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# What is the most useful approach for forecasting hydrological extremes during El Niño?

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El Niño and La Niña, the extremes of the El Niño Southern Oscillation (ENSO), are known to impact river flow and flooding at the global scale (Chiew and McMahon 2002, Ward et al. 2014). In the past, efforts to prepare for the impacts of El Niño have often relied on seasonal precipitation forecasts as a proxy for hydrological extremes, due to a lack of hydrologically relevant information. However, precipitation forecasts are not necessarily the best indicator of hydrological extremes (Stephens et al. 2015, Coughlan de Perez et al 2017). Now, two different global scale hydro-meteorological approaches for predicting river flow extremes on seasonal timescales are available to support flood and drought preparedness. These approaches are statistical forecasts based on large-scale climate variability and teleconnections, and resource-intensive dynamical forecasts using numerical weather prediction systems. Both have the potential to provide early warning information, and both can be used to prepare for El Niño impacts, but which approach provides the most useful forecasts?

We present results of a recent global scale study using river flow observations to assess and compare the ability of two recently-developed forecasts to predict high and low river flow during El Niño: statistical historical probabilities of ENSO-driven hydrological extremes (e.g. Emerton et al. 2017), and the dynamical seasonal river flow outlook of the Global Flood Awareness System (GloFAS-Seasonal; Emerton et al. 2018). Our results highlight regions of the globe where each forecast is (or is not) skilful compared to a forecast of climatology, and we further discuss the advantages and disadvantages of each approach for predicting hydrological extremes during El Niño.

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