Loss of Some US Forests Causes Climate Cooling, Not Warming:
Key Insights for Reforestation and Avoided Deforestation

Williams, C.A., et al. (2021), *Science Advances*, 7(7), eaax8859, DOI: 10.1126/sciadv.aax8859 (link).

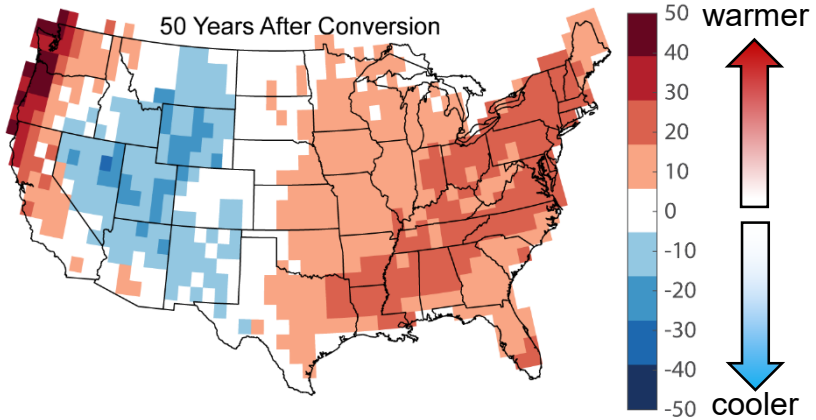
Background
Forests aid climate mitigation by storing CO_2, but this is not their only effect on climate. Low forest albedo warms the climate by decreasing surface reflectivity. This study quantifies the net effect on climate, key to guiding reforestation efforts.

Analysis
EOS-derived forest biomass and surface albedo maps were combined with USFS forest inventory data to quantify the balance of the carbon and albedo effects for forests of the US.

Findings
Loss of Pacific Coast forests (green dots) imposes large carbon warming but modest albedo cooling. Loss of Intermountain and Rocky Mountain forests (red dots) imposes small carbon warming but large albedo cooling, while loss of eastern U.S. forests (blue dots) imposes intermediate carbon warming and small albedo cooling.

Significance
These findings are essential for informing efforts to cool the planet with reforestation or avoided deforestation. They reveal where such efforts will have maximum effect, and where they risk being counterproductive.

Net radiative forcing of potential forest loss, including albedo, carbon emissions, and lost carbon uptake.



Point-based scatterplot of carbon warming versus albedo cooling clustered by geographic region.