

Urban Pluvial Flood Forecasting and Warning

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The RAINGAIN project is a joint Local Government Flood Forum/Imperial College London/Met Office/EU project to improve fine-scale measurement and prediction of rainfall and to enhance urban pluvial flood prediction. This will enable urban water managers to adequately cope with intense storms, so that the vulnerability of populations and critical infrastructure can be reduced.

To help us tailor the project to meet the needs of local government, we are conducting a survey aimed at capturing your perception of the surface water flood risk alert service currently provided by the Flood Forecasting Centre and the potential benefits of more localised and improved urban pluvial flood warnings.

The survey contains 15 questions and should take no longer than 20 minutes to complete.

We are are very grateful for your time and interest.

Your organisation and your role

*1. Which organisation do you work for?

*2. What kind of organisation is it?

- Local Authority
- Emergency Services
- Utilities
- Other (please specify)

*3. What is your role within your organisation?

4. On a scale from 1 to 5, how big of a concern do you consider pluvial/surface flooding to be in your local area?

Very low concern (1)	(2)	(3)	(4)	Major concern (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. What was the most recent pluvial/surface flood event in your local area?

6. To what extent do you agree with the following statement: "In my area, the location of pluvial/surface flooding changes significantly from event to event"

Strongly disagree	Disagree	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional comments (optional)

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Perception of the surface water flood risk assessment service currently pro...

Background information:

When the risk of surface water flooding is assessed to be low, medium or high in a given county, information about it is included in the Flood Guidance Statement (FGS) issued daily by the Flood Forecasting Centre (FFC). The FGS provides an overview of the risk of all types of natural flooding, one of which is surface water flooding. In the assessment the likelihood and magnitude of the event, as well as its potential consequences, are taken into account.

This new assessment of surface water flood risk included in the FGS superseded the former Extreme Rainfall Alert service, previously provided by the FFC.

More information on the Flood Guidance Statement (FGS) can be found on:

http://www.ffc-environment-agency.metoffice.gov.uk/services/FGS_User_Guide.pdf

7. Were you aware that since October 2011 the Extreme Rainfall Alert (ERA) Service disappeared as such and was superseded by a new type of surface water flood risk assessment which was incorporated into the Flood Guidance Statement (FGS)?

Yes

No

Additional comments (optional)

8. To what extent do you agree with the following statement: "I have a general understanding of the surface water flood risk assessment provided in the FGS and of the way in which it is determined"

Strongly disagree

Disagree

Agree

Strongly agree

Additional comments (optional)

9. To what extent do you agree with the following statement: "It is clear to me how the new surface water flood risk assessment (included in the FGS) differs from the former ERA service"

Strongly disagree

Disagree

Agree

Strongly agree

Additional comments (optional)

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10. To what extent do you agree with the following statement: “I consider the new surface water flood risk assessment service to be an improvement over the former ERA service”

Strongly disagree	Disagree	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional comments (optional)

11. How useful do you think the surface water flood risk assessment provided by the FFC is to your organisation?

Very useful	Useful	Not useful	Not useful at all
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional comments (optional)

12. When does your organisation take action upon receipt of the following surface water flood (SWF) risk alerts (included in the FGS)? And when did your organisation used to take action upon receipt of the former ERAs?

	Always	Most of the time	Seldom	Never
Low risk of SWF (indicated in FGS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medium risk of SWF (indicated in FGS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High risk of SWF (indicated in FGS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ERA Early	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ERA Imminent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional comments (optional)

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13. Using the matrix below, please indicate what your organisation does upon receipt of surface water flood (SWF) risk alerts (included in the FGS) and what your organisation used to do upon receipt of Extreme Rainfall Alerts (ERAs).

The actions you can choose from are as follows:

A1. Do nothing (no action)

A2. Monitoring of ordinary watercourses and gullies

A3. Cleansing of gullies in high risk areas

A4. Notification of contractors and partners, such as water companies and fire services

A5. Activation of pumping stations, storage and other control elements

A6. Notification of flood wardens

A7. Notification of the general public and prescription of advice

A8. Activation of stand-by procedure (i.e. placement of staff and other resources on stand-by)

A9. Deployment of temporary/demountable flood defences, aqua-bags and the like

A10. Road closures (to keep cars from being trapped in roads expected to flood)

A11. Closure of underground passages, tube stations and other public locations most susceptible to pluvial flooding

A12. Other actions (please specify in the comment box below)

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
Low risk of SWF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medium risk of SWF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High risk of SWF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ERA Early	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ERA Imminent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional comments (optional)

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14. Can you provide an estimate of the average cost of implementing some of the actions mentioned in the previous question?

This would give us an estimate of the cost of false alarms.

A2. Monitoring of watercourses and gullies	<input type="text"/>
A3. Cleansing of gullies in high risk areas	<input type="text"/>
A4. Notification of contractors and partners	<input type="text"/>
A5. Activation of control elements (pumping, storage)	<input type="text"/>
A6. Notification of flood wardens	<input type="text"/>
A7. Notification of the general public	<input type="text"/>
A8. Placement of staff and resources on stand-by	<input type="text"/>
A9. Deployment of temporary flood defences	<input type="text"/>
A10. Road closures	<input type="text"/>
A11. Closure of public locations susceptible to pluvial flooding	<input type="text"/>
A12. Other actions (please specify)	<input type="text"/>

15. Based on previous surface water flood events in your area, can you provide an estimate of the average cost of the different actions associated to the recovery phase of flooding?

This would help us give an estimate of the savings made by authorities through avoided damage. If possible, indicate the date and magnitude of the flood event for which the costs are provided.

Date of flood event(s)	<input type="text"/>
Magnitude of flood event(s) (this can be expressed in terms of the return period, total rainfall, number of properties affected, etc.)	<input type="text"/>
A1. Evacuation and sheltering	<input type="text"/>
A2. Search and rescue	<input type="text"/>
A3. Damage assessment	<input type="text"/>
A4. Drainage of flood water	<input type="text"/>
A5. Debris clearance, removal and disposal	<input type="text"/>
A6. Reconstruction/repair of infrastructure	<input type="text"/>
A7. Temporary housing	<input type="text"/>
A8. Community support	<input type="text"/>
A9. Other actions (please specify)	<input type="text"/>

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Potential benefits of improved urban pluvial flood forecasting and warning

16. The RainGain project aims at improving measurement and forecasting of extreme rainfall events which cause urban pluvial (surface) flooding. Our aim is to produce more localised and reliable warnings for this type of flooding and we would like to know what the benefits of having such warnings would be.

As you know, confidence levels of pluvial flood prediction increase closer to the rainfall event and when the meteorological situation becomes clearer. Therefore, the reliability of the forecasts and warnings increases as the lead time decreases, and vice versa.

Taking this into consideration, the table below presents a number of possible scenarios of LOCALISED (catchment-specific) pluvial flood warnings with different lead times and levels of reliability.

For each scenario you are asked to indicate which actions you would be willing to implement.

The actions you can choose from are as follows:

A1. Do nothing (no action)

A2. Monitoring of ordinary watercourses and gullies

A3. Cleansing of gullies in high risk areas

A4. Notification of contractors and partners, such as water companies and fire services

A5. Activation of pumping stations, storage and other control elements

A6. Notification of flood wardens

A7. Notification of the general public and prescription of advice

A8. Activation of stand-by procedure (i.e. placement of staff and other resources on stand-by)

A9. Deployment of temporary/demountable flood defences

A10. Road closures (to keep cars from being trapped in roads expected to flood)

A11. Closure of underground passages, tube stations and other public locations most susceptible to pluvial flooding

A12. Other actions (please specify in the comment box below)

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
12h lead time & 20% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12h lead time & 40% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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6h lead time & 20% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6h lead time & 40% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2h lead time & 40% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2h lead time & 60% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1h lead time & 40% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1h lead time & 60% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1h lead time & 80% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.5h lead time & 60% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0.5h lead time & 80% probability of occurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional comments (optional)