Submitted Abstract

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First Author First Name Last Name	 Bryan Greenwood (1) Mark
Submitting Author First Name Last Name	 Bryan Greenwood Mark
Correspondence	mark.9@osu.edu
Co-Authors **>> E-Mails will be not listed**	Fernández, Alfonso (2); Baraer, Michel (3)
Organisations	1: Ohio State University, United States of America 2: Universidad de Concepción, Chile 3: École de Technologie Supérieure, Canada
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Abstract

Mountains are key hydroclimatic features that couple large-scale atmospheric processes with the earth surface, influencing the development of diverse waterscapes. In this presentation we summarize recent published knowledge on the hydroclimate of the American Cordilleras inspired in a recent collection of papers we were invited to edit. Decades of transformative research have highlighted how mountains are valuable for society, revealing that changes in these landscapes exert significant impacts on downstream hydrological regimes that support lives and livelihoods of millions. Yet despite sharing common features of verticality and orographic uplift, the complexity of mountain environments is an inherent feature that inevitably leads to geographic particularities, and challenges maintaining consistent observations. Nowadays, many of these mountain waterscapes are undergoing significant alterations in the context of ongoing climate and environmental changes. The vast latitudinal expanse of the Cordilleras that span from Patagonia to Alaska provides abundant examples of mountain hydroclimatic dynamics as they traverse entire atmospheric systems and delimit diverse climatic regions. Along this interhemispheric transect are similarities and contrasts in both biophysical and human components, whereby intercomparisons may broaden understanding. By learning how similar and how distinct is the research emerging in this context perhaps we, as a community of researchers, leverage our geographic diversity to gain new insights that so far have not been described in a frame facilitating cross comparisons along the American Cordilleras. Our aim with this presentation is to move us forward to questioning our perspectives and advance on coordinated efforts. We show that while the published studies highlight different aspects of the hydroclimate along the American mountains, the larger pool of submitted papers also show different operative understanding of the elements that define mountains and how they become important. Thus, while our intention is to show diverse research – distinct in methodology, scale, and topic – that is linked to a common mountain hydroclimatic theme, we also discuss how and why certain areas are weakly represented (i.e. Central America mountains) and provide ideas for a more comprehensive view of all these regions. The context of rapid climate and environmental change raises the value and urgency of interconnected mountain research that allows for comparative views along the American Cordilleras. We anticipate that such efforts might elucidate constructive perspectives on the changes taking place at unprecedented rates, and ideally may support future strategies to tackle these emergent challenges.