

G-05-2023			
Date of award: 3 July 2024			
Project	Beneficiary(ies)	Description of the project	Duration
BorealNet	Norwegian University of Life Sciences, Faculty of Environmental Sciences and Natural Resource Management, Norway Norwegian Institute of Bioeconomy Research, Norway	The boreal zone is warming twice as fast as the global average due to climate change, however, the ways in which these forest ecosystems are responding to the rapidly changing conditions are poorly understood. Forests cover about 38 percent of Norway's land area, or about 122 000 square kilometres, of which all are classified as part of the boreal forest biome. Declines in the growth and vitality of boreal trees will have profound impacts on forest ecosystems, reducing biodiversity, limiting the ability of trees to sequester carbon and risk the financial stability of the forestry industry. There is an urgent need to predict the impacts of the rapidly changing climate on boreal forest species to ensure the ongoing preservation and correct management of these areas. The aim of this project is to facilitate the development of a spatially comprehensive and connected tree growth monitoring network across Norway ("BorealNet"). This will be achieved by connecting long-term monitoring networks such as ICP Forests and ICOS forest sites with existing and newly developed growth monitoring projects across the country through standardised linking methods by the installation of autonomous high-resolution dendrometers and microclimate sensors (focus area 1) facilitating the integration of collected data from more than 60 individual forest plots into the FORWARDS European-wide nowcasting models. In addition, the project will link tree growth with remotely sensed spectral indices of forest productivity and stress (focus area 2) and LiDAR derived structural information (focus area 3) using drone-based assessments at the individual tree, as well as upscaling to forest and landscape level. BorealNet will fill critical knowledge gaps on the impact of climate extremes and climate-related disturbances on boreal forest ecosystems through co-ordinated, long-term, ecosystem-based research and monitoring efforts.	Start: 8/2024 18 Months

OAKS	Croatian Forest Research Institute, Croatia Slovenian Forestry Institute, Slovenia Institute of Lowland Forestry and Environment, Serbia	Since climate change is supposed to greatly influence the forest ecosystems in Europe, there is a great need for better forest monitoring that would encompass terrestrial and airborne techniques. This topic is also in the focus of the European Union, as evidenced from the Proposal for a new regulation for a monitoring framework for resilient European forests, where a comprehensive, high-quality forest monitoring system is envisaged to help counter new pressures and hazards. Existing monitoring schemes, such as UNECE ICP Forests, with its harmonised monitoring methodology, enhanced by additional, modern technologies can be a strong base for such a monitoring system. Due to complex stand and ecological conditions, pedunculate oak forest ecosystems occupying large lowland areas in South-East Europe, are no longer as stable as they used to be. Therefore, the objectives of OAKS are to: - enhance the existing intensive monitoring on ICP Forests pedunculate oak plots in South-East Europe (Slovenia, Croatia and Serbia) in order to link water availability with tree growth - perform parallel terrestrial and airborne measurements in the crowns of pedunculate oak trees to determine the relation of actual physiological data and vegetation indices acquired from multispectral images - provide FORWARDS project with near-real time data on tree growth in relation to weather conditions and soil water status for the duration of the project and additional 3 years. For this purpose, the existing west-east climate/precipitation gradient in the form of three ICP Forests intensive monitoring plots, one in each country, is going to be utilised.	Start: 7/2024 18 Months
SesOFOREST	Fundación Centro de Estudios Ambientales del Mediterráneo, Spain Agencia Estatal Consejo Superior	SensOFOREST aims to contribute to the FORWARDS network of pilot sites by developing a comprehensive integrated system based on the combined use of ground sensors and multi-scale and multi-sensor proximal and remote sensing. Three sites representative of typical Mediterranean Quercus ilex open forest, including a well-established high-profile long-term monitoring site, have been selected to contribute, in an optimal way, to the FORWARDS network. The three call foci are covered by the project including: (1) the implementation, in two sites, of point dendrometers and soil water potential sensors following the TreeNet Network recommended standards in terms of	Start: 7/2024 18 Months

	de Investigaciones Científicas, Spain	instrumentation and data management. These sites will then provide the full suite of measurements by the linking methods concept and qualify as supersites to contribute to the pilot FORWARDS network for stress nowcasting. (2) linking ground measurements, airborne and satellite systems to monitor open forest. Hyperspectral and thermal flights, compatible with call requirements, will be undertaken in the 3 study sites. Simultaneous foliar and canopy sampling including spectral and biochemistry as well as additional information (leaf area index, crown defoliation assessment) will be performed. An integrated database of multilayer optical and functional traits will be produced that will allow us to derive, through empirical and radiative transfer models, tree functional traits linked with forest status. (3) gaining information on carbon stocks and stand structure by performing both terrestrial laser scanning and UAV-LIDAR measurements at the 3 selected sites. Carbon stock and sequestration rate will also be estimated.	
ZOE-FS	Umweltbundesamt GmbH (Environment Agency Austria), Austria	Zöbelboden Forwards Supersite aims to connect the LTER site Zöbelboden to the ForestWard Observatory established by the Horizon Europe FORWARDS project. The site will be equipped with modern technology and, in combination with modelling approaches and existing data, will be able to provide regional scale nowcasting tools for monitoring the stressors on forest ecosystems. As such, Zöbelboden will be upgraded to an ensemble of a supersite and surrounding forest inventory plots representing temperate mountain mixed forests on carbonate bedrock of the European Alps.	Start: 7/2024 18 Months