



Moon's Wobble Effect

Why in News

Recently, the [National Aeronautics and Space Administration](#) (NASA) has highlighted **Moon's Wobble** as a **potential problem in the near future**.

Key Points

▪ Moon's Wobble:

- When the Moon makes its **elliptical orbit**, its **velocity varies and alters causing our perspective of the "light side"** to appear at **slightly different angles**. This is what it calls the Moon's wobble or that is how it appears to our eyes.
- It is a **cyclical shift in the moon's orbit**, it is a **regular swaying (Oscillation) in the moon's orbit**.
- It was first documented **way back in 1728**. This wobble takes **over an 18.6-year** period to complete. It acts as a background of [sea level rise](#).

▪ Impact of Wobble on Earth:

- The moon wobble impacts the gravitational pull of the moon, and therefore, indirectly influences **the ebb and flow of tides** on the Earth.
- Each wobble cycle has the **power to amplify and suppress the tides on Earth**.
 - During **half of the Moon's orbit of 18.6 years**, the **Earth's regular tides are suppressed** i.e. high tides are lower than normal and low tides higher than normal (Current situation).
 - In the **other half**, the **effect is reversed, which is called the tide-amplifying phase** of the Moon.

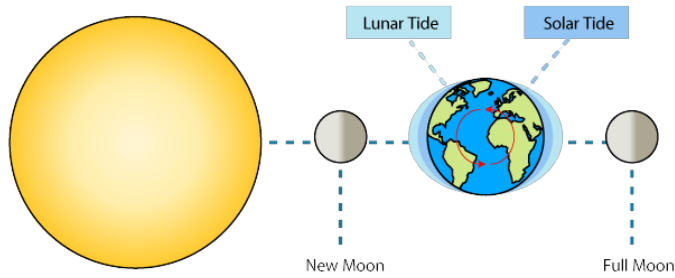
▪ Related Concerns:

- The **lunar cycle is expected to shift again by mid-2030**, and in the coming phase, the **tides will amplify once again**.
- The upcoming changes in the lunar cycle will pose a serious threat, as the amplified **high tides coupled with the rising sea levels** will make the risk of flooding far greater across **all coastal regions of the globe**.
 - It raises **the baseline**, and the more the baseline is raised, the smaller the weather event to cause flooding.
- The **high tide-associated floods**—also known as nuisance floods or sunny day floods—**may occur in clusters that could last for months** or even for longer periods.
- This surge will be closely associated with the **position of the Moon, Earth and the Sun**.

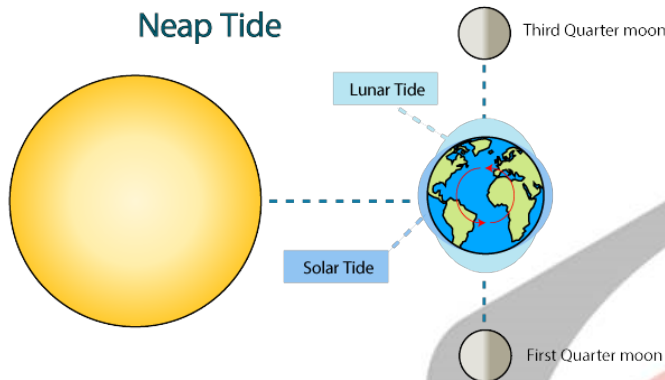
Tides

▪ About:

Spring Tide



Neap Tide



- Tides can be defined as the **alternate rise and fall of the ocean water**.

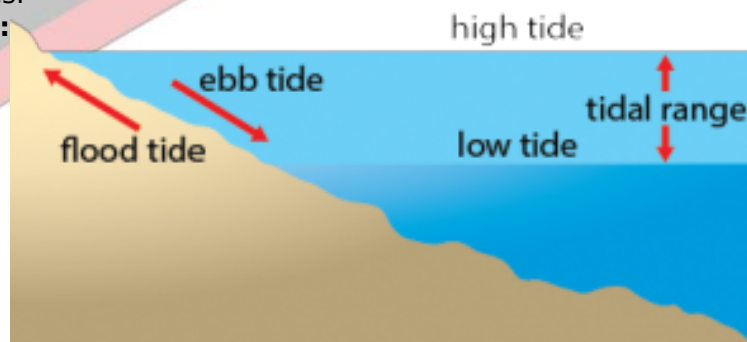
▪ Occurrence:

- It is caused by the combined effects of the **gravitational force** exerted on Earth **by the Sun**, the gravitational force exerted on Earth **by the Moon** and **rotation of the Earth**.

▪ Types:

- **Spring Tide:** It occurs during the **full moon and new moon days** when the sun, the moon and the earth are in the same line twice each lunar month all year long, without regard to the season.
- **Neap Tide:** It occurs when the moon is in **its first and last quarter**, the ocean waters get drawn **in diagonally opposite directions** by the gravitational pull of sun and earth resulting in low tides.

▪ Stages of Tidal Changes:



- **High tide** is the stage when the tidal crest arrives at a particular location on shore, raising the local sea level.
- **Low tide** is the stage when the trough arrives, lowering the local sea level.
- **Flood tide** is a rising or incoming tide between low tide and high tide.
- **Ebb tide** is a falling or outgoing tide between high tide and low tide.

- The vertical distance between high tide and low tide is the tidal range.

▪ **Impact:**

- Tides affect other aspects of **oceanic life, including the reproductive activities** of fish and ocean plants.
- High tides **help in navigation**. They raise the water level close to the shores which helps the **ships to arrive at the harbour more easily**.
- Tides stir the ocean water that **makes habitable climatic conditions** and balance the temperatures on the planets.
- The fast movement of water **during the inflow and outflow** will provide a source of renewable energy to communities living along the coast.

[Source: IE](#)

PDF Refernece URL: <https://www.drishtiias.com/printpdf/moon-s-wobble-effect>

