



Acronym	ADAPT-FOREST
Full Title	ADAPT-FOREST: AI-Enhanced Abrupt-Adaptive Filtering for Near Real-Time Forest Stress Nowcasting
Grant Theme	Pilots of long-term climate impact forest monitoring sites: Providing temporally resolved ecosystem-level information on the effects of climatic drivers on forest structure and function in near real-time
Participants	Torus Actions, France (<i>coordinator</i>) University of Helsinki, Faculty of Science Institute for Atmospheric and Earth System Research (INAR) / Physics, Finland
Start Date	February 2026
Duration	18 months
Description	ADAPT-FOREST will establish a FORWARDS-compatible supersite at the Hyytiälä SMEAR II station (ICOS & LTER), with additional supporting site at Lapinkangas (and possibly Siikaneva wetland if necessary) creating a spatially representative North European pilot. The project upgrades existing infrastructure with standardized, high-resolution measurements of tree growth, water status, soil properties, and climate conditions. By deploying patented abrupt-adaptive filtering and AI-based detection modules, ADAPT-FOREST will provide robust, near real-time stress nowcasting. Ground-based dendrometer, soil, and meteorological measurements will be harmonized with UAV-LiDAR forest structure mapping and integrated into the ForestWard Observatory. This approach will reduce noise in data streams, preserve extreme-event signals, and enable rapid detection of droughts, heatwaves, and other disturbances. The project will generate high-quality, open access datasets, demonstrate scalable integration of long-term monitoring with AI-enhanced detection, and provide a replicable monitoring model for European forests. To ensure long-term sustainability, ADAPT-FOREST commits to maintaining continuous data collection beyond the 18-month grant duration. The University of Helsinki guarantees continued operation of SMEAR II and supporting sites through existing ICOS/LTER funding, while Torus Actions provides modular software maintenance. Together, this ensures that stress nowcasting and standardized data streams will remain active for at least three years after the project ends.



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