



Searching for mesoscale processes in tree ring proxies of a mountainous region

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Tree ring proxies are an important source for the reconstruction of past climates, but they still have a considerable amount of unexplained variance. Paleo climatologists and climate modelers collaborate to improve this situation by using general circulation models to associate circulation patterns with proxies. This advanced method is insufficient for mountainous regions, where mesoscale processes that are not captured by general circulation models have a huge impact and strong climate gradients exist. However, mountains form an important environment for biodiversity and hence supply us with many goods. To understand the climate dynamics of these regions even in a warming climate, reconstructions of the past are essential. Our study aims to increase the amount of explained variance of proxy data from a mountainous region. We chose Ecuador as our study location, because high-resolution tree ring data of a semi-wet forest already exist for the western flanks of the Andes. Moreover, in situ measurements to verify our results are available for this region. In contrast to previous studies we use a high-resolution regional atmospheric model instead of a general circulation model. This allows us to investigate mesoscale processes and their potential effects on tree ring proxies.