

# Project *brief*

Thünen Institute of International Forestry and Forest Economics

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## Spatial valuation of forest services in Germany

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- **We determine the annual values of forest services in Germany (timber, climate, recreation as well as nature conservation and landscape management) - and their spatial distribution**
- **The monetary value of each individual service exceeds the billion Euro mark**
- **For the implementation of the results into practical policy, we present an elaborated concept**

### Aim

The aim of the study is to determine the economic benefits of essential forest ecosystem services in Germany in their spatial distribution from a demand perspective and to identify spatial hot spots. We compile this information into a consistent model (ReWaLe-model) in order to enable the analysis of alternative forest management scenarios.

### Methods

The forest services studied are timber production, the global climate protection through carbon sequestration, recreation for local residents, and services for nature conservation and landscape amenity, which are created in the course of regular forest management as well as through the establishment of protected areas. For this purpose, we identify spatial determinants of the monetary benefits of ecosystem services with the help of existing valuation data, additional spatial statistics and supplementary primary surveys and translate them into generalisable valuation functions for each of the services. We apply these valuation functions, in the sense of a benefit transfer, with a geographical information system to the conditions in the regional units (usually communities); we aggregate and map the results at the county level. By varying the input data, we simulate the effects of changed regional conditions (e.g. changed forest management) on the values of ecosystem services and their relations.

### Results

- We evaluate the timber production by means of the gross revenue potential, which is based on the sustainably harvestable increment. In total it amounts to € 7.1 billion/year. The spatial focus is primarily on the low mountain ranges, which are characterized by high-yielding tree species, and the densely wooded Northeast of Germany.
- The sustainably usable increment also serves to calculate carbon sequestration; we take into account above-ground tree biomass, harvested wood products and material and energy substitution. On the basis of the net increment and evaluated by means of ETS market prices, the benefit of climate protection by German forests amounts to € 2.1 billion/year. Its spatial distribution resembles that of timber production.
- The recreation service, valued by Contingent Valuation, amounts to 2.4 billion €/year nationwide. The spatial distribution pattern differs significantly from the previous one: High recreation values are found primarily in and around larger cities (due to high demand) and in areas with low forest density (due to the scarce supply of forests for recreation).
- We value several indicators for nature conservation and landscape management by means of Choice Experiments – including the diversity of bird species, which is also employed in the German sustainability strategy. For example, the willingness to pay for the restoration of original species diversity in the regions totals around € 1 billion/year; in the individual counties, it varies between € 0 and just over € 6 million/year. Further valuation results are also available for different shares of broadleaved, coniferous and mixed forests as well as for the establishment of nature reserves in forests.

## Further Information

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### Support

