Geophysical Research Abstracts
Vol. 20, EGU2018-8188-1, 2018
EGU General Assembly 2018

Developing a global operational seasonal hydro-meteorological forecasting system

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Seasonal hydro-meteorological forecasting of river flow has potential benefits for many sectors, including agriculture, water resources management and humanitarian aid. At present, such forecasts for large or global scales are few and far between. While smaller scale forecasting systems have begun to emerge over the past decade, a system providing globally consistent seasonal hydro-meteorological forecasts could be of great benefit in regions where no other such forecasting system exists, and to organisations operating at the global scale.

We present a new operational global ensemble seasonal hydro-meteorological forecasting system, developed in collaboration with the University of Reading and ECMWF as part of the Global Flood Awareness System (GloFAS). The new seasonal outlook builds upon the flood forecasts available through GloFAS, extending the forecast horizon from the 30-day flood forecast, to a 4-month river flow outlook providing early indication of both high and low flows. This system makes use of forecasts from the latest version of ECMWF's seasonal forecasting system, SEAS5, and runs these through a hydrological model to produce forecasts of weekly-averaged river flow out to 4 months, for the global river network.

The new seasonal outlook is made openly available through the GloFAS web interface, and provides summary maps of the river flow forecast, indicating the likelihood of high or low river flow during the 4-month forecast horizon, alongside additional forecast information, such as ensemble hydrographs, at points throughout the river network. We describe the key hydro-meteorological components of the GloFAS seasonal forecasting system, introduce the forecast products available, and discuss initial evaluation results and next steps.