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El Niño-Flood Predictability for Early Humanitarian Action

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El Niño Southern Oscillation (ENSO), a mode of variability which sees anomalously high or low sea surface temperatures in the Pacific, is known to have a significant impact on both hydrology and meteorology across the globe. One significant influence is that of El Niño, the warm phase of ENSO, on flooding in the Piura region of Peru. The anticipation and forecasting of floods is crucial for flood preparedness, and the link between El Niño and flooding in Peru, alongside the predictive skill of El Niño up to seasons ahead, may provide an early indication of upcoming severe flood events.

The Global Flood Awareness System (GloFAS) has been used to create the first 110-year global reanalysis dataset of river discharge, using the ECMWF ERA-20C atmospheric reanalysis. These datasets are being used to analyse the predictability of flood events in Peru in relation to ENSO, using both hydrological and meteorological approaches; with the aim of providing early indicators of potential flood events and thresholds for early humanitarian action in the region. In particular, this research also aims to determine the causes of the most extreme flood events, such as those observed in 1982/83 and 1997/98, through investigation of the changes in atmospheric circulation during these events.

Forecast-based Financing (FbF) is an initiative of the German Red Cross, for disbursing humanitarian funding as soon as a forecast threshold is crossed, prior to a severe event. Collaboration with the Peruvian Red Cross and SENAHMI during 2015 led to the use of such research to define thresholds for action in Piura during an El Niño, as part of an FbF pilot study. We will present here the link between El Niño and flooding, with a focus on the Piura region of Peru, and how this El Niño-flood predictability may be used for flood preparedness and early humanitarian action in regions across the globe.