



THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

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*Climate Change and Invasive Species as Agents of
Evolution and the Use of a New Research Platform, The
Southwest Experimental Garden Array, to Provide
Genetics-Based Solutions to Assisted Migration and
Other Global Challenges*

Friday, April 18, 2014 - 11:00am to 12:00pm

Room: Bannister 110

Climate change, invasive species and other global challenges are agents of selection that are affecting the ecology and evolution of foundation plant species (cottonwood, pine, eucalypts). These impacts cascade to affect whole communities of associated species and their ecosystem processes. Using observational studies in the wild and common garden experiments we partition genetic and environmental variation and show how gene by environmental interactions are redefining communities composed of 1000s of species. Using an array of common gardens where the same genotypes, populations and multiple species are reciprocally transplanted, we identify superior genotypes, source populations and communities of interacting foundation plant species that can best survive predicted climate change as well as support high biodiversity and community stability. These long-term findings have resulted in a new NSF funded research platform available to the scientific community for studying gene x environment interactions of diverse organisms ranging from grasses to trees and their associated communities of other plants, microbes, arthropods and vertebrates. Twelve experimental gardens of the Southwest Experimental Garden Array (SEGA) are arranged along a steep elevation gradient from desert to mixed conifer forest that represents a spatial surrogate for temperature and moisture changes that reflect expected climate changes this century. On site climate instrumentation, remote monitoring, manipulations of water and other variables are available. This facility is backed by adjacent land owners (Forest Service, National Park Service, Bureau of Land Management, Bureau of Reclamation, AZ Game & Fish, The Arboretum, Babbitt Ranches, Grand Canyon Trust) seeking better land management and restoration practices to mitigate global changes.