

## Delft-FEWS PM Update

FEWS community talk (05.10.2023)

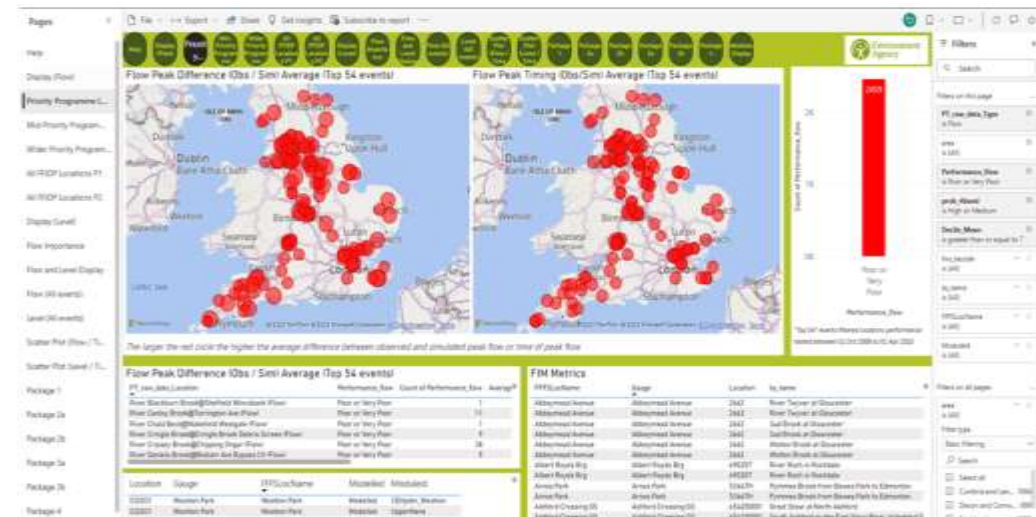
**Community  
Talk**

Emma Ferguson / Ian Clayton (Environment Agency, UK)

Ilonka ten Broeke / Gerben Boot (Delft-FEWS Product Management)

# Program

- Welcome & Introductions
- Update from Delft-FEWS Product Management
- Central presentation: EA Incident Management Reference and Thresholds Database and Performance Testing App - current use and benefits for configuration and modelling
- Interaction / Q&A
- Wrap-up & close



# Delft-FEWS organisation

- **Delft-FEWS Product Management Team**



**Ilonka ten Broeke**  
focus: community



**Gerben Boot**  
focus: developments



**Marcel Ververs**  
focus: support



[fews-pm@deltares.nl](mailto:fews-pm@deltares.nl)

- **(NEW) Delft-FEWS Product Owners**



**Dave de Koning**  
PO Delft-FEWS (from 1<sup>st</sup> of Sept '23)



**Jeroen Gerrits**  
PO Open Archive (from 1<sup>st</sup> of Oct '23)



**Tom Bogaard**  
PO Web Operator Client

# Table of contents

- Organisational changes
- Delft-FEWS release 2023.02
- Community update
- Roadmap 2023

# Delft-FEWS 2023.02 Benchmarks

planned: Dec 2023 – [release notes](#)



**±110** new features



**± ??** bugs reported (**??** fixed)



**6+** new import-export modules



**10+** new features in FEWS-webservices



**Internal reservoir** module



New **transformations & statistics**



**Web OC** MVP release



**Metadata** Manager Display



**Many new** and **updated** 3<sup>rd</sup> party libraries



open archive **product vision**



**Export status page** added to admin interface



**FSS** scaling



# Community updates

- Delft-FEWS User Days ([programmes and presentations](#))
  - International Delft-FEWS User Days
  - 8 and 9 November 2023 (Delft, NL)
  - PLEASE REGISTER [HERE](#): [softwaredays.deltares.nl](https://softwaredays.deltares.nl)
- Courses (Basic, New features, Probabilistic,...)
  - Around User events
  - [Schedule](#)
- Online events (recordings via [portal](#))
  - Latest webinar: available for review (2023.01 new features)
  - Next webinar – 2023.02 new features: Jan '24



Delft-FEWS AUS User Meeting (Aug 2023)

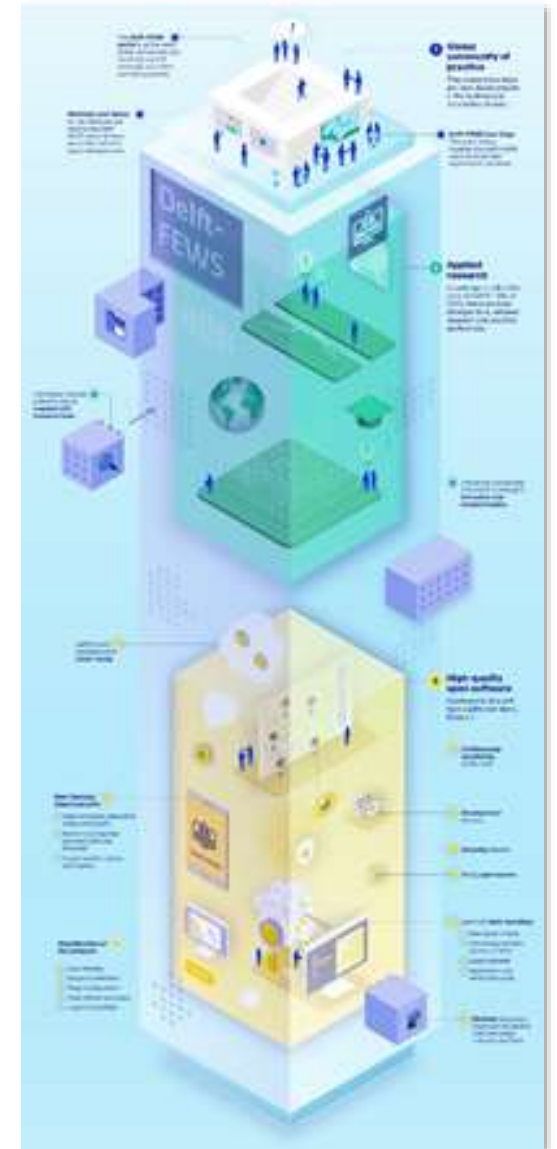


Webinar 2023.01 features (Sept 2023)

# Outlook Roadmap 2023

# Outline

- Continuation:
  - [Code clean-up](#) & code quality
  - Release test automation
- Security (from 2023.01)
  - Security Matrix + **descriptive document**
  - Connectivity Guide **extended with security aspects**
  - Admin Guide **extended with security aspects**
- Python Integration – **working on first use case (general adapter)**
- Archive Vision (Q3) – **Ongoing as we speak**
- Start of preparation of the Delft-FEWS Vision 2025 **successor**
- Summary of progress: **International Delft-FEWS User Days**



# Environment Agency Incident Management Reference and Thresholds Database and Performance Testing App - current use and benefits for configuration and modelling

Ian Clayton and Emma Ferguson

1

## The Service

A brief overview of the end-to-end service, incident management structure, and why it is important.

2

## The System

How the configuration system (IMRD) works in relation to IMFS, the technology used, and why it is important.

3

## Live Demo

Real-time demo of the different elements that make up IMRD showing some of the benefits realized.

4

## Performance App

How the Performance App works and the benefits for modelling and service improvements

5

## Questions

An opportunity for an interactive session based on some questions we have. Please do feedback in the chat during the presentation and at the end.



# The Service

# Environment Agency 2025 Strategy

The EA2025 strategy has three core long-term goals:

- **A nation resilient to climate change**
- **Healthy air, land and water**
- **Green growth and a sustainable future**



# Forecasting & Warning users

## Our Users



3k+ internal users



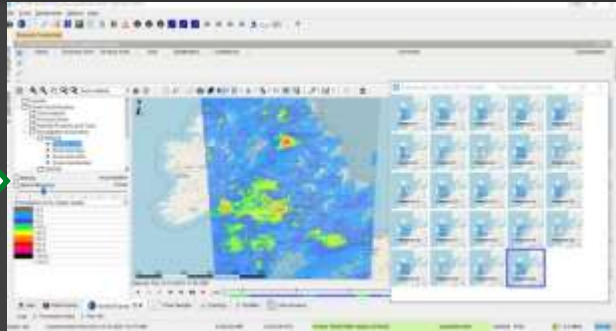
65k businesses



2.9m external active users



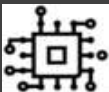
Telemetry systems and weather/coastal forecast data



Incident Management Forecasting System (IMFS) (Delft- FEWS)



Flood Warning System/Check For Flood



**Digital Services**  
Incident Management & Resilience  
Environment Agency



**GOV.UK** Incident Management Reference Database



**Environment Agency**



Met Office run their weather forecast models for Hydromets at the Flood Forecasting Centre (FFC).

1

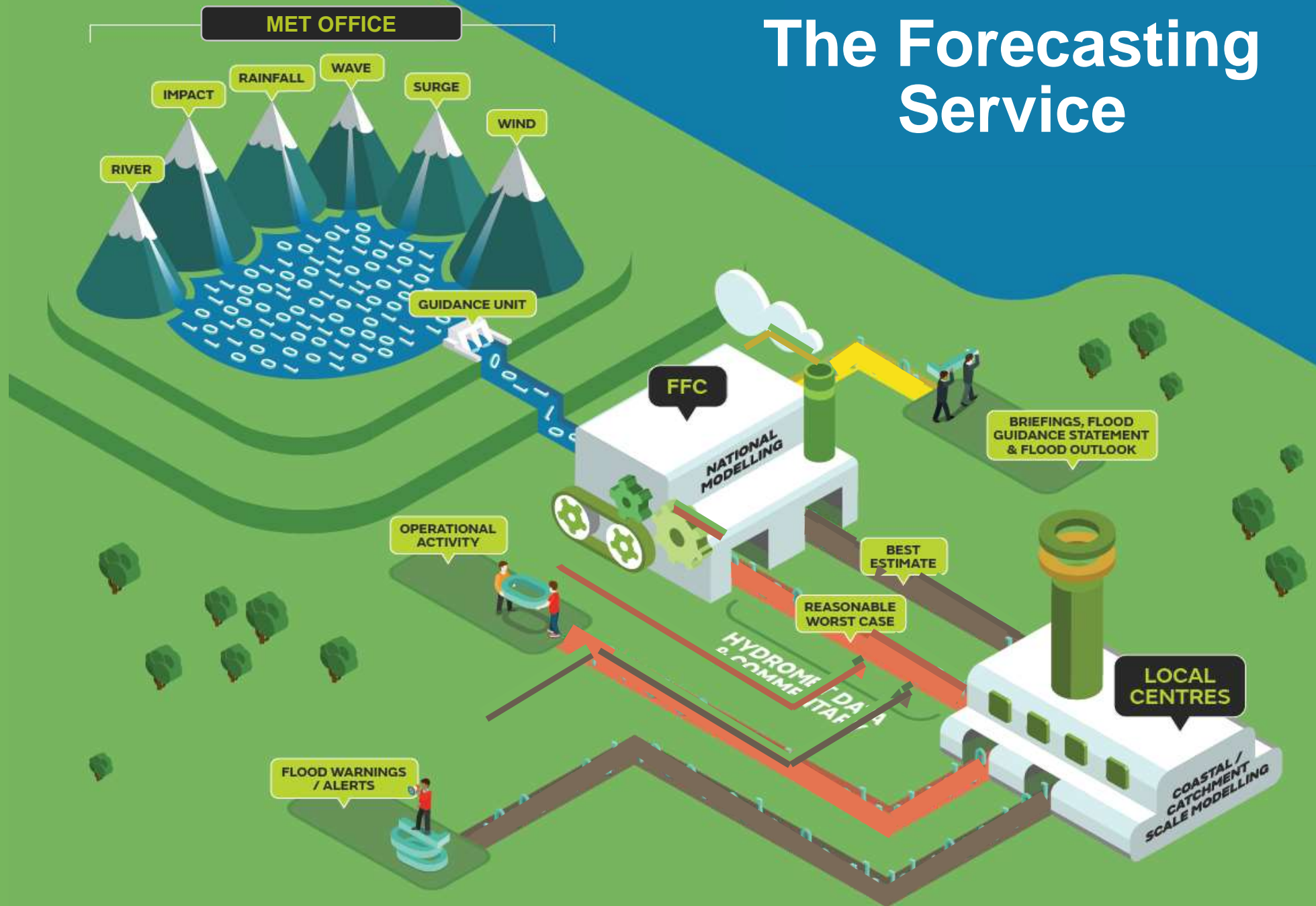
FFC Hydromets create a Best Estimate and Reasonable Worst Case scenario (if required) for EA MFDOS.

2

EA Monitoring & Forecasting Officers create local flood forecasts for users

3

**'Decision makers'** respond or plan a risk-based response to flood forecast.



# The Forecasting Service

# Expectations of the Forecasting System

## Emergency Partners



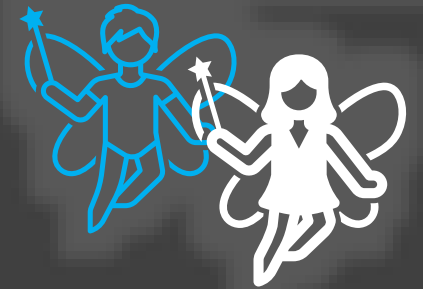
## EA Strategic Manager



## EA Tactical Officers



## EA Forecasters



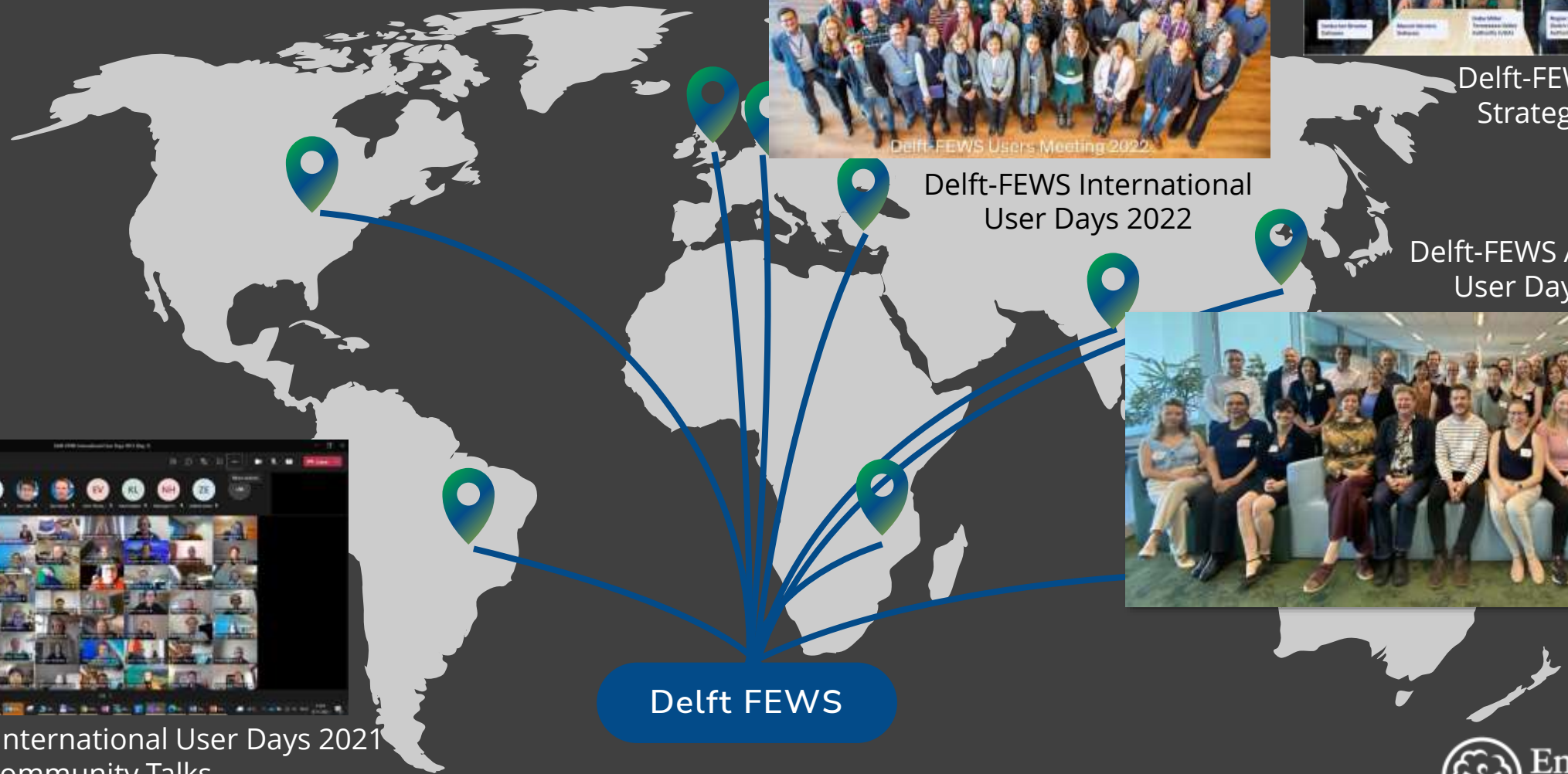


# The System



# Intro - Forecasting System Community

## Global Collaboration



Delft-FEWS Users Meeting 2022



Delft-FEWS Community Strategy Board 2022

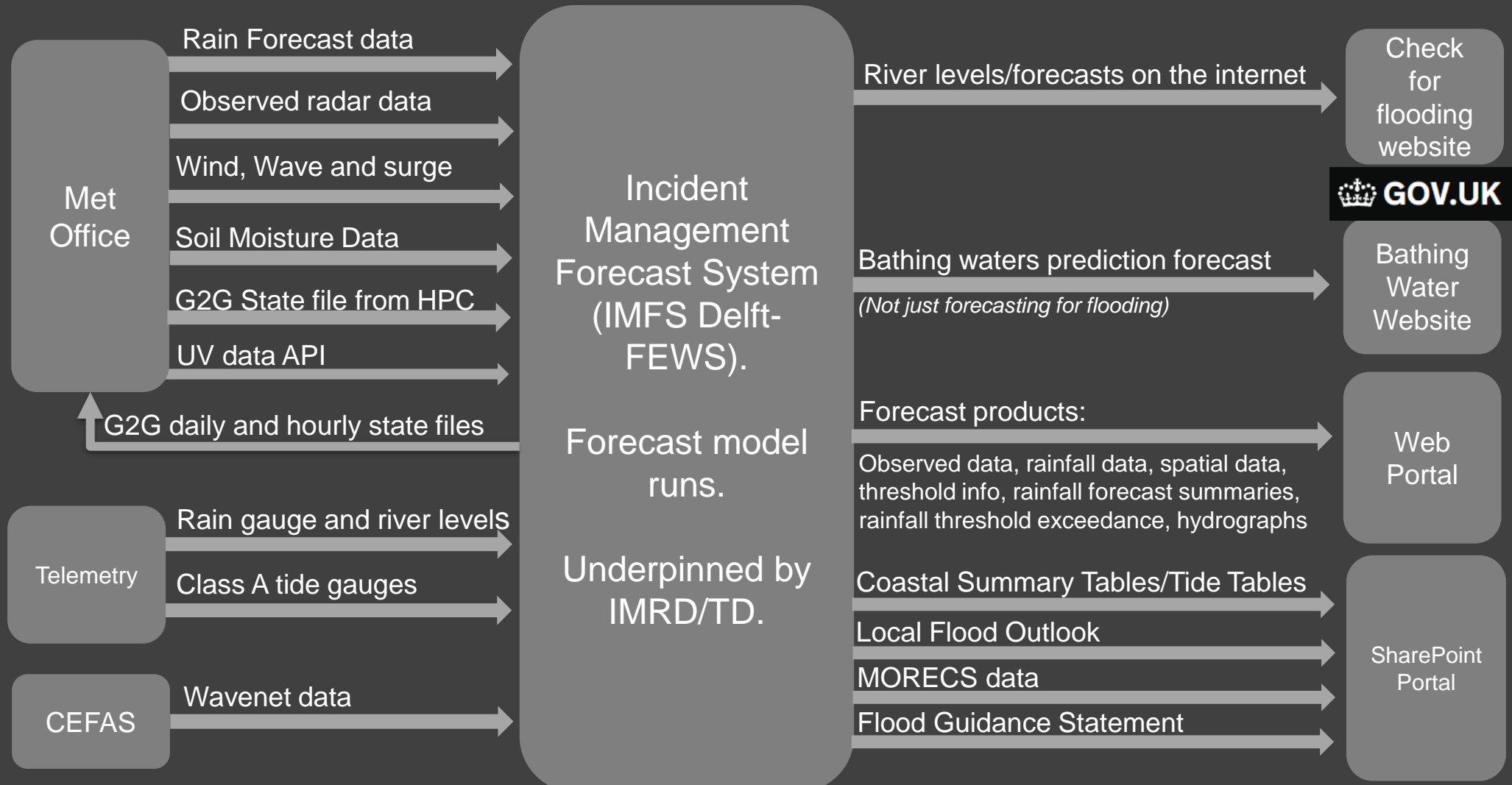
Delft-FEWS International User Days 2022

Delft-FEWS Australian User Days 2023



Delft-FEWS International User Days 2021  
And FEWS Community Talks

# The dataflows



# The System

## The Stats

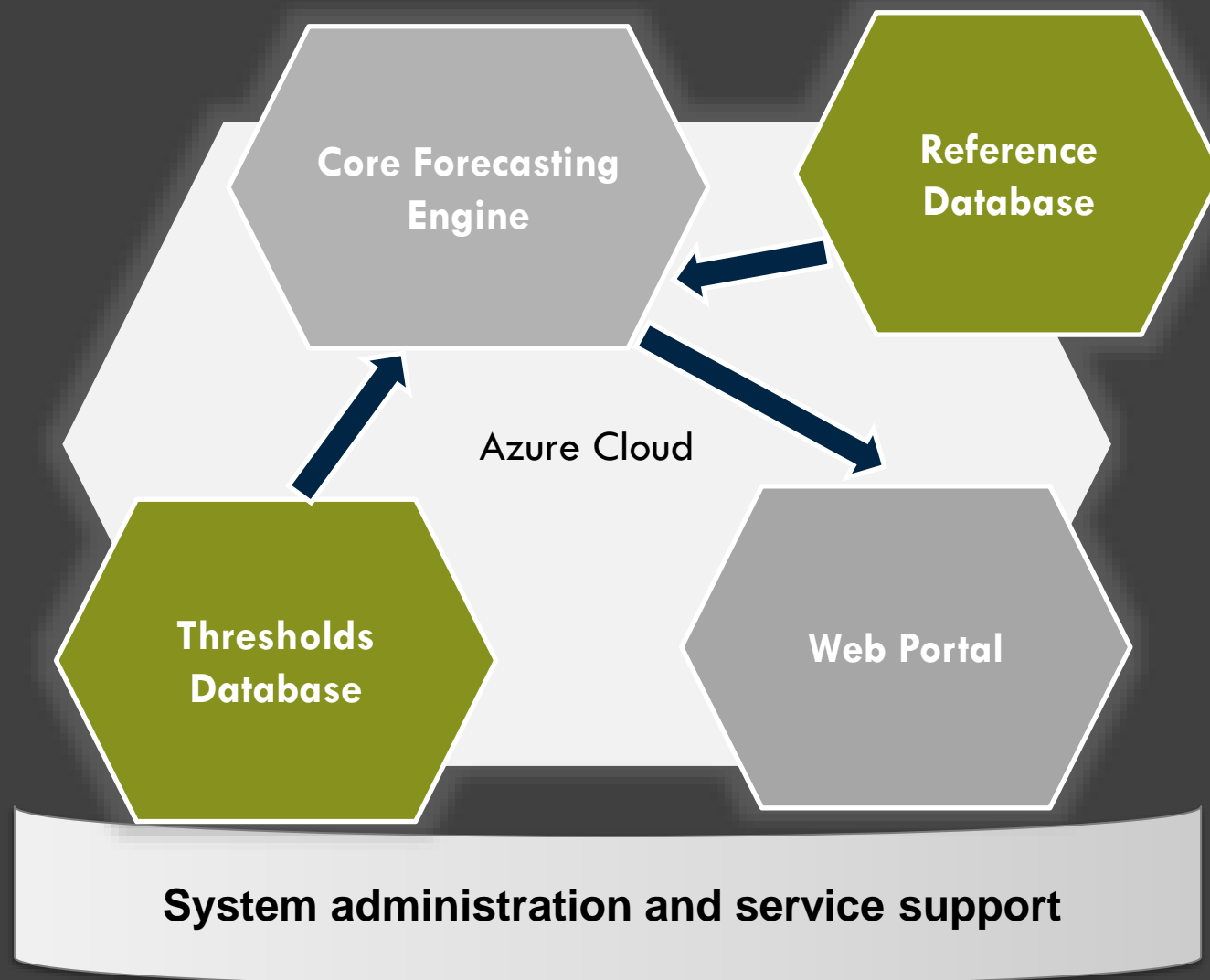


- 14k model runs each day
- 1800 models
- 60 products available each day



17k user logins per month

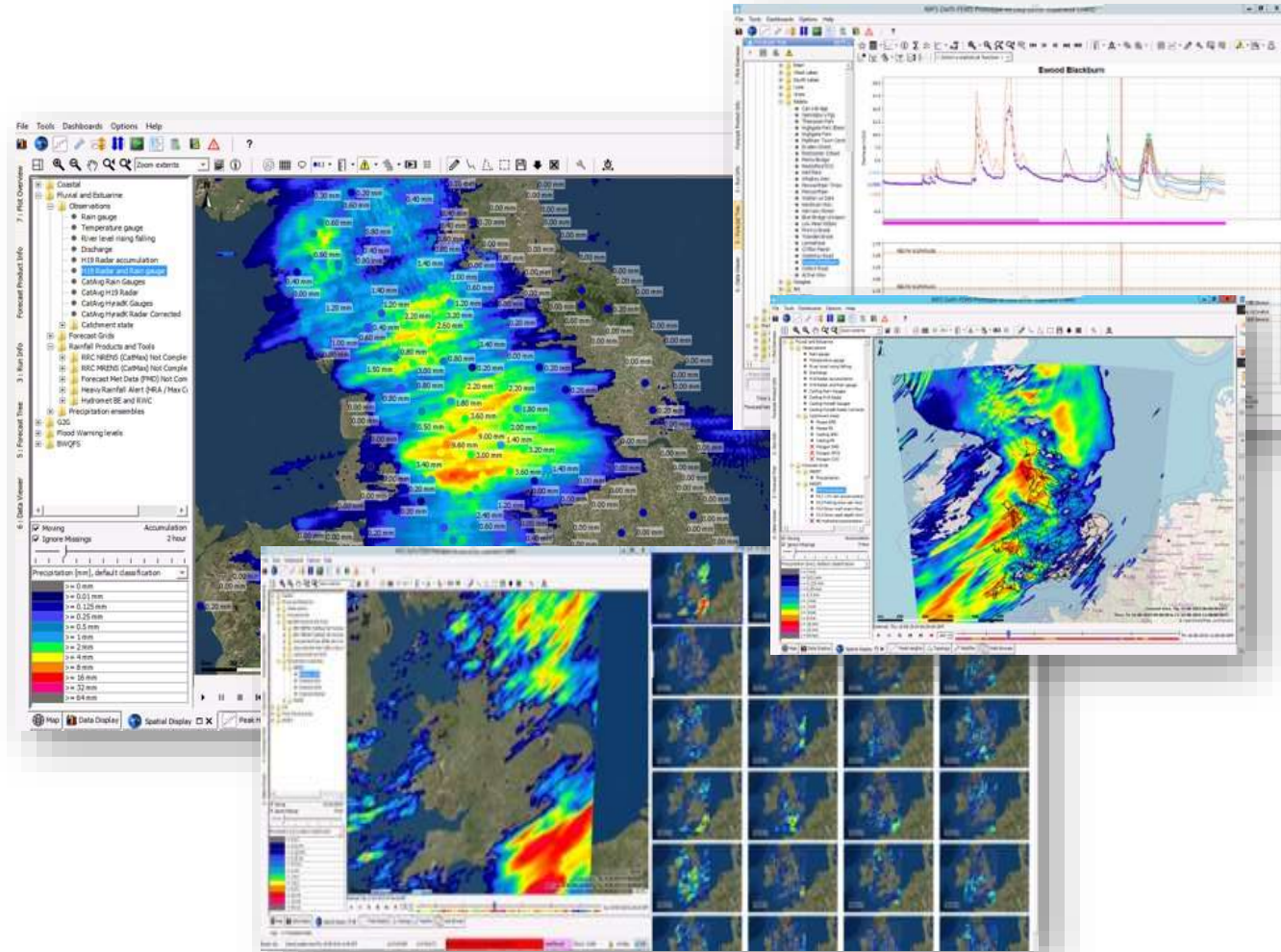
## The key components





# CORE FORECASTING ENGINE

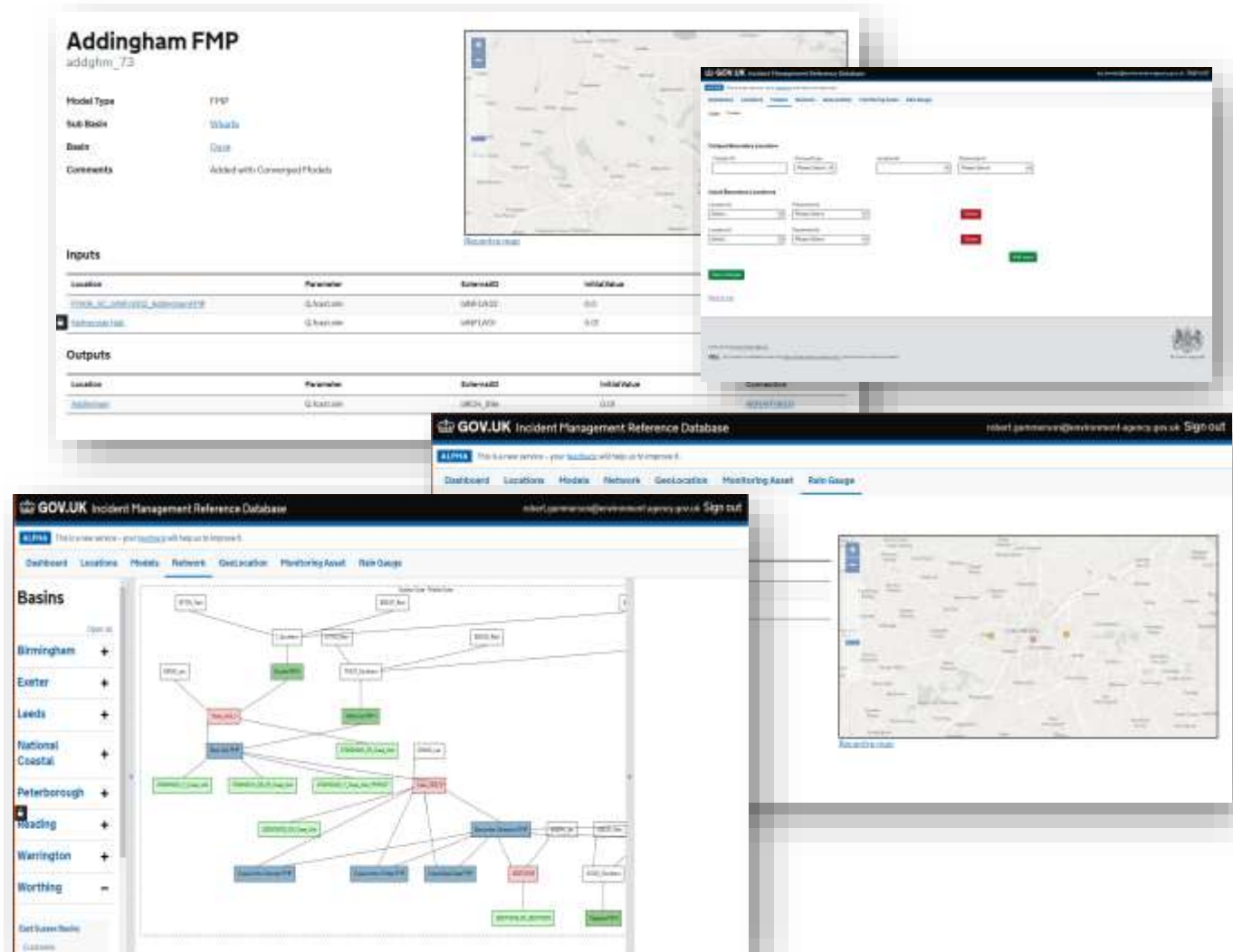
- ✓ Displaying real-time and forecast weather information
- ✓ Simple and efficient access to 100s of datasets
- ✓ Fluvial and Coastal model processing and output displays
- ✓ Site specific hydrological information and model performance
- ✓ Historical information
- ✓ Single system for all EA forecasters helping to deliver a consistent national service
- ✓ Driven by IMRD/TD metadata





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- ✓ Previously in NFFS inconsistent and inefficient configuration and models
- ✓ Single place for all nationally converged location and forecasting model information
- ✓ Master reference location for all forecasting information
- ✓ New efficient configuration front-end GUI that generates xml files using Python scripting
- ✓ Pushes data internally and external for other digital services and third parties to access



# FORECASTING THRESHOLD DATABASE

- ✓ Previously with NFFS thresholds and associated information updated multiple times in multiple digital services
- ✓ Single location updated once for all our threshold and associated impact information
- ✓ Single location for all our operational information
- ✓ New efficient configuration front-end GUI
- ✓ Dynamically links with other Digital Services like Check For Flood and in the future EATEL.

The screenshot displays the GOV.UK Incident Management Thresholds Database interface. It features a navigation bar with links to Dashboard, Locations, Thresholds, Full-Catchment Thresholds, and Alerts. The main content area is divided into several sections:

- Threshold details:** A form showing details for a specific threshold, including Location (A6 Brock Upstream), Value (1.3 mALD), Comment, Depth Definition, Direction (Up), and Active status (Yes). A map on the right shows the location on a river.
- Select an output location:** A dropdown menu showing the selected location: 054F08C0A - Wincoburn, Wincoburn Brook and Pitt Lane.
- Select a threshold category:** A dropdown menu showing the selected category: All categories.
- Target Area:** A table showing the target area for the threshold, with columns for Location, Parameter, Qualifier, and Value.
- Location information:** A form showing details for a specific location, including Name (A6 Brock Upstream), River (River Brock), Description (Fluvial Gauge (Wyre)), Easting/Northing (351210, 440550), Lat/Long, Catchment, WISKI IDs (720215), Telemetry ID (720215), and RLOI IDs (5022).
- Thresholds:** A table showing the thresholds for the location, with columns for Name, Direction, Value, Comments, Parameter, and Responses.

Name	Direction	Value	Comments	Parameter	Responses
null	Up	1.3 mALD		Water Level, Stage	1
null	Up	1.1 mALD		Water Level, Stage	1

Showing 1 to 2 of 2 entries

**More actions**

[Add a new threshold at this location](#)

# Live demo

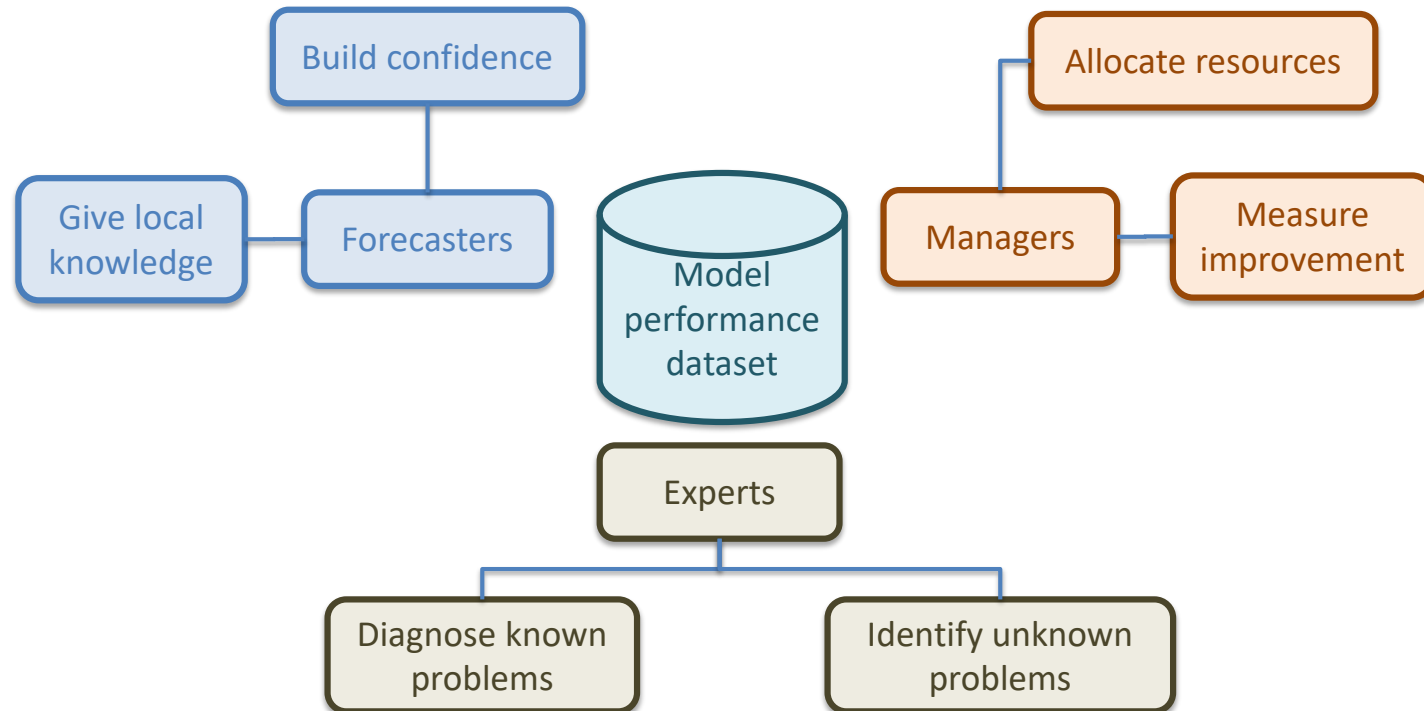
A large green circular logo on the left side of the slide. Inside the circle is a white stylized figure with its arms raised, surrounded by swirling cloud-like shapes.

# IMFS and IMRD = A platform for Improvements

Emma Ferguson – Senior Technical Advisor  
Flood Forecasting Improvement and  
Development Programme

# Model Performance Testing

- Incident Management Reference Database is intrinsically linked to our Performance testing Application
- Only by consistent model config and set up are we able to run consistent model performance testing





# PT App and Summary Map

GOV.UK Performance Testing

emma.ferguson@environment-agency.gov.uk Sign out

ALPHA

This is a new service – your [feedback](#) will help us to improve it.

Dashboard

Virtual machines

Map

10 jobs

Show only jobs which have never been assigned a virtual machine

☒ Hide jobs for other users' pending edits

Clear filters

Search:

Job name	Date created	Created by	Historical run status	Forecast run status	Historical reporting status	Forecast reporting status	
Test_Run	20/09/2023 12:44	emma.ferguson@environment-agency.gov.uk	Complete	Not configured	Completed	Not configured	<a href="#">View job details</a>
Automotive_Test_Servers	22/09/2023 16:06	emma.ferguson@environment-agency.gov.uk	Running	Not configured	Not configured	Not configured	<a href="#">View job details</a>
Automotive_Test_Cameras	22/09/2023 15:58	emma.ferguson@environment-agency.gov.uk	Complete	Not configured	Completed	Not configured	<a href="#">View job details</a>
Automotive_Test_Sensors	22/09/2023 14:30	emma.ferguson@environment-agency.gov.uk	Complete	Not configured	Completed	Not configured	<a href="#">View job details</a>
Automotive_Test_Antennas	21/09/2023 18:59	emma.ferguson@environment-agency.gov.uk	Complete	Not configured	Completed	Not configured	<a href="#">View job details</a>
Test_Run_IPMI	28/08/2023 18:30	emma.ferguson@environment-agency.gov.uk	Complete	Copyrights jobs complete	Completed	Not configured	<a href="#">View job details</a>
Automotive_Test_Wireless	28/08/2023 18:19	emma.ferguson@environment-agency.gov.uk	Failed				
Automotive_Test_Sensors	28/08/2023 17:28	emma.ferguson@environment-agency.gov.uk	Failed				
Automotive_Test_Camera	22/08/2023 16:46	emma.ferguson@environment-agency.gov.uk	Complete				
Automotive_Test_Pengines	21/07/2023 18:30	emma.ferguson@environment-agency.gov.uk	Complete				

## Create performance testing job

Job name

Description

The performance testing job can be carried out against your IMRD pending edits or against the committed version of the data. The selected version of the IMF5 config will be pulled from the repository when the historical run stage of the job is started.

- ☒ Use my IMRD pending edits
- ☐ It is your responsibility to ensure that IMRD edits are not made by you or committed by any user which could affect this performance testing job while it is in progress.

GOV.UK Performance Testing

emma.ferguson@environment-agency.gov.uk Sign out

ALPHA

This is a new service – your [feedback](#) will help us to improve it.

Dashboard

Virtual machines

Map

Home > Map

## Performance Testing mapping

Select a statistic and then one option from the sub-basin, basin or centre lists.

Centre

All centres

Basin

All basins

Sub-Basin

All sub-basins

Model type

All

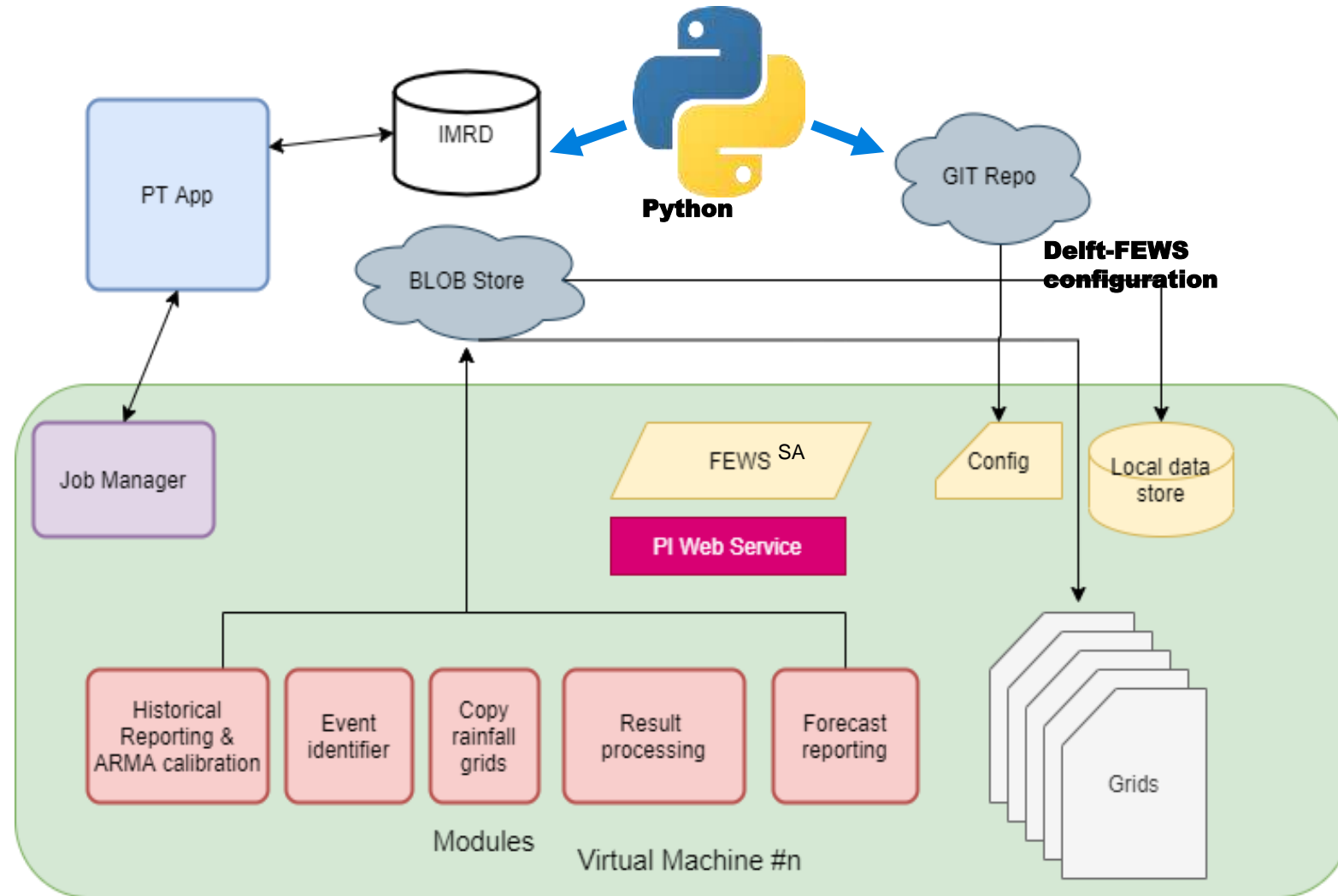
Error correction

All

Rainfall



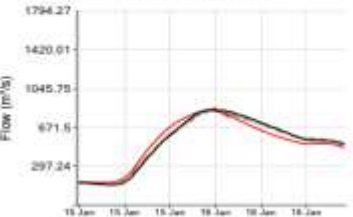
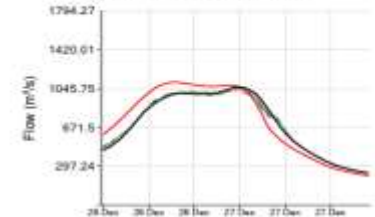
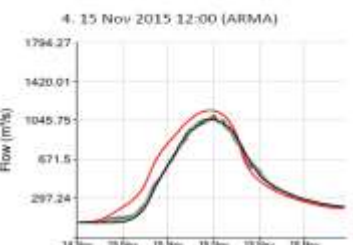
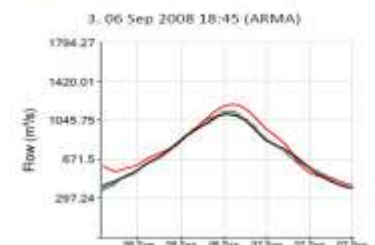
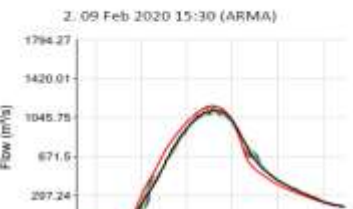
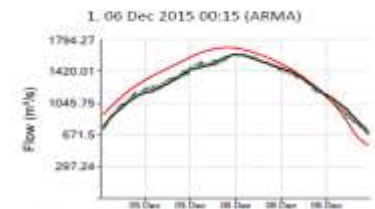
# How does the App Work?



# The Performance Testing Results = Historic

- Raw model performance based on perfect observed rainfall and data inputs

River River Tyne@Bywell (Flow)  
Tyne\Tyne\Lower South Tyne FMP\023001



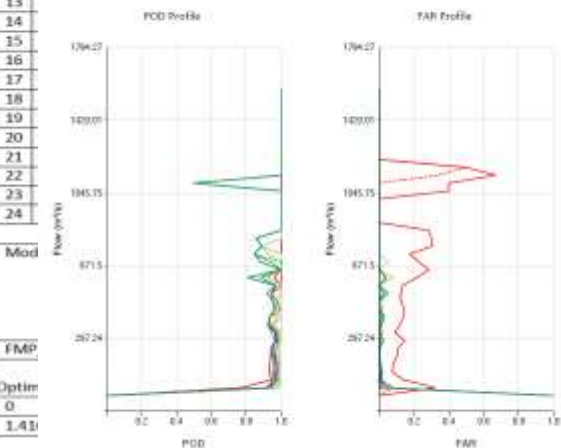
River River Tyne@Bywell (Flow)  
Tyne\Tyne\Lower South Tyne FMP\023001



Historical Report for 01 Apr 2008 to 01 Apr 2020 using:  
LevelToFlow\023001\Q\_rated  
FMP\_Tynte7\_Historical\023001\Q\_hist.sim

	Date	Obs (m³/s)	Date	Sim (m³/s)	% Peak Diff	% Vol Diff	NSE	r²
1	06 Dec 2015 00:15	1622.05	05 Dec 2015 23:00	1705.16	5.1%	5.5%	0.763	0.916
2	09 Feb 2020 15:30	1120.01	09 Feb 2020 15:30	1160.53	3.6%	5.0%	0.972	0.975
3	06 Sep 2008 18:45	1109.77	06 Sep 2008 19:15	1201.02	8.2%	5.5%	0.907	0.961
4	15 Nov 2015 12:00	1064.07	15 Nov 2015 11:30	1143.74	7.5%	6.5%	0.892	0.931
5	26 Dec 2015 23:45	1058.55	26 Dec 2015 15:30	1106.02	4.5%	6.0%	0.865	0.910
6	15 Jan 2011 23:45	845.66	15 Jan 2011 23:15	835.38	-1.2%	5.2%	0.958	0.960
7	18 Nov 2009 11:45	837.96	18 Nov 2009 11:15	891.76	6.4%	5.5%	0.890	0.923
8	16 Mar 2019 18:45	817.20	16 Mar 2019 18:30	846.75	3.6%	5.4%	0.941	0.946
9	16 Feb 2020 00:30	700.00	16 Feb 2020 00:30	847.43	6.0%	5.3%	0.950	0.970
10	River River Tyne@Bywell (Flow)				4.9%	0.930	0.930	0.930
11	Tyne\Tyne\Lower South Tyne FMP\023001				5.6%	0.852	0.955	0.955
12					5.4%	0.929	0.955	0.955
13					5.4%	0.955	0.955	0.955
14					5.3%	0.930	0.955	0.955
15					5.2%	0.941	0.955	0.955
16					5.3%	0.912	0.955	0.955
17					5.2%	0.942	0.955	0.955
18					5.0%	0.943	0.955	0.955
19					4.9%	0.880	0.955	0.955
20					5.5%	0.752	0.955	0.955
21					5.3%	0.980	0.955	0.955
22					5.3%	0.934	0.955	0.955
23					5.2%	0.958	0.955	0.955
24					5.2%	0.831	0.955	0.955

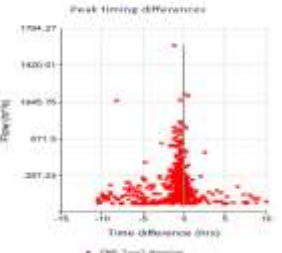
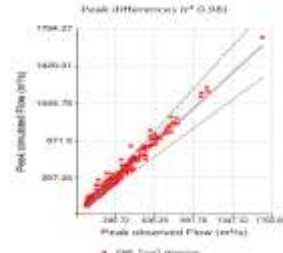
River River Tyne@Bywell (Flow)  
Tyne\Tyne\Lower South Tyne FMP\023001



Mod  
FMP  
Optim  
0  
1.41

Sign	Seasonality	Overall Score	Overall NSE
0	4.08	2.64	0.9

River River Tyne@Bywell (Flow)  
Tyne\Tyne\Lower South Tyne FMP\023001



River River Tyne@Bywell (Flow)  
Tyne\Tyne\Lower South Tyne FMP\023001



NSE for error corrected time series of different lead times (minutes)							
Event	Simulated	t-15	t-30	t-45	t-60	t-75	t-90
1. 06 Dec 2015 00:15	0.7632	0.9982	0.9971	0.9956	0.9932	0.9806	0.9870
2. 09 Feb 2020 15:30	0.9723	0.9992	0.9981	0.9967	0.9954	0.9940	0.9929
3. 06 Sep 2008 18:45	0.9068	0.9995	0.9990	0.9981	0.9967	0.9947	0.9919
4. 15 Nov 2015 12:00	0.8924	0.9995	0.9989	0.9981	0.9966	0.9945	0.9922
5. 26 Dec 2015 23:45	0.8652	0.9996	0.9992	0.9986	0.9975	0.9958	0.9941
6. 15 Jan 2011 23:45	0.9575	0.9995	0.9992	0.9988	0.9984	0.9977	0.9968
7. 18 Nov 2009 11:45	0.8902	0.9997	0.9993	0.9981	0.9963	0.9937	0.9904
8. 16 Mar 2019 18:45	0.9407	0.9996	0.9992	0.9988	0.9978	0.9966	0.9951
9. 16 Feb 2020 00:30	0.9504	0.9995	0.9988	0.9978	0.9962	0.9941	0.9915
10. 10 Aug 2019 21:30	0.9299	0.9989	0.9982	0.9967	0.9946	0.9920	0.9886
11. 18 May 2013 17:15	0.8523	0.9987	0.9988	0.9971	0.9946	0.9915	0.9879
12. 28 Jun 2012 21:45	0.9289	0.9995	0.9982	0.9956	0.9920	0.9879	0.9834
13. 25 Nov 2009 04:15	0.9551	0.9998	0.9996	0.9991	0.9982	0.9969	0.9953
14. 04 Dec 2015 03:30	0.9296	0.9996	0.9990	0.9978	0.9964	0.9941	0.9913
15. 05 Feb 2011 08:30	0.9412	0.9994	0.9990	0.9986	0.9979	0.9968	0.9957
16. 01 Nov 2009 19:45	0.9117	0.9997	0.9990	0.9973	0.9944	0.9903	0.9850
17. 22 Dec 2015 15:30	0.9415	0.9996	0.9993	0.9985	0.9971	0.9951	0.9924
18. 25 Sep 2012 11:00	0.9429	0.9991	0.9983	0.9970	0.9953	0.9921	0.9883
19. 05 Jan 2016 16:00	0.8798	0.9994	0.9988	0.9982	0.9971	0.9954	0.9932
20. 18 Jul 2009 05:15	0.7519	0.9997	0.9992	0.9982	0.9964	0.9937	0.9903
21. 12 Jan 2009 10:45	0.9800	0.9996	0.9993	0.9990	0.9984	0.9975	0.9965
22. 08 Dec 2011 17:45	0.9338	0.9996	0.9988	0.9977	0.9961	0.9940	0.9914
23. 11 Jan 2020 23:00	0.9577	0.9995	0.9987	0.9979	0.9963	0.9939	0.9908
24. 10 Dec 2015 06:15	0.8312	0.9995	0.9987	0.9974	0.9950	0.9915	0.9869

# The Performance Testing Results = Forecast

- Forecast model performance based on forecast rainfall at different lead times.
- The model is graded based on forecast threshold crossing and Peaks performance at different lead times, with and without error correction.
- Helps show expected model performance when used for real time flood forecasting

Grade	Forecast level tolerance	Forecast lead-time tolerance
1. Very Good	+/- 100mm	+/- 10% TLT
2. Good	+/- 200mm	+/- 20% TLT
3. Fair	+/- 300mm	+/- 30% TLT
4. Poor	+/- 400mm	+/- 40% TLT
5. Very Poor	+/- 500mm	+/- 50% TLT



# The Performance Testing Results = Forecast

## River Tyne at Hexham

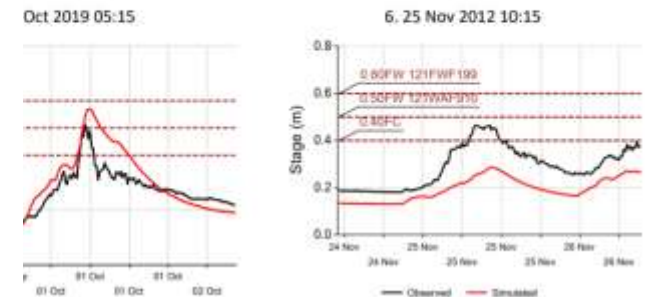
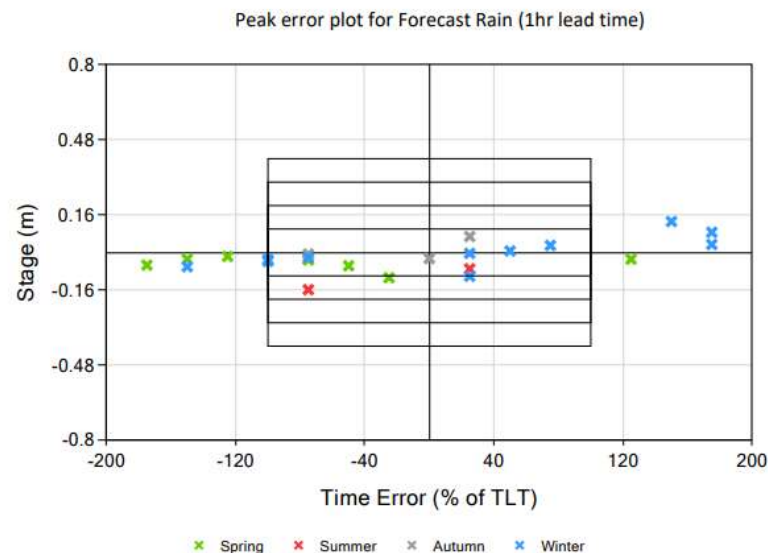
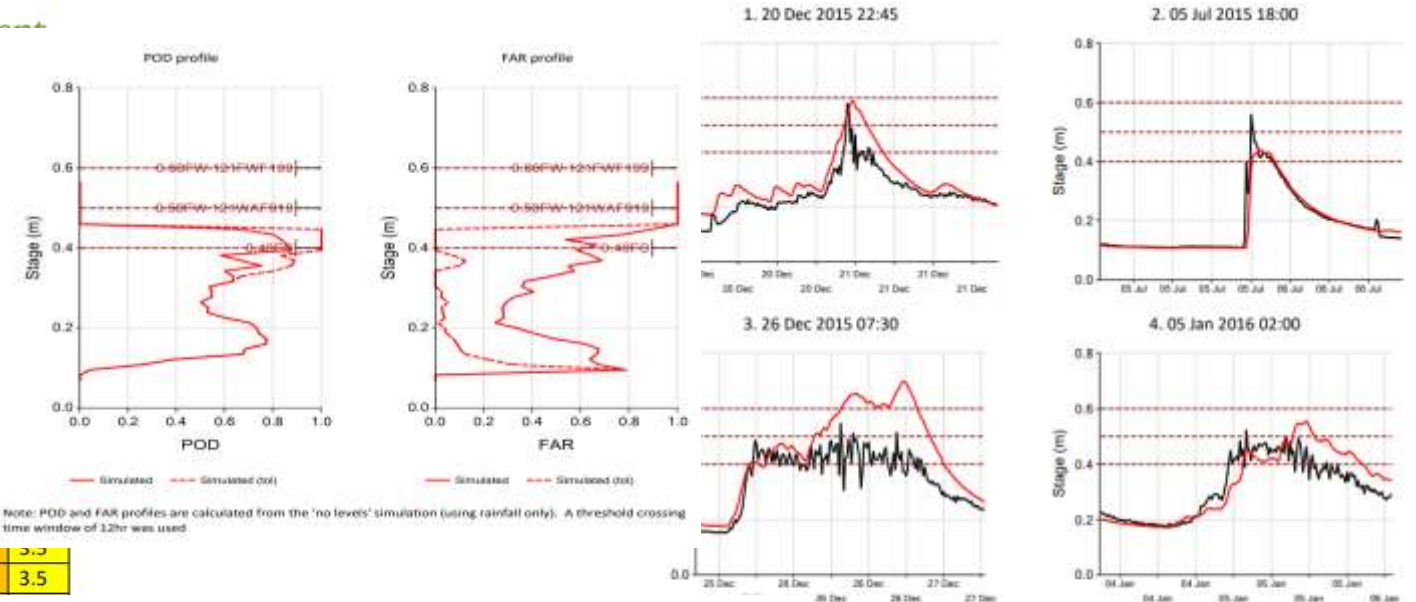
Using config dated 30 May 2023 11:28



Location ID	Model name	Level calculation
023020	023020_FMP_Q	Rating
Indicative response time (hrs)	Time series	N peaks in analysis
-99.0	H.rated.fcast.upd	40

Performance summary table

		Lead Time (Hours)									
Threshold	N	0.5	1	1.5	2	2.5	3	4	8	12	24
Observed Rain											
FC null (32.80mAOD)	24	1.2	1.2	2.0	2.0	1.8	1.8	1.8	2.1	3.2	3.3
FC null (33.10mAOD)	11	1.0	1.0	1.4	1.4	1.7	1.7	1.7	1.4	2.8	2.8
FW 121WAF910 (33.30mAOD)	8	1.0	1.5	1.0	1.5	1.5	1.5	1.5	2.0	2.5	4.0
FW 121FWF213 (33.30mAOD)	8	1.0	1.5	1.0	1.5	1.5	1.5	1.5	2.0	2.5	4.0
OPS null (33.80mAOD)	4	1.0	1.0	1.0	1.0	2.0	2.0	2.0	3.0	5.0	4.0
OPS null (33.90mAOD)	2	1.0	1.0	1.0	1.0	1.0	1.0	1.5	3.0	5.0	5.0
FW 121FWF203 (33.95mAOD)	2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.0	5.0	5.0
FW 121FWF205 (33.95mAOD)	2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.0	5.0	5.0
FW 121FWF213 (34.30mAOD)	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	5.0	5.0
Peaks	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	5.0	5.0	5.0
Forecast Rain											
FC null (32.80mAOD)	24	1.0	1.0	2.0	1.9	1.7	1.7	1.9	3.3	4.6	4.2
FC null (33.10mAOD)	11	1.0	1.0	1.4	1.4	1.7	1.7	2.2	3.8	4.5	4.0
FW 121WAF910 (33.30mAOD)	8	1.0	1.5	1.0	1.5	1.5	1.5	2.0	3.8	4.5	5.0
FW 121FWF213 (33.30mAOD)	8	1.0	1.5	1.0	1.5	1.5	1.5	2.0	3.8	4.5	5.0
OPS null (33.80mAOD)	4	1.0	1.0	1.0	1.0	2.0	2.0	2.0	3.0	4.0	5.0
OPS null (33.90mAOD)	2	1.0	1.0	1.0	1.0	1.0	1.0	1.5	3.0	5.0	5.0
FW 121FWF203 (33.95mAOD)	2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.0	5.0	5.0
FW 121FWF205 (33.95mAOD)	2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.0	5.0	5.0
FW 121FWF213 (34.30mAOD)	1	1.0	1.0	1.0	1.0	1.0	1.0	5.0	1.0	5.0	5.0
Peaks	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	5.0	5.0	5.0







# **What are the benefits of IMRD and the Performance Testing data?**



Inland Forecast  
Model  
Improvements



Developing  
Forecasting  
Capabilities

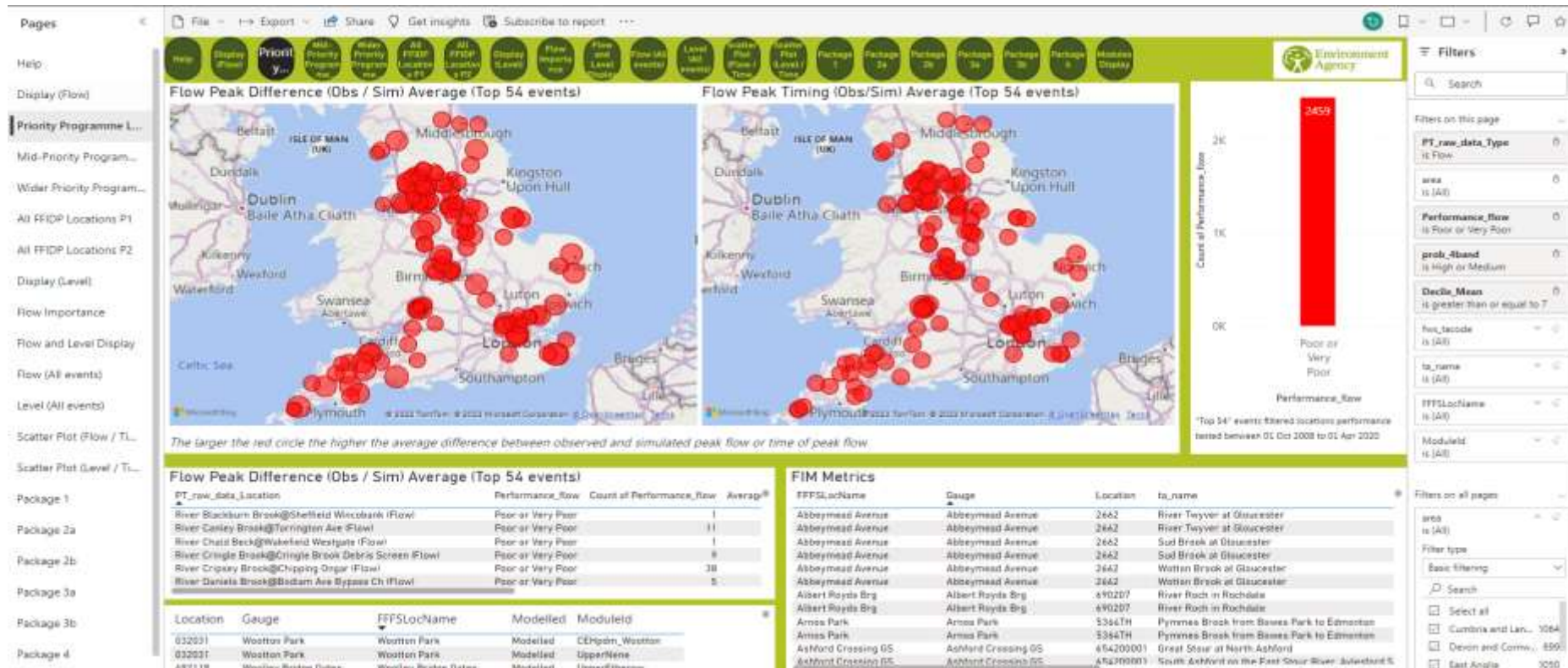


Coastal Forecast  
Model  
Improvements

# Flood Forecasting Improvements and Development Programme

# Inland Model Improvements Prioritisation

- Inland Model Improvements – Prioritisation and cost benefit analysis





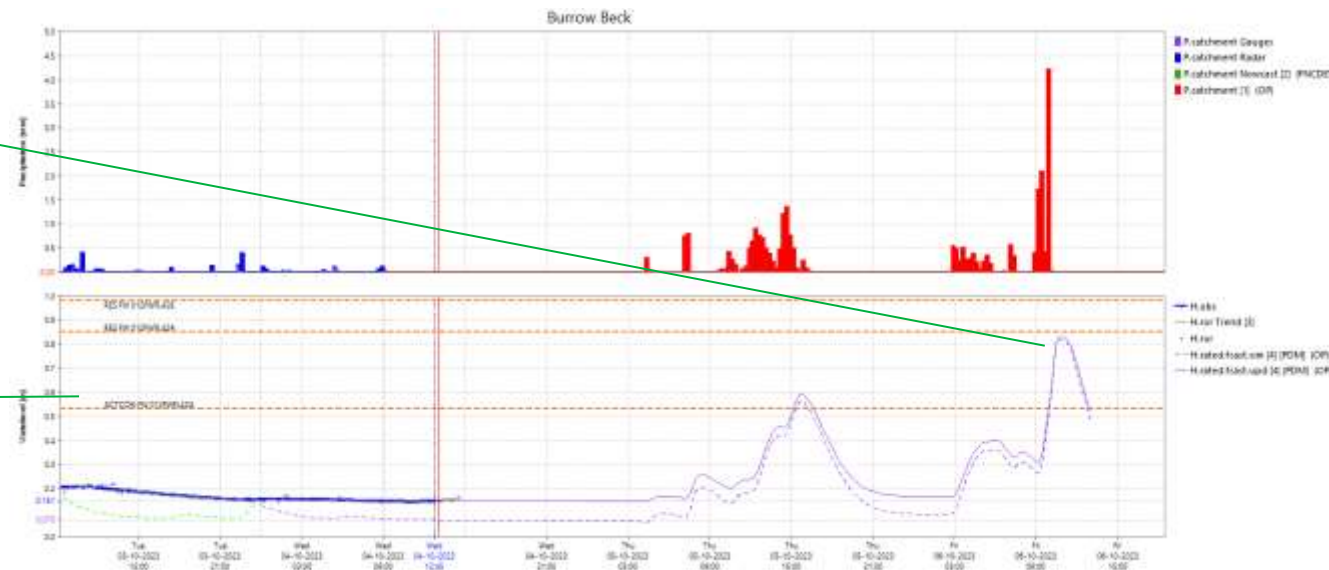
- Reports and Qualitative summary available for duty officers



# Alarm Handling and Threshold setting

- Currently we alert our duty officers of the potential for flooding inconsistently across England
- Looking to use the performance testing results to inform where to set the alerts based solely on the model output at appropriate lead times to take action, where performance is good enough.

Want to alarm the duty officer when the Forecast is going through the RES threshold within the next 6 hours – instead of on the observed going through the ACTCON



# Sharing our Forecasts Externally Online

## Bewdley

[Map](#) [Upstream](#) [Downstream](#) [Nearby levels](#)

Latest at 1:15pm on 4 October <sup>①</sup>

Height  
1.77m <sup>①</sup>

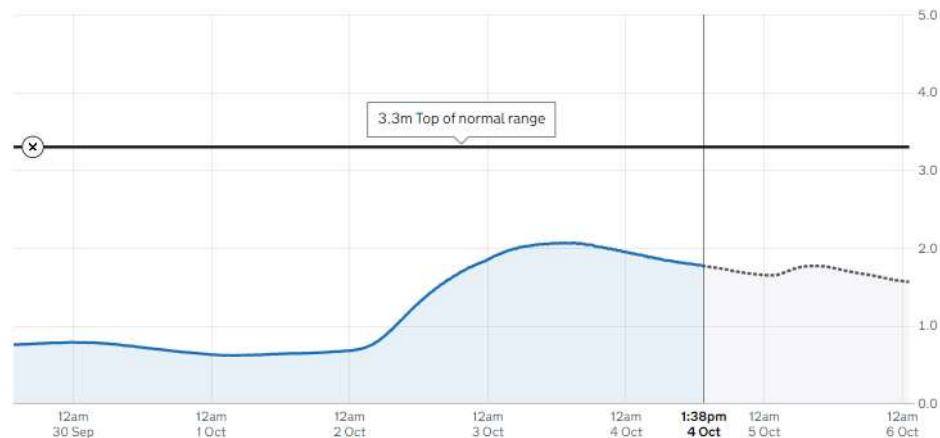
Trend  
Steady <sup>①</sup>

State  
Normal <sup>①</sup>

Normal range 0.21m to 3.30m

Height in metres over the last 5 days and up to 36 hour forecast

<sup>①</sup> This station includes an automated model which you should consider alongside other factors. The highest level in the model is 1.77m at 4 October at 1:15pm.



[Download data CSV \(16KB\)](#)

How levels here could affect nearby areas

[Show historical events](#)

5.56m	Water reaches the highest level recorded at this measuring station (recorded on 2 November 2000)	<a href="#">Show on chart</a>
3.40m	Property flooding is possible above this level. One or more flood warnings may be issued	<a href="#">Show on chart</a>

- Currently share our forecast model outputs for a limited number of sites online (subject to area requirements)
- PT data is a nationally consistent evidence base that allows us to determine which model outputs perform well and therefore provides us with a consistent view of what is reliable enough to be shared online
- Also investigating using the data to give confidence bands/ expected performance at different lead times to allow us to share all our forecasts online



# Automation of Warnings based on the forecast

- Currently have the functionality to automate the issuing of flood warnings based on the observed (but gives little lead time)
- Looking to automate the issuing of our flood warnings based on the model outputs where performance is good
- Currently testing how this could work = hear more at FEWS User days



## **FLOOD WARNING**

FLOODING IS EXPECTED. IMMEDIATE ACTION REQUIRED.

# Questions for interactive discussion

## Data and model management and configuration

- If you could adopt a similar reference and threshold database solution for your Delft-FEWS configuration, would you and how would you transform your existing configuration? Or if you have already implemented a similar setup, what would you do differently if you could do it again and do you have any advice for anyone else thinking of following this process?
- We use Microsoft SQL Server Databases. What databases do you use and what benefits have they realised?
- Do you use Python in any of your configuration or other activities? If so, what is your experience?

## Model Performance

- What performance testing data do you gather?
- Can you recommend any other performance testing information you find useful?
- What do you use your performance testing data for? What benefits do you get?

# Wrap up & take-away messages...

# Registration for the International Delft-FEWS User Days

Deltares

Startpagina

Programma

Travel & Stay

Presentations

Zoek periode

dd-mm-yyyy

dd-mm-yyyy

Sessle Onderwerp

Delft-FEWS Platform

Sessle Type

User Days

☐ Presentatie beschikbaar

Zoeken ...



[Clear selection](#)



08 november 2023



Delft-FEWS International User Days 2023 (Day 1)

09:00 - 18:00 (GMT+1) | Grátis

09 november 2023



Delft-FEWS International User Days 2023 (Day 2)

09:00 - 18:00 (GMT+1) | Grátis

# Contact

- |   |  |   |  |   |   |
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