

Forest Genetics 2025



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Western Forest Genetics Association
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A CLIMATE-INFORMED SEED SELECTION TOOL FOR NORTH AMERICA: NA-SST

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As climate change is reshaping habitat conditions, ensuring the long-term health and productivity of forest ecosystems requires climate-informed seed transfer strategies. This may involve new species choices for reforestation, but more often can be addressed by matching planting stock from different, locally adapted source populations to new planting environments within the species range. The North America Seed Selection Tool (<http://tinyurl.com/NA-SST>) provides a framework to inform assisted migration and seed transfer across North America, covering all major tree species in the United States, Canada, and Mexico (the latter under development). NA-SST also visualizes historical and projected climate change for every potential target location to help evaluate which ecosystem types and species are likely to be supported in the long-term. The tool relies on forest inventory-based species distribution modeling for the historical 1951-1980 climate normal period to create a reference where species populations are assumed to be in equilibrium with climate conditions. Then, target ecosystem climates for the 1990s, 2020s, 2050s, 2080s are matched with historical climates of source ecosystems (1960s) using multivariate climatic distance matrices for 12 bioclimatic variables. The tool guides assisted migration in two steps: (1) species selection by identifying where a species' relative abundance is expected to remain stable, decline, or increase; (2) identifying seed source locations based on climate matching. For example a user can specify that the seed sources must be a reasonable climate match for both current (2020s) climate as well as still being a viable choice under anticipated climate change (e.g. 2050s). This presentation will showcase the tool's current capabilities and discuss planned extensions and improvements, including enhanced uncertainty quantification and inclusion of operational seed zones as selectable target regions, as well as seed collections orchard seed as potential sources to facilitate cross-border transfers of seed sources at the state/province and national level.

