Ship captains must know the vertical clearance: how much room there is between the top of their ship and the bridges and power lines they pass under while navigating. Some ships carry very tall cargo like cranes or are piled high with hundreds of containers. Occasionally, ships break off antennae when passing under bridges. Mariners must also know how much room there is between the keel of their ship and the seafloor; sometimes it is merely inches! That is why the Office of the Coast Survey need the times and heights of high and low tides.

Moving water levels are measured in between bronze discs on the ground called tidal benchmarks. They are like the markings on a football field. You can only measure a touchdown run if the markings don’t move and are the right distance apart. That is why NOAA checks the distance between benchmarks for any movement.

Cartographers use the information collected from tide gauges and benchmarks to create tidal datums. They record these different water-level averages on the charts. To clear bridges and overhead cables, mariners refer to Mean High Water (MHW). To avoid underwater obstructions, mariners refer to Mean Lower Low Water (MLLW).

A dangerous underwater rock of uncertain depth

A rock that rises out of the water

Big, sharp submerged rocks can rip open the hulls of ships.