

# Forest Landscapes and Global Change

New Frontiers  
in Management,  
Conservation  
and Restoration

Abstracts

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**Oral Session Patterns and processes 1**

**ESTIMATING SHIFTS IN SPECIES DISTRIBUTIONS: INFLUENCE OF MACRO-CLIMATE AND LOCAL PROCESSES**

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During Holocene climate change, species ranges adapted rapidly to changing climate conditions. For recent climate change, however, it is unclear if species are able to keep pace. Here, we estimate the influence of changing macro-climate and local processes (i.e., biotic interactions, seed dispersal, anthropogenic land-use) on large-scale species distributions and migration. First, we evaluated the variation of species co-occurrence patterns in climate space and estimated the influence of these patterns on species distributions for current and future climate over Europe with niche based-models. Second, we combined current tree species distributions from the niche-based models with migration rates from a process-model and a GIS cost analysis, to estimate key processes influencing tree migration and to predict more realistic shifts in large-scale tree distribution. Results show, that according to the 'stress gradient-hypothesis', biotic interactions mainly limit species distributions and migration towards favorable growing conditions, while climate seems to be directly limiting only where biotic interactions are low. Landscape fragmentation is limiting migration of secondary successional species, because they show rather short seed dispersal distances. Overall, this may lead to considerable time lags in range shifts during climate change. Compared to species distribution models assuming no or unlimited migration, implementing more realistic migration rates may reduce the uncertainty in projections of species distributions under climate change scenarios.

**Oral Session Management and sustainability 2**

**BIOMASS YIELD AND CARBON SEQUESTRATION: A POTENTIAL FROM SPAIN'S FORESTS (ON CENTRAL AND IBERIAN MOUNTAIN RANGE SYSTEMS)**

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The interest on the estimation of forest biomass, regulation of carbon sequestration and nutrient cycling has increased over the past decade. Forests in Spain are important resources of timber and other forest products. Therefore, it is necessary to estimate and to understand the potential role of forests in the mitigation of global warming effects. Up to now, few studies have been conducted to estimate the biomass carbon accumulation of Spanish forest ecosystems. With current data, we developed a forest growth model which considered the structure variables of forest growth. The main focus of this study is to provide an estimation framework based on growth of Maritime pine (*Pinus pinaster* Aiton) and Scots pine (*Pinus sylvestris* L.) stands. We developed a model to estimate woody biomass and carbon sequestration under different ecoregions. Data were analyzed throughout the last decade. As expected, factors related to density and site productivity interacted on woody biomass production of forest stands. Due to these interactions, managers need more tools for forest management, knowledge of different forest structure and practical silvicultural methods.