>> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

Submitted Abstract

ID IMC22-FSAbstr- 710

First Author		
	First Name	Lukas (1,2)
	Last Name	Flinspach
Submitting Author		
	First Name	Lukas
	Last Name	Flinspach
Correspondence		Lukas.flinspach@ufz.de
Co-Authors >> E-Mails will be not listed		Wiegand, Thorsten (2); Bader, Maaike (1)
Organisations		1: Ecological Plant Geography, Faculty of Geography, Philipps-University Marburg, Deutschhausstr. 10, 35032 Marburg, Germany 2: Helmholtz Centre for Environmental Research (UFZ), Permoserstraße 15, 04318 Leipzig, Germany
Country		Germany
Region		Western Europe

Title	Modelling Demographic Processes To Understand Spatial Patterns In Alpine-Treeline Ecotones.
Keywords	Alpine-Treeline Ecotone, Individual-Based Modelling, Treeline Types, Pattern-Oriented Modelling
Type	List Of Focus Session
Focus Session ID	05

Research Area Mountain Regions
Innrain 52f
6020 Innsbruck
Austria

WWW.IMC2022.INFO

imc2022@uibk.ac.at
+43 512 507 54442

1 of 2

Abstract

Tree populations in alpine-treeline ecotones are characterized by shifts in tree density, spatial distribution, size and shape. The nature of these shifts may reveal what underlying demographic processes shape the treeline and control its dynamics. To study the link between these processes and spatial patterns in alpine-treeline ecotones, we are developing an individual-based spatial model of treeline tree populations. In the first version of this model, we focus on the effects of imposed elevational gradients in demographic processes (growth, dieback and mortality) on the emerging spatial treeline patterns. Even though the general parameterization is based on field data from several Pyrenean alpine-treeline sites, this version is used mainly to study how hypothetical demographic gradients lead to conceptual treeline types. For example, we test if survival gradients, together with simplified facilitative neighborhood interactions (i.e. higher survival of seedlings near established trees) is sufficient to produce island-type treelines, or if growth gradients only will produce treelines with a gradually declining tree height and a discrete edge.

In future versions of the model, the demographic gradients will no longer be imposed but will emerge from tree-environment interactions. The model aims to serve researchers as a tool to test hypotheses on pattern formation at alpine treelines around the globe, and to help predict future dynamics in these ecotones in the context of the ongoing global change.

Research Area Mountain Regions
Innrain 52f
6020 Innsbruck
Austria

WWW.IMC2022.INFO

imc2022@uibk.ac.at
+43 512 507 54442

2 of 2