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Impacts of El Niño and El Niño Modoki on the streamflow in Ecuador

César Quishpe-Vásquez, Matilde García-Valdecasas Ojeda, Sonia Gámiz-Foris, Yolanda Castro-Díez, and María Jesús Esteban-Parra

Universidad de Granada, Física Aplicada, Granada, Spain (cesarqv@correo.ugr.es)

The influence of the tropical Pacific SST on streamflow in Ecuador is examined using 20 stations covering the period 1965-2015. Through a Singular Value Decomposition (SVD) the two main coupled variability modes show SST patterns clearly associated with El Niño and El Niño Modoki, respectively, presenting high coupling strength with the corresponding seasonal spatio-temporal streamflow modes in Ecuador. The results reveal that, mainly in winter and summer, El Niño Modoki events are associated with a significant streamflow decrease over western Ecuador, meanwhile for the Andean area, decrease streamflows seem to be more associated with El Niño mode. For autumn, the influence of El Niño Modoki is also remarkable in the western part. The Partial Regression Analysis used to quantify separately the influence of these two types of ENSO on seasonal precipitation shows the importance of both types in the reconstruction process. The results obtained in this study establish the base for modeling and forecasting the seasonal streanflow in Ecuador using the tropical Pacific SST associated with El Niño and El Niño Modoki.

Keywords: Seasonal streamflow, Tropical Pacific SST, El Niño, El Niño Modoki, Singular Value Decomposition, Ecuador.

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