

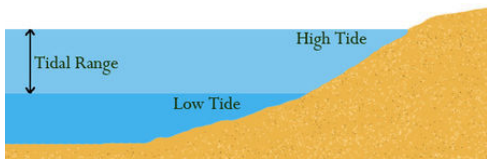
High and Low Tide

- If you have ever visited an ocean beach you no doubt have witnessed ocean tides.
- How would you define high tide versus low tide?

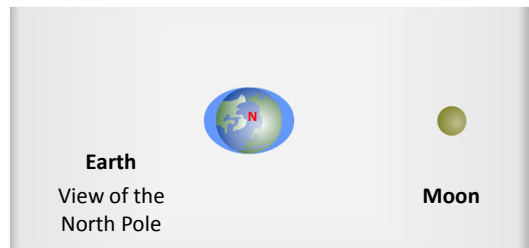


Background Vocabulary #2

- **High Tide** – Tide at its highest level
- **Low Tide** – Tide at its lowest level
- **Tidal Range** - The difference in height between the high tide and the low tide

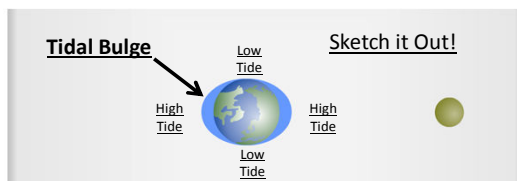


Tidal Bulge Simulation



Tidal Bulge

- **Tidal Bulge** - The “lump” of water created on two opposite sides of the Earth.
– Represents location of high tides.




Tidal Bulge Simulation

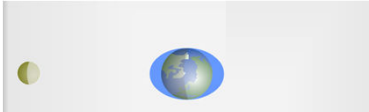

- Tidal Bulge Simulation:
<http://astro.unl.edu/classaction/animations/lunarcycles/tidesim.swf>

Spring Tide- When the tidal range is the largest. Occurs twice (New and Full Moon) during a lunar month (29.5 days) **#4**

New Moon

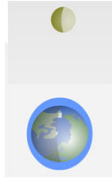


Full Moon

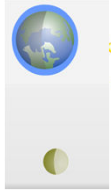




Neap Tide- When the tidal range is the smallest. Occurs twice (1st and 3rd Quarter) during a lunar month. **#4**

1st Quarter

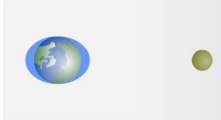


3rd Quarter





What would happen if the Sun did not affect the Earth's tides?

Without Sun



With Sun

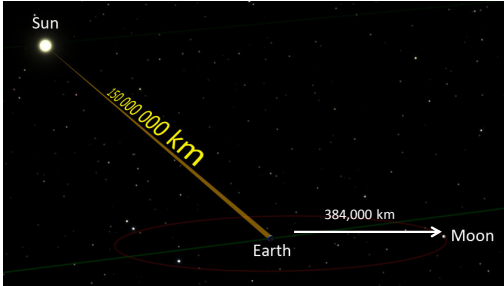


- Without the Sun's effects the Earth would not have neap or spring tides.

Gravity: Sun vs. Moon **#1**

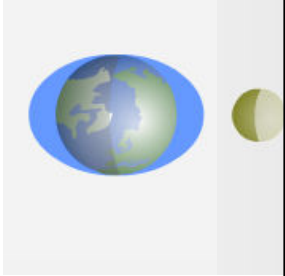
Does the Sun or the Moon have the greatest effect on the Earth's tides?

Even though the Sun is a much larger it is much farther away from the Earth than the Moon, meaning the Sun's effect on the Earth's tides is much smaller than the Moon's. **#1**



Why Two Bulges Anyway?

- Recall Earth and Moon orbit around their barycenter.
- Centrifugal force pushing water to the outside and gravitational force pulling water towards the moon.
- Overly simplified: Two bulges one away (mostly centrifugal, little gravitational) and one towards (mostly gravitational, little centrifugal).

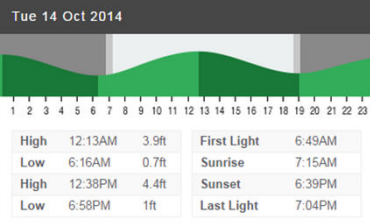


How Many Tides in a Day? #3

http://oceanservice.noaa.gov/education/kits/tides/media/supp_tide05.html

- The Earth rotates through two tidal bulges every lunar day.
- Therefore, a beach experiences two high tides and two low tides each day.

About how much time is in between two high tides?

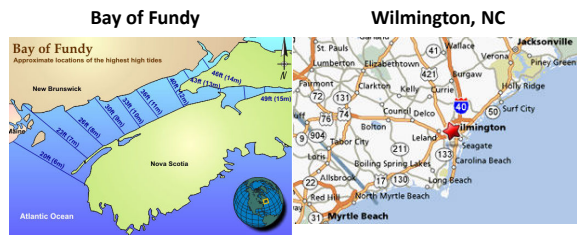


Why is the tidal range in this area of Canada different from that of our area?

https://www.youtube.com/watch?v=qfhNjpu_IU4

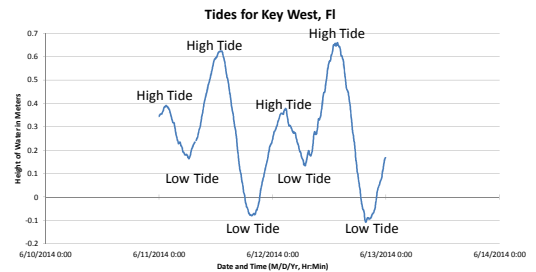
- Short answer: Geography!!
- Long answer: The continents and other geographical features can cause the water during the tides to build up and create extreme highs and lows, or they can be blocked by surface features and not have such extreme changes.
- This area of Canada works with the motion of tides making it very easy for the water to build up very high in the Bay.

Note the Differences



Reading a Tidal Graph

At the crest the area would be on the same or opposite side of the Earth as the Moon. **High tide.** At the trough the area would be at a right angle to the Moon. **Low tide.**



Quiz Topics For Tomorrow!

1. Know the 8 phases of the Moon in order and by their "shape" from yesterday.
2. Study the **Review Discussion Questions (#1-4)** of the tide handout from today

