

USING GENOMICS TO PREDICT THE POTENTIAL FOR ADAPTATION TO CLIMATE CHANGE IN SOUTHWESTERN CONIFERS

A McIntire-Stennis supported project



School of Forestry

Increasing temperatures are causing a rise in the severity and duration of drought episodes, and the spread of diseases that pose a great risk to natural populations of tree species. In the case of commercial species, there is a need to predict the fate of populations in the face of climate change to design sustainable management strategies. These predictions will only be accurate when genetic information is taken into consideration.

In this study, we aim to predict the genetic and physiological responses to drought, heat and cold in different varieties and hybrids of Douglas fir (*Pseudotsuga menziesii*), an important conifer species in the Southwest United States. We will study current and historic migration rates and use the information gained on rate of migration, adaptation and genetic diversity to improve our predictions using climate modelling with different climate change scenarios.



About McIntire-Stennis

The McIntire-Stennis program, a unique federal-state partnership, cultivates and delivers forestry and natural resource innovations for a better future. By advancing research and education that increases the understanding of emerging challenges and fosters the development of relevant solutions, the McIntire-Stennis program has ensured healthy resilient forests and communities and an exceptional natural resources workforce since 1962.



COLLABORATION

The USDA Forest Service provided the seeds planted in the greenhouse. Results of this study were used as preliminary data for an NSF CAREER awarded in year 2022 to Dr. Amanda De La Torre.



6

Six graduates and undergraduate students were supported by this funding.

IMPACT

The data collected are providing forest managers with an understanding of local adaptation and the effects of climate change in Douglas fir



6,000

Seeds planted in the NAU greenhouse



60 %

Of seeds developed into seedlings currently under study



5 + 2

5 presentations and 2 publications to date