

# *Tides*





# ***Spring Tides***

Every other week the sun and moon are both in line with the earth; the two *gravitational forces* added together will cause exceptionally strong tides.

A diagram illustrating the formation of neap tides. It shows the Sun at the top, the Earth in the center, and the Moon to the right. A vertical red line connects the Sun and Earth, and a horizontal red line connects the Earth and Moon, forming a 90-degree angle at the Earth. The Sun is a large yellow sphere, the Earth is a blue and white globe, and the Moon is a smaller grey sphere. Labels 'Sun', 'Earth', and 'Moon' are in red text next to their respective bodies.

Sun

# Neap Tides

When the sun and the moon are at 90 degrees of each other, the *gravitational force* of the sun will neutralize half of the moon's *gravitational force*, resulting in *neap tides*.

MHWS (MEAN HIGH WATER SPRING)

MHW (MEAN HIGH WATER)

MHWN (MEAN HIGH WATER NEAPS)

MSL (MEAN SEA LEVEL)

MLWN (MEAN LOW WATER NEAPS)

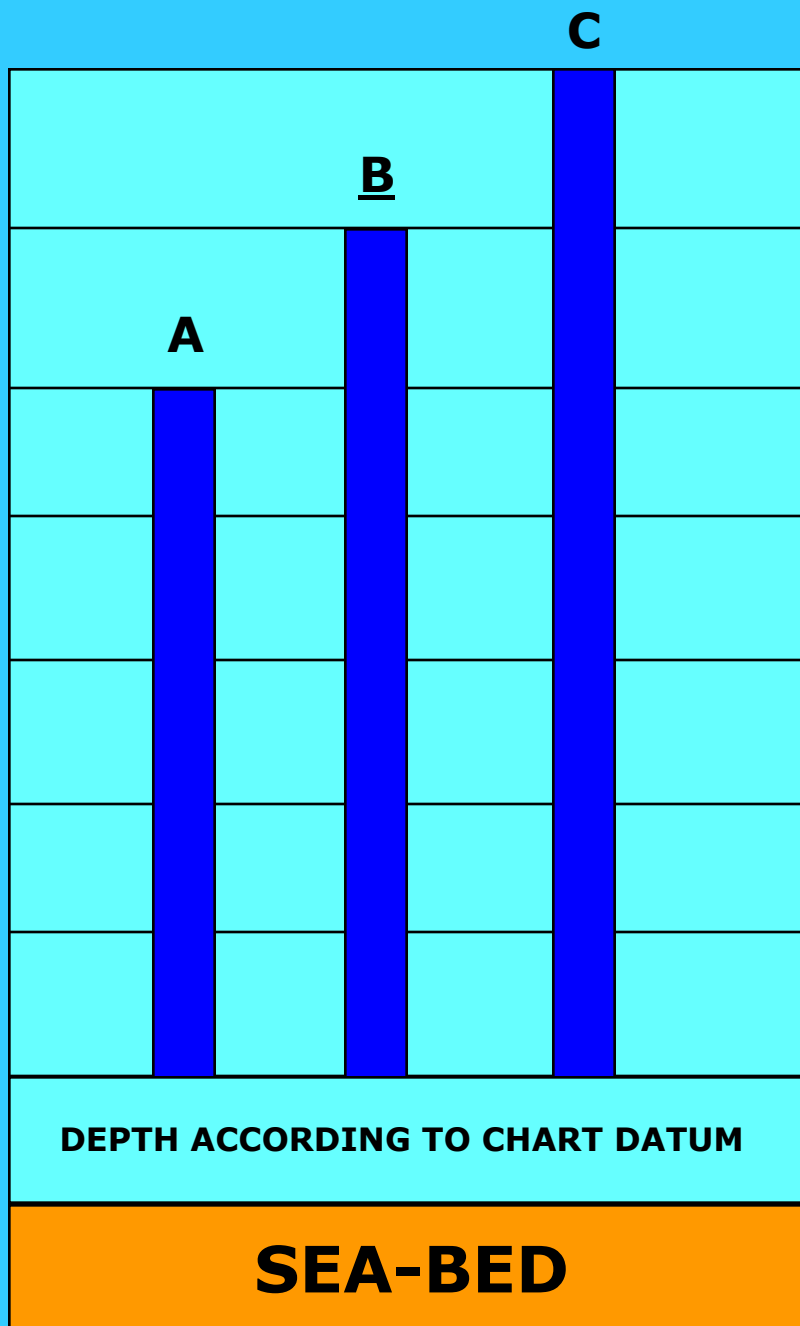
MLW (MEAN LOW WATER)

MLWS (MEAN LOW WATER SPRING)

LAT (LOWEST ASTRONOMICAL TIDE)

**DEPTH ACCORDING TO CHART DATUM**

**SEA-BED**

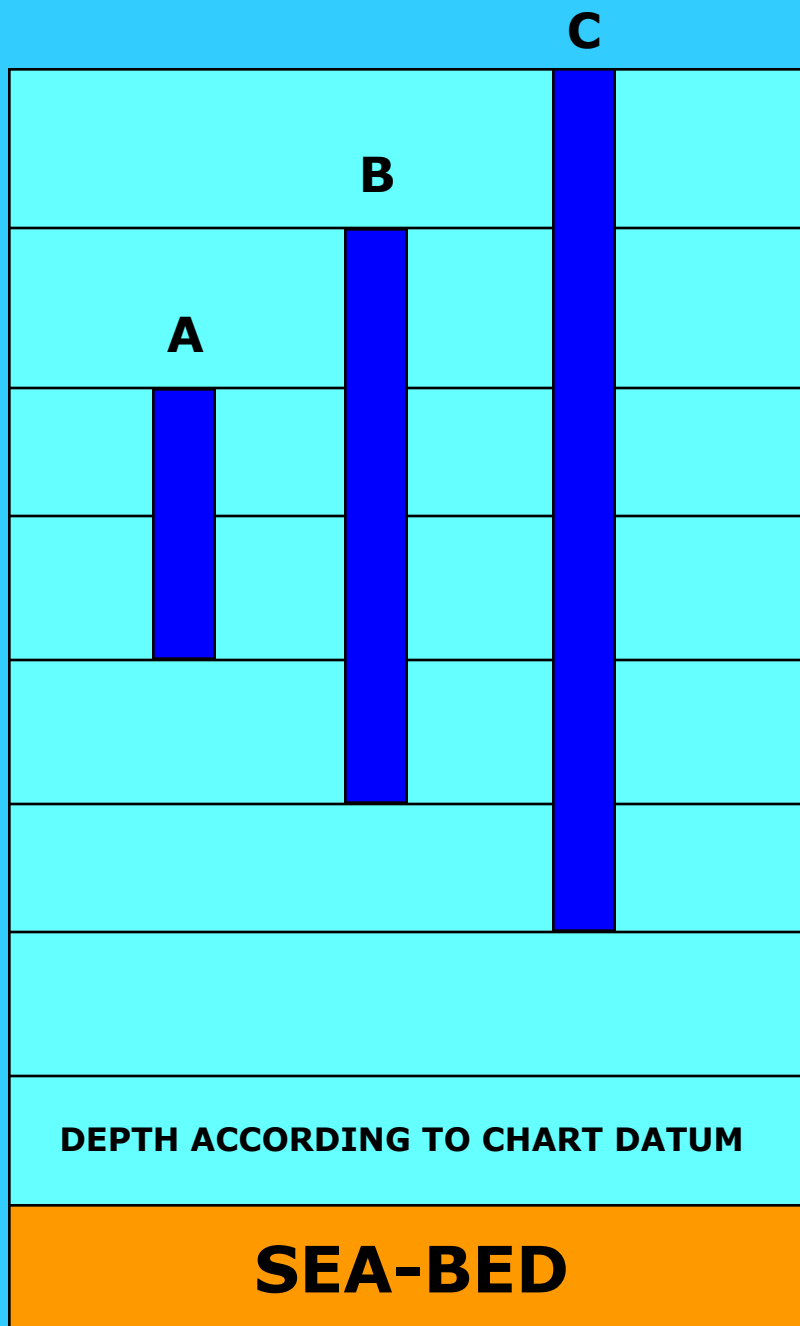


**RISE:**

A= neap rise;

B= mean rise;

C= spring rise.



## **RANGE**

- A) neap range
- B) mean range;
- C) spring range.

By "Range" is understood the *average difference* between 2 waterlevels.

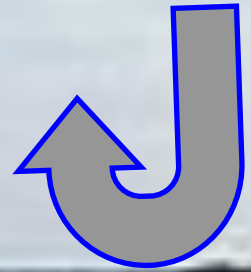


# ***high slack tide***



*High slack water (HSW)*  
is when the high water is  
highest and about to go down.

# ***low slack tide***



*Low slack water (LSW)* is the tide when the low water is lowest and about to go up.



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# FINISHED

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