



The 125th Anniversary Congress on 18-22 September 2017 in Freiburg, Germany, will offer a wide selection of scientific sessions highlighting innovative research and interdisciplinary research approaches of relevance to forests, and focus on the transfer of scientific knowledge on critical global forest-related challenges to national and international political agendas. In a series of “Congress Spotlight” articles individual sessions shall be showcased to give a foretaste of the richness and scope of research findings that will be presented at the Congress. Keep updated at: <http://iufro2017.com/>

IUFRO 125<sup>th</sup> Anniversary Congress Spotlight / Theme 5 - #50 / August 2017

## Filling in knowledge gaps about natural disturbances and their interactions in mountain forests

In mountainous terrain they are called protection forests – forests that protect human settlements and infrastructure against natural disturbances such as rockfall, snow avalanche and shallow landslides.

Natural disturbances are becoming more and more important drivers in many mountain chains worldwide, mainly because of past land-use legacies. But also, under climate change, the incidence of some natural disturbances is increasing.

These disturbances and their interactions can threaten human life and property and can compromise the protection function of mountain forests.



Forest fire in protection forest  
(Photo U. Wasem/WSL)

“Certainly we have learned a fair amount in terms of understanding and quantifying protection functions and disturbance interactions, but knowledge gaps remain,” said Dr. Peter Bebi of WSL-Institute for Snow and Avalanche Research SLF, Davos, Switzerland.

Dr. Bebi, who is coordinating a session entitled: **Natural hazards and disturbance interactions in mountain forests** at the IUFRO 125th Anniversary in Freiburg in September, said some of the more important gaps are related to management interventions associated with natural disturbances such as windthrow, fire or beetle outbreaks.

“These can dramatically and abruptly change forest structure and function, individually or through their interactions,” he said. “It is crucial to better understand how disturbances interact and how these interactions affect gravitational natural hazards in different forest types.

“At this point,” he continued, “we actually have little experience related to interactions between gravitational natural hazards and other natural disturbances in forests and related cascading processes.”

As an example of interactions, he notes that a gravitational natural hazard like an avalanche will leave a track down a mountainside. That avalanche track may interact with another type of natural disturbance such as a wildfire, by acting as a firebreak and retarding the fire's spread. But with climate change, wildfires are increasing, so a better understanding of how these two disturbances – as well as other types of gravitational and non-gravitational disturbances – interact is critical to good management.

He anticipates his session will deal with four main points of discussion:

- The effect of different forest structural characteristics (including different development stages, tree species composition and terrain roughness) on natural hazard processes and how these characteristics change over time;
- Ways and means to better quantify and account for the effect of such forest characteristics;
- How the forest characteristics that are responsible for providing protection function are affected by disturbances and their interactions; and
- The management implications that can be deduced from recent findings on natural hazard processes in forested terrain and from expected changes in forest structures and disturbance regimes in mountain forests.

“The future management of mountain forest ecosystems has to take into account the important, and potentially increasing, influence of natural disturbances,” Dr. Bebi said. “It is not possible and, from an ecological perspective, also not desirable to impede these natural disturbances. However, where the protection of forests against natural hazards is threatened by disturbances, management may focus on reducing risks and increasing the resilience of these forests.

“This can be achieved by disturbance management that allows forests to adapt to future environmental conditions and by counteracting the growing biomass and reduced fragmentation,” he said.

As examples of important mitigation measures, he suggested increasing terrain roughness and resilience after natural disturbances by the fostering of advance regeneration in combination with remaining dead woody debris and setting up forest fire management plans in areas that have protection forests where fires have not occurred for a long time but will be more likely to happen in the future.

*The September 18-22 Congress in Freiburg will celebrate IUFRO's 125th anniversary. Founded in 1892 in Eberswalde Germany, IUFRO has grown to unite more than 15,000 scientists (who cooperate in IUFRO on a voluntary basis) in almost 700 member organizations in more than 120 countries.*

*IUFRO promotes global cooperation in forest-related research and enhances the understanding of the ecological, economic and social aspects of forests and trees. It disseminates scientific knowledge to stakeholders and decision-makers and contributes to forest policy and on-the-ground forest management.*

*About 2000 scientists from 89 countries are expected to attend the Congress. The Mountain Forests session in Freiburg will be one of 172 scientific sessions that will cover a wide array of topics dealing with various aspects of forest research.*

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*The International Union of Forest Research Organizations (IUFRO) is the only worldwide organization devoted to forest research and related sciences. Its members are research institutions, universities, and individual scientists as well as decision-making authorities and other stakeholders with a focus on forests and trees. Visit: <http://www.iufro.org/>*

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