

# Climate change damaging North America's largest temperate rainforest, harming salmon

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New research released in *Bioscience* found that a remote region of North America's largest temperate rainforest is experiencing changes to its ecosystem due to climate change. Brian Buma, a researcher and

professor of integrated biology at University of Colorado Denver, co-leads the research network that outlined the changes in a new paper.

North America's largest remaining temperate rainforest, located in Southeast Alaska, is one of the most pristine and intact [ecosystems](#). The entire ecosystem stretches well over 2,000 km from north to south and stores more [carbon](#) in its forests than any other.

The region can store more than 1,000 tons per hectare of carbon in biomass and soil. Although the area is extremely remote, researchers say it is not immune from the negative impacts of climate change. Glaciers are disappearing faster than most other places on Earth and winter snows are turning into winter rains. This is leading to a change in stream temperatures, which can harm salmon, and changes in ground temperatures, causing the death of forests.

"This is an incredible landscape in a relatively compact area we have as much biomass carbon as 8% of the lower 48 states put together," said Buma. "The 200-foot trees, the deep soils—it's just layers and layers of life. And that land is so intertwined with the water that any change in one means massive change in the other, downstream and into the ocean."

Why is this important? Forests absorb more carbon than they release. Trees absorb carbon during photosynthesis, removing large amounts of carbon from the atmosphere. Since the [forest](#) is growing faster as the climate warms, a lot of that carbon "leaks" out through the creeks and rivers. This carbon powers downstream and marine ecosystems, which thrive on the flow of energy off the land.

"This region is immensely important to global carbon cycles and our national carbon strategy, but we still don't know the direction overall carbon stocks and movement will take as the world warms," said Buma. "While there is ample research identifying how important this area is,

more work is needed to determine where this large reservoir will trend in the future."

**More information:** Allison L Bidlack et al, Climate-Mediated Changes to Linked Terrestrial and Marine Ecosystems across the Northeast Pacific Coastal Temperate Rainforest Margin, *BioScience* (2020). [DOI: 10.1093/biosci/biaa171](https://doi.org/10.1093/biosci/biaa171)

Provided by University of Colorado Denver

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