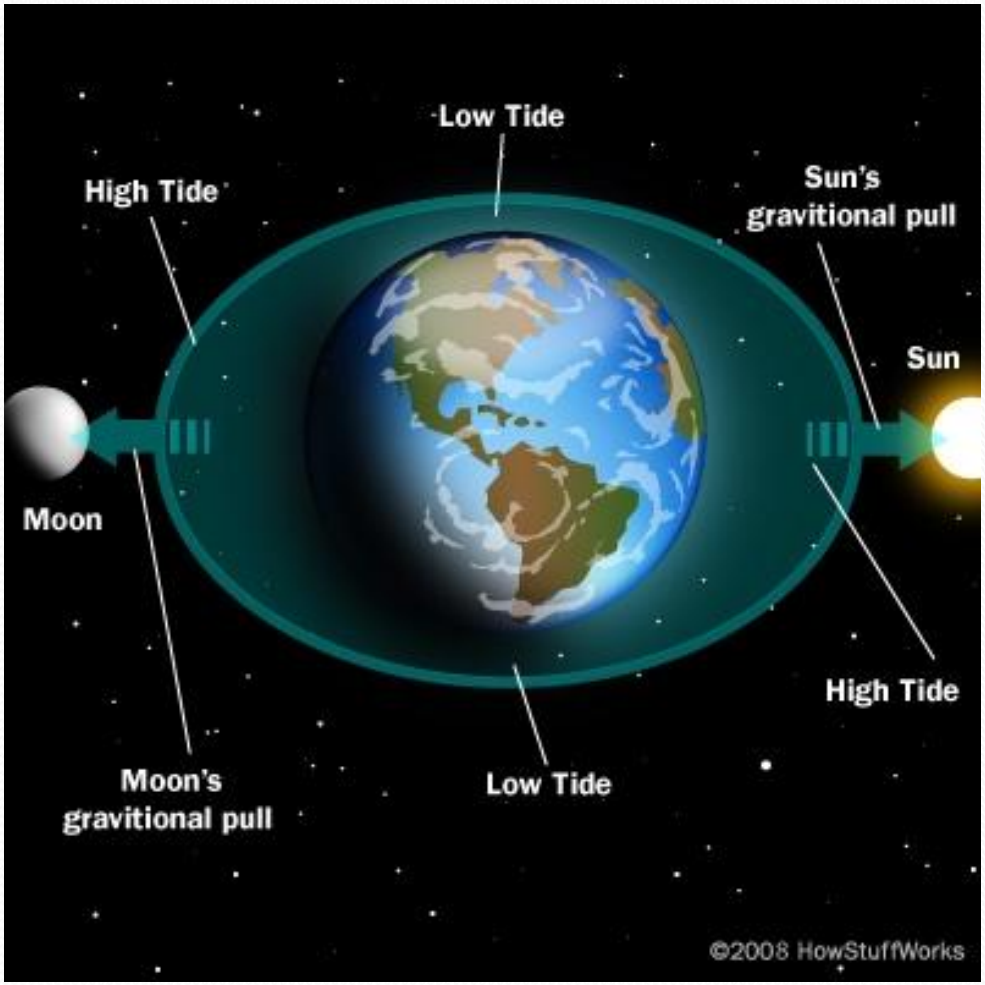
Tides

- It is caused by the gravitational force of the moon.

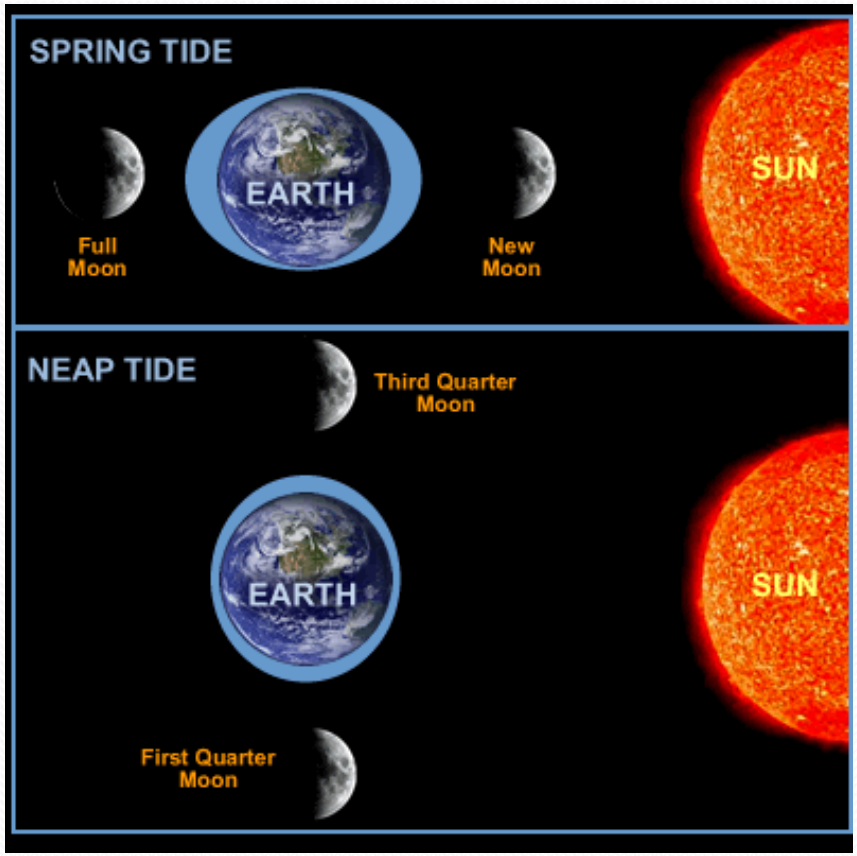


- The moon takes 24 hours and 50 minutes to pass over all oceans.
- Thus, tides shift by 50 minutes each day.

- **Tidal Range** is the difference between the high and low tides for a specific location.

Bay of Fundy, Canada

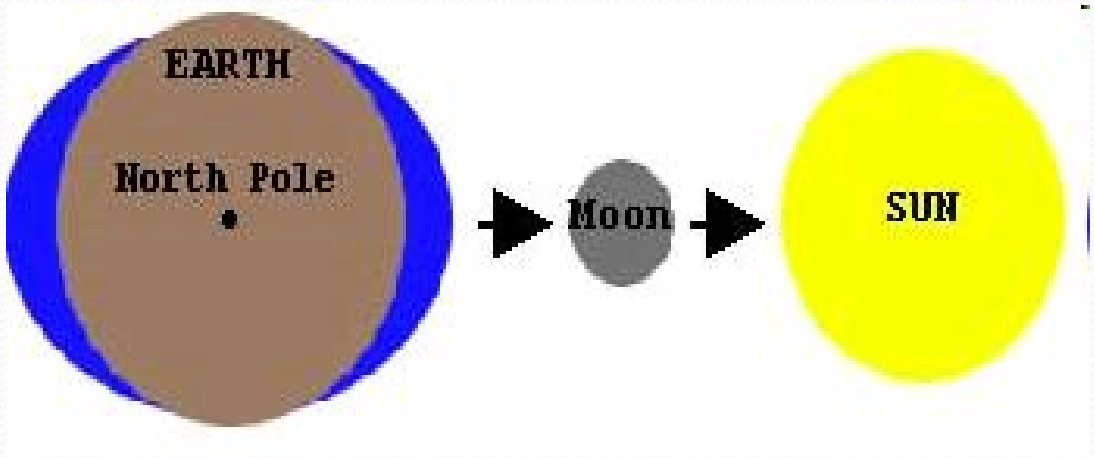
- **Spring Tides** occur twice a month when the sun and moon are aligned. This produces higher and lower tides.



- **Neap Tides** occur when the sun and moon are at right angles to each other. This produces smaller high and low tides.

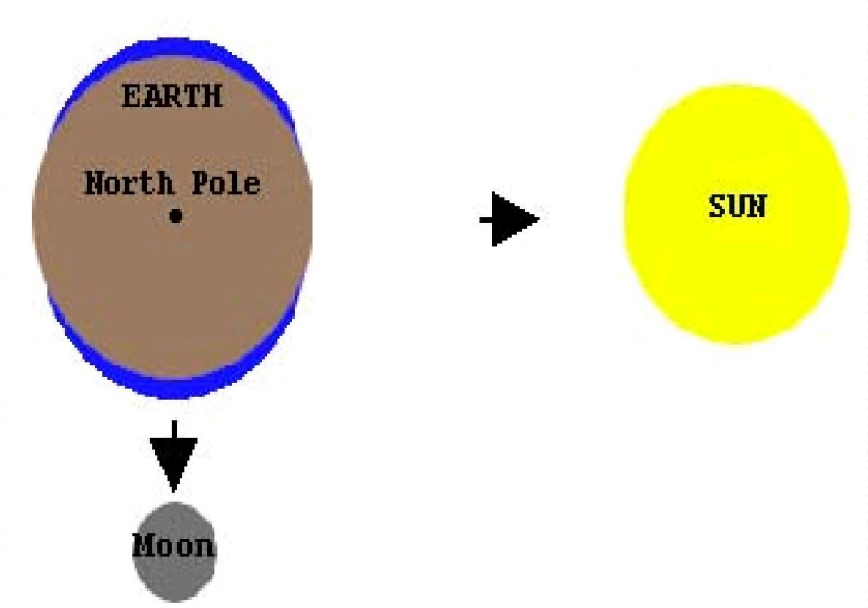
Monthly Tide Cycle – Spring Tides

- When the Sun, Earth and moon line up in a straight line, the combined gravity of the Sun and the moon have an effect on the earth's oceans, causing them to rise by as much as 15 meters.
  - These very high and low tides are called Spring tides and happen every two weeks.
  - **The daily tidal range is at its greatest during this time**



Monthly Tide Cycle – Neap Tides

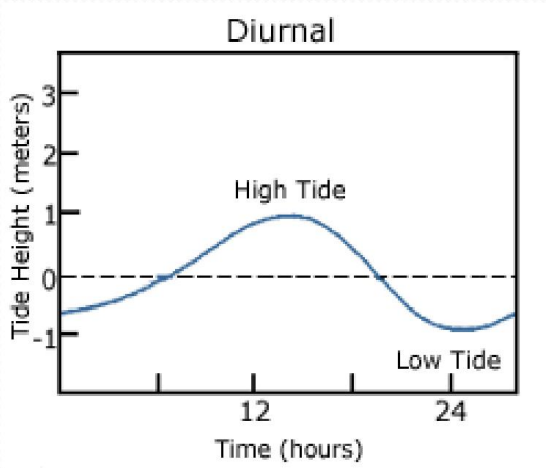
- When the Sun, Earth and moon are perpendicular to each other, their gravitational pulls cancel each other out resulting in weak high and low tides.
  - These tides are called Neap tides.
  - The daily tidal range is at its smallest during this time

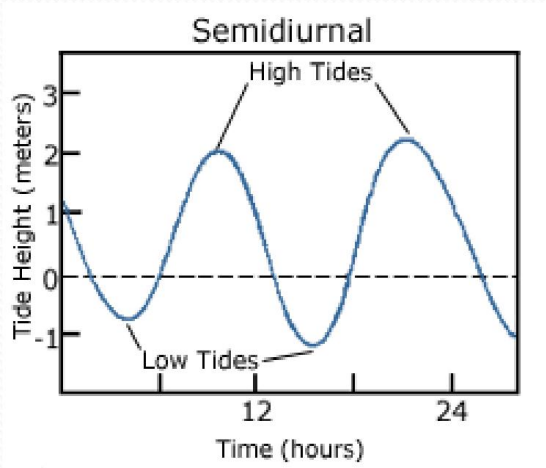


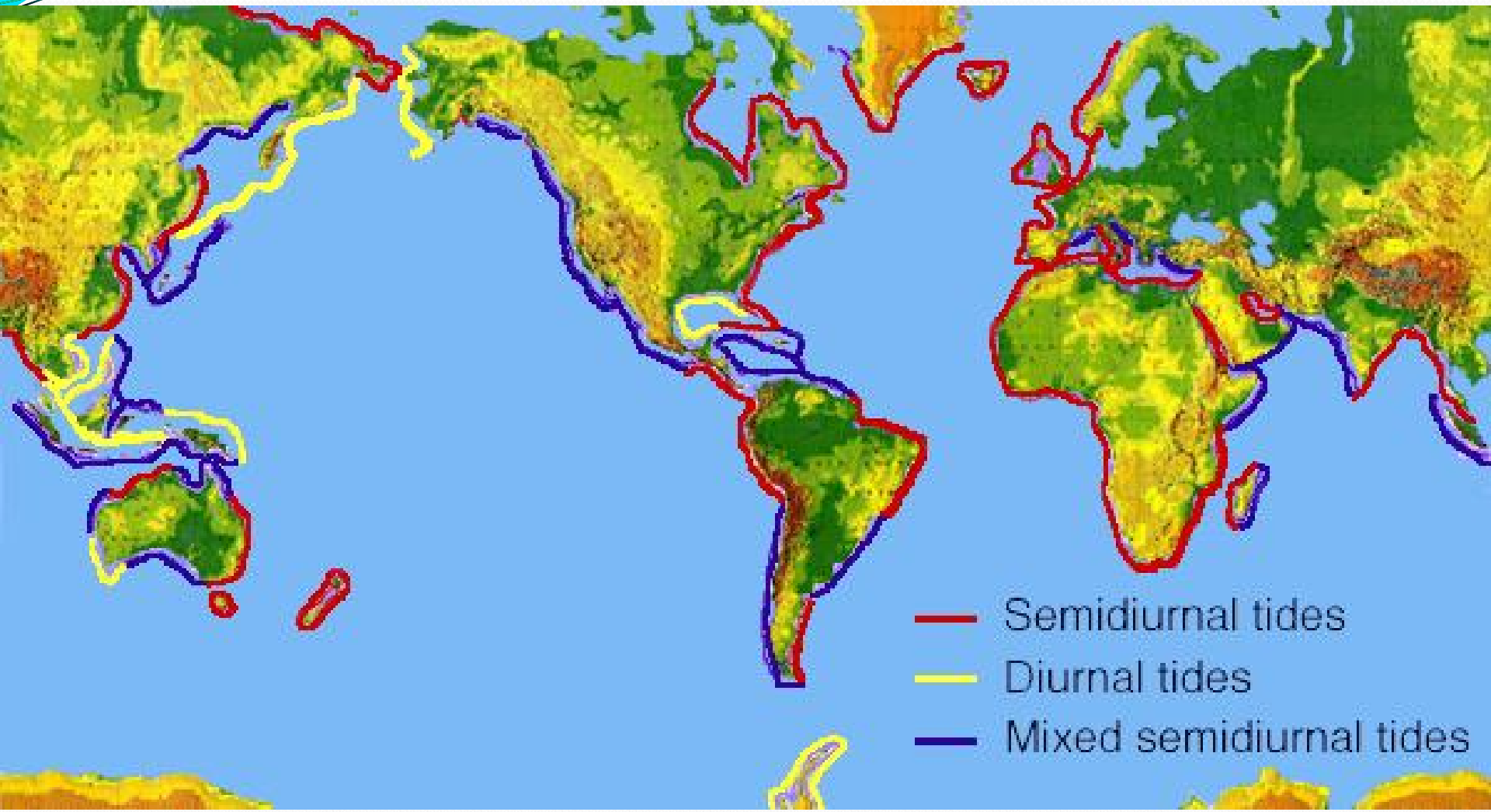
- Friction created between the water and the ocean floor slows the rotation of the earth.
  - ~ 10.8 minutes since the dinosaurs died.

- **Diurnal** – 1 high and 1 low tide a day.
  - *Gulf of Mexico*

- **Semidiurnal** – 2 high and low tides a day
  - *East Coast*






Semidiurnal tides
Diurnal tides
Mixed semidiurnal tides

- **Flood Tide** – water that is coming in.
- **Ebb Tide** – water that is going out.
- **Slack Water** – the time between flood tide and ebb tide

- **Tidal Bore** – the surge of water that rushes upstream at high tide.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The dream mark is 20km - about 50 minutes constant surfing on the wave. That is 50 minutes on a wave travelling at around 15mph with the full power of the Atlantic tide behind.

Bay of Fundy videos

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

- https://www.youtube.com/watch?v=ohjYStNihEM

  (time lapse ~3 min)