elevation, resulting in the recharge of waters back into the groundwater system.

**The influence of salt water**

The regular rise and fall of the water level within a water body, such as an ocean, estuary or saltwater wetland, is important to the surrounding groundwater system, as this process may - 8 - influence the rate of exchange of nutrients and contaminants between surface and subsurface waters. It is likely that the tidal rise and fall of the water level within a coastal water body will assist the mixing between fresher groundwater discharging towards the coast and saline or brackish waters entering the groundwater from the water body. Without tides, the fresh groundwater would flow over the denser saline groundwater, which would occur at a considerable depth below the ground surface.

