

National Real-Time Flood Forecasting England



Key facts

- Real-time 2D flood forecasting platform, delivering results in minutes.
- Powered by Azure and Flood Modeller's GPU-enabled solvers.
- Enhanced resolution and confidence in extent and timing of flood forecasts.
- Improved accuracy and scalability of flood warnings.
- Reduced false alarms and increased public trust in the flood warning system.
- Effective resource allocation and response planning.

The Environment Agency needed a reliable way to accurately forecast flood extents in real-time for the whole of England. Using Flood Modeller, Jacobs developed the Flood Incident Mapper platform, enabling effective response planning and reducing unnecessary flood alerts.

The responsibility of overseeing flood risk management throughout England rests with the Environment Agency. This entails taking a leading role in the upkeep of flood management infrastructure, including defences, providing the public with guidance on flood risk, and promptly responding to flood incidents.

Recent flood events throughout England have highlighted conditions when existing tools are limited and cannot provide the required flood information fast enough. It can take several days to analyse the data, by which point the flood event has already subsided.

In practice, the existing flood warning system lacked the level of detail and flexibility desired. Flood warnings are issued to predefined areas based on a river forecast. These areas remain fixed regardless of the actual flood event, resulting in many properties receiving unnecessary alerts. The fixed nature of the alerted area made it difficult to accurately represent the flood extent and scale the response appropriately, hindering effective resource allocation and response planning.

Another significant challenge when it comes to managing flood incidents is the assessment of the impact of flooding, especially when considering the unpredictable and dynamic nature of asset failure or overtopping (walls, pumps, gates, etc.).

To make informed decisions that directly affect the risk to life and property, it is vital to have instant access to robust and high-quality real-time forecast data. Furthermore, providing operational teams with the ability to assess "what-if" scenarios before they occur enables responders to be prepared and plan for potential events.

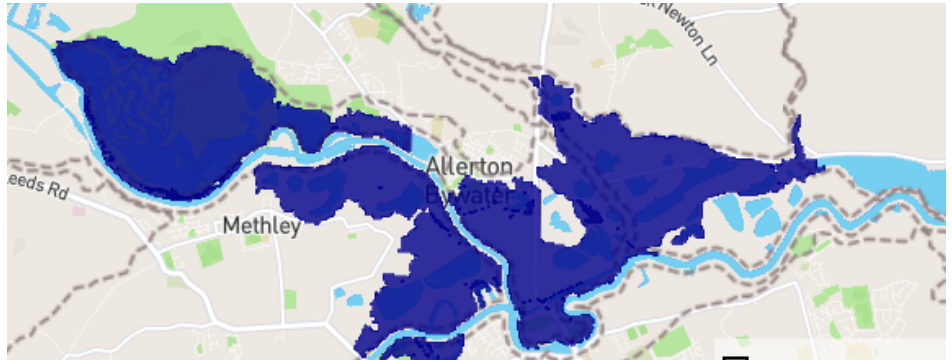
To solve these issues, Jacobs leveraged the power of GPU technology that can be used to run Flood Modeller 2D solvers and the automations provided by Jacobs' flood modelling system (known as Flood Platform) to develop the Flood Incident Mapper platform.

What our clients say

"The FIM platform will be a valuable addition to our national flood risk management capabilities and we plan to operationally implement in 2023. We can use the tool to better understand the areas and properties most likely to flood in real time, which can speed up and better target our response to flood events."

Tim Harrison
Senior Advisor,
Environment Agency

Flood Modeller was selected over alternative products due to its industry-leading speed and the robustness of the 2D GPU-enabled solver. Additionally, as the GPU solver is included with Flood Modeller as standard (with Professional and Unlimited Editions) there were no additional licensing costs.



FIM generated hydraulic model displayed using a webmap - Source: Flood Modeller

Flood Incident Mapper

Flood Incident Mapper is a web-based (Azure), on-demand 2D hydraulic modelling platform that allows for the instant access to and the creation of fast-running hydraulic models to forecast flood extents where complex events occur (defence failure, reservoir release, etc). These are pre-prepared/-populated with standard datasets and linked natively to the Environment Agency's national forecasting system (IMFS- Incident Management Forecasting System), which provides real-time and forecast river level data across England. Data from IMFS can be applied directly as boundaries to models within the Flood Incident Mapper platform. This is done by selecting the nearest forecast point. This approach brings consistency with the IMFS and reduces the overall modelling process. User-defined boundaries can also be applied where needed.

The Flood Modeller 2D GPU-enabled solver allows models to be run in minutes, giving near-instant results to support operational decisions.