OptFor-EU: Optimising forest management decisions for a low-carbon, climate resilient future in Europe

The increase in European forest coverage and green spaces are foreseen as essential measures to combat climate change and its impacts (e. g. European Commission 2021). Significant reductions in anthropogenic emissions and increases in carbon dioxid sinks are needed to reach the climate-neutrality goal of the European Green Deal by 2050. Forests play a key role in the European Green Deal climate change mitigation strategy. However, more frequent and severe droughts and heatwaves could further increase the vulnerability of European forests to disturbances and lead to increasing tree mortality and reduced forest growth. We need a better and quantitative understanding of the effectiveness of forest management under changing climate conditions and its effects and feedbacks in the regional earth system, in order to maintain and enhance the mitigation potential of forests and reduce their vulnerabilities to climate change.

The EU Horizon project OptFor-EU (https://cordis.europa.eu/project/id/101060554/de) builds a Decision Support System (DSS) to provide forest managers and other relevant stakeholders with tailored options for optimising decarbonisation and other forest ecosystem services across Europe. Based on a supply-demand approach, the methodology combines an iterative process of data consolidation, modelling, and co-development of solutions alongside forest managers and other practice stakeholders in European Forest Types. The DSS will be designed and tested at 8 case study areas (CSA), to provide a ready-to-use service, while a user adoption and up-take plan will maximise the societal and business impact. The project OptFor-EU started in January 2023 and will continue until end of 2026.

Model simulations will tackle the integration of European forests, including forest management practices, in a scalable modelling framework that extends from local CSA to the European domain. Models will be enhanced to improve the representation of forest cover and forest management practices across Europe, and simulations will be designed to improve the understanding of the individual and combined impacts of forest management practices, socio-economic and climate scenarios on forest processes and forest ecosystem services across Europe. The Hereon/GERICS team implements future forest management scenarios into the regional climate model REMO interactively coupled to Mosaic-based Vegetation (REMO-iMOVE) and performs model simulations following the experiment protocol of the international CORDEX Flagship Pilot Study LUCAS and the OptFor-EU CSA experiments according to user priorities, to evaluate the simulated effects and feedbacks of land use changes and climate-resilient forest management measures in Europe under present and potential future climate conditions. The results will be tailored to forest stakeholders and support suitable climate adaptation and mitigation options for enhancing forest resilience and its capacities to mitigate climate change across Europe.