



**Final COST-STReESS meeting,  
Joachimsthal, Berlin, Germany  
12-14 April 2016  
Venue: Ringhotel Schorfheide**

PROGRAM (version 08.04.2016)

## Opening

### Tuesday 12 April

20:00-20:30	<b>INTRO</b> - COST STReESS: Welcome and review of 4 years of fruitful collaboration
20:30-20:45	<b>IMPACT</b> - The relevance of STReESS for actual issues in European Forestry
20:45-21:30	<b>INSIDE View</b> - Highlights, anecdotes and lots of serious research
21:30-	Drinks & snacks

## Scientific STReESS Symposium

### Wednesday 13 April

08:30-09:00 Opening and welcome (Local organizers & Chair)

**TOPIC 1: ENVIRONMENT AND WOOD FORMATION DYNAMICS** (Chairs: Giovanna Battipaglia & Cyrille Rathgeber)

*Environmental changes affect tree functioning and wood formation leading to permanent imprints of specific events into the tree-ring structure. Studying these records allows investigating long-term effects of environmental factors on tree plasticity and forest resilience. However, how, when and which environmental factors influence the intra-annual dynamics of the xylogenesis and the resulting xylem structure is still not fully understood. This is hampering the assessment of global change impact on tree growth, stand productivity, and forest ecosystems functioning. Improved techniques for monitoring tree-ring formation and tree physiological state at weekly to hourly time-scale, combined with high-resolution measurements of climatic conditions, are providing crucial information to mechanistically link environmental causes, to physiological and structural consequences. This session is dedicated to the presentation of new results providing a valuable and unique mechanistic insight on the influence of environmental factors on xylogenesis and how this impacts tree functioning and performance on short and long term scale.*

09:00-09:20	Kathy Steppe - High resolution growth dynamics in tree stems: linking anatomy and ecophysiology
09:20-09:40	Cyrille Rathgeber - Influence of climate on xylem cell differentiation and resulting tree-ring structure in temperate coniferous forests
09:40-10:00	Ignacio Garcia-Gonzales - Do climate-caused changes in spring phenology affect earlywood vessels? Perspective from the xylogenesis monitoring of two sympatric ring-porous oaks

Discussion break

## Wednesday 13 April (continued)

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| 10:10-10:30 | Martin De Luis - IADFs and missing rings to study drought stress resilience of Mediterranean species |
| 10:30-10:50 | Georg von Arx - Dendroglobal: a global network to study effects of extreme events on tree growth     |
| 10:50-11:20 | Eugene Vaganov - Dynamics in wood formation as key to understand forest resilience                   |
|             | Coffee break   |

### TOPIC 2: TREE PLASTICITY (Chairs: Anna Lintunen & Gaii Petit)

*Trees are size-increasing organisms that constantly modify their structures to sustain optimal physiological performances under changing resources availability through decades to millennia. These modifications are constrained by a number of trade-off mechanisms which can affect carbon balance and allocation patterns, and hydraulic safety / efficiency. Yet, the limits of these plastic changes are not fully understood, i.e., how and to which extent the balance of functional traits (e.g. xylem area, phloem area, leaf biomass) can be re-modulated to survive climate change and related extreme events. This section presents results on how environmental constraints induce (or maybe not?) plastic changes in structural properties and allocation patterns, and how these changes optimize physiological performances and survival.*

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| 12:00-12:20 | Maurizio Mencuccini - Plasticity, functional scaling and trait coordination under climate change               |
| 12:20-12:40 | Georg von Arx - Structure-function balances in trees across Europe   |
| 12:40-13:00 | Teemu Hölttä - Phloem and xylem plasticity   |
|             | Lunch break  |
| 14:30-14:50 | Marco Carrer - Tree plasticity and tree rings  |
| 14:50-15:10 | Jesus Camarero - Dieback-plasticity  |
| 15:10-15:30 | Tommaso Anfodillo – Optimal allometric trajectories, phenotypic plasticity and stress: a quantitative approach |
|             | Discussion break   |

### TOPIC 3: TREE SURVIVAL (Chairs: Lucia de Soto & Stefan Mayr)

*Extreme climatic events often engender widespread tree mortality events, and it often takes years until trees die. In fact, mortality is only the final manifestation of a long-term process of vitality loss and thus, it is extremely difficult to identify stress factors, the mechanisms triggering mortality or the strategies which enable trees to survive. Within this section, specific focus is given to the identification of relevant stress factors and to the underlying mechanisms of climate-induced tree mortality. It will enable insights into long-term dynamics of mortality processes, the species-specific sensitivity to stress factors and intensities as well as resistance strategies.*

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| 15:40-16:10 | Hervé Cochard - The significance of hydraulic traits in the survival of trees to drought stress                |
| 16:10-16:30 | Sabine Rosner - Sounds of stress or a lot of noise? Recent advances in acoustic emission testing of plants     |
|             | Coffee break   |
| 17:00-17:20 | Kathy Steppe - Wood tissue photosynthesis and tree dieback   |
| 17:20-17:40 | Maxime Cailleret - How does tree growth change before mortality? Insights from a new global tree-ring database |
| 17:40-18:15 | Panel discussion with the invited speakers and co-chairs. "Tree survival: future challenges"                   |
| 19:00-      | Dinner   |

## Thursday 14 April

### TOPIC 4: FROM TREE TO FOREST (Chairs: Jordi Vilalta & Mikko Peltoniemi)

*The impacts of climate change on forest ecosystems will be mediated by individual tree-level responses to extreme events. However, extrapolating these impacts from individual tree effects is still a challenging task. This session discusses possible ways forward to integrate and up-scale novel mechanistic understanding at the tree level to forecast forest responses under climate change. Specific focus is given to emerging research needs, conceptual challenges and novel methodological developments.*

09:00-09:20	Harald Bugmann - What can individual-level growth tell us about forest dynamics under changing environmental conditions?
09:20-09:40	Koen Kramer - Individual-tree genetic modelling to assess adaptive responses to local environmental conditions - With application at the European scale
09:40-10:00	Annikki Mäkelä - Prospects and critical issues in applying optimality concepts to up-scale physiological processes
	Discussion/Coffee break
10:30-10:50	Cyrille Rathgeber - The implications of wood phenological development for forest carbon balance
10:50-11:10	Francesco Minunno - How can Bayesian methods help up-scaling tree function to the ecosystem level
11:10-11:40	Amy Zanne - Potential of the functional trait concept to bridge the gap between individual and community-level responses
11:40-11:45	Closing
12:30	Lunch

## Outreach Afternoon

## Thursday 14 April

### PANEL DISCUSSION on "Shaping future forests: the tree perspective!" (Moderator: Patrick Fonti)

14:00-15:00	Panel members: Prof Dr Reinhart Ceulemans, Department of Biology of the University of Antwerp, Belgium; Dr Marcus Lindner, European Forest Institute (EFI), Joensuu, Finland; Dr Christopher Reyer, Potsdam Institute for Climate Impact Research (PIK) Potsdam, Germany; Prof Dr Kathy Steppe, Laboratory of Plant Ecology, Ghent University, Belgium; Prof Dr Eugene Vaganov, Rector of Siberian Federal University, Russia.
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### OUTREACH EVENT

15:00-17:00	In the interactive outreach pathway visitors can experience activities and achievement of our COST Action STReESS. STReESS participants will guide you through our main results, will discuss further challenges and research needs, and demonstrate innovative methods and equipment, like TreeWatch and mobile NMRI. See and experience STReESS in a nutshell!
-19:00	Drinks

## Closing Party

19:30-...	Dinner & more
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