Science for Environment Policy

Improving use of the European Flood Alert System

Cultural and institutional barriers, coupled with a lack of confidence about whether and how to use it, mean that the European Flood Awareness System (EFAS) has yet to be fully integrated into national flood warning systems, according to a recent study.

EFAS is a European Commission warning system for floods from rivers, for which it generates twice-daily forecasts up to 10 days in advance of a flood. The EFAS was developed by the EU’s Joint Research Centre (JRC) in Ispra, Italy, from the results of an earlier Fifth Framework programme collaborative research project.

It began issuing alerts on an experimental basis in 2005 before making the transition to full operational status in 2012 as part of the Commission’s wider Global Monitoring for Environment and Security (GMES) Emergency Management Service. EFAS uses ensemble prediction systems (EPS) used in weather forecasting to determine a range of possible outcomes given the large uncertainties about the underlying weather and its evolution.

The study investigated the communication, understanding and use of information from the EFAS during the pilot phase of its experimental development. Data on the use of EFAS alerts for flood management were obtained from 69 formal interviews conducted between 2008 and 2010 with weather forecasters, civil protection authority officials and policymakers in 17 countries across Europe. These data were compared with feedback from users of the EFAS, collected since 2003, at meetings and in annual reports.

EFAS alerts are communicated via a password protected website, which can be checked daily by forecasting agencies that have signed a formal memorandum of understanding with the JRC. In terms of perception, site visits and interviews revealed that these medium-term ‘pre-alerts’ for transnational rivers were often deemed as unnecessary or too uncertain for operational use. Locally-calibrated, fine-resolution models, which could deal with smaller-scale issues, such as flash floods, were preferred.

Medium-term alerts from EFAS were used to raise internal awareness within forecasting centres. However, none of the 29 flood forecasters interviewed used the EFAS to trigger earlier responses and instead preferred to rely on short-term warning systems, thus reducing the chances of ‘false alarms’. More effort is therefore needed to encourage institutions to make use of medium-term flood forecasts.

Improved communication of how flood thresholds are calculated is also needed so that EFAS users can understand how the information can be integrated into their own warning systems. In turn, the EFAS team needs to understand more about the requirements of local flood forecasters responsible for managing both large river floods and also small-scale floods beyond the scope of EFAS.

The research also highlights deeper questions about how useful earlier warnings issued at higher thresholds of uncertainty are; institutions need to balance safety with damage to their reputation and incurred costs if warnings do not lead to flood situations. Despite this, changes made to the EFAS, such as the introduction of hydrographs (which measure the rate of flow of water at a specific point), have led to increased user satisfaction and demonstrate the effectiveness of user feedback. The study predicts that confidence in the EFAS will grow as the system continues to improve.