Introduction

The northern Pacific region of Peru suffers from flooding, especially due to high rainfall during the El Niño. In March 2017 extreme rainfall across Peru led to flooding and landslides. In Piura (9.3-11.3 latitude) rainfall was measured, resulting in flooding which affected 12,000 people and resulted in 4 casualties [1]. Flooding in Piura caused by extreme El Niño rainfall is frequent and accurate prediction of the El Niño rainfall extremes and flood peaks can help reduce the impact of the flooding and reduce the loss of life.

In Piura forecast based financing is a project run by the Red Cross that enables early action to be taken using probabilistic forecast information, with the aim of reducing flood impacts [2]. The project uses a combination of forecast models including GloFAS.

The main objective of this paper is to analyse the uncertainty related with flooding in Piura during El Niño events. For this, the GloFAS reforecast data that use ERA-Interim/Land dataset were used. ERA-Interim/Land combines soil moisture, soil temperature and snow-pack. It benefits from an improved parameterization of the land surface scheme [3]. The first section of the poster shows how ERA-Interim/Land precipitation captures the rainfall extremes for Piura during the El Niño events and the second part of the poster shows the performance of the GloFAS reforecast for the Piura catchment.

Global Flood Awareness System (GloFAS)

The GloFAS model has been setup with the aim to provide an overview of upcoming floods in large world river basins. GloFAS has been setup to forecast using the Variable Resolution Ensemble Prediction System (VAREPS), consisting of a 51-member ensemble with a horizontal grid resolution of ∼12 km with a forecast span of 10 days, and ∼65 km with a forecast of days 11-15. Twice daily forecasts are available via the GloFAS website on a 10 km grid and for reporting points around the world, including Piura.

GloFAS simulation of El Niño at Piura

The lower limit of catchment size advised for using GloFAS is 10,000 km² [5]. Piura’s catchment area of 7,435 km² is below this lower limit and therefore higher uncertainty is expected. Figure 4 shows flows in the El Niño year of 2016 as modelled by GloFAS compared to the monthly average modelled flows in the period 2006-2017. The El Niño year is clearly picked up as an anomaly for the average.