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EFAS Rapid Flood Mapping Layers

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Please go to:

**<https://www.menti.com> and
enter code **4883 7742****

Don't answer the questions yet!



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Outline

Aims:

1. Introduce the layers
- 2. What are the priorities for future improvements?**

0 - 10 mins: Introduction to the Rapid Flood Mapping and Impact Layers

- What are the layers?
- How are they produced?

10 - 15 mins: Quick poll

15 - 25 mins: Group Discussions

- What should be our priorities for future improvements?

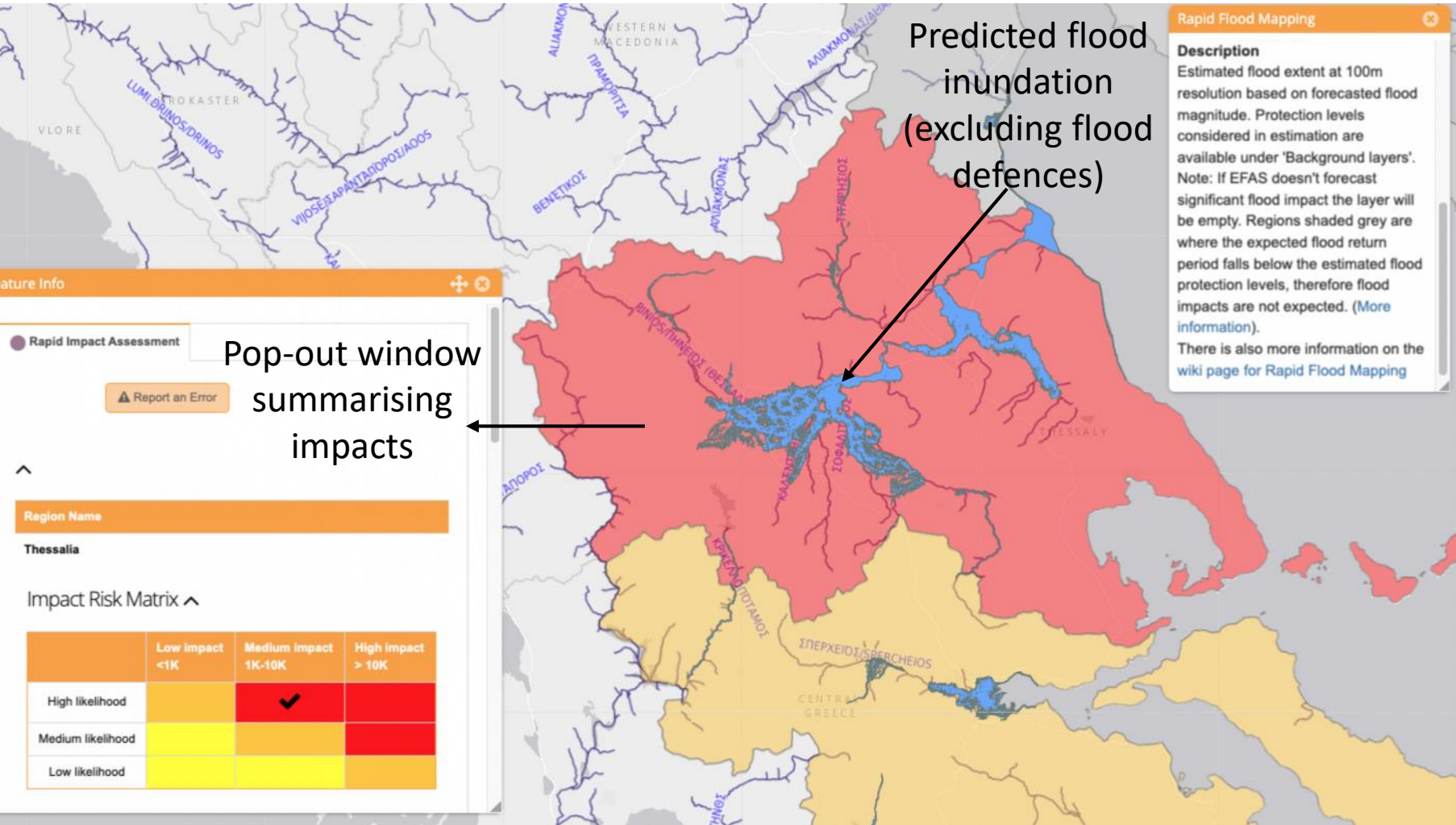
25 - 35 mins: Feedback from Group Discussions

35 – 40 mins: Poll on direction for future improvements

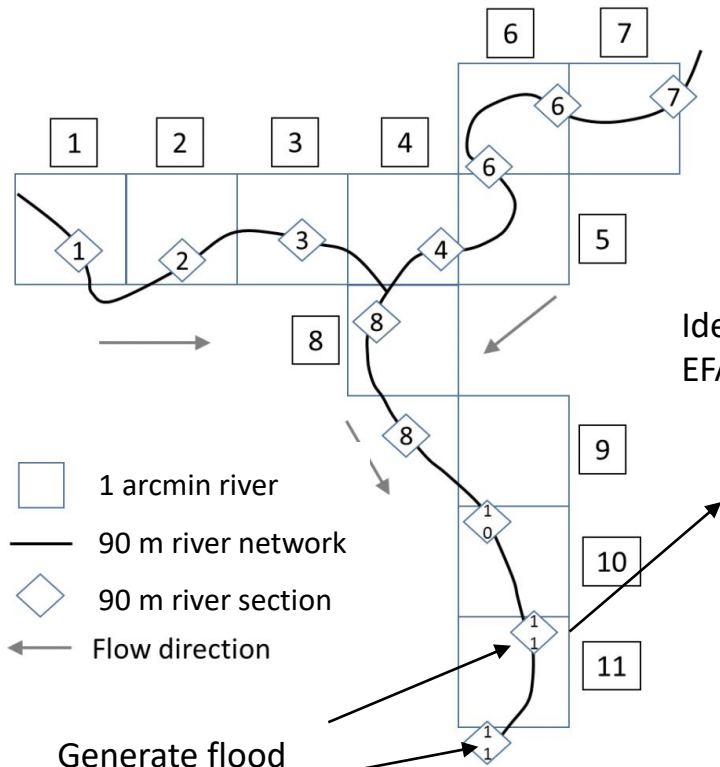
Rapid Flood Mapping & Rapid Impact Assessment layers

FLOOD SUMMARY

- Flood Probability < 48h
- Flood Probability > 48h
- Flood probability persistence
- National Flood Monitoring
- Rapid Flood Mapping
- Rapid Impact Assessment
- Reporting Points



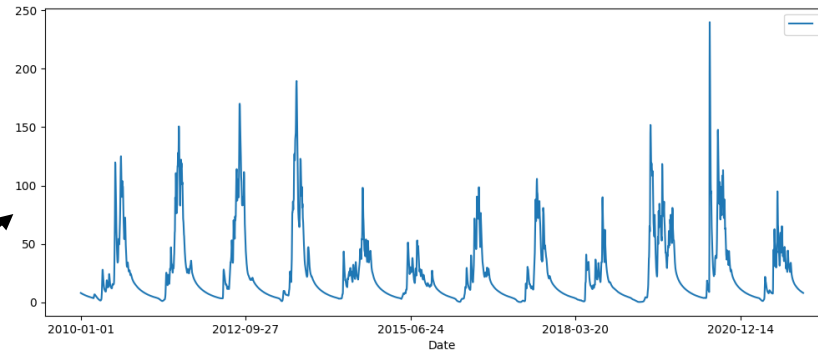
Generating Flood Inundation Data



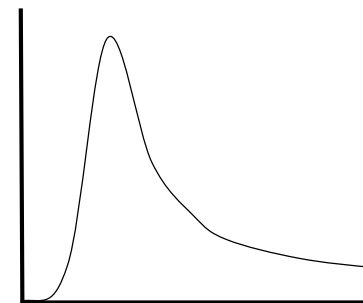
Generate flood points every 2km along river network

Identify nearest EFAS grid cell

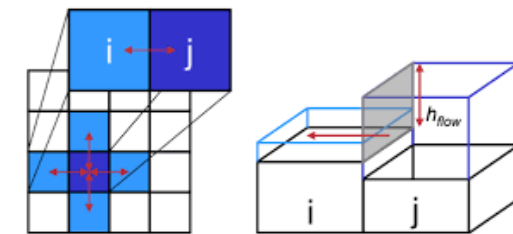
Extract EFAS discharge long term run



Generate flood event hydrographs for each return period



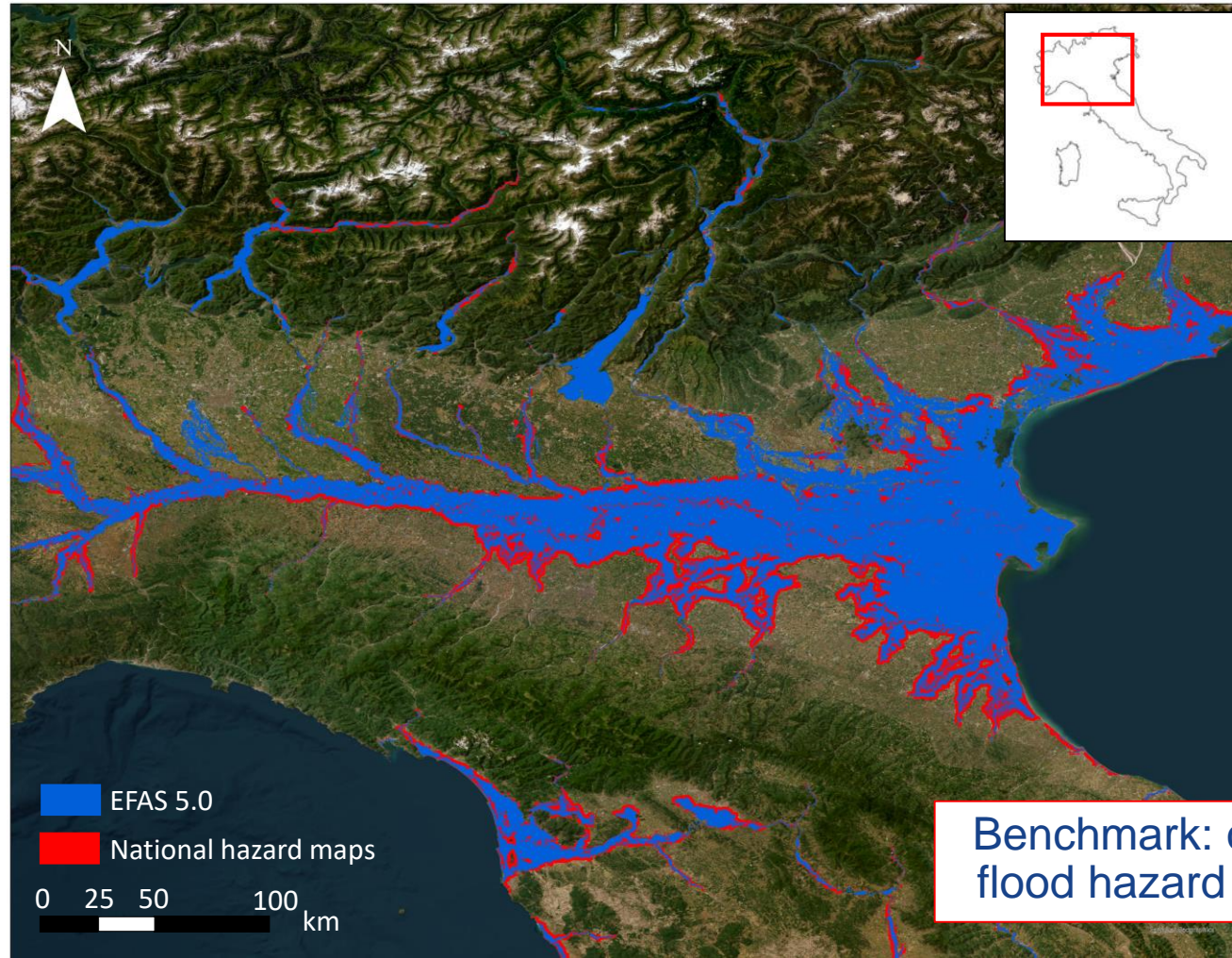
Run hydraulic model with hydrograph



LISFLOOD-FP

Create 90m pan-European mosaic for each return period scenario (10, 20, 30, 40, 50, 100, 500 years)

Evaluating the Flood Inundation Data



Analysis carried out on national scale

The performance is evaluated using the following indexes:

Hit rate:

$$H = (Fm \cap Fo) / (Fo)$$

False - alarm rate:

$$F = (Fm / Fo) / (Fo)$$

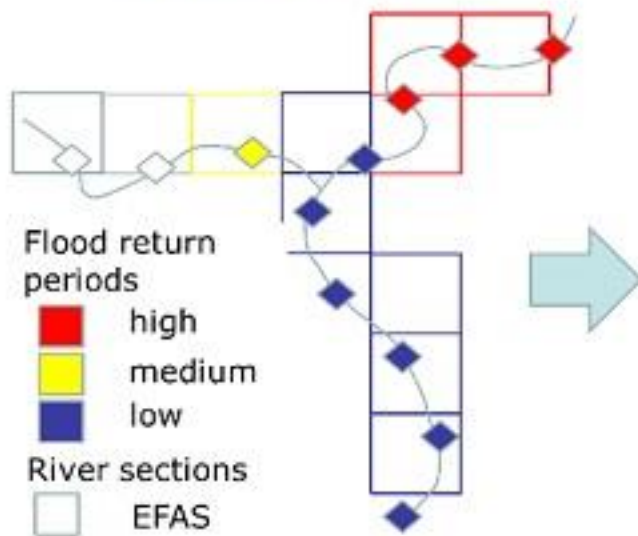
Critical - success index:

$$C = (Fm \cap Fo) / (Fm \cup Fo)$$

Stay tuned for results!

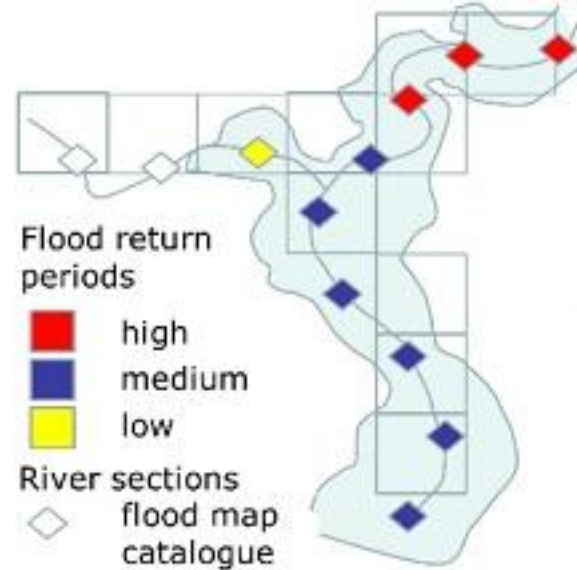
Creating Realtime Inundation Forecasts

1: flood forecast



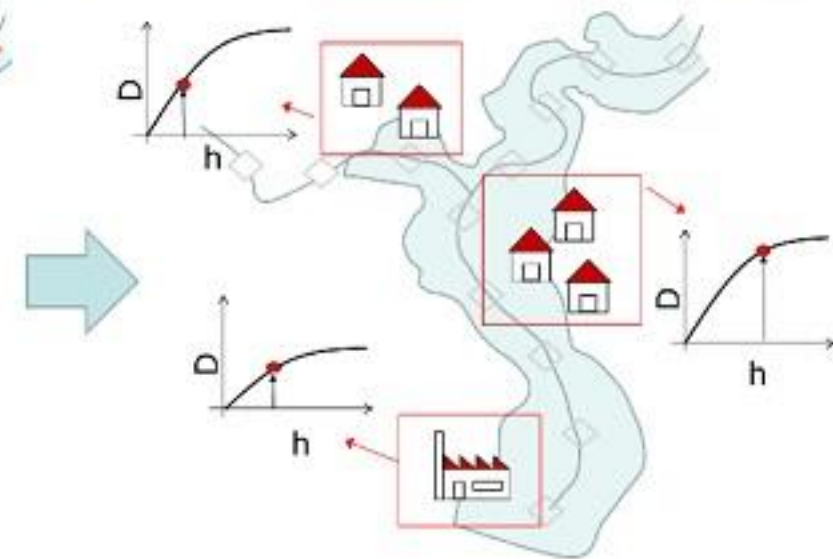
1. Identify EFAS/GloFAS grid cells where flooding is possible

2: rapid flood mapping



2. At each cell, extract flood map from catalogue for closest matching RP > mosaic together into global flood mosaic

3: impact assessment

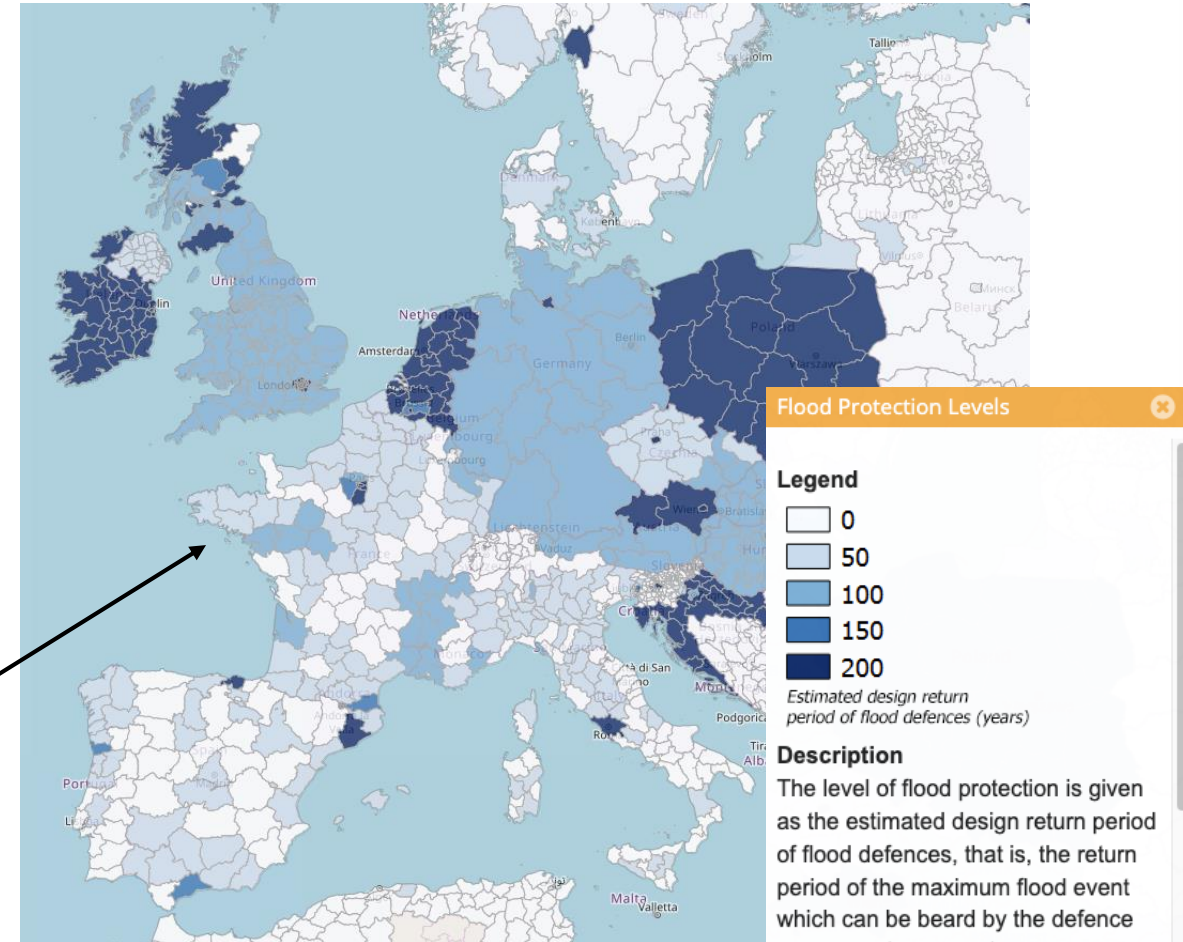


3. Overlay flood inundation with exposure data e.g. population & critical infrastructure

Methodology developed by JRC: [Alfieri et al., 2014](#); [Dottori et al., 2017](#)

Considering Flood Defences

- Flood defences are not explicitly within the DEM used to generate the flood maps
- Instead, estimated flood defence protections from FLOPROS dataset ([Scussolini et al., 2016](#))
 - Regional summaries of design > policy > modelled standards
- Generate 2 scenarios within the forecast:
 1. **Unprotected:**
 - Don't consider role of flood defences
 2. **Protected:**
 - Compare EFAS forecast return periods against FLOPROS protection standards
 - If FLOPROS data > EFAS return period, discard flooding in that area
- EFAS-web Static layer > **Flood Protection Levels**



Limitations of the Rapid Flood Mapping Layer

- Only considers fluvial flooding sources
 - Excludes, pluvial, coastal dam break floods
- Considers flooding only in rivers above 150 km²
- May struggle to capture flooding in urban areas due to
 - Terrain data errors
 - Incomplete flood defence information
- Will reflect biases/errors in the input LISFLOOD long term run data
 - E.g. if the simulation under-estimates streamflow, the flood maps will under-estimate flood extent/depth

Rapid Impact Assessment

- Overlay the forecasted protection Exposure Information ^

- Population: [Global Human Settlements](#)
- Critical infrastructure: Cities, Health facilities, refugee camps, airports

- Summarise impacts per administrative region

- Pop-out table summarises impacts

	PROTECTED	UNPROTECTED
Population affected [No. of people]	5800	30700
Roads affected [km]		
Artificial surfaces [ha]	1080	5059
Agricultural surfaces [ha]	32264	108707
Forest and Seminatatural [ha]	1067	7078
Cities/proportion affected [%]	6	22

Flood Event Information ^

	Low Impact <10k (people)	Medium Impact 10k - 100k
Short Lead time (1-3 days)	Orange	Red
Medium Lead time (4-10 days)	Yellow	Orange
Long Lead time (>10 days)	Yellow	Yellow

	PROTECTED	UNPROTECTED
Estimated peak return period [yr]	177	27
Estimated protection level [yr]	46	0
Estimated flooding start date	ongoing	ongoing
Estimated flooding end date	2023-09-12 12 hours	2023-09-12 12 hours
Estimated flooding duration [days]	6 days 06 hours	6 days 06 hours
Estimated peak date	2023-09-06 18 hours	2023-09-06 12 hours
Estimated flooded area [km ^ 2]	2280	8079
Mean probability exceeding 2-years threshold [%]	100	99
Mean probability exceeding 5-years threshold [%]	100	82
Mean probability exceeding 20-years threshold [%]	96	28



Quick Poll...

Please go to:

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Please answer the first 3 questions



Group Discussion (10 mins)

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Current: NUTS L2/3

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Local Administration Units



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Subcatchments



Exposure In



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Artificial surfac

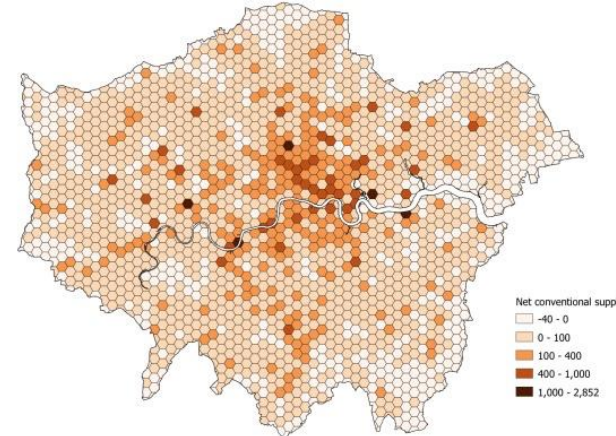
Agricultural sur

Forest and Sem

Cities/proportio

- Each

Hexbins



Net conventional supply
-40 - 0
0 - 100
100 - 400
400 - 1,000
1,000 - 2,852

ct layers

Go back to the Menti Poll

- Answer the next 2 questions:

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- What improvements should be made to the products?
- What other improvements could help?



Additional Poll Questions...

- Do you have national information which you could provide?:
 - Flood maps
 - Flood defences
 - Exposure (population, critical infrastructure)

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- Fill in final 3 questions in the poll with url's to the data



Any Further Questions

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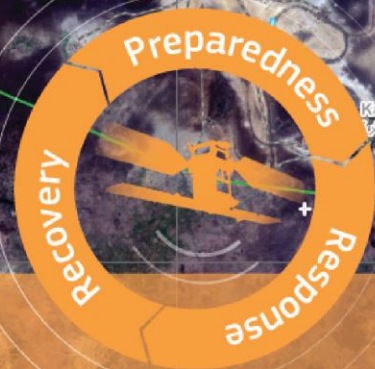
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Rapid Mapping



Risk & Recovery Mapping



Floods



Fires



Droughts



Population



Built-up areas



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