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**INFLUENCE OF SUMMER TEMPERATURES ON THE RADIAL GROWTH OF CONIFERS IN CONDITIONS OF ARCTIC WARMING**

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Arctic ecosystems are warming nearly four times faster than the global rate, impacting water balance, frozen soil thermal dynamics, and plant community structure. Northern latitudes face permafrost thawing, reduced snow cover, and shifts in carbon and hydrological cycles. The forest-tundra ecotone, a transition zone between tundra and boreal forests, is especially vulnerable, where small temperature increases alter woody vegetation distribution and growth. Understanding tree responses to these changes is vital for predicting ecosystem shifts and their role in global climate balance.

This study investigates the influence of climatic factors, primarily temperature, on radial growth of coniferous species in the permafrost zone above the Arctic Circle. It aims to identify key climatic drivers, their spatial-temporal dynamics, and their role in tree adaptation to warming. Four species - *Pinus sylvestris L*., *Larix sibirica Ledeb*, *Larix gmelinii (Rupr.) Kuzen*, and *Larix cajanderi Mayr.* - were studied across five sites from 27°E to 166°E: Apatity (**APA**) for *P. sylvestris*; Polar Urals (**PUR**) for *L. sibirica*; Khatanga (**KHA**) for L. gmelinii; Chokurdakh (**CHO**) and Bilibino (**BIL**) for *L. cajanderi*. A total of 137 trees were sampled with a 5-mm increment borer. Tree-ring widths (TRW) were measured using CooRecorder, standardized in ARSTAN, and correlated with monthly temperature and precipitation data from nearby stations (Kandalaksha, Salekhard, Khatanga, Chokurdakh, Ostrovnoye) from September of the previous year to September of the current year. In addition, 25-year (one-year step) moving correlations, based on mean monthly temperatures, were used to assess the temporal stability of TRW climate signals.

Results indicate summer temperature, particularly June and July, as the primary limiter of radial growth. At **APA**, *P. sylvestris* showed a strong correlation with July temperatures (r = 0.41, *p <* 0.01), linked to milder conditions and a deep active soil layer (1 - 2 m). *Larix* species at **PUR**, **KHA**, **CHO**, and **BIL** were more sensitive to June temperatures, with highest correlations at **PUR** (r = 0.54, *p <* 0.01) and **KHA** (r = 0.43, *p <* 0.01), and weaker but significant at **CHO** (r = 0.24, *p <* 0.05) and **BIL** (r = 0.41, *p <* 0.01), reflecting extreme continentality and short vegetation periods. Precipitation had a minor role, with rare significant correlations, though positive signals at **APA** and **BIL** suggest sufficient snowmelt moisture.

Moving correlations showed rising temperature influence in recent decades. At **PUR** and **KHA**, June-July correlations peaked until the 1990s (r = 0.60 - 0.65) but later declined (r = 0.40 - 0.45). At **CHO**, the signal weakened since the 1980s (r < 0.20), possibly due to warming, while at BIL it increased from r = 0.40 to r = 0.55 over 30 years, hinting at divergence. Species physiology influenced responses: evergreen *P. sylvestris* benefits from a longer photosynthetic season, relying on July temperatures, while *Larix* species depend on rapid June leaf unfolding in short-summer permafrost zones. Precipitation played a secondary role, with correlations being mostly weak, but in rare cases significant negative or positive. Rare positive signals (e.g., on **APA** and **BIL**).

In conclusion, summer temperatures dominate conifer radial growth in the permafrost zone, with *P. sylvestris* tied to July and *Larix* species to June, reflecting regional adaptations. Rising temperature influence indicates ongoing adaptation to warming, with precipitation secondary. These findings inform forest-tundra dynamics and carbon cycle predictions under climate change.

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