Summer School 2021

FORMON

Long-term Forest Monitoring
to assess Forest Functioning
under Air Pollution and Climate Change

22–28 August 2021

Davos, Switzerland

ICP Forests

SWISS FOREST LAB

nfz.forestnet

Background

Forest monitoring is defined by the International Union of Forest Research Organizations (IUFRO) as the regular and periodic measurement of certain parameters of forests (physical, chemical, and biological) to determine baselines to detect and observe changes over time. Without standardized and harmonized methodologies, understanding the loss of biodiversity and reduction of carbon sequestration capacity that results from global change becomes much more difficult.

Climate change and air pollution affect forest ecosystems in many different ways. Drought periods, as the one in 2018, strongly reduce tree growth and increase tree mortality in Europe and elsewhere. At the same time, elevated air pollution levels affect forests from the leaf to ecosystem level. While societies' expectations to forests are increasing and forests have become focal points for local, national and global interests, the provision of ecosystem services such as timber production, water purification, and carbon sequestration is more and more endangered. To address the impact of global change on forest ecosystems and their resilience, long-term data series are indispensable to evaluate status, trends and processes in forest ecosystems.

Latest debates on fake news, climate crisis and increasing expectations to forests and future forest management demonstrate the demand for scientific sound information and the need to address the impact of global change on forest ecosystems and the changing societal conditions from complementary angles (see Figure 1):

a) On the scientific level; the forest state, functioning and forest dynamics, including the many processes and interactions within forest systems and their (changing) environment need to be monitored over long-term and analysed towards a better understanding of cause-response relationships to develop reliable future scenarios.

b) On the applied level; sustainable forest management practices have to be adapted to future climate conditions and societal needs to improve the forests' resilience in order to safeguard the multitude of ecosystem services they provide.

c) On the economic, societal and political level; the economic, societal and political framework is central to warrant the sustainable and efficient use of forests.

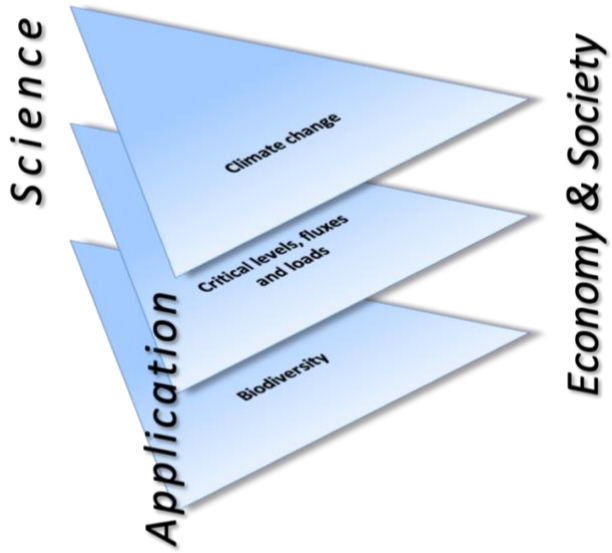

Figure 1. *Long-term effects on forest ecosystems studied across the three topics (1) climate change, (2) critical levels, fluxes and loads, and (3) biodiversity from a (a) scientific, (b) applied, and (c) economic, societal and political angle.*

Goal of the Summer School 2020

Three decades of monitoring effects from air pollution and climate change within the International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) under the UNECE Convention on Long-range Transboundary Air Pollution (Air Convention) have provided a harmonized and standardized asset of long-term data series that allows scientists, stakeholders and policy makers to assess the status and predict the fate of European forest ecosystems and their functioning in a changing environment.

The goal of the ICP Forests/SwissForestLab/NFZ Summer School 2021 is to provide an in-depth understanding of the concepts, approaches, and available data infrastructure of forest long-term monitoring. Novel modelling and assessment approaches will be discussed considering the expectations of future forests from a scientific, forest management, and socio-economic perspective.

The participants will reflect on their own work with respect to other disciplines and discuss possible benefits of interdisciplinary approaches in their field.

Ultimately, the participants will get to know the interfaces of their own research with other methods and approaches. This will increase the impact and the relevance of their work.

Organization

The Summer School is organized around four major topics that address different aspects of long-term forest monitoring:

1. Strength and challenges of forest long-term monitoring;
2. Cross-scaling: scaling over space and time;
3. Management and socio-economic or socio-ecological perspectives;
4. Interdisciplinary methods and approaches addressed with project examples

In each topic, experienced and internationally recognized researchers and speakers are responsible for the scientific content and the discussions (see Table 1).

Major topics	Methods	Keynotes
Strength and challenges of forest long-term monitoring	History *vs*. future requirements	Dr. Marco Ferretti (WSL, ICP Forests) Prof. Werner Eugster (ETHZ, ICOS) Dr. Mana Gharun (ETHZ, ICOS) Dr. Marcus Schaub (WSL, ICP Forests)
Cross-scale: scaling over space and time	Forest modelling, long-term monitoring, biodiversity, soil/hydrology	Prof. Arthur Gessler (WSL, SwissForestLab, NFZ) Dr. Katrin Meusburger (WSL) Dr. Esther Thürig (WSL) Prof. Benjamin Stocker (ETHZ, WSL)
Management and socio-economic perspectives	Socio-economic and socio-ecological analyses, risk assessment	Prof. Roland Olschewski (WSL) Dr. Rasoul Yousefpour (Uni Freiburg) Dr. Daniel Orenstein (Technion) Dr. Clémence Dirac (FOEN) Dr. Nele Rogiers (FOEN)
Interdisciplinary methods and approaches addressed with project examples	Interdisciplinary methods and approaches	Dr. Claude Garcia (ETHZ) Isabella Sedivy (srf.ch) Dr. Petra D'Odorico (WSL) Dr. Peter Bebi (SLF) Dr. Erwin Dreyer (INRAE) Representatives from the local forest service

Table 1. *Main topics, methods and lecturers*

In addition to the active participation in the Summer School, PhD students are expected to contribute with a poster addressing disciplinary and interdisciplinary interfaces of their own work to the major topics of the Summer School: natural science basics, cross-scale effects, economic, political or management perspectives. A poster session will be held on Monday, 24 August (see Table 2). In addition, participants are expected to read the most important articles relevant to the major topics of the Summer School. These articles will be appointed in advance by the lecturers.

The organizing committee consists of Dr. Marcus Schaub (WSL, ICP Forests), Prof. Arthur Gessler (WSL, SwissForestLab, NFZ), Dr. Stefan Hunziker (WSL, SwissForestLab) and Dr. Julia Born (WSL, SwissForestLab).

Preliminary program

The Summer School will start with an introductory lecture on Sunday evening. The following five days will comprise input lectures and discussions with various experts, assigned group work and two excursions to:

- the Dischma Valley (Stillberg alpine tree line afforestation experiment; changes in forest cover and forest structure caused by natural disturbances, forest management), and
- the Davos area (Davos Seehornwald long-term monitoring site and part of the networks LWF, TreeNet, ICP Forests, ICOS and eLTER).

As enrichment of the scientific scope of the Summer School and to foster interdisciplinary, a workshop on stakeholder dialogue will be facilitated by Dr. Claude Garcia (ETHZ). On the last day, the final product of the group work will be discussed, followed by a synthesis workshop and feedback round.

	Sunday 22.8.	Monday 23.8.	Tuesday 24.8.	Wednesday 25.8.	Thursday 26.8.	Friday 27.8.	Saturday 28.8.
MORNING		Poster Session S. Hunziker	**I. Sedivy** "Interdisciplinary" Keynote & disc	Stakeholder Dialogue C. Garcia	**P. D'Odorico** "Interdisciplinary" Keynote & disc	**W. Eugster** "Strength & challenges" Keynote & disc	DEPARTURE Hotel Shima
		M. Ferretti "Strength & challenges" Keynote & disc					
		Group work S. Hunziker	Excursion Stillberg P. Bebi	**A. Gessler** "Cross-scale" Keynote & disc	**D. Orenstein** "Socio-ecol analyses" Keynote & disc	**C. Dirac, N. Rogiers** "Managem & socio-econom" Keynote & disc	
AFTERNOON		**E. Thürig** "Cross-scale" Keynote & disc		**K. Meusburger** "Strength & challenges" Keynote & disc	Excursion Seehornwald M. Gharun & W. Eugster	**B. Stocker** "Cross-scale" Keynote & disc	
		R. Olschewski "Managem & socio-econom" Keynote & disc		**R. Yousefpour** "Managem & socio-econom" Keynote & disc		**E. Dreyer** "Interdisciplinary" Keynote & disc	
	ARRIVAL Hotel Shima	Poster Session S. Hunziker		Stakeholder Dialogue C. Garcia		Pres. Group work S. Hunziker	
EVENING	Introduction M. Schaub	Poster Session S. Hunziker		Group work	Group work	Synthesis M. Schaub	
	Ice-breaker S. Hunziker	Group work				Feedback J. Born	

Table 2. *Program of the Summer School FORMON*

Back to back with the 9th ICP Forests Scientific Conference

The Summer School will complement the 9th ICP Forests Scientific Conference on the same topic "*Forest Monitoring to assess Forest Functioning under Air Pollution and Climate Change*", taking place on 7-9 June 2021 at the Swiss Federal Research Institute WSL in Birmensdorf nearby Zurich. Students are encouraged to attend the ICP Forests Scientific Conference.

Application

The 2021 Summer School organized under the umbrella of the ICP Forests, SwissForestLab and the nfz.forestnet networks can welcome around 20 highly motivated students. It is open to PhD students, MSc in their last year and PostDocs from any country in the world. Applications will be evaluated according to their fitting and interest in the research topic, their evidence of academic quality, and their expected benefits from this Summer School. The language of the Summer School will be English.

Costs

Fees: 700 Swiss Francs (exclusive of VAT). This includes accommodation (shared rooms) at the Hotel Shima (https://www.shima-davos.ch/) and meals from dinner on 22 August to breakfast on 28 August, course materials and excursions. Accepted participants are expected to bear travel costs to Davos.

Application for the 2021 Summer School FORMON

Please register here:

Conference web page: https://www.wsl.ch/swissforestlab/summer-school/

Registration tool: https://conf.wsl.ch/ssltfm2021/

For registration, please provide your CV, a motivation letter (1 A4 page) and your PhD thesis abstract.

Registration deadline is 1st March 2021. If you have any questions, please contact the organizing committee: swissforestlab_summerschool@wsl.ch