

First global survey of Earth's surface waters by SWOT

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In news— NASA is planning to conduct the first global water such as oceans, lakes and rivers survey from space for the first time.

About the SWOT-

- **Dubbed SWOT, short for Surface Water and Ocean Topography, the advanced radar satellite is designed to give scientists an unprecedented view of the life-giving fluid covering 70% of the planet,** shedding new light on the mechanics and consequences of climate change.
- A Falcon 9 rocket, owned and operated by billionaire Elon Musk's commercial launch company SpaceX is to carry SWOT into orbit.
- If all goes as planned, the SUV-sized satellite will produce research data within several months.
- Nearly 20 years in development, SWOT incorporates advanced microwave radar technology that scientists say will collect height-surface measurements of oceans, lakes, reservoirs and rivers in high-definition detail over 90% of the globe.
- **The data, compiled from radar sweeps of the planet at least twice every 21 days,** will enhance ocean-circulation models, bolster weather and climate forecasts and aid in managing scarce freshwater supplies in drought-stricken regions, according to researchers.
- The **satellite was designed and built at NASA's Jet Propulsion Laboratory (JPL)** near Los Angeles.
- Developed by the U.S. space agency in **collaboration with its counterparts in France and Canada, SWOT was one of 15 missions listed by the National Research Council as**

projects NASA should undertake in the coming decade.

- One **major thrust of the mission is to explore how oceans absorb atmospheric heat and carbon dioxide** in a natural process that moderates global temperatures and climate change.
- Scanning the seas from orbit, SWOT is designed to precisely measure fine differences in surface elevations around smaller currents and eddies, where much the oceans' drawdown of heat and carbon is believed to occur. And SWOT can do so with 10 times greater resolution than existing technologies.
- Taking inventory of Earth's water resources repeatedly over **SWOT's three-year mission will enable researchers to better trace fluctuations in the planet's rivers and lakes during seasonal changes and major weather events.**
- **SWOT's radar instrument operates at the so-called Ka-band frequency of the microwave spectrum,** allowing scans to penetrate cloud cover and darkness over wide swaths of the Earth.
- This enables scientists to accurately map their observations in two dimensions regardless of weather or time of day and to cover large geographic areas far more quickly than before.
- By comparison, previous studies of water bodies relied on data taken at specific points, such as river or ocean gauges, or from satellites that can only track measurements along a one-dimensional line, requiring scientists to fill in data gaps through extrapolation.