Shark Bay's Hypersaline Waters

Why some waters of Shark Bay are super salty

Shark Bay's combination of climatic and geographical conditions creates an environment like few places on the planet. Shallow bays, seagrass banks and low rainfall are just some of the factors that have helped create an amazing hypersaline ecosystem.

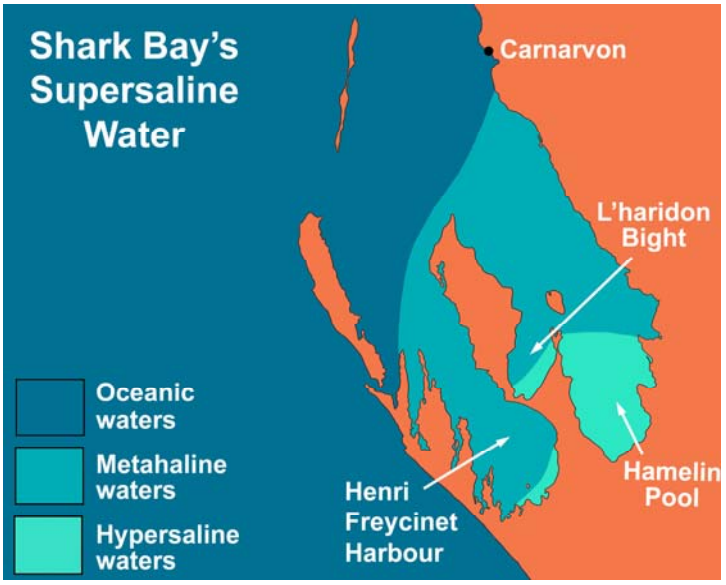
In Shark Bay's hot, dry and windy climate, evaporation rates are very high. Because of this, seawater in the area's shallow bays become concentrated and hypersaline (very salty). In normal ocean environments, highly saline waters would be diluted by fresh water flowing in from waters or groundwater, or by low salinity waters of the open ocean flowing through on tides and currents.

Shark Bay, however, has three features which conspire to prevent this from happening. Firstly there is very little fresh water run-off or seepage into Shark Bay because of very low rainfall (with the exception of the occasional running of the Wooramel River). Secondly, Dirk Hartog, Bernier and Dorre Islands limit the flow of low salinity oceanic currents into the bay. Thirdly, and most importantly, the shallow water banks created by the seagrasses restrict tidal flows into and out of the southern parts of the bay. These three effects ensure low salinity water does not dilute Shark Bay's highly concentrated, hypersaline waters.

Seawater entering the shallow waters of Shark Bay crosses two large sandbanks stabilised by seagrass. These banks or 'sills' restrict tidal movement into and out of the bays where evaporation rates are high.

The most saline parts of the bay are, Hamelin Pool, the southern half of L'haridon Bight and the southern extreme of Freycinet Harbour, which are almost twice as salty as the open ocean. The northern part of the eastern gulf and almost the entire western gulf are 'metahaline' – meaning that they are up to 1.5 times as salty as the open ocean.

While hypersaline and metahaline waters are not uncommon in shallow inland water bodies (such as salt lakes and birridas), they are very unusual in ocean environments. In fact, Shark Bay is one of the very few marine environments in the world that has hypersaline waters, the other notable exception being Exuma Cays in the Bahamas. Because hypersaline conditions occur so rarely in marine environments, Shark Bay's hypersaline waters are regarded as a globally significant phenomena.



So what if Shark Bay has super salty waters? Well, these hypersaline waters are one of the reasons for Shark Bay's World Heritage listing. The geological processes that created the hypersaline waters and the unique ecosystem that it supports, including the occurrence of rare stromatolites, are Shark Bay features that lead to World Heritage listing.

For fact sheets on stromatolites and other interesting Shark Bay features visit www.sharkbay.org.