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European forest management in a more extreme climate: Modelling solutions for risk resilient management

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Climate change and in particular extreme weather events require the development of risk-resilient forest management strategies across Europe. Here, we introduce the concept of our recently started EU-FP7 ERA-NET "Sumforest" project "FOREXCLIM" (FORests and EXtreme weather events: Solutions for risk resilient management in a changing CLIMate). In FOREXCLIM, we investigate the interactions between extreme weather (heat waves, drought, storm), subsequent forest susceptibility to fire and pathogens, market developments, forest management and related uncertainties to determine on how current forest management strategies should be adapted to sustain risk-resilient multifunctional forest landscapes in the future. In close collaboration with stakeholders, we develop a model-based strategy for identifying and operationalizing risk resilient forest management regimes. We will present first results of our modelling approach, which is a process-based forest ecosystem model (LPJ-GUESS) coupled with a multi-objective, risk-sensitive optimization for robust forest functioning and ES provisioning (YAFO). The goal is to derive the optimal forest management under changing climate and timber markets. Our assessment will provide optimal silvicultural management regimes for integrated management of forests, i.e. fulfilling multiple ecosystem service provision goals. These results will serve as a basis for the development of guidelines for alternative, adapted management strategies at a local and regional scale.