

Why do real tides differ from the predictions?

The dynamic theory of the tides

- shallow water wave
- the continents in the way
- the shape of the basins

Tide patterns

1. regular pattern of one high and one low tide each day → diurnal tides
2. regular pattern of cyclic high water – low water twice a day → semidiurnal tide (most of the coasts)
3. semidiurnal mixed tides – reach different heights and low levels regularly

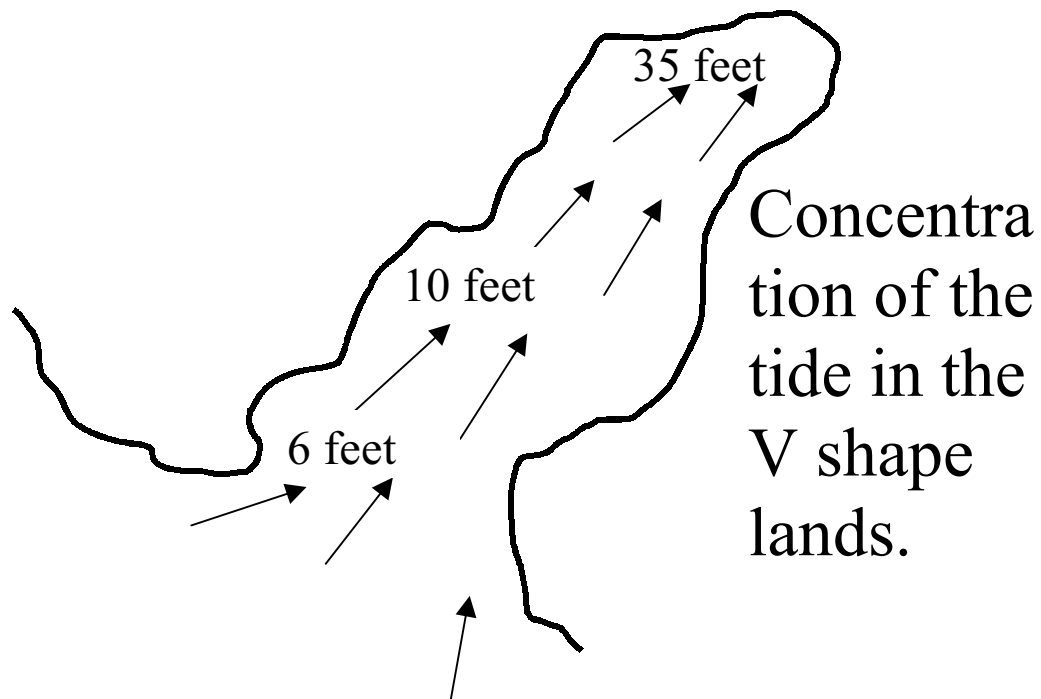
The examples are shown in Figure 11.25

In large ocean basins, water moving in a tide wave flows around an
AMPHIDROMIC POINT
See Figures 11.27 & 11.28

The reference level = tidal datum

Tidal range = high tide level - low tide level

Tide waves in **NARROW BASINS**



Bay has a natural oscillation period that can match the tidal period and either

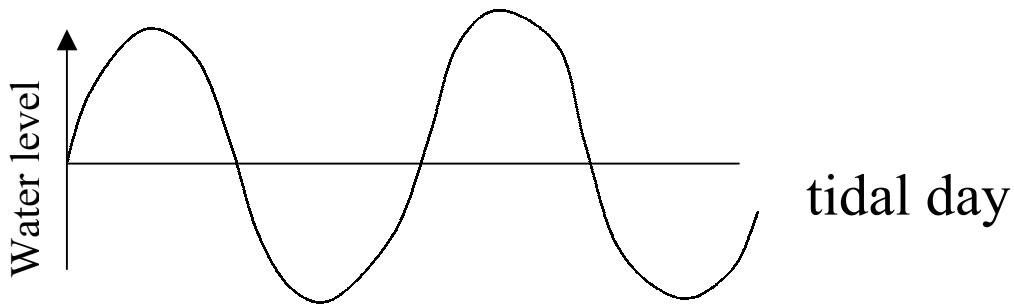
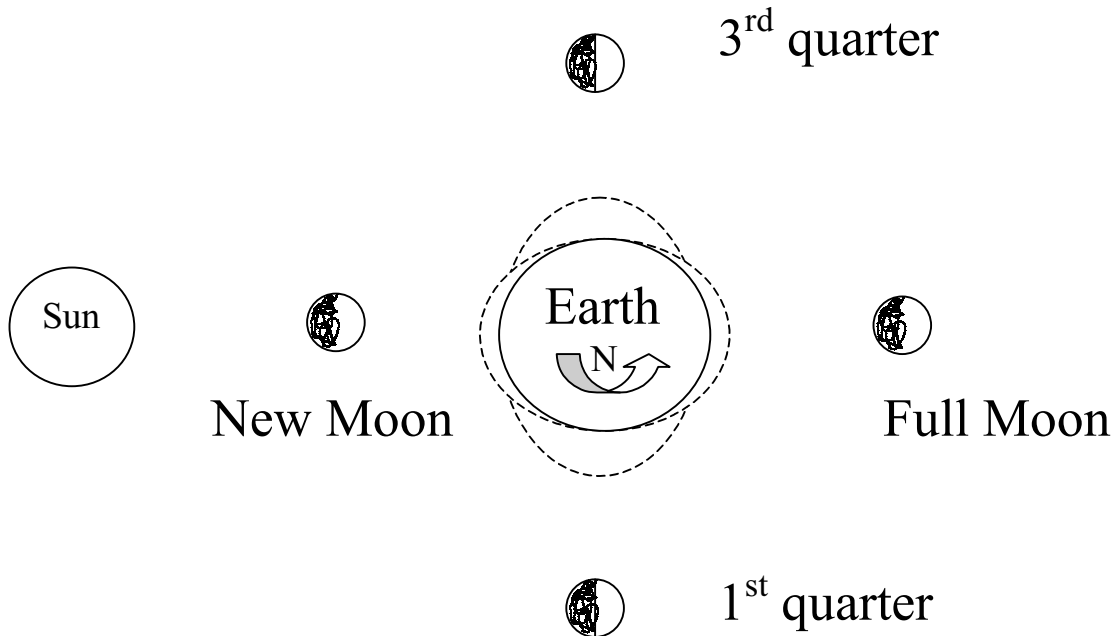
- create a large oscillation at the head of the bay (15m, the Bay of Fundy), or
- decrease the tide's range in the bay

Predicting Tides and Tidal Currents

- A. harmonic analysis
(astronomical data)
- B. local effects
(local geography)

Computer prediction of time & elevation of high and low water.

How do tides affect living organisms?



Wavelength of the tide wave is 12 000 miles.



Deepest ocean 7.5 miles



The bottom animals feel tides!

Reproductive activity driven by tides.

Example: Horseshoe crab

- at the FULL moon lay eggs in dry sand
- it takes 2 weeks to hatch
- larvae go into the sea at NEW moon tide

Why?

Water column makes pressure differences on animals in the ocean, and they sense it finely.



Thus, **THEY CAN FEEL THE TIDES!**