OCEANS OF OUR SOLAR SYSTEM

Which worlds of our Solar System have oceans of their own?

Earth isn't the only ocean world in our Solar System. Water on other worlds exists in diverse forms on moons, dwarf planets, and even comets. Ice, water vapor in the atmosphere, and oceans on other worlds offer clues in the quest to discover life beyond our home planet.

Dwarf Planet Ceres

Scientists estimate that dwarf planet Ceres consists of about 25 percent water ice, only a fraction of which could be in the liquid state. Ceres may harbor a subsurface ocean. Data from NASA's Dawn mission could provide an answer.

(Icons show size comparison of Earth and the body discussed)

Jupiter's Moon Europa

Scientists strongly suspect that a subsurface salty ocean lies beneath Europa's icy crust. Tidal heating from its parent planet, Jupiter, maintains this ocean's liquid state and could also create partially melted pockets, or lakes, throughout the moon's outer shell.

Jupiter's Moon Ganymede

Ganymede is the largest moon in our Solar System, and the only moon with its own magnetic field. Recent studies indicate a large underground saltwater ocean is present. Ganymede could in fact have several layers of ice and water sandwiched between its crust and core.

Jupiter's Moon Callisto

Callisto's cratered surface lies at the top of an ice layer, which is estimated to be about 124 miles (200 km) thick. An ocean, which is thought to be at least 6 miles (10 km) deep, could be directly beneath the ice.

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124 miles

Saturn's Moon Enceladus

Scientists predict that a regional reservoir about 6 miles (10 km) deep lies under a shell of ice 20 to 25 miles(30 to 40 km) thick at Enceladus' south pole. This underground ocean is thought to feed the moon's impressive jets, which spray from deep fissures (called "tiger stripes") in the moon's surface.

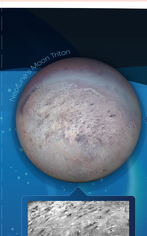
Saturn's Moon Titan

Titan is believed to have a salty subsurface ocean - as salty as the Dead Sea on Earth - beginning about 30 miles (50 km) below its ice shell. It is also possible that Titan's ocean is thin and sandwiched between layers of ice, or is thick and extends all the way down to the moon's rocky interior.

Saturn's Moon Mimas

Research suggests that Mimas has either a subsurface ocean or that its core is shaped like a football. If Mimas is hiding a liquid water ocean, it lies 15 to 20 miles (25 to 30 km) beneath the moon's impact-battered surface.

Neptune's Moon Triton



Active geysers on Triton spew nitrogen gas, making this moon one of the few worlds known in the outer Solar System. Volcanic features and fractures mark its cold, icy surface, likely results of past tidal heating. A subsurface ocean at Triton is considered possible, but is unconfirmed.

Dwarf Planet Pluto

With towering mountains of water ice and flowing glaciers of Nitrogen and Methane ice, Pluto is a surprisingly active world. Mysterious fault lines, some hundreds of miles long, may suggest that Pluto has a hidden subsurface ocean.