



## Can you Fathom It? River Soundings

It is important for ships to know the geography of reefs or river beds and how much water is underneath the boat, so they don't run aground or get stuck on the river bed! Sailors can measure the depth of the water and map the ocean floor by **sounding**. Seabed contours are constantly changing due to gales, water currents and physical channelling by ships. River soundings in shallow areas need to be repeated to account for any of these changes. Changes in tide also need to be taken into account. If a ship is safely harboured during high tide, sailors need to be sure that the keel will not drag along the bottom when the tide is low and water level is lowered.

William Bligh who sailed on HMS *Resolution* II and HMS *Bounty* was a very skilled hydrographer and was able to perform river soundings with great accuracy. Modern sailors use electronic echo sounders, which give a map of the ocean floor. Before these were invented however, sailors used **sounding lines** (consisting of lead and line) or a marked pole to calculate the depth of the water.

The marked pole is simply a piece of wood or bamboo cane with measurements marked along its length. When it is placed down into the water, the number of marks is counted and the water depth can be calculated.

A sounding line is a marked line with a lump of lead tied to one end. Lead is used as it sinks easily in water due to its high density. The lead is hollowed out at its base and filled with engine grease, which can pick up a soil or rock sample from the bottom. This is called arming the lead and can be useful when fixing a boat's position. Sailors can also work out their location by smelling the sample.

The lead needs to be thrown ahead to where the ship will be sailing, so as the ship floats along the water, it will reach the point where the lead was thrown, to form a vertical line down from the ship. If the lead line is thrown directly over the side, the ship will continue to float along and the lead line will be dragged behind – giving a deeper than actual reading.

The use of a sounding line was recorded in Egypt 2 500 years ago. For many years, the line was unmarked and the leadsman estimated how much line they had let out, or how much was hauled in hand over hand on retrieving it. Sailors from European and Asian cultures regularly used sounding lines, particularly when sampling from the bottom. The introduction of a marked line is thought to have occurred around 1600, the measurements being in fathoms (a measure of six feet or 1.8 metres).

Two boats continually took soundings ahead of HMB *Endeavour* as it slowly navigated its way through coral reef in Australia. Although HMB *Endeavour* had a relatively flat bottom which allowed it to sail in shallow waters, the coral reef was hazardous and it was vital to know the depth of the water they were sailing through.