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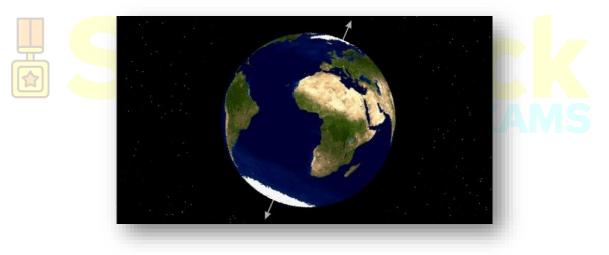




Groundwater Extraction Has Tilted Earth's Spin - How Will It Impact The Climate Change

Why In The News?

- Groundwater Pumping Has Shifted Such A Large Mass Of Water That The Earth Tilted Nearly 80 Centimeters East Between 1993 And 2010 Alone, Which Could Impact Our Planet's Climate, According To A Study.
- The Research, Published In The Journal Geophysical Research Letters, Found That During The Study Period, The Most Water Was Redistributed In Western North America And Northwestern India.



What Do We Know?

- Scientists Have Previously Estimated Humans Pumped 2,150 Gigatons Of Groundwater, Equivalent To More Than 6 Millimeters Of Sea Level Rise, From 1993 To 2010. However, Validating That Estimate Is Difficult.
- The Researchers Noted That Water's Ability To Change The Earth's Rotation Was Discovered In 2016, And Until Now, The Specific Contribution Of Groundwater To These Rotational Changes Was Unexplored.
- The Latest Study Modelled The Observed Changes In The Drift Of Earth's Rotational Pole And The Movement Of Water First, With Only Ice Sheets And

Glaciers Considered, And Then Adding In Different Scenarios Of **Groundwater Redistribution.**

- The Model Only Matched The Observed Polar Drift Once The Researchers Included 2150 Gigatons Of Groundwater Redistribution. Without It, The Model Was Off By 78.5 Centimeters, Or 4.3 Centimeters Of Drift Per Year.
- The Researchers Said Attempts By Countries **To Slow Groundwater Depletion Rates,** Especially In Those Sensitive Regions, Could Theoretically Alter The Change In Drift, But Only If Such Conservation Approaches Are Sustained For Decades.
- The Rotational Pole Normally Changes By Several Metres Within About A Year, So Changes Due To Groundwater Pumping Do Not Run The Risk Of Shifting Seasons. However, On Geologic Time Scales, Polar Drift Can Have An Impact On Climate.



- A 2021 Study Published In The Journal Geophysical Research Letters Found That The Direction Of Polar Drift Moved From Southward To Eastward In 1995 And That The Average Drift Speed From 1995-2020 Was 17 Times Quicker Than From 1981-1995.
- In The Past 50 Years, Humans Have Extracted **18 Trillion Tonnes Of Water** From Aquifers Without Replacing It.



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