

Larch trees in Northern China's permafrost forests are receiving an unexpected benefit from climate change: rapid growth. Many of these larches have had more growth in the span between 2005-2014 than in the previous 40 years. Trees older than 400 years also grew more rapidly in that decade than in the past 300 years, indicating the oldest trees had the biggest growth spurts. What's causing this? Researchers suspect that warmer soil temps are what is fueling this growth by lowering the depth of the permafrost layer, thus allowing the trees' roots to expand and take up more nutrients.

Dahurian larch is the Earth's northernmost tree species and these larches are the only trees that can tolerate the frigid permafrost plains of Russia, Mongolia, and Northern China. The permafrost regions have been thawing in the past few decades due to rising temperatures, thus turning these areas into swamps or wetlands.

Measuring the growth rings of the Dahurian larch have allowed researchers to see the extent of the increase in growth. Just as in people, trees do most of their growing when young. Dahurian larch trees experience their fastest growth up to 150 years old, at that point their growth slows until it reaches about 300 where it generally levels off. The results show Dahurian larch trees older than 300 years grew 80 percent more from 2005 to 2014 than in the preceding 40 years. Trees between 250 and 300 years old grew 35 percent more during that time, while trees younger than 250 years grew only between 11 and 13 percent more. This is unusual, as it would be like a 100-year-old person suddenly getting taller. The older trees could be growing more than the younger trees because of their more developed root systems that can take in more resources from the soil. Increased soil temps, especially in the winter is thought to be the main factor in these growth spurts. While the trees have benefitted initially from the soil warmth increase, further thawing of the permafrost will likely decrease tree growth and cause the forest to decline. There is no other tree species that can survive the permafrost plains that far north, so if these larch forests in northern Asia disappear, the entire ecosystem will change as a result.



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