

The TerraDT **Forest Impact Model**

Turning climate and land-surface data into actionable intelligence for forests and biodiversity

Background

Forests play a critical role in climate regulation, biodiversity preservation and carbon sequestration. However, climate change, land-use pressures and extreme events are increasingly affecting forest health, productivity and resilience.

Decision-makers need high-resolution, reliable and forward-looking information to support sustainable forest management and climate adaptation strategies.



What the model delivers

The Forest Impact Model transforms km-scale climate and land-surface simulations into decision-ready indicators for forest ecosystems.



Forest productivity and carbon dynamics: simulates forest growth, biomass production, carbon stocks and carbon sequestration under present and future climate conditions.



Forest disturbance and management: represents land-use change, forest management and natural disturbance processes to improve long-term assessments of forest ecosystem responses.



Earth observation and in-situ data integration: combines satellite observations, flux tower measurements and other environmental datasets for model calibration, validation and performance evaluation.



Climate scenario analysis: assesses how forests may respond to different climate and management scenarios, supporting long-term planning and decision-making.



Integrated within the TerraDT framework: benefits from advanced modelling approaches, including AI- and machine learning-enabled components developed across TerraDT, to enhance data integration, computational efficiency and large-scale scenario analysis.

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Our impact

The model advances from research to operational readiness by enabling testing of alternative climate and land-management scenarios in representative forest environments across Europe.



Who benefits

- Forestry agencies
- Land managers
- Environmental authorities
- Biodiversity and conservation organisations
- Climate adaptation practitioners
- Researchers and Earth system scientists
- Policymakers working on carbon neutrality strategies



Which benefits

- Evidence-based forest management
- Improved carbon sequestration assessments
- Enhanced biodiversity monitoring
- Better understanding of climate impacts on forests
- Support for nature-based solutions
- Improved long-term climate adaptation planning

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of the change!**



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