***eco2adapt*'s Newsletter**
Volume 2, Series 2
Editor: Dr. Tahamina Khanam
tahamina.khanam@uef.fi
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"*eco2adapt* is a Horizon Europe Research and Innovation action project funded by the European Union and coordinated by INRAE. It began in September 2022 and will run for five years with 31 partners from 11 countries. The project aims to provide solutions to combat the uncertain effects of climate change and promote resilient forest ecosystems for future generations."

Exploring Diverse Ecosystems: Visits to Living Labs and Forests

Two INRAE scientists visit Chinese Living Labs to strengthen Europe – China cooperation

Dr. Zhun Mao, INRAE - UMR AMAP

Two scientists (Dr. Zhun Mao and Mr. Jiaxi Yao) from the French INRAE (National Research Institute for Agriculture, Food and Environment), the UMR AMAP (Joint Research Unit of botAny and Modeling of Plant Architecture and vegetation) laboratory, carried out a mission to China at the end of August 2024. The mission aimed at establishing new collaborations between Europe and China in the framework of the ongoing Europe – China *eco2adapt* project (https://www.eco2adapt.eu/). More specifically, INRAE – UMR AMAP has planned to identify suitable Chinese case studies that can be modelled by DORIAN, a recently published model by UMR AMAP researchers that allows to assess the fate of ecosystem services in a complex and dynamic social ecosystem (see Mao et al. 2021, https://doi.org/10.1016/j.ecoser.2020.101220).

Exchanges in the demonstration area of close-to-nature forest management, Mulan Forest, Chengde, Hebei, China. Source: Dr. Zhun Mao

On 21 and 22 August, they visited the Mulan Living Lab in Hebei Province, which is part of the state-owned Mulan Forest, accompanied by Mr. Hui Wang and Mr. Qiankun Zhi, senior engineers of the Mulan Forest, and Ms. Tongfang Guo, a PhD candidate working in Prof. Shuirong Wu's group at the Chinese Academy of Forestry. Mr. Hui Wang introduced several examples of Mulan's innovative close-to-nature forest management practices, including target tree selection, seedling nursing, and coppice conversion. Fruitful discussions took place both in the forest and in the office about Mulan's forest-based ecosystem services and their multi-sectoral beneficiaries in the context of China's administrative reforms that converted the farm's nature from Category II (partially government-supported) to Category I (fully government-supported) in terms of governmental financial supports.

On 24 and 25 August, accompanied by Dr. Tingting Mei, Prof. Guangsheng Chen and Ms. Zihui Sun from Zhejiang Agriculture and Forestry University (ZAFU), they visited the Anji Living Lab, best known for its bamboo forests. In Anji and surrounding counties, they visited several experimental sites established by ZAFU and exchanged views with local people, including officials from the state-owned Lingfengsi Forest and the owner of the private Suimei Forest. The exchanges focused on the resilience of bamboo-related ecosystem services under climate and social-economic changes. After returning to the ZAFU campus, Dr. Mao gave a presentation to introduce UMR AMAP, his research activities and ongoing project related to DORIAN. Brainstorming discussions, with the participation of Prof. Guomo Zhou and Prof. Lei Wang, were held on the holistic modelling of the Anji social-ecosystem using DORIAN.

Group photo in front of the main building of the Lingfengsi Forest, Anji, Zhejiang, China. Source: Dr. Zhun Mao

Policy Section

Forest monitoring – why is it important and why now?

Jo Van Brusselen, EFI

As announced in the latest EU Forest Strategy and following a public consultation, in November 2023 the European Commission published a proposal for a legal act, and an accompanying policy impact assessment, on forest monitoring and strategic plans. The proposal describes the possible division of responsibilities in forest monitoring between the EC and the member states, and it outlines indicators that will need to be monitored.

On the one hand, the EU has increased the demand for forest data with legislation such as the regulation on land use, land-use change and forestry (LULUCF) , the renewable energy directives (REDII and REDIII), the sustainable finance regulation, the nature restoration law, and the soil protection law. These acts altered the need for high quality data for proof of compliance, monitoring and enforcement. For some new developments in the bioeconomy, no appropriate statistical systems are yet in place to adequately monitor the uptake of climate-friendly products.

Most experts agree that a European forest monitoring system needs to be holistic, addressing multi-sectoral, multi-user information needs. The monitoring should also consider the stakeholders themselves, in finding answers to questions such as: What drives the management choices of forest owners and managers in their action towards more resilient climate adaptive forests? What are the forest industries' innovation and competitiveness capability to deliver the products of the future? What are the public's expectations and beliefs towards forests and environment and how do these influence use and consumption of the forest.Forest data are not only to serve the needs of policy makers. The on-going debate on forest monitoring is also about the multi-functionality of the data system itself – whether that should supply all levels of forest data users, from forest managers to public authorities, or if every level should have its purpose-specific information system, which some countries already have in place, some of which influence e.g. national accounting, monitoring and enforcement of their respective legislation.

NFI's have evolved in many countries from systematic plot-based in-situ observations, to multi-source inventories that integrate other data sources, such as satellite and air-borne data, from a variety of sensors (including optical, (N)IR, radar and lidar). For most indicators, remote sensing will not be able to replace in-situ monitoring but it offers great advantages in delivering higher resolution data, with shorter intervals.

In situ data represent the "ground truth", which remote sensing uses for calibration and validation. Doing away with ground truth data would risk remote sensing to deliver fairytales or horror stories. Despite past investments in research projects aiming to harmonise and further develop forest inventory and monitoring systems, data gaps remain for many countries and for many indicators. Additional efforts to harmonise data are still necessary, while standardisation is often not considered to be acceptable, for practical and legal reasons. Any initiative to harmonize or standardise the data should always consider compatibility also with international definitions as well as with national definitions. Monitoring capability is moving from observing the 'state' of the forests, towards predicting the future of European forests. This capability relies on scenario-based modelling, allowing to better predict impacts from climate and management decisions and consumer choices on future delivery of forest ecosystem services. Several projects are currently developing alternative methodologies to achieve this (e.g. the currently on-going projects *eco2adapt*, Forwards, ForestPaths, PathFinder, and MoniFun).

The above outlines just a few of the reasons why forest monitoring is important. In terms of timing, it has always been important, though the aspects that are monitored change with time, in tune with the big societal challenges that need to be addressed. Now, with the forest legislation in the making, and all the big research projects being funded, we are seeing perhaps the biggest momentum in decades.

Overview of the Living Lab

Living Lab in EU: The Swiss Living Lab in the Surselva valley – preliminary results

Maximiliano Costa, Harald Bugmann – Forest Ecology, ETH Zürich

The Alps are a major mountain range in Europe whose ecosystems provide multiple services, the most important in a European context being flood control, protection against gravitational natural hazards (landslides, avalanches, rockfall) and biodiversity conservation. The steep terrain and multiple ecosystem types within a short distance provide an ideal living laboratory for assessing forest resilience to climate change and related adaptive management approaches. Given that the main overarching question for the *eco2adapt* project is "How can different forest landscapes provide different bundles of ecosystem services under climate change?", the specific research objective for the Swiss Living Lab is how to balance the protective function of the forest with timber production.

Climate change is expected to impact the functioning of mountain forests, altering the equilibrium between forest state and climatic conditions, leading to new and sometimes novel forest structures that include different species composition.

Figure 1. The blue dot represents the position of the Living Lab, i.e. the Surselva valley in the Canton of Grisons

Forest susceptibility to natural disturbances is thus expected to change, and disturbances will likely shift to new regimes (higher frequency and magnitude).At the same time, transitioning current forests towards future states is complicated by the fact that future species may not be able to grow yet today, hence raising the question as to when the time has come to start e.g. planting; and uncertainty about the future climatic development remains high while the sensitivity of many forests to the magnitude of climate change is large, thus necessitating a broad while still cautionary view on adaptive management strategies.

The Swiss Living Lab (LL) is located in the Surselva valley, canton of Grisons (Figure 1). It has an area of >1200 km^2.This LL is a good representation of the Alpine environment, presenting a wide range of elevations (from 700 to over 2500 m asl), vegetation zones, ecosystems, and species.

The main tree species are typical Alpine species such as Norway spruce (*Picea abies* (L.) Karst), larch (*Larix decidua* Mill.) and Swiss stone pine (*Pinus cembra* L.), with some broadleaves at lower altitudes. To investigate the interactions between climate change and forests, the landscape dynamic vegetational model LANDCLIM is used. LANDCLIM is a process-based model that considers the interaction between climate, vegetation dynamics, natural disturbances and forest management.

The first exploratory simulations that we are sharing here are based on three climatic scenarios: historical climate (1950-1980, so as to exclude the first early signals of anthropogenic climate change that became obvious after 1980), RCP 4.5 and RCP 8.5. We run a spin-up for each scenario, i.e. starting from bare ground the model runs for 2000 years, with no management.

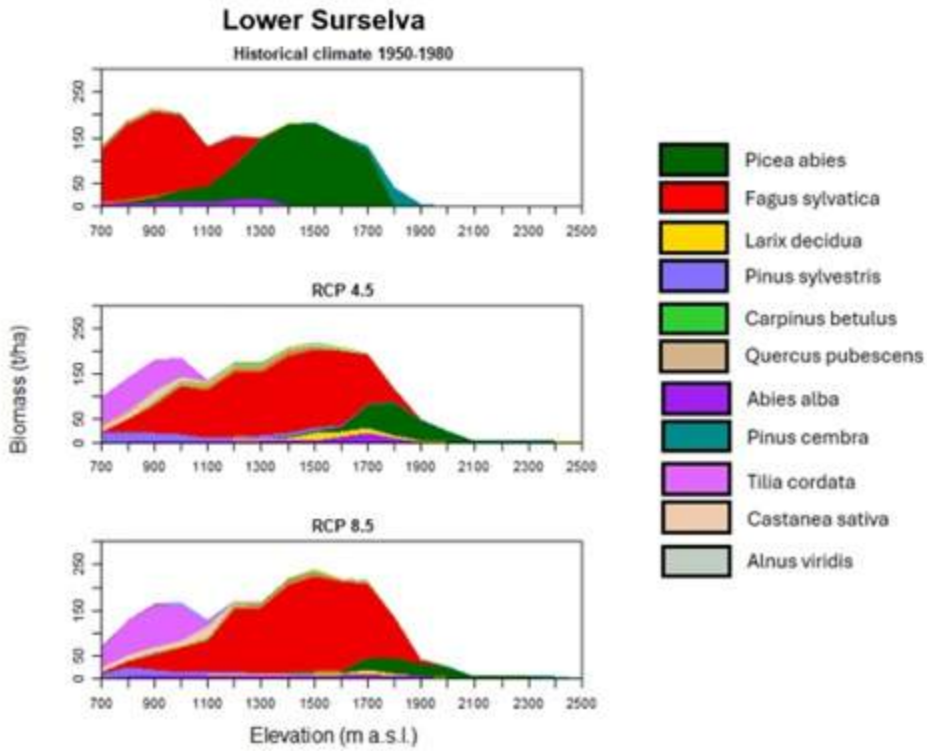


Figure 2. Output of LANDCLIM spin-up simulations under three climate scenarios: historical climate (1950-1980), RCP 4.5 and RCP 8.5. The graphs show the share of species according to biomass (t/ha) along elevation (m a.s.l.).

The final output is the Potential Natural Vegetation (PNV) at equilibrium with the corresponding climate scenario. These simulations were run for a smaller portion of the Living Lab, in the surroundings of the city of Ilanz, this first case study is called 'Lower Surselva'.

Simulations for the Lower Surselva show that under the historical climate, PNV well represents the 'classic' Alpine vegetation with some beech (*Fagus sylvatica* L.) at lower elevations, which is substituted by the main species that are also dominating the current landscape: Norway spruce.

The climate change scenarios show a complete switch to a dominance of broadleaves, with mostly spruce in RCP 4.5 and a wider variety of species in RCP 8.5. Under climate change, conifers are limited to higher elevations (Figure 2). Generally, the simulations feature higher C storage in the landscape under climate change (higher amount of biomass), with higher productivity at higher elevations, but more drought sensitivity at lower elevations.The simulation results also suggest that species composition will change. This Living Lab will likely move from a conifer-dominated landscape to a broadleaf-dominated one when being subject to a warmer and drier climate.The species shift will change strongly with elevation, being particulary abrupt around intermediate elevations, where most forests are currently pure spruce stands (e.g. at 1500 m a.s.l., Figure 2). To better showcase the species shift at this elevation, further simulations were run.

Starting from the equilibrium under the historical climate (assumed to occur in the year 2010), LANDCLIM was run under the RCP 4.5 and RCP 8.5 scenarios until the year 2500 under the assumption that the theoretical assumpation that the changing climate will reach a new equilibrium at the end of the 21st century, thus using random data from the last three decades (2070-2100) to continue the simulations after 2100.

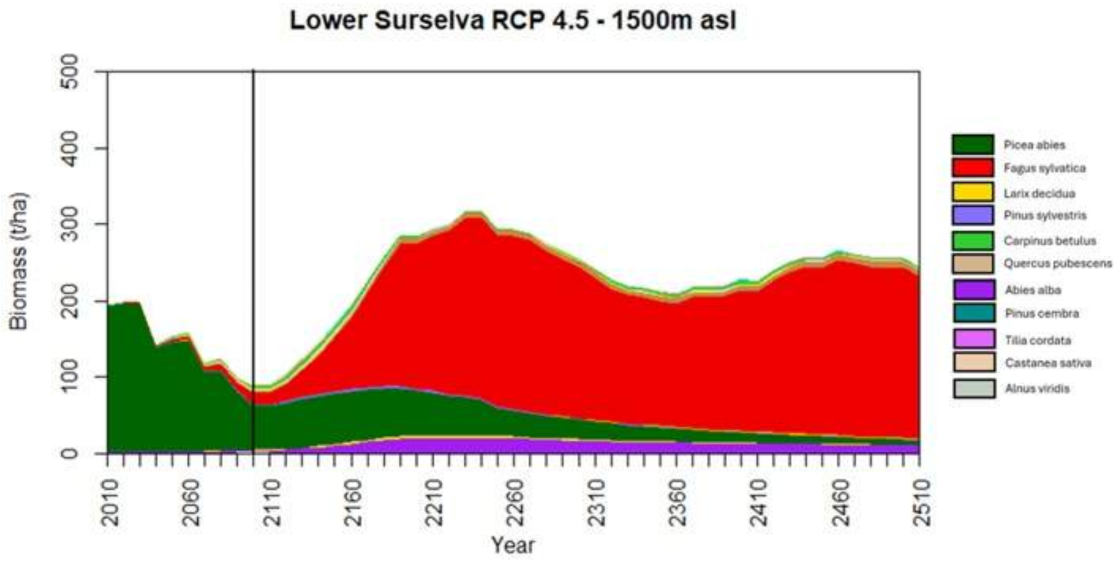


Figure 3. LANDCLIM simulations starting from historical equilibrium under climate change conditions: RCP 4.5 scenario. The graph shows the amount of biomass through the years, at 1500 m asl in the lower Surselva case study

Results show that Norway spruce will decline rapidly, reaching the lowest biomass at the end of the 21st century (Figures 3 & 4). The main difference between the two climate scenarios is the time that is required for biomass to reach a new maximum value: in RCP 8.5 this takes ca. 30 years longer. Furthermore, under the RCP 8.5 scenario more broadleaved species are simulated to be present in the landscape.

The next steps of the analysis will focus on the integration of forest management in the simulations, in order to investigate alternative strategies and objectives (e.g. planting different species, focusing on maintaining protective efficiency vs timber production).

This is of primary importance since management should prepare to fill gaps in productivity and in provisioning of ecosystem services (e.g., protection gaps against gravitative hazards during a species shift). An active collaboration with local stakeholder is ongoing, in order to better design these management scenarios and strategies. To better evaluate the different outputs of simulations, ecosystem services indices will be computed to analyze how the protective function and timber provision will vary. Different natural disturbances regimes will also be included, as well as some focus will be put on how susceptibility to disturbances might change with new species and forest structures.

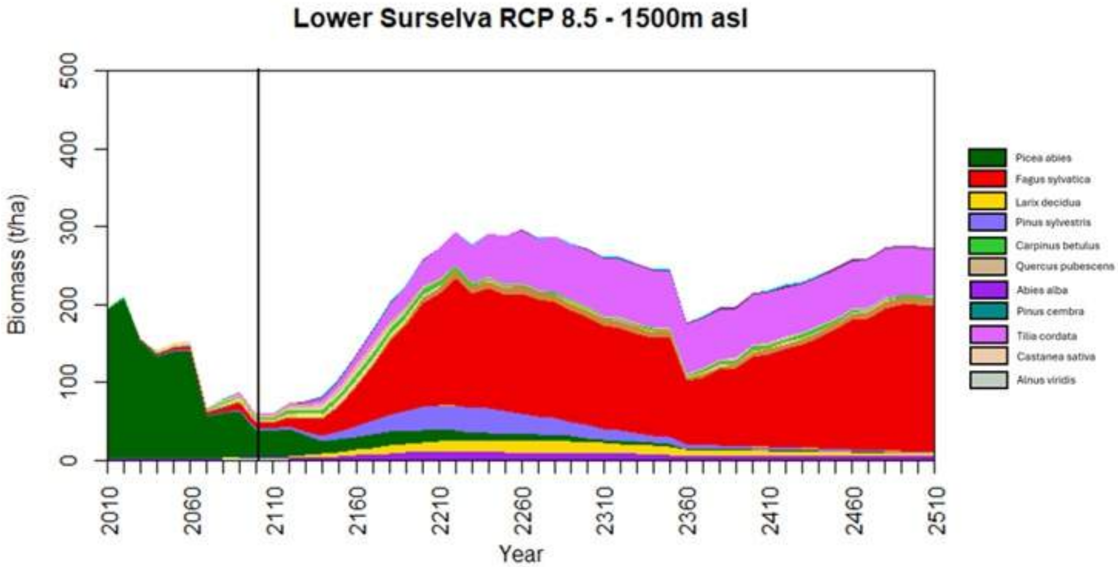


Figure 4. LANDCLIM simulations starting from historical equilibrium under climate change conditions: RCP 8.5 scenario. The graph shows the amount of biomass through the years, at 1500 m asl in the lower Surselva case study

Finally, simulations will be initialized using a ‘tree initialization file’ derived from inventory data. Through a statistical approach, we have generated "Representative Stand Types" based on inventory plots, which are then spatially applied across the landscape. This method should provide a more accurate representation of the current state of the forest stands in the Surselva valley, ultimately improving the analysis of future species composition and forest structure.

Living Lab in China: Bawangling Experiment Forest

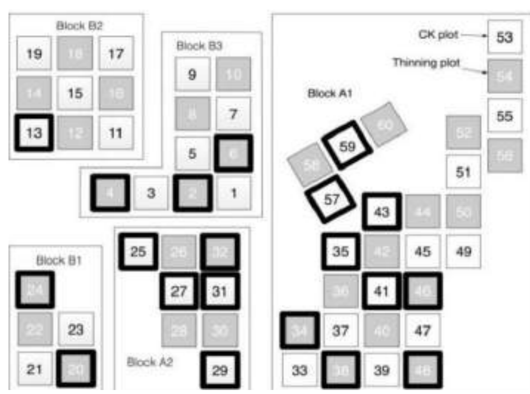
Located in Changjiang County and Baisha County of Hainan Province. It boasts a typical tropical forest of Hainan Island, and it is also the only distribution area of Hainan gibbon (Hylobateshainanas), the world's most endangered primate.

Expected Results: The research team conducted community surveys, investigated environmental factors, collect & determine plant functional traits in 31 one-hectare plots (Picture A) which are at different disturbance regimes and recovery stages, as well as investigating the ecological restoration of tropical secondary forest plots (60 0.25-hectare plots, Picture B/C).

Field investigations were carried out to generate continuous forest dynamic monitoring data spanning 10 to 15 years since 2009.

Picture A. 31 one-hectare plots

Picture B. Conservation of key species for tropical ecological functions and sample plots for the management of secondary tropical forests.



Picture C. Ecological restoration of tropical secondary forest plots.

The field work can provide data for elucidating the impacts of various disturbance regimes on the natural tropical forest communities in Hainan Island. It can also be used to reveal the influencing factors to forest ecosystem resilience at different spatial scales and their variation characteristics.

Source: Newsletter of China-EU Project eco2adapt, second Issue

The Business-As-Usual (BAU) inventory in Finnish Forest: Need to improve

Sanna Härkönen, Eero Muinonen, Sanna Peltola, Leena A. Leskinen and Meri Suppula

Finnish Forest Centre collects and maintains forest data. This task is based on the Forest Information Act. Open data is widely utilized in forest planning, wood procurement and timber trade. Forest Centre provides Metsään.fi eService for forest owners and companies. Laser scanning and aerial photography program 2020-25 is a second national level program. Finnish Land Survey coordinates the program. It has a 6 years scanning cycle (Northern Lapland 12 years). Thera are about 22 inventory areas including 60 000 km^2/ year and 3.5 – 4 million ha forests. Laser point density is 5 p/m^2. There are 3 years cycle of aerial photos having 30 cm ground resolution.

Currently ongoing EU Horizon funded *eco2adapt* project (2022-2027) focuses examining modeling of impacts of climate change and forest resiliance. Thus, it was natural that in the project, Finnish Forest Centre and Sitowise Oy from Finland have been studying especially mapping of forest vitality and bark beetle damages in North Carelia, Finland. The problems caused by spreading bark beetle damages are very topical in North Carelia. There have been news that bark beetle is already threatening even Finland's "national scenery" in Koli, and there is increasing need for monitoring the forest disturbances and being able to act quickly when the damages are noticed to avoid further damages.

Source: Metsäkeskus

Quality of inventory. In business as usual inventory a certain accuracy has been reached. In the even-aged forest stands the RMSE of the total volume (m^3), basal area (m^2) and mean diameter (cm) is about 10-(15) % and height (m) only about 5 %. The main tree species is correctly classified in 95 % of the stands. In the case of bark beetle damages, it is crucial to identify small, the groups of only 3-5 dying or dead trees.

Field sample plots. In FFC remote sensing process the data is improved by measuring reference data for helping the interpretation from remote sensing data. Both tree map sample plots and circular sample plots are measured. Reference data must cover the variation of the forests in the inventory area (tree species, size/density of the trees). In tree map sample plots each tree is located using local pseudolite network and separate GPS points measurements. Total accuracy of single tree location is 10-30 cm. Larger 1 000 – 2 000 m^2 tree maps are measured and calculated (location, species, diameter, height, volume and age). Actual laser heights of the trees are also utilised.

As based on our earlier experience, our forest disturbance modeling study started with collecting field reference data from sample plots representing both healthy and suffered spruce forest sites. European spruce bark beetle damage measurements was conducted so that the aim was that 1/3 of the measurement sites would be healthy, 1/3 weakened and 1/3 dead. Measurement sites were circles with nine-meter radius. Location was measured with 3,5-meter-high Topcon-locator, site information and tree measurements (tree species, condition of tree and tree diameter) was made with Masser measuring scissors, and Vertex was used to measure distance from the center of site and to measure height of trees. All trees at least 10 cm thick were measured, and trees under that if they were in open area.

Tree condition included normal living tree, damaged living tree, dead tree and other more specific classes. Information of damage (pitch leak, bark damage, holes in bark, change of canopy color and dripping of needles) was added to other than normal living trees. Height was measured from one average size spruce, pine and deciduous tree of the site. Sites were found using QField map application. Other tools used were marking pen to mark measured trees, fiber tape to mark the center of the site and tape measure to calibrate Vertex. Every site and possible tree damages were photographed. In total 226 sites were measured.

Examples of 9-m-radius field plots in North Karelia, Finland; trees appearing cyan in the image have damages caused by spruce bark beetle. The point in magenta is the plot centre point, and the blue dotted line indicates the field plot area. (Background: Aerial false colour orthophoto from National Land Survey of Finland).

The field survey data was then applied to creating different variants of models for estimating forest vitality based on Sentinel2 satellite data. Also detecting unhealthy or dead trees based on orthoimages was examined. The results indicate that Sentinel2 images with 10 m resolution are too coarse for detecting damaged single trees, especially the small ones and those under bigger tree crowns. Orthoimages with high resolution are better for that purpose, but the disadvantage with them is that they are always outdated for some regions in Finland since their survey cycle is 3 years. Based on our findings in Southeastern Finland so far, orthoimage-based estimates have around 70-80 % of performance (F1-score) in detecting dead trees/tree groups. Main issues are caused by variability of image quality and conditions. Detection of damaged tree groups from Sentinel2 images is more challenging but shows potential for larger damages. As a result of this study, maps showing forest vitality development in the time series was created for the test area in North Carelia. The maps can be demonstrated in real use via Sitowise's Foresta web application. Next steps will include testing using of the maps with *eco2adapt* Living Lab in North Carelia by Finnish Forest Centre.

InNovaSilva in *eco2adapt*

Palle Madsen

Mission and vision of InNovaSilva

InNovaSilvas mission is to advance and improve sustainable management and restoration of forests and forest landscapes challenged by climate change. We do it by implementing the latest technological innovations in applied research and development to create new solutions to meet the challenges. We do also believe that intelligent use of wood and woody biomass, in tandem with sustainable forest restoration and management, is the strongest and most cost-effective tool our societies we have available for making our modern societies more sustainable.

The challenges are in many ways larger than ever, but so are our opportunities to implement good solutions. The approach of InNovaSilva is to collaborate with practitioners and stakeholders to facilitate implementation of relevant solutions. This is done in full recognition of the changing conditions in our modern world including growing human populations and economies, altered climate futures, as well as widespread emergence of novel ecosystems.

InNovaSilva's drone borne LiDAR – DJI Zenmuse 2 carried by a Matrice 350 RTK drone. Source: Palle Madsen, InNovaSilva

Tasks for InNovaSilva in *eco2adapt*

Our main task as a partner in eco2adapt is to design portfolios of mixtures of species and provenances as well as management options and techniques for managing future resilient forests. We will bring and exchange knowledge and experience across European and Chinese Living Labs.

This is to facilitate new and sustainable solutions for practices that otherwise may be too to limited by business as usual locally. Rapidly changing climate and needs for a fossil free world with 8 billion people require new approaches for the future.

Demonstrating new technology to facilitate implementation

Drone-borne LiDAR scanner will be used to create 3D models of existing forests in the Living Labs – both degraded and promising desired forest structures and species compositions. Based on such examples on the ground we will provide estimates of expected future deliverables of ecosystem services for alternative solutions within the portfolios – but using existing examples of forests as starting points. The 3D models will also serve as starting points for visualization of the portfolios.

The estimated future deliverables of ecosystem services cannot be documented at this point since they are expectations for the future. However, the drone-borne LiDAR is an example of recent technological advancement, that can be used for cost-efficient inventories and verification in future of the predicted future ecosystem services as they appear. For example, this may be classical evaluations of growth, yield, and CO2-sequestration of the managed forests – an ecosystem service of increasing value for a world in great need to become fossil free. But it may also serve as valuable characterization of e.g. habitats for biodiversity, desired structures in agroforestry and silvopastoral systems, or forest cover providing erosion control.

New generation of operational scale field experiments

Additionally, we will provide suggested designs for long-term field experiment in operational scale in selected Living Labs. These designs will match the Resilient Future Forests Lab (RFFL, https://resilientfutureforest.org/ under the auspices of IUFRO) to demonstrate, documents, and compare alternatives for future forest management options. The drone-borne LiDAR technology will serve as key to provide the cost-efficient monitoring needed to make such experiments realistic to establish, maintain and monitor.

Upcoming events

Invitation to the 3rd Annual *eco2adapt* Meeting

Gediminas Brazaitis and Michael Manton

We are delighted to invite you to the 3rd Annual *eco2adapt* Meeting, which will take place in mid of November, 2025, at Vytautas Magnus University's Agricultural Academy in Kaunas, Lithuania. This meeting aims to bring together all *eco2adapt* project partners to present the years project progression, findings and to discuss the remainder of the project.

As part of the meeting, we are excited to organize tour trip to the Dzukija National Park Living Lab. Dzukija National Park, located in southern Lithuania, is the largest protected area in the country renowned for its rich biodiversity, extensive forests, and traditional rural landscapes. National Park established in 1991 to preserve both its natural landscapes and ethnocultural heritage, currently is also a popular Lithuanian tourist destination. Majority of the parks' area is covered by vast forests growing on sandy inland dunes with valleys full of meadows, flowing streams and springs, and meandering rivers, surrounded by raised bogs and marshes.

The park represents a unique example of a Scots pine forest ecosystem that has both natural and human influences, and serves as a living laboratory for studying adaptive management techniques that promote ecosystem resilience. Pure Scots pine takes up around 88.5% of the forests with 3.7% silver and downy birch, 3.4% black alder, 2.0% Norway spruce, 0.2% European aspen, 0.1% pedunculate oak and 2.1% other species admixtures. The field trip will provide participants with a hands-on opportunity to observe and discuss forest management practices in the context of climate adaptation. Under climate change Dzukija forests are facing exacerbated drought and wildfire risks, with increasing ungulate browsing pressures that shape forest regeneration patterns. We will visit areas of the park where sustainable forestry practices are being applied, as well as sites that are part of the Natura 2000 network, showcasing conservation efforts to preserve rare and endangered species, such as the re-created open sand dunes. Local experts will guide the visit, offering valuable insights into the challenges and successes of managing forests in a rapidly changing climate.

Landscape of LL Dzukija National Park

Experiments of forest floor removal in LL Dzukija National Park

Mixed pine-birch stands in LL Dzukija National Park

Čepkeliai raised bog – strictly protected area of Dzukija National Park

About Kaunas and Vytautas Magnus University

Kaunas in the heart of Lithuania is the second-largest city. It has a vibrant cultural and academic hub and known for its historical significance and architectural heritage, Kaunas has been a center of innovation and education for centuries. The city's dynamic atmosphere, rich in history and modern development, provides an ideal backdrop for our meeting.

Vytautas Magnus University Agricultural Academy will host the meeting. The campus is located just outside the city center and is one of the leading institutions in Lithuania for agricultural and environmental research. With a long-standing tradition of excellence in forestry and sustainable land management, the Academy is the perfect venue for our discussions on climate adaptation and ecological sustainability.

Kaunas can be reached by direct flights to Kaunas airport or to Vilnius airport (1 hour trip by bus or train) or by either International bus carries (i.e. Flex busses), or by train. A range of accommodation options are available in Kaunas. We expect to start registration process for the event during spring 2025.

We believe that this year's meeting will offer an excellent opportunity to exchange ideas, learn from ongoing projects, and explore the beautiful landscapes of Lithuania. We look forward to welcoming you to Kaunas and engaging in productive discussions that will contribute to advancing our collective goals of ecosystem resilience and sustainability.

European bison's in LL DNP

Sources: Old part of Kaunas in the Caption - Michael Manton; rest of the photos provided by Gediminas Brazaitis

Past event

2nd annual meeting of the *eco2adapt* project in Brasov, Romania

Darius Hărdălău and Alexandru Lucian Curtu, Transilvania University of Brasov, Romania

The second annual meeting of the *eco2adapt* project (Ecosystem-based Adaptation and Changemaking to Shape, Protect, and Maintain the Resilience of Tomorrow's Forests), funded by the EU HORIZON EUROPE programme, took place this year in the heart of Transylvania, in Brașov, Romania, from July 2nd to 4th, 2024.

Organized by the Faculty of Silviculture and Forest Engineering at Transilvania University of Brașov, the meeting was hosted in the university's rectorate conference halls. Approximately 60 professors, researchers, and postgraduate students from 31 international universities and research centers across Europe and China participated in the event.

Sources: Darius Hărdălău and Alexandru Lucian Curtu

On the first day, guests were welcomed in the rectorate's conference hall, where the university rector, Ioan Vasile Abrudan, delivered an opening address. Updates and provisional results for several work packages were then presented.

The second day included a visit to the Living Lab Iedera in Dâmbovița County, where forest owners and managers greeted the attendees. The private company ForestDesign showcased the methods used for forest inventory and planning, including innovative laser scanning techniques.

Sources: Darius Hărdălău and Alexandru Lucian Curtu

On the third and fouth day, provisional results from the remaining work packages were presented, along with an overview of the project's overall progress. Workshops were conducted to emphasize specific working tasks.Discussions focused on future needs, necessary adjustments, and objectives that must be accomplished.

The meeting was a resounding success, featuring presentations and discussions on the current progress of the project and significant work was accomplished regarding the next steps and further development of the project. Overall, the meeting was highly productive, and important groundwork was laid for the *eco2adapt* project.

Summer school 2024 in UEF

The University of Eastern Finland (UEF) coordinated a two-week Summer School in Joensuu, Finland, focused on *Ecosystem Restoration and Climate Change* (5 ECTS). The program took place on the Joensuu campus from August 5 to 16, 2024. The in-person instruction covered various fields of study, and the language of instruction was English. The course was coordinated by Prof. Dr. Frank Berninger.

Using concrete examples from North Karelia, the course provided an overview of the natural, economic, legal, and social frameworks for ecosystem restoration. The Summer School also fostered international collaboration, involving Zhejiang A&F University (ZAFU, China) and universities in Ghana. The program worked in partnership with the *eco2adapt,* GCUN, and Microeco projects.

The Summer School offered a valuable opportunity for student exchange and networking with peers and universities. During the session, 25 students from ZAFU in China participated in the course.

The next UEF Summer School is scheduled for the summer of 2025, with the exact dates to be announced at the beginning of the year.

Announcement

Optfor-EU

- Save the Date to our mid-term conference, that you can find here: https://optforeu.eu/event/6th-edition-of-the-forest-innovation-workshop-and-mid-term-conference-of-the-optfor-eu-project-inform-prioritise-collaborate-building-a-sustainable-forest-future-through-regional-cooperation-and-inn/
- Report and infographic - The new report shows the practical benefits derived from the project complex approach and how it will facilitate the just transition principle of the EGD and its constituencies under the New EU Forest strategy 2030. LinkedIn. X.
- Practice abstracts - The first two project factsheets focussing on European Forest Types and Stakeholder Engagement Plan. LinkedIn. X.

Funded by
the European Union