## What is a datum?

When measuring the height of a water level, that height must be specified relative to some other level called the datum. In day-to-day use, the height of an object is usually given relative to the floor on which that object is sitting. In this case the datum is the floor and it is usually obvious what is what the height is measured from so is not explicitly stated. However with tidal levels the datum must be specified as there are numerous possible datums that could be used to specify the height of the tide.

Analogy - if I am holding a ball out at arm's length it might be 1.0m above the floor, but then if I move to stand by my desk it could be described as 0.5m above my desk. All that has changed is the datum (the floor or the desk). If I set the ball on the floor its height is now 0m to 'floor datum' and −0.5m to 'desk datum'.
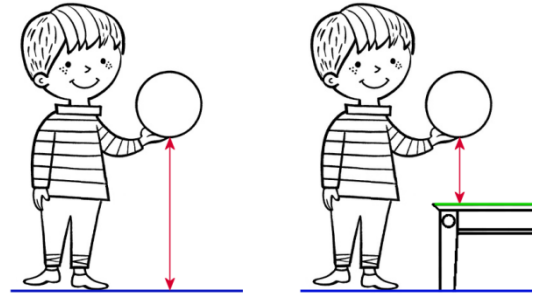
You can see that if I raise the height of the datum, I reduce the height of anything measured relative to that datum.

Tidal Datums

With tidal levels the two most commonly used datums are Chart Datum and Ordnance Datum. Some tide table formats might say "Heights given to Chart Datum" and not mention the other one. However many of our standard formats state the datum <u>and</u> the position of the other datum relative to this.

Chart Datum is unique to each location and is usually set to be close to the lowest tide level that can occur under normal meteorological conditions. Therefore heights will almost always be positive values. Ordnance Datum is a datum common to all locations and is required when comparing the heights at different ports - something you can't do with Chart Datum tide tables as it is not a fixed level everywhere.

Chart Datum is nearly always below Ordnance Datum and a tide table might show something like:

Datum of Predictions = Chart Datum : 2.3 metres below Ordnance Datum (Newlyn)

This means Chart Datum is the lower datum of the two (like the floor in the analogy) and therefore the heights (arrow length in the analogy) will be higher than on a tide table with all the heights given to Ordnance Datum (the table in the analogy).

Chart Datum is the most common datum for tide tables, although for engineering purposes, Ordnance datum is more common as it is easier to relate the height of the water to levels on land.

Datums in the British Isles

Ordnance Datum (Newlyn) is the datum of the land levelling system used in most of the UK, and is defined as the average value of the sea level recorded at Newlyn for the period 1915 to 1921 (6 years). However due to sea level rise since this time, the current mean sea level at Newlyn is about 0.2m above Ordnance Datum (Newlyn).

Ordnance Datum (Belfast) is defined as the average value of the sea level at Belfast for the period 1951 to 1956. This is approximately 2.7m above Ordnance Datum (Dublin).

Ordnance Datum (Dublin) is unusual in that it is based on the level to which the tide fell on 8-April 1837 in Dublin Bay rather than a mean sea level.

Ordnance Datum (Malin) is the same level as Ordnance Datum (Belfast).