



GloFAS-Seasonal: Operational Seasonal Ensemble River Flow Forecasts at the Global Scale

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Seasonal hydrological forecasting has potential benefits for many sectors, including agriculture, water resources management and humanitarian aid. At present, no global scale seasonal hydrological forecasting system exists operationally; although smaller scale systems have begun to emerge around the globe over the past decade, a system providing consistent global scale seasonal forecasts would be of great benefit in regions where no other forecasting system exists, and to organisations operating at the global scale, such as disaster relief.

We present here a new operational global ensemble seasonal hydrological forecast, currently under development at ECMWF as part of the Global Flood Awareness System (GloFAS). The proposed system, which builds upon the current version of GloFAS, takes the long-range forecasts from the ECMWF System4 ensemble seasonal forecast system (which incorporates the HTESSEL land surface scheme) and uses this runoff as input to the Lisflood routing model, producing a seasonal river flow forecast out to 4 months lead time, for the global river network. The seasonal forecasts will be evaluated using the global river discharge reanalysis, and observations where available, to determine the potential value of the forecasts across the globe.

The seasonal forecasts will be presented as a new layer in the GloFAS interface, which will provide a global map of river catchments, indicating whether the catchment-averaged discharge forecast is showing abnormally high or low flows during the 4-month lead time. Each catchment will display the corresponding forecast as an ensemble hydrograph of the weekly-averaged discharge forecast out to 4 months, with percentile thresholds shown for comparison with the discharge climatology. The forecast visualisation is based on a combination of the current medium-range GloFAS forecasts and the operational EFAS (European Flood Awareness System) seasonal outlook, and aims to effectively communicate the nature of a seasonal outlook while providing useful information to users and partners.

We demonstrate the first version of an operational GloFAS seasonal outlook, outlining the model set-up and presenting a first look at the seasonal forecasts that will be displayed in the GloFAS interface, and discuss the initial results of the forecast evaluation.