

## Submitted Abstract

ID IMC22-FSAbstr- 655

<b>First Author</b> First Name Last Name	Ana (1) Stritih
<b>Submitting Author</b> First Name Last Name	Ana Stritih
<b>Correspondence</b>	ana.stritih@tum.de
<b>Co-Authors</b> >> E-Mails will be not listed	Senf, Cornelius (1); Kuemmerle, Tobias (2,3); Bleyhl, Benjamin (2); Seidl, Rupert (1,4)
<b>Organisations</b>	1: Technical University of Munich, Germany TUM School of Life Sciences, Ecosystem Dynamics and Forest Management 2: Geography Department, Humboldt University Berlin, Germany 3: Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-University Berlin, Germany 4: Berchtesgaden National Park, Berchtesgaden, Germany
<b>Country</b>	Germany
<b>Region</b>	Western Europe
<b>Title</b>	Pathways And Legacies In Mountain Forest Structures Across The Alps And Caucasus.
<b>Keywords</b>	Ecosystem Services, Land-Use Legacies, Spaceborne Lidar, Forest Structure, Disturbance
<b>Type</b>	List Of Focus Session
<b>Focus Session ID</b>	52

## Abstract

Mountain forests help mitigate climate change, provide a source of renewable energy and support the adaptation of mountain communities by providing ecosystem-based disaster risk reduction. While the demand for these ecosystem services is growing, forests' capacity to provide them may be jeopardized by climate change and increasing disturbance rates. At the same time, forest landscape development is partly determined by legacies of past land-use, so the potential to steer development on the short term might be limited. In this study, we make use of recent developments in spaceborne lidar and forest disturbance mapping to investigate mountain forest structure and dynamics comparatively, at broad scale across the European Alps and the Caucasus Mountains. Both regions share similar natural vegetation types, a long history of human land use, and landscapes shaped by mountain agriculture. However, the development of both regions has diverged during the last centuries. The Alps experienced a rapid development of tourism, agricultural intensification and abandonment, and protection and expansion of forests. Today, these forests are experiencing an increasing frequency of natural disturbances. While the Caucasus has also experienced land abandonment and an increase of protection since regime changes in the 1990s, many communities still rely on traditional mountain agriculture and use forests as a source of firewood and for livestock grazing, sometimes leading to conflicts with conservationists in this biodiversity hotspot. We investigate how these land- and forest-use legacies influence today's forest structure, and, in turn, forests' capacity to provide ecosystem services. Our results show that across both mountain forest regions, forest structures converge to a similar distribution with two main basins of attraction - open and closed forests. The pathways between both states are shaped by natural disturbances and forest management, which are also influenced by past land use. Recognizing these path dependencies may help us understand the potential future trajectories of mountain landscapes and identify strategies to address the changing needs for forest ecosystem services under global change.