



Project acronym: a

Project title: How (fast) do they grow? Cambial activity study of arctic shrubs (CASAS)

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Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Toolik Field Station (USA)

Every growing season arctic shrubs, as any other woody plant, activate their cambial cells and form a unique layer of xylem. The annual growth rings register valuable environmental information that, due to remoteness of arctic sites, hardly has been studied in higher than annual resolution. Thus the study of cambial activity and variation in anatomical parameters along tree-ring series (i.e., early and late wood) in high resolution (for e.g. weekly) might provide a novel understanding on heterogeneous climate-growth relations of arctic shrubs.

In order to monitor annual growth ring formation and cambial activity phases of arctic shrubs weekly sampling of two dominant arctic shrub species is proposed in the vicinity of Toolik Field Station in two habitats (dry and moist). This unique cambial activity dataset, that covers three consecutive growing seasons (two already completed), will help us to perform a comparative studies on shrubs' growth performance and climate sensitivity in weekly resolution.

The results of the project might provide a more mechanistic understanding of the physiology of tree-ring formation and thus might supply novel insights on, if not a proxy of, intra-annual growth processes of arctic shrubs and their long-term changes. Up-to-date there have not been any cambial activity studies conducted on tundra shrubs in the Arctic. The study might elaborate a protocol for future cambial activity study of arctic shrubs for other locations and stations involved in INTERACT TA and most of all increase our knowledge on tundra shrub climate sensitivity, growth and productivity.