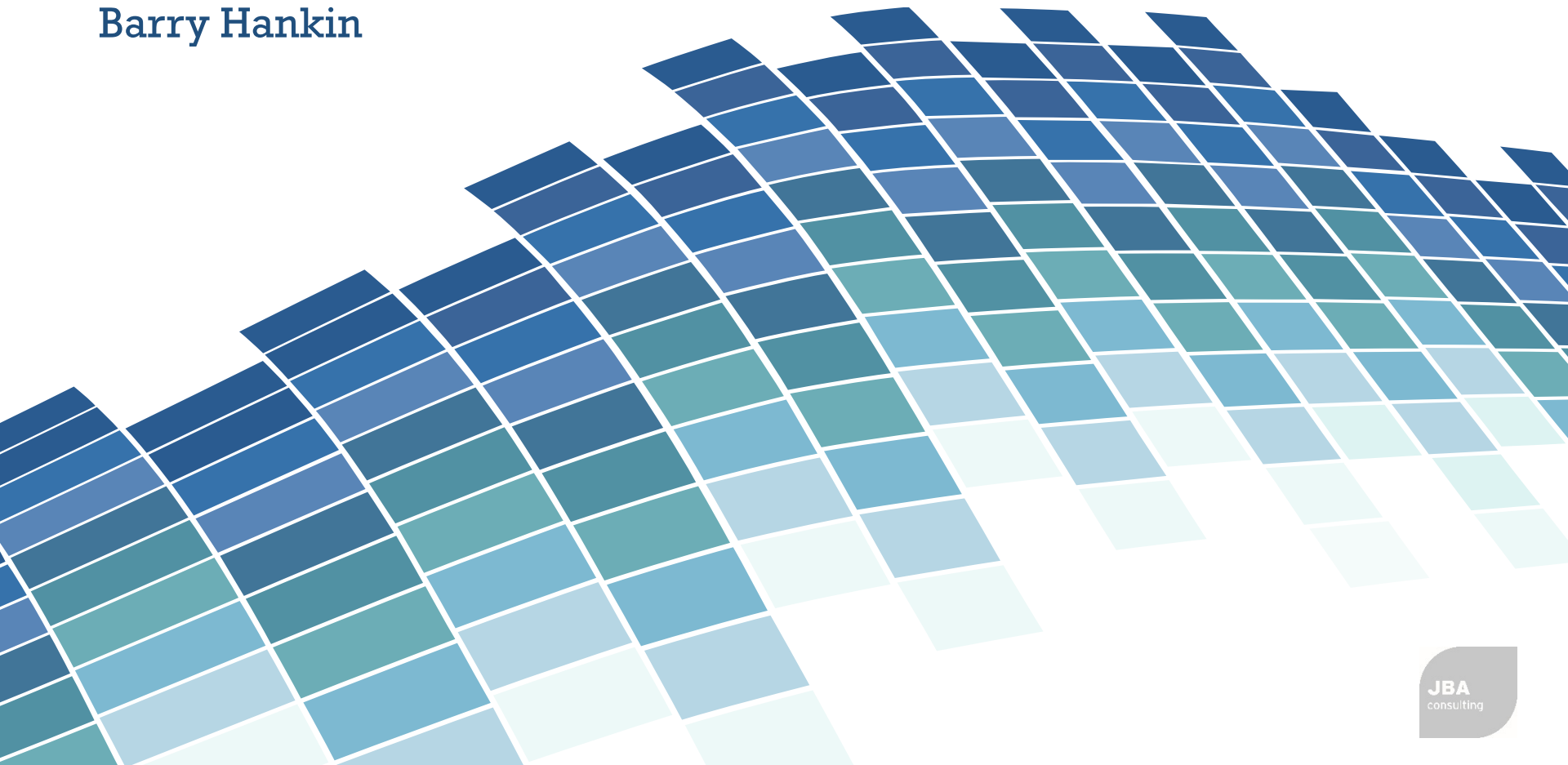




TII National Roads Conference
Wexford, 28 September 2018

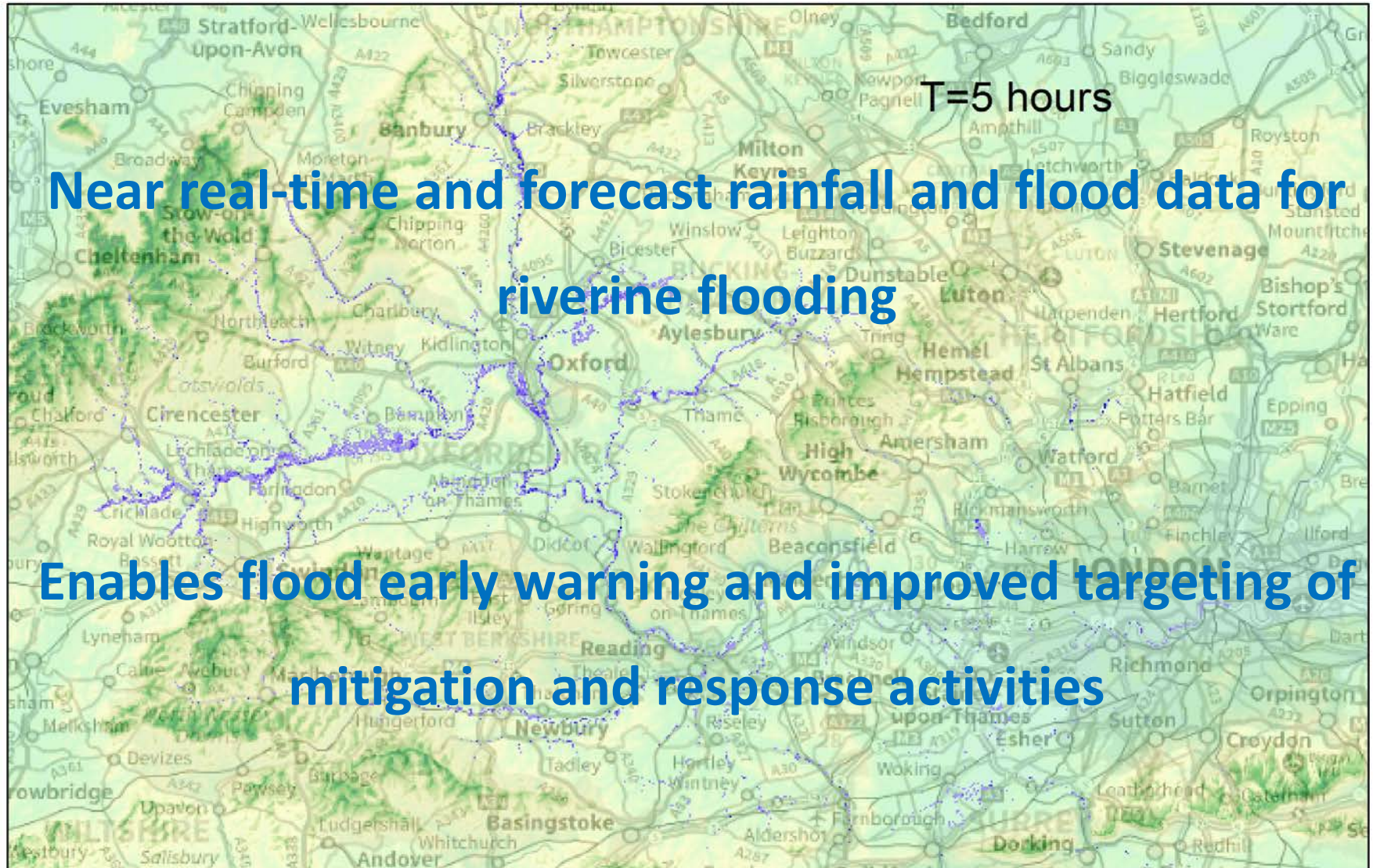
Effective flood management begins with Foresight

Barry Hankin



Summary

- Summary of Flood Foresight
 - What does it add to current forecasting?
- Case study – March 2018 event
 - Rainfall Screening
 - Forecasting Tool
 - Custom road impacts
 - Combine with Flood Risk to Roads Protocol and vulnerability maps
 - Integration
- Next steps





Exposure /
Asset data

Rainfall
forecast



Post-event
maps and loss
assessment



Modelling and
mapping




Flood
Foresight®

Forecast flood
inundation
maps



Near real-time
inundation
maps



Forecast
impact & early
action

Flood

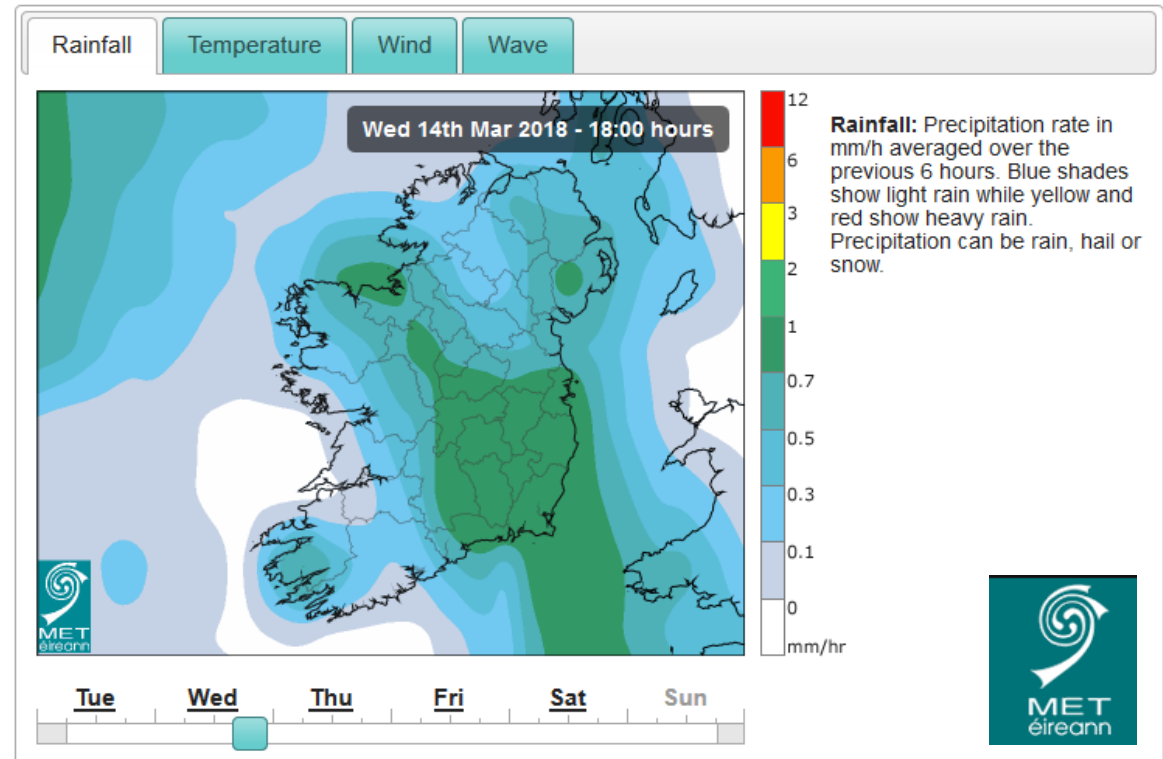
Early
warning



- Goes beyond rainfall forecasting
- Provides forecast flood inundation maps
- Allows custom impact forecasting
- Enables early action to reduce disruption/loss

5 Day Irish Forecasts

Atlantic forecasts



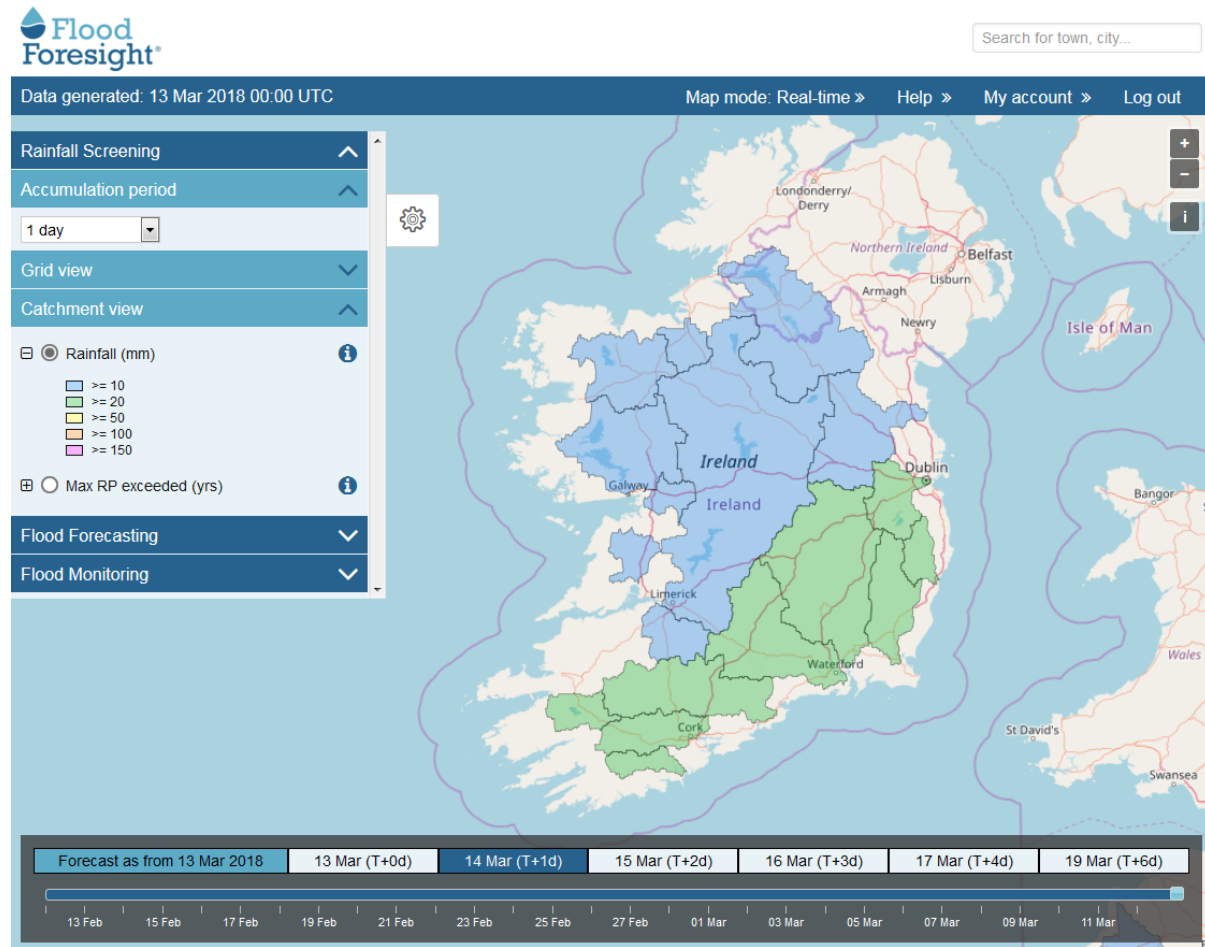
General: The information presented here is derived from Numerical Weather Prediction (NWP) models used in Met Éireann as forecaster guidance. Information for up to 5 days ahead comes from the ECMWF model, presented at 6-hourly intervals. The official forecast may not always reflect the guidance charts illustrated; the forecasters also consider information from satellite, radar and weather observations, in addition to the application of their own experience.

Case study: March 2018

Rainfall Screening

13 March Forecast for the 14 March 2018

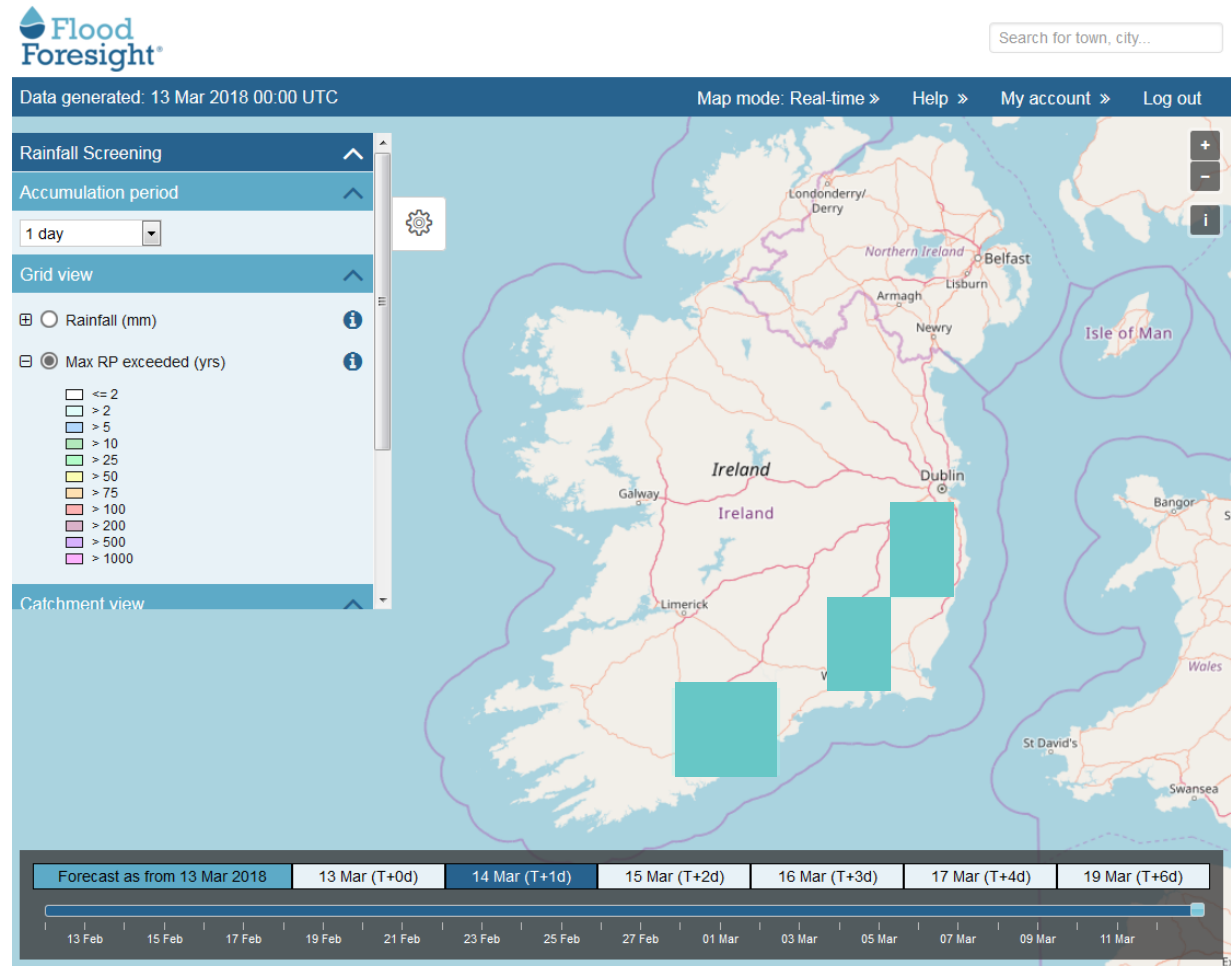
- Rainfall amounts:
 - 10-20mm N and W
 - 20-50mm S and E



Rainfall Rarity Screening

13 March Forecast for the 14 March 2018

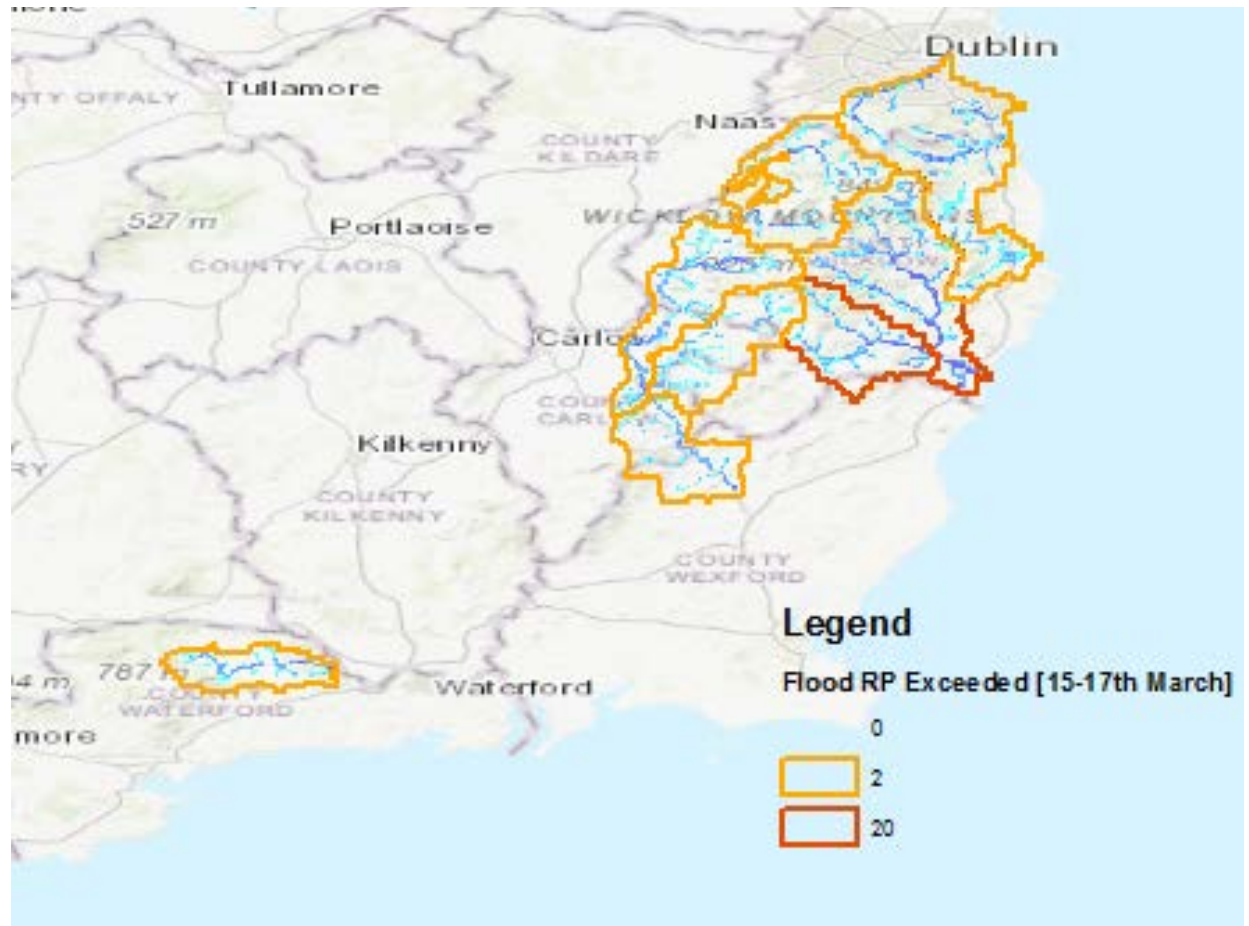
- Where is the added value?....
 - Rarity assessment
- 2-yr RP exceeded SE coast
- Dublin, Carlow and Wicklow



13th March forecast for the 15-17th March

Flood Severity Information

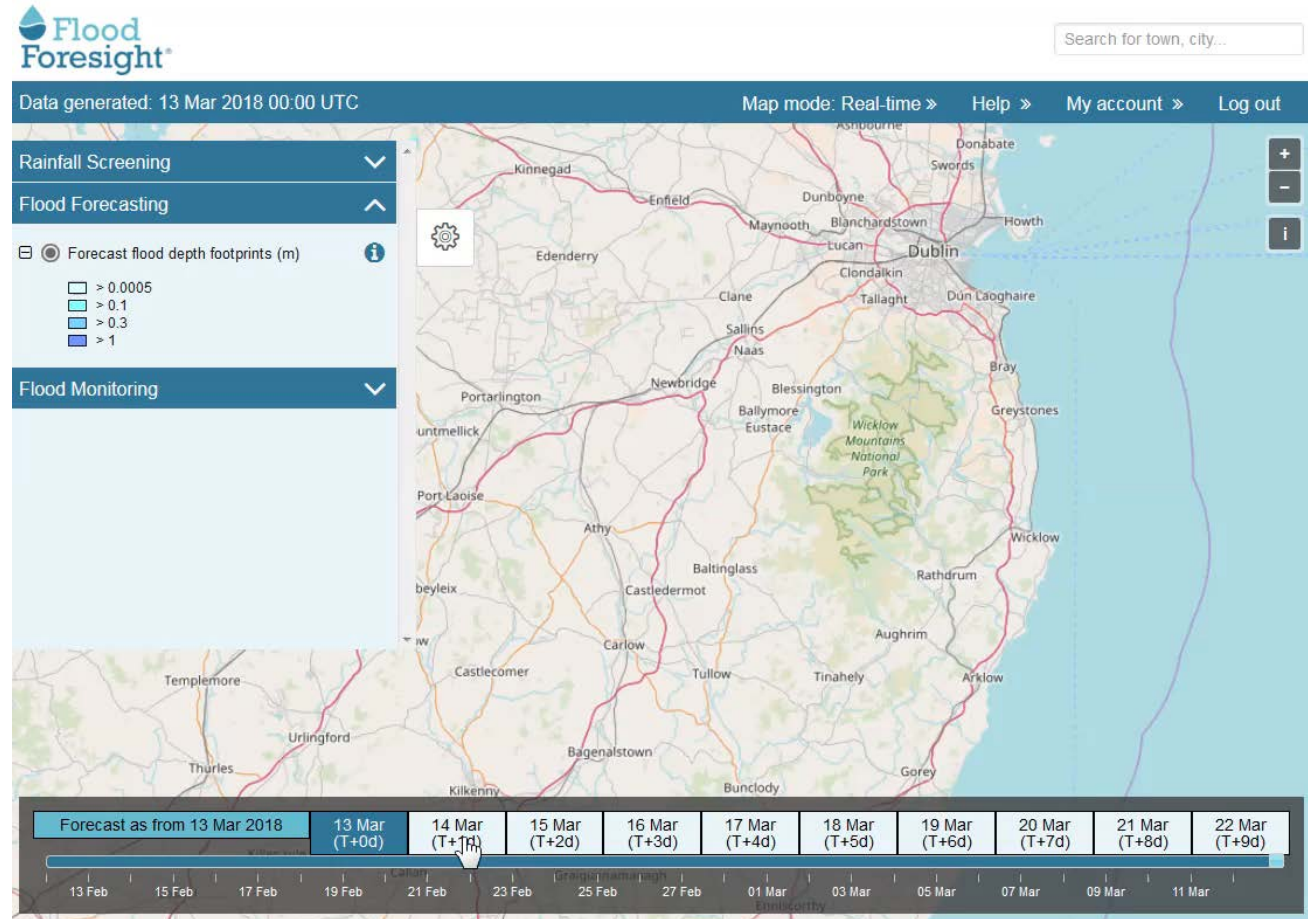
- 2-yr RP exceeded
- 20-yr RP exceeded only for the 15th March at those basins



Today's Forecast for next 10 days

Flooding (2-20-yr RP) may occur 15-17 March 2018

- Dublin, Carlow and Wicklow
- 2-yr RP exceeded SE coast

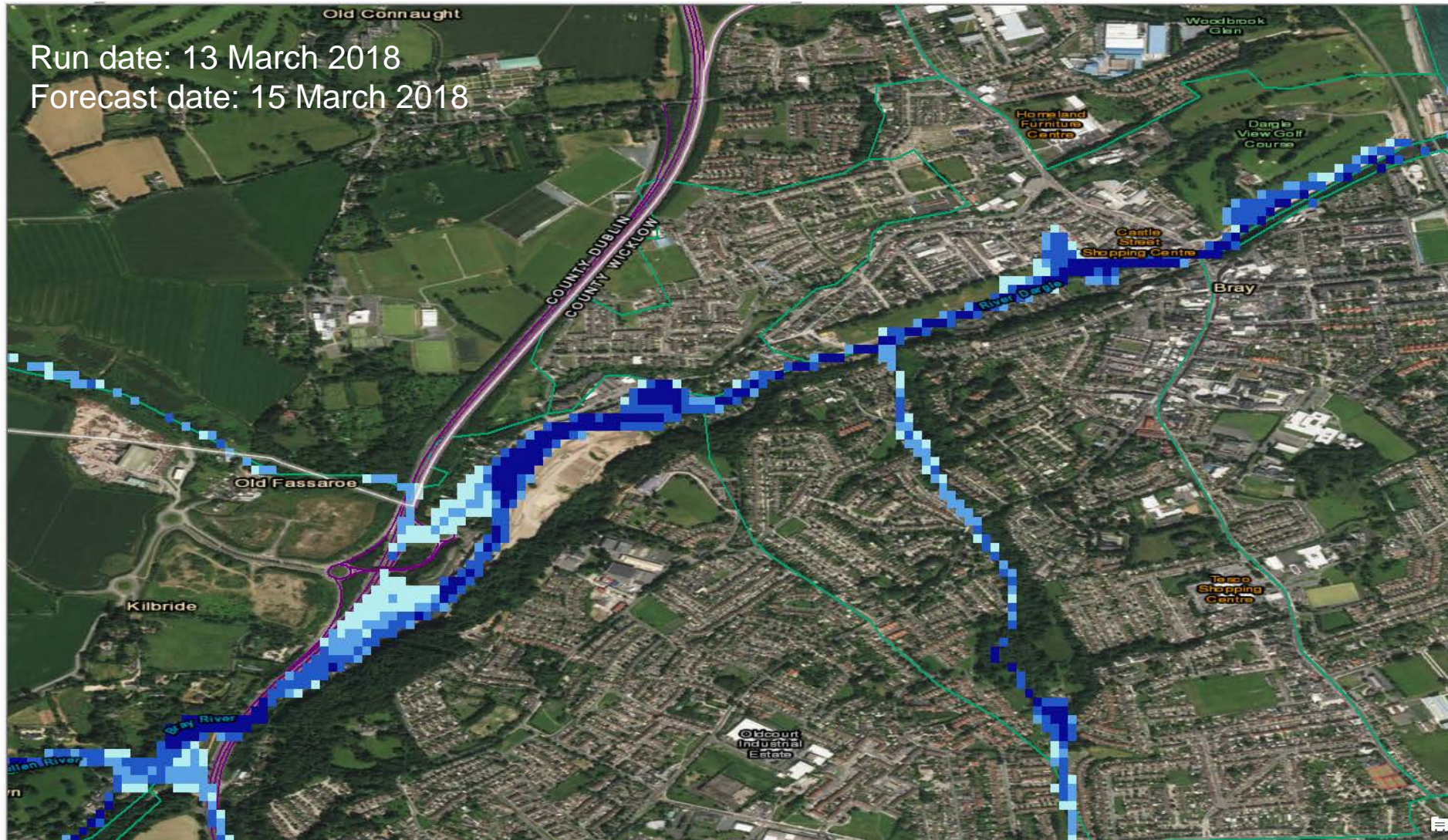


Zooming in: Bray, Wicklow



Bray, Wicklow

Run date: 13 March 2018
Forecast date: 15 March 2018



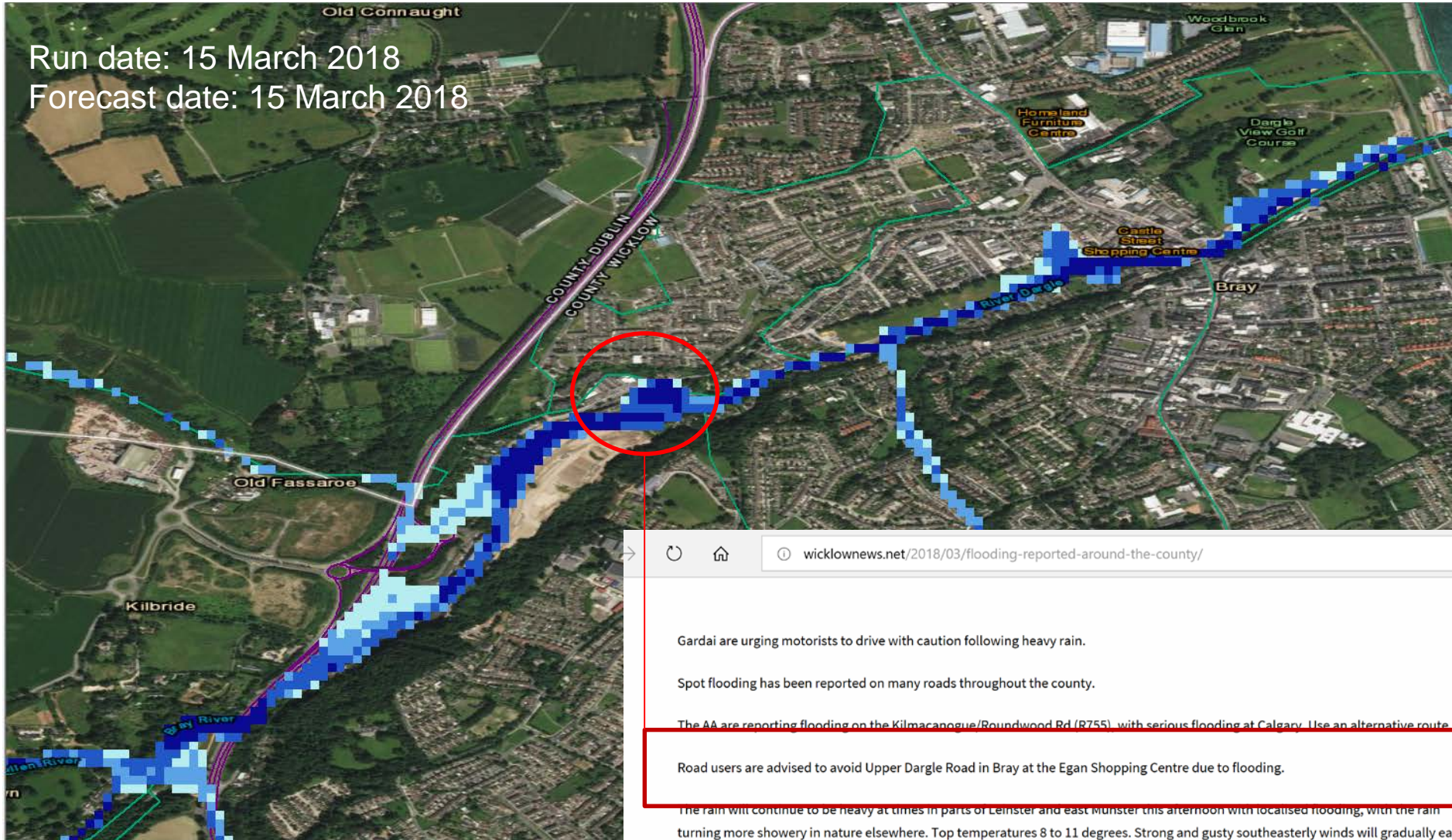
Bray, Wicklow

Run date: 14 March 2018
Forecast date: 15 March 2018



Bray, Wicklow

Run date: 15 March 2018
Forecast date: 15 March 2018




New TII customised road impact alerts (intersection footprint + carriageway)

AutoSave road_flood_risk_20180313.xlsx - Read-Only - Excel John Bevington

File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do

A1

Potential flooding to roads
Daily forecast produced on: 2018-03-13



T+0 days forecast 2018-03-13

T+1 day forecast 14/03/2018


T+2 days forecast 15/03/2018

T+3 days forecast 16/03/2018

T+4 days forecast 17/03/2018

Colour	Risk
Light Blue	Very Low
Medium Blue	Low
Dark Blue	Medium
Black	High

Flood estimates from riverine sources. Data produced by Flood Foresight
More information can be found in the About tab



Route Name	Segment	Junctions	Direction	Mainline Direction	County	16/03/2018	17/03/2018	18/03/2018	19/03/2018	20/03/2018	21/03/2018	22/03/2018	23/03/2018	24/03/2018	25/03/2018	Potential Flooding
N80	Centreline		D1		Carlow											1
N80	Mainline		D1	Southbound	Carlow											1
N80	Mainline		D2	Northbound	Carlow											1
N81	Centreline		D1		Carlow	1	1									1
N81	Mainline		D1	Southbound	Carlow	1	1									1
N81	Mainline		D2	Northbound	Carlow	1	1									1
N04	Centreline	J5 - J6	D1		Dublin											1
N04	Mainline	J4 - J3	D2	Eastbound	Dublin											1
N04	Mainline	J5 - J6	D1	Westbound	Dublin											1
N04	Mainline	J6 - J5	D2	Eastbound	Dublin											1
N07	Centreline	J2 - J3	D1		Dublin											1
N07	Entry/Exit Ramp		D1		Dublin											1
N07	Entry/Exit Ramp		D2		Dublin											1
N07	Mainline	J2 - J3	D1	Westbound	Dublin											1
N07	Mainline	J3 - J2	D2	Eastbound	Dublin											1
N11	Centreline		D1		Dublin	1	1									1
N11	Entry/Exit Ramp		D1		Dublin	1	1									1
N11	Entry/Exit Ramp		D2		Dublin											1
N11	Entry/Exit Ramp		D2		Dublin											1

Informative summary

Combine with vulnerability information

Flood Risk hotspots – worst sections of each major road



Flood Risk hotspots for each major road route in Ireland

Please Select a Route:



Rank	Worst ranking areas 1km grid on multiple measures of flood risk	County	(RouteID)	Hyper-linked Map
1	X297000Y139000	Wexford	N11D2ML	\Route Rank Maps\RiskRank X297000Y139000.pdf
2	X326000Y187000	Wicklow	N11D2ML	\Route Rank Maps\RiskRank X326000Y187000.pdf
3	X324000Y217000	Wicklow	N11D2ML	\Route Rank Maps\RiskRank X324000Y217000.pdf
4	X327000Y180000	Wicklow	N11D2ML	\Route Rank Maps\RiskRank X327000Y180000.pdf
5	X327000Y190000	Wicklow	N11D2R2042	\Route Rank Maps\RiskRank X327000Y190000.pdf
6	X298000Y144000	Wexford	N11D2ML	\Route Rank Maps\RiskRank X298000Y144000.pdf
7	X326000Y210000	Wicklow	N11D2ML	\Route Rank Maps\RiskRank X326000Y210000.pdf
8	X327000Y195000	Wicklow	N11D2ML	\Route Rank Maps\RiskRank X327000Y195000.pdf
9	X297000Y137000	Wexford	N11D2ML	\Route Rank Maps\RiskRank X297000Y137000.pdf
10	X324000Y175000	Wicklow	N11D2ML	\Route Rank Maps\RiskRank X324000Y175000.pdf

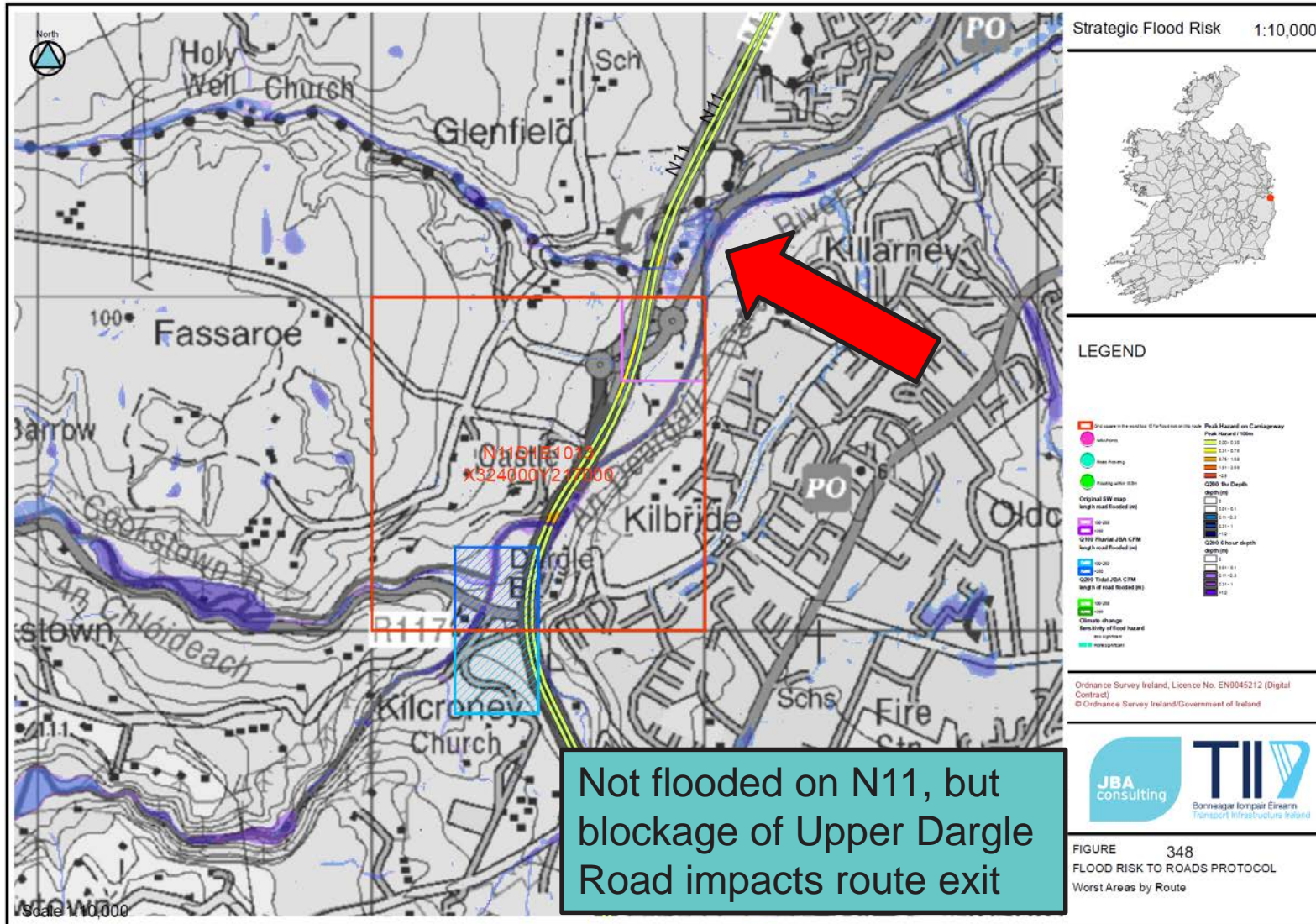
This Spreadsheet shows where the flood risk from multiple sources is worst for each major route

There is a linked sub-folder with 780 PDF maps called "Route_Rank_Maps"

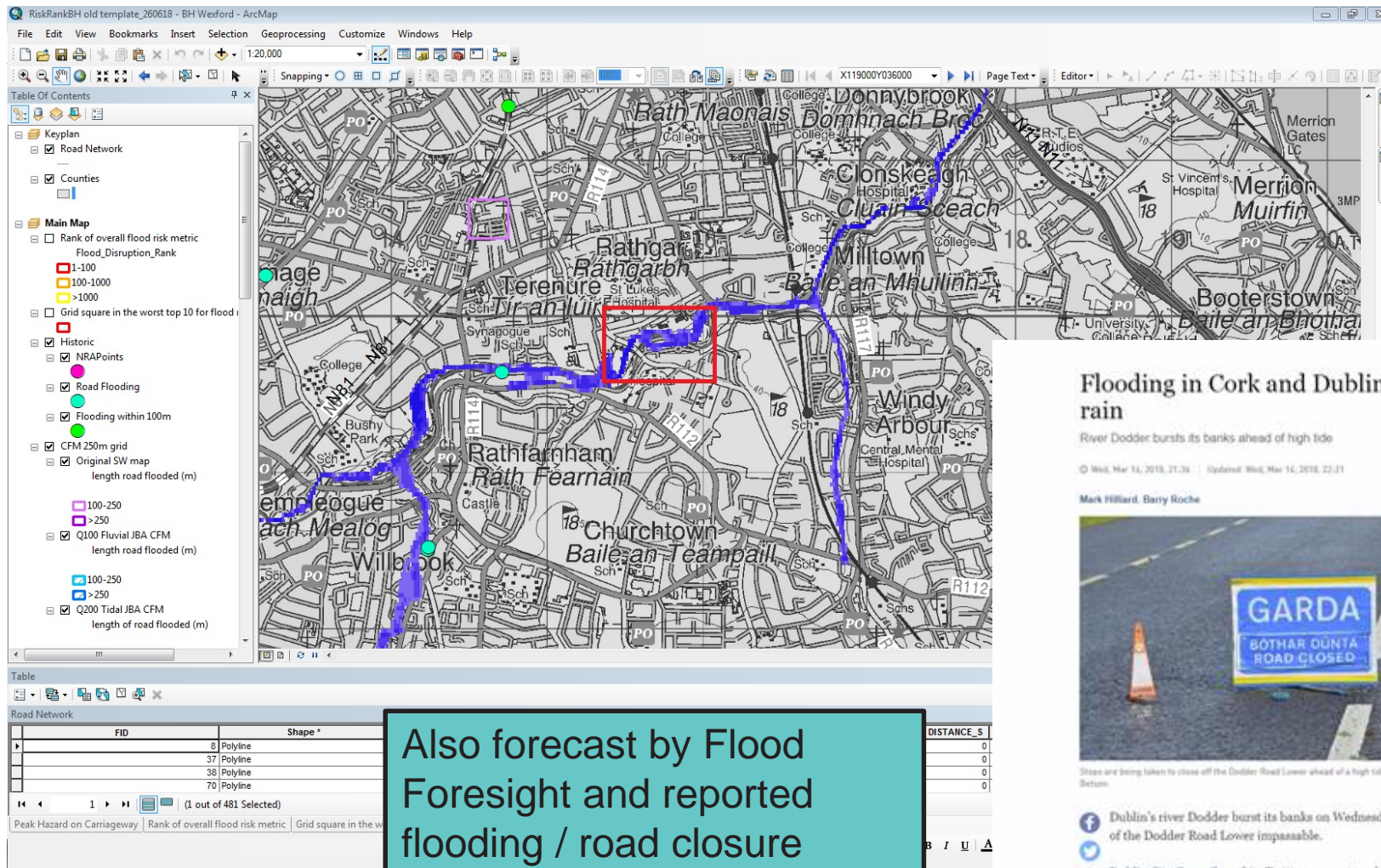
If this is present then the Hyper-links in column H above should activate the correct map on clicking

Click on one of the “worst ten road sections for flood risk” to open map

Vulnerability Map for high risk area / Bray



Other areas picked up by Forecasting Tool: River Dodder



Flooding in Cork and Dublin after day of rain

River Dodder bursts its banks ahead of high tide

Wed, Mar 11, 2015, 21:34 | Updated Wed, Mar 11, 2015, 22:21

Mark Hilliard, Barry Roche



Streets are being taken to close off the Dodder Road Lower ahead of a high tide at 10pm. File photograph: Alan Bottom

Dublin's river Dodder burst its banks on Wednesday evening leaving a portion of the Dodder Road Lower impassable.

Dublin City Council used its Twitter account to alert people to avoid the river at Orwell Road, as the fire brigade attended the scene.

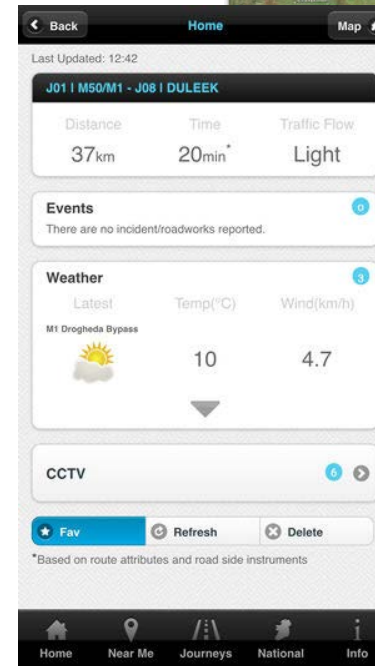
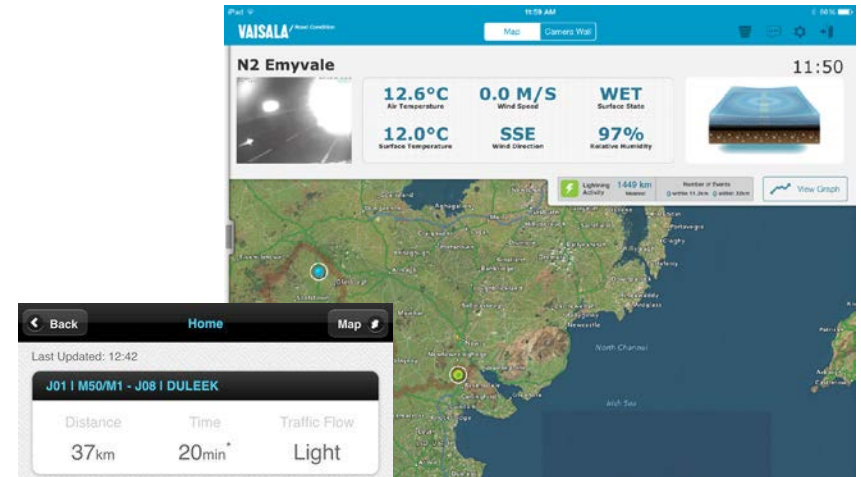
It is understood steps are being taken to close off the Dodder Road Lower ahead of a high tide at 10pm. Gardai are attending.

Earlier, concerns were mounting locally over the height of the water. One

Integration options

Where next?

- Assessing current working practices, software and facilities with RDOs
- Flood Foresight layers and vulnerability maps can be brought into existing decision-support systems (e.g. TII app, GIS, Vaisala)
 - also available as CSV/Excel, on FTP or website
- Need to develop thresholding and link to decision making



Next steps

- Concluding this phase of R&D project
- Assessing integration options
- Works alongside other tools
- Looking for 1-2 RDOs in which to demonstrate integration and develop decision protocols - towards having a full Flood Risk Service Plan
- Volunteers welcome!



jbaconsulting.com/floodforesight

For more information, contact:
barry.hankin@jbaconsulting.com

