Estimating the Net Primary Productivity of major Tree Species in Europe

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Get Net Primary Productivity of a specific tree species

Estimate Net Primary Productivity by using site specific predictors

Changes in Productivity and relative ranking due to increased temperature

The maps on the left side show the NPP estimates under the current site conditions for Pinus pinaster (Maritime Pine) which is limited to warm regions, Fagus sylvatica (Beech) which is limited to the central regions and Pinus sylvestris (Scots pine) which can grow in most regions of Europe. By grid-wise comparing the productivity of all examined species (Abies, Betula, Fagus, Picea, Pinus pinaster, Pinus sylvestris and Quercus), which is done in the figures showing the NPP rank, it can be observed that Pinus pinaster belongs in most regions which are suitable to the low productive species. Only in some small areas it belongs to the species with the highest productivity. Fagus belongs in most of the regions to the species with average and Pinus sylvestris to those with average to high productivity.

Increasing the temperature by 2.5°C or 5°C shows in most of the regions in Europe for all species higher productivity rates. Only in the southern parts and in the flat lands of Hungary the productivity is decreasing. The area suitable for growing is decreasing in the south for all species. On the other hand the potential sites in the north eastern part could be expanded especially by Pinus pinaster and Fagus sylvatica. The increasing temperature does not change much of the relative productivity of Fagus sylvatica and Pinus sylvestris but it looks like that Pinus pinaster profits most of an increasing temperature. Where Pinus pinaster can expand its area it belongs many times to the most productive species.

Even if most of the regions in Europe might be profiting from a temperature increase by showing higher productivity rates, the circumstance, that large regions in the south, in Hungary and north of the Black Sea show a dramatic reduction of the productivity or even a degradation until the sites will not be suitable for trees, is alerting.