

Valles Marineris Flood & Ancient Martian Ocean

Prelims: Current events of national and international importance | Space

Why in News?

A recent study published in the peer-reviewed journal Icarus reconstructs evidence of a significant ancient flood event on Mars.

- **New study** - The flood is believed to have originated from the **Valles Marineris** canyon system.
- Researchers estimate that the flood released approximately **1,245 trillion cubic metres of water**.
- This event may have increased the **global mean level of the hypothesised ancient Martian ocean by approximately 34 metres**.
- The study employed two-dimensional **hydraulic modelling** to reconstruct the flood and assess its potential impact.
- **Valles Marineris** - It is a gigantic canyon system on Mars.
- It is the largest canyon system in the Solar System.
- The canyon extends for more than 4,000 kilometers.
- It is situated broadly along the equatorial region of Mars.
- Researchers believe that Valles Marineris once contained extensive bodies of water, including paleolakes.

***Paleolake** refers to an ancient lake that existed during the geological past but no longer persists in its original form.*



SHANKAR
IAS PARLIAMENT

VALLES MARINERIS

THE GIANT CANYON OF MARS

Exploring
Mars,
Expanding
Horizons



	Planet	Mars
	Type	Canyon system
	Location	Equatorial Mars
	Length	>4,000 km
	Significance	Largest canyon system in Solar System

SIMPLIFIED MARTIAN GEOLOGICAL CHRONOLOGY



BROAD CHARACTERISTICS

Period	Broad significance
 Noachian	Ancient, heavily cratered Mars; evidence of substantial water activity
 Hesperian	Major volcanic activity and declining surface-water stability
 Amazonian	Younger geological period; generally colder/drier Mars

Vast Canyons.
Greater Discoveries.

MARS | SCIENCE FOR A BRIGHTER TOMORROW

- On Mars, evidence for the presence of ancient water includes the following features:
 - Ancient valleys
 - Lake basins
 - Sedimentary deposits
 - Delta-like landforms
 - Channel systems



SEQUENCE OF EVENTS

FROM VALLES MARINERIS TO OCEANUS BOREALIS



***Oceanus Borealis** denotes a hypothesized ancient ocean that is proposed to have covered portions of the northern lowlands on Mars.*

Reference

[The Hindu | Valles Marineris Flood](#)

