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Abstracts

Physiological performance of temperate seedlings in a FACE experimental forest

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In a changing climate, understanding the behaviour of tree species subjected to elevated CO_2 is crucial to predicting the future of forest ecosystems. We selected the five most representative tree species coexisting in a mature, unmanaged, oak-dominated, FACE forest to assess their performance during one growing season. We measured leaf-level physiological traits on naturally regenerated seedlings coming from seeds that were developed under elevated atmospheric CO_2. We also introduced self-irrigated, nursery-sourced, potted seedlings from the same five species into the treatment and control patches in order to have an estimation of the physiological baseline of these species under somewhat more controlled conditions and elevated CO_2. A Non-linear model was fitted to each set of measurements from each seedling to describe the temperature effect on photosynthetic capacity. More than one hundred and fifty combinations of ecologically meaningful parameters (Amax at saturating light and Topt) were obtained. Under field water capacity (potted seedlings), the five species showed similar photosynthetic capacity to each other and under both treatments. However, natural *Quercus robur*, *Crataegus monogyna* and *Ilex aquifolium* seedlings exhibited higher maximum photosynthetic capacity (Amax) under elevated CO_2, suggesting a positive effect of increasing CO_2 on Amax with decreasing soil moisture. We did not find differences in the optimum temperature to maximize photosynthetic capacity, excepting for naturally regenerated Acer pseudoplatanus seedlings. Under the forecasted scenario of increasing CO_2, our preliminary results suggest a competitive advantage at the regeneration stage of species able to maximise photosynthetic capacity with elevated CO_2 under drier conditions over the other species.

B8e: FOREST ADAPTATION AND RESTORATION UNDER GLOBAL CHANGE: FROM GLOBAL TO REGIONAL PERSPECTIVE

Results of a global online survey on forest adaptation and restoration

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Adaptive Forest Management and Forest Landscape Restoration are major challenges for forest management in times of global change and there is a need for information regarding the implementation of such measures. We present results from a global online survey on real-world examples of forest adaptation and restoration. The survey gathers information on the location, environmental conditions, management regimes, involved actors, targets, silvicultural measures and success factors for the respective forest adaptation and restoration projects. The survey audience can be classified as forestry experts. We examine the possibility to combine forest restoration and -adaptation and present results regarding targets, species selection (native vs. non-native), and forest management as reported by the survey participants. We further identify success factors derived from the survey information. Almost half of the reported projects pursue an approach that combines forest restoration and adaptation. Forest adaptation is associated with very high human development (HDI < 0.8) in contrast to forest restoration which is associated with low human development (HDI < 0.55). Native tree species are often preferred. Silvicultural interventions targeting existing stands (e.g. changing species composition, thinning etc.) are associated with adaptation whereas measures related to stand establishment are associated with restoration. Adaptation measures are likely to play a role in the future management of restored forests. Capacities in silviculture and the production of seedlings of native species should be assessed and developed to reach restoration goals. Restoration goals and objectives need to be clearly defined in a participatory process and monitored using criteria and indicators.

Do we have sufficient data and information for a knowledge based adaptation of forest management to climate change?

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Scientifically based data on the relationship of forest ecosystem functioning, forest stand naturalness and biodiversity status are urgently needed for a better understanding of the effects of forest management adaptation strategies under climate change. The contribution will summarize information on i) natural processes in forest ecosystems; ii) natural disturbance history, iii) differences between ecosystem processes during grow stage and mature stage and iv) the sustainability of forest management compared to the natural forest ecosystem processes. A framework of indicators will be proposed to quantify the key elements of natural processes (succession), the forest biodiversity status (genetic, species, ecosystem and landscape level) and the effects of sustainable forest management. The framework will allow to answer questions with regard to quantitative and qualitative aspects of forest management and maintaining forest ecosystem functioning (e.g. genetic pools, energetic-material fluxes, including soil nutrient level, water regime and forest microclimate and the incremental risks of natural forest disturbance, including resilience processes in disturbed forests). In addition, the possibility of comparison the primary (with an emphasis on improving soil properties) and secondary forest succession (similarity of clear cutting with natural disturbance) will be discussed. The findings will be exemplified by case studies from different forest ecosystems in Europe.

From commitment to commitment? Translating multiple FLR targets

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Restoration, and forest landscape restoration (FLR) in particular, has become a widely used tool to reverse forest loss and degradation. Several countries have identified restoration opportunities via the restoration opportunities assessment methodology (ROAM) and have also committed to restore vast areas under the Bonn Challenge on FLR. For a selection of the countries with publicly-accessible ROAM reports we explore, analyse and compare their commitments under the