Mountain Streams Emits Carbon Dioxide

Recently the Scientists have reported the findings of the first large-scale study of the **carbon dioxide emissions from mountain streams,** and their role in global carbon fluxes.

- Although, mountains cover 25% of the Earth's surface, but the streams make up just 5% of the global surface area of the **fluvial networks**.
- This research shows how important it is to include mountain streams in assessments of the **global carbon cycle**.
    - So far, scientists had focused mainly on streams and rivers in low-altitude tropical and boreal regions.
- The scientists collected environmental data from the streams draining the world's main mountain ranges.
    - They specifically focused on their **hydrologic and geomorphologic properties** as well as the **soil organic carbon content** within the catchments.
    - They used these data to develop a model to estimate the natural CO_2 emissions from more than 1.8 million mountain streams worldwide.

Findings of the Study

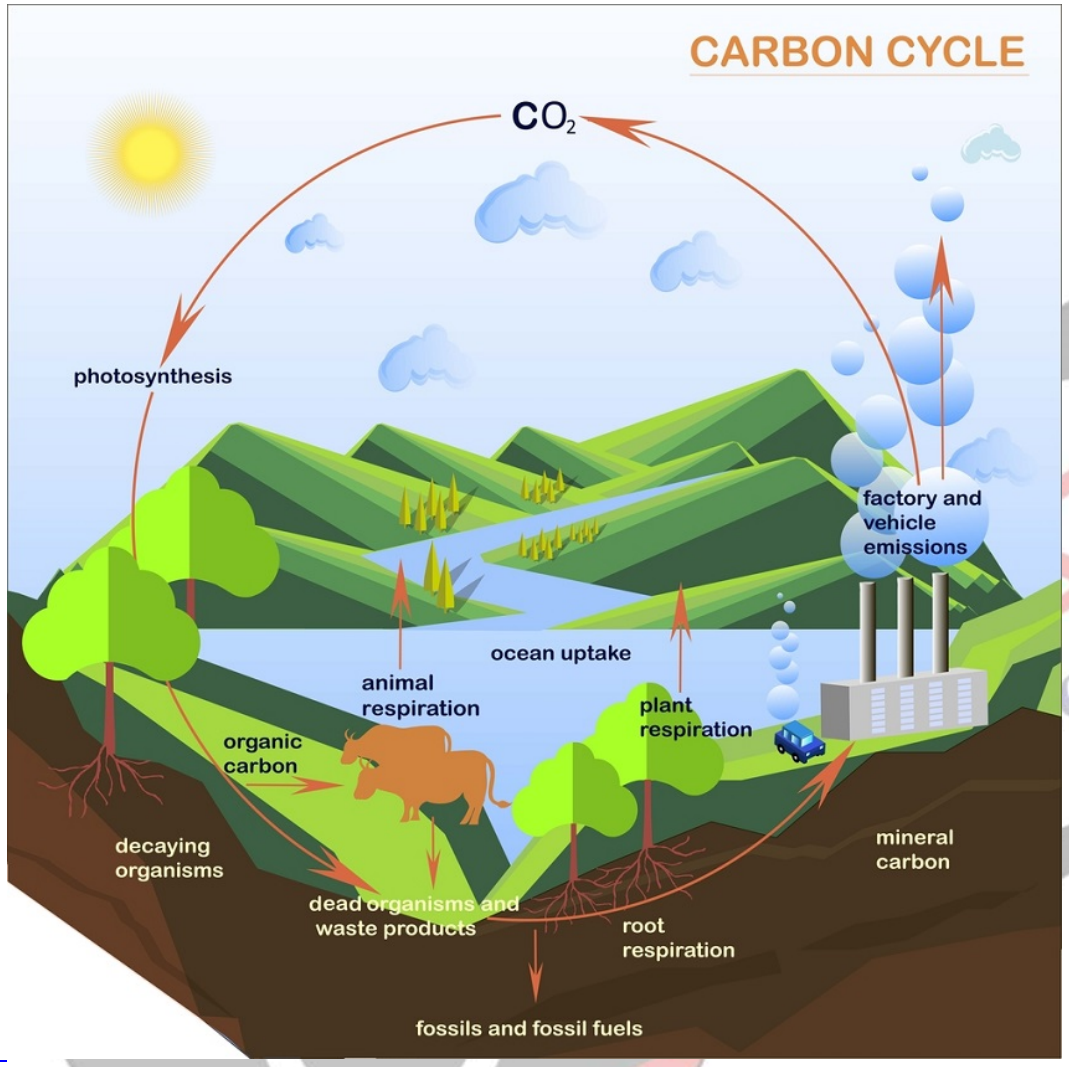
- Researchers found that these streams have a higher average CO_2 emission rate per square meter than streams at lower altitudes, due to the **additional turbulence** caused as water flows down the mountain slopes.
    - They likely account for 10% to 30% of CO_2 emissions from these networks.
- The gas exchange velocities across the air-water interface in mountain streams occurs **100 times faster** than previously thought.
- The findings seem to indicate that the CO_2 comes from **geological sources**, given that **carbonate rock** dominates geology in numerous regions around the world.
    - These rocks were formed from "skeletal" components of marine microorganisms that lived millions of years ago when Earth was largely covered by oceans.

Importance

- It is known for a number of years that freshwater ecosystems emit roughly the same amount of CO_2 that the oceans absorb, but the studies were never done on the role of the mountain streams for the global CO_2 fluxes.
- The latest findings will open up new research avenues, that will help to better understand where all that CO_2 comes from and how a more accurate assessments of the global carbon cycle can be made.
- The findings mark an important step forward but numerous uncertainties still persist.
    - It will require long-term monitoring of carbon fluxes in mountain streams to understand how climate change affects their biogeochemistry.

Global Carbon Cycle

- It refers to the exchanges of carbon within and between **four major reservoirs: the atmosphere, the oceans, land, and fossil fuels**.
- Carbon may be transferred from one reservoir to another in seconds (e.g., the fixation of atmospheric CO_2 into sugar through photosynthesis) or over millennia (e.g., the accumulation of fossil carbon (coal, oil, gas) through deposition of organic matter.



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