Seminar Jeudi AMAP

Gwendolyn is currently an assistant professor at the University of the Andes, Bogotá, Colombia. Working on tropical highland plant ecology and biogeography, she is interested in studying spatio-temporal patterns of plants at the species, functional unit and community levels using both observational and modelling approaches.

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The fate of páramo plants in the sky islands of the northern Andes

presented by

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ABSTRACT

Predicting climate change impacts on biodiversity is a main scientific challenge, especially in the tropics, therefore, we predicted the future of plant species and communities on the unique páramo sky islands. Specifically, we implemented the complete SESAM framework, by i) calculating species' dispersal capacity, ii) modelling species distributions at present up to 2100, iii) assembling models into communities and iv) assessing the vulnerability of sky islands based on richness and composition changes. Using species trait data, the maximum dispersal distance of 435 species from the ecuadorian sky islands (> 4200m) was calculated. Species distribution models (SDM) were conducted to obtain present and future distribution predictions per decade based on dispersal and bioclimatic factors. The final assemblages for present and 2100 were achieved by stacking all probabilistic SDMs and applying the probability ranking rule. The vulnerability of each sky island was evaluated by quantifying richness and composition changes.
Overall, dispersal distance ranged between 0.008-6027 m/yr, and across all scenarios, 70% of models showed a net loss in species distribution while 9% of all species were predicted to undergo extinction by 2100. Local richness was estimated to decrease by 56.63% on average, and composition changes in each sky island suggested a mean loss of 64.74% of their original species pool against a 12.97% gain. Finally, 5% of the sky island floras reconverted from high-elevation to low-elevation species. These numbers were usually more drastic for high-elevation species and the mountains Pichincha, Ilinizas and Antisana. Our study is methodologically pioneer and provides novel insight on the future of páramo biodiversity. Significant losses in species distribution and changes in community richness and composition suggest drastic impacts and call for further scientific focus considering additional factors, such as land-systems. Finally, monitoring and conservation strategies should be envisaged for northern Ecuadorian sky islands.

KEY WORDS

páramo; climate change; biotic communities; species response

Invited and animated by:	Dr. Gwendolyn Peyre
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