

Real-time flood forecast and warning services help address problems associated with current climate variability, while at the same time building adaptive capacity to future climate change.



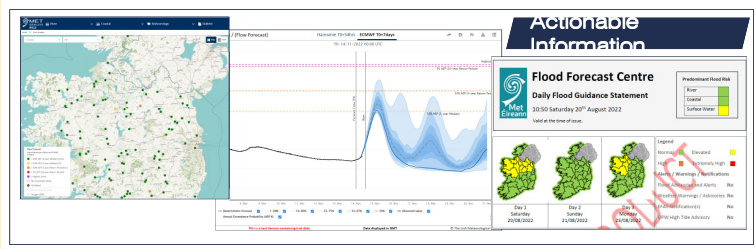
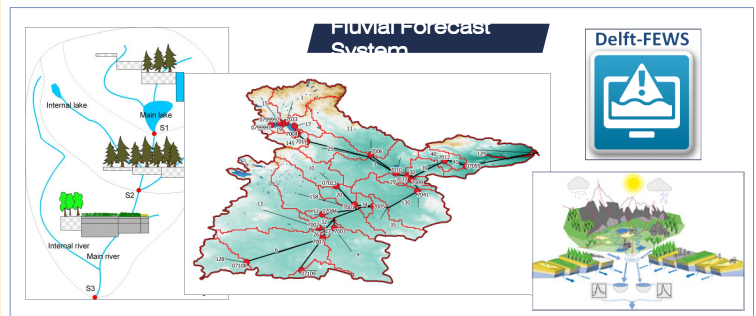
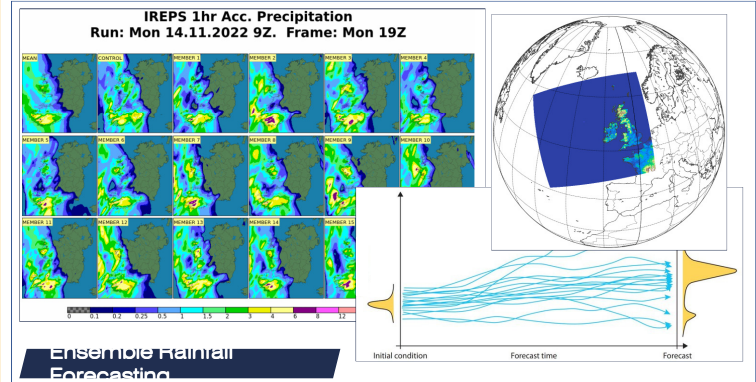
1. Introduction

Uncertainty in future climate changes mean adaptation measures can be costly to develop. Real-time flood forecast and warning services help build adaptive capacity to future climate change. They represent a 'no-regret' adaptation option, where there is societal value even in the absence of climate change. Met Éireann are currently developing Ireland's own National Flood Forecast and Warning Service.



2. Fluvial Forecasting System

- Uses the HYPE model (HYdrological Predictions for the Environment model); from SMHI and the Delft-FEWS integrator platform.
- Delft-FEWS: runs HYPE operationally, schedules tasks, pre and post processes data, runs state and forecast simulations, visualizes output, stores data, etc.
- System ingests observational hydrometeorological data from multiple streams (e.g. radar, synoptic stations, river discharge, etc.) along with Numerical Weather Prediction (NWP) forecasts - both from Met Éireann (Harmonie) and the European Centre for Medium-range Weather Forecasts (ECMWF).
- Produces ensemble river discharge forecasts at numerous point locations nationally at an hourly resolution.
 - ECMWF: 51 ensemble members twice daily with +7 day lead time.
 - Harmonie: higher resolution 16 ensemble members 4 times per day with a +54hr lead time.
- HYPE developed (model setup and calibration) using historical records from inactive and active gauges administered by the OPW, EPA and Department for Infrastructure Rivers.
- Data assimilation applied: (i) direct updating (upstream) and (ii) correction for forecast drift using real-time discharge from the OPW's hydrometric network.
- Running in real-time on Microsoft Azure's cloud computing service.
- Visualised by stakeholders using the IFICS (Irish Flood Integrated Communication System).



3. Discussion

- Provide actionable and timely information to the public, relevant authorities and first responders.