



The Yangtze river forecast service

Strong El Niño events tend to lead to above-average rainfall in the Yangtze river basin, with the widespread flooding in 1998 as an example. The strong El Niño event of 2015-16 raised similar concerns about flooding along the Yangtze. The Met Office seasonal forecasting system shows good skill in forecasting the variability of the El Niño Southern Oscillation (ENSO) and its impact on Chinese rainfall. Using this capability, a CSSP China collaboration between the Met Office and the Institute of Atmospheric Physics (IAP) established significant skill in forecasting summer rainfall and river flow in the Yangtze river basin.

This new science capability, combined with a strong user requirement for such information, led to the development of a real time seasonal forecasting product which was trialled in 2016 to collaborators at the China Meteorological Administration (CMA) who advise different water management organisations in the Yangtze basin including the Three Gorges Dam. Advanced warning of above or below average rainfall and river flow help inform organisations to manage water resources, prevent flooding and generate hydroelectric energy.

The performance of the 2016 trial service has been analysed. While May and June indeed saw more rainfall than normal, July was closer to average, and August saw below-average rainfall in the basin, which was reflected in the Met Office's forecasts and there is evidence that the forecasts contributed to the confidence of decision-making across the Yangtze Basin region.

The Yangtze river valley forecast has continually evolved in response to developing user needs in recent years. Users have requested more regional detail, with a desire for information in both the upper and lower Yangtze regions to aid hydrological planning. The latest forecast (for the 2019 summer) has met this requirement using dynamical monsoon indices as predictors. In addition, the first forecast of 2019 was issued in early February in response to user requirements for more preparation time ahead of the summer months.

Finally, recent work shows significant skill in predicting the broad-scale onset of the South China Sea summer monsoon up to 4 months in advance. This provides further information on possible delays or early occurrence of the rains for millions of people who rely on the onset for farming and such information could help inform decisions about the timing of crop planting, helping to minimise economic costs.