Climatic Controls of the Global High Elevation Treelines

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The term "treeline" refers to the natural high elevation or polar limit of tree growth, irrespective of the tree species. Thus, the treeline is a limit of the life form tree, with trees defined as single stemmed, upright woody species taller than an adult person. This life form boundary occurs globally wherever the seasonal mean temperature declines to c. 6 řC and the length of the growing season is at least 3 months. The position of this treeline isotherm is near sea level in the Arctic and can exceed 4000 m in the subtropics and tropics. It commonly is higher in drier and lower at more humid conditions. Human land use (logging, pastoralism) or disturbances (fire, erosion, avalanches) can cause trees to be absent from the climatic treeline. The reason why trees reach a thermal limit, beyond which alpine or arctic, small stature plants do well, has to do with the coupling of tree crowns to atmospheric circulation, while small plants profit from solar heating near the ground.

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