

Supporting Early Action with a flood Impact-based Forecasting: a case study of Tropical Cyclone Idai

Re**ceipt**

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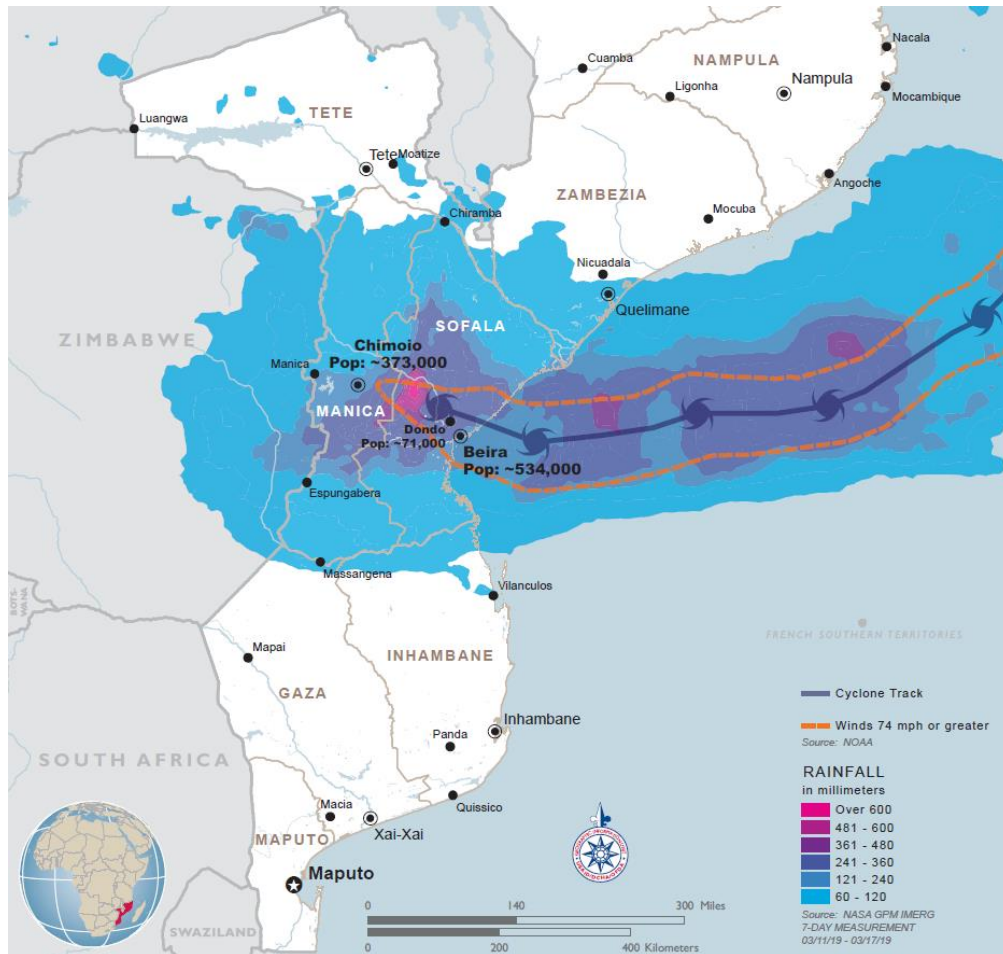
climatestorylines.eu
 [RECEIPT_eu](https://twitter.com/RECEIPT_eu)



RECEIPT has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant agreement No. 820712

Tropical Cyclone Idai | Impacts

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Fatalities
600

Affected people
1.85 M

Displaced people
478'000



Cost of recovery & reconstruction
2.9B USD



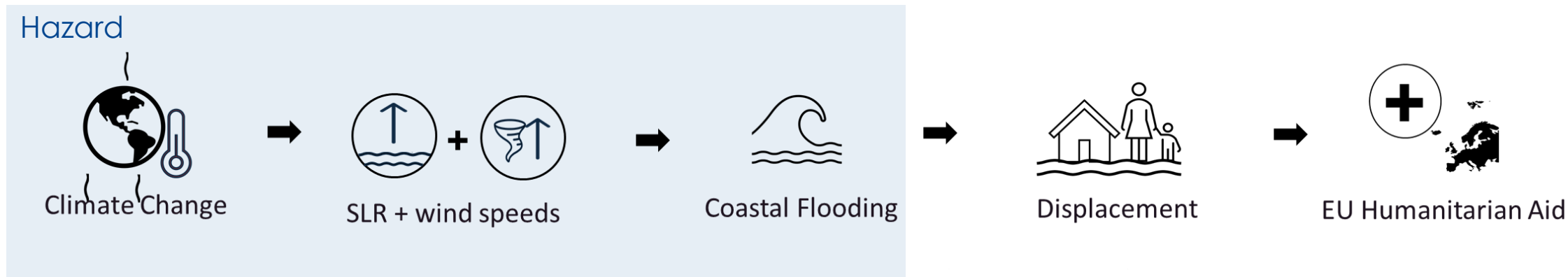
Tropical Cyclone Idai | The storyline

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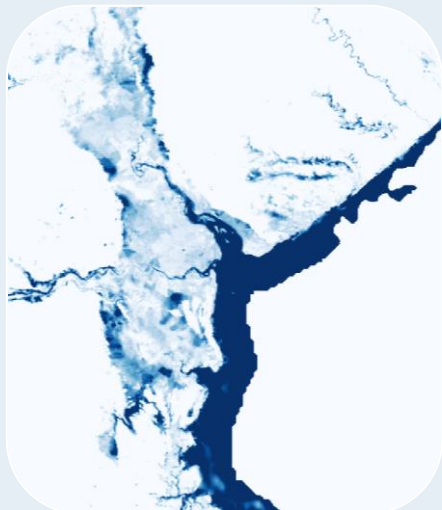


Tropical Cyclone Idai | The storyline

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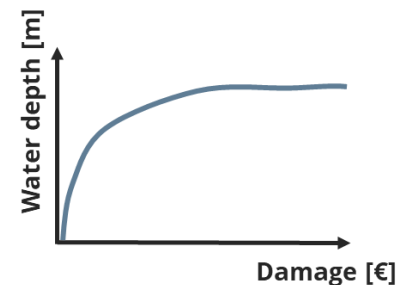
From flood depth to direct damage



Flood depth
modelled by
PIK (factual +
scenarios)



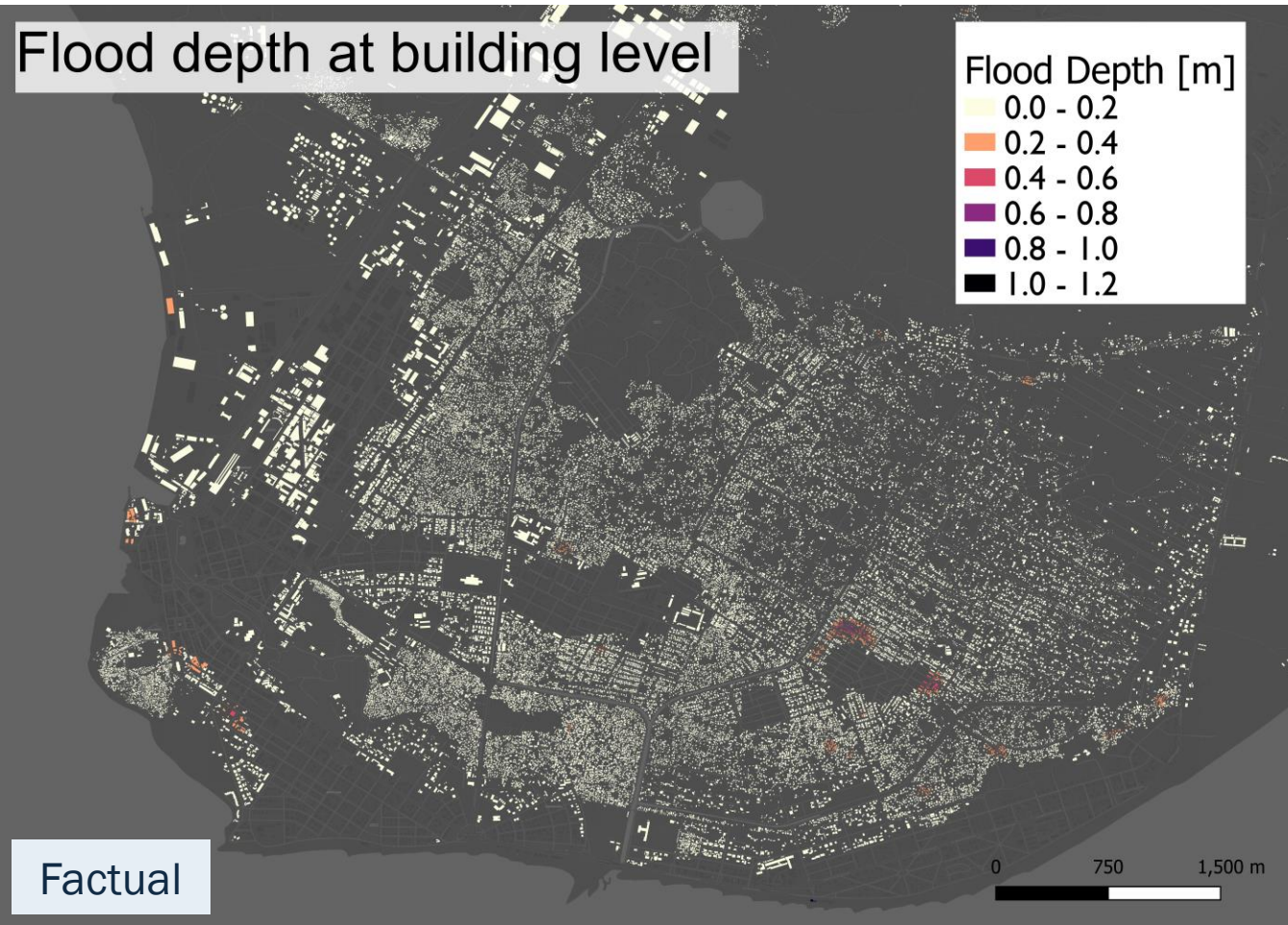
OpenStreetMap
building data



JRC water
depth-damage
functions



Flood direct
damage at
building level
& aggregated



Total direct damage to the buildings in Beira

Factual
257 M EUR

2050 SSP5-8.5 (high)
+19% Wind; +35cm SLR
569 M EUR

2100 SSP5-8.5 (high)
+33% Wind; +156cm SLR
871 M EUR

What next?

ReGeipt

- **RECIEPT** has come to an end



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 - Exploitation of knowledge on past events
 - Allows for multi-source approach
 - Dynamic framework and dynamic variables (i.e. population movements)

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 - Increased accuracy and spatial resolution (RS)
 - Scenario-based approach & stochastic capacity (HM)

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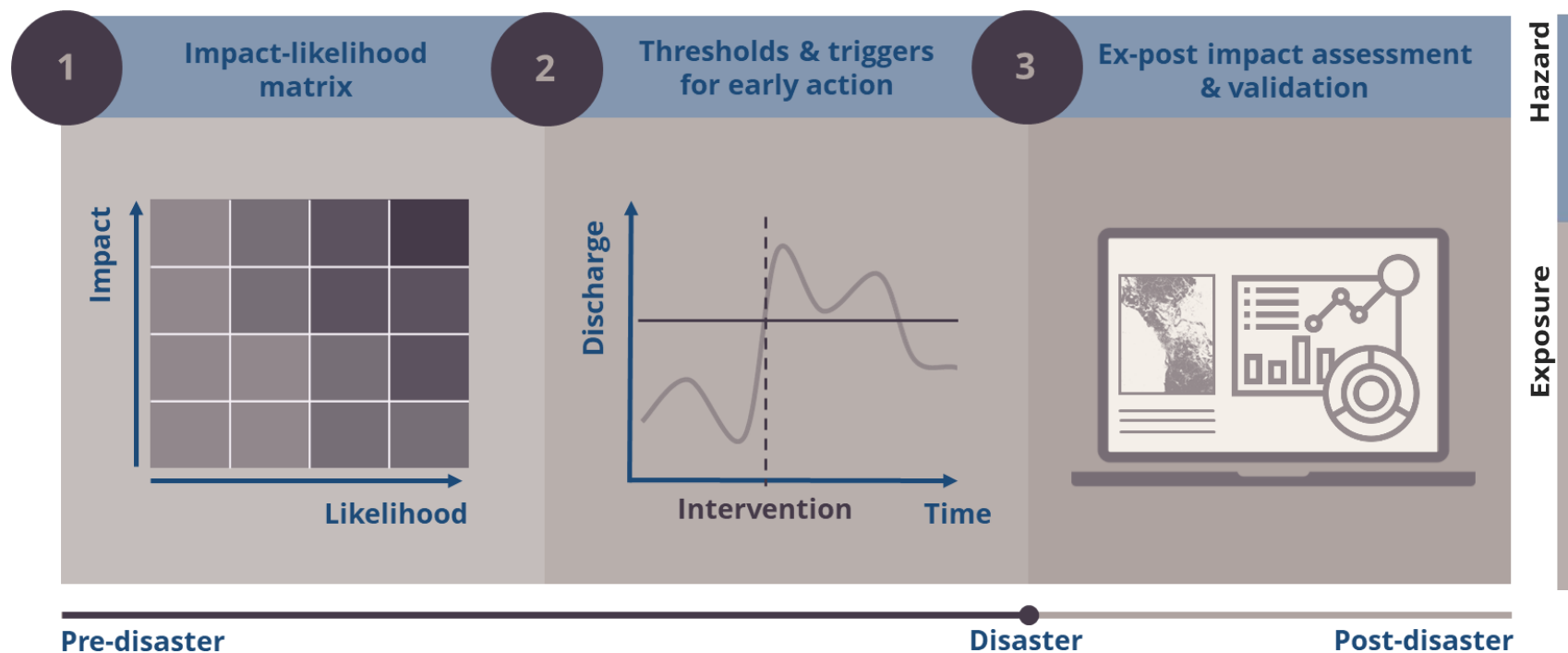
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Goals

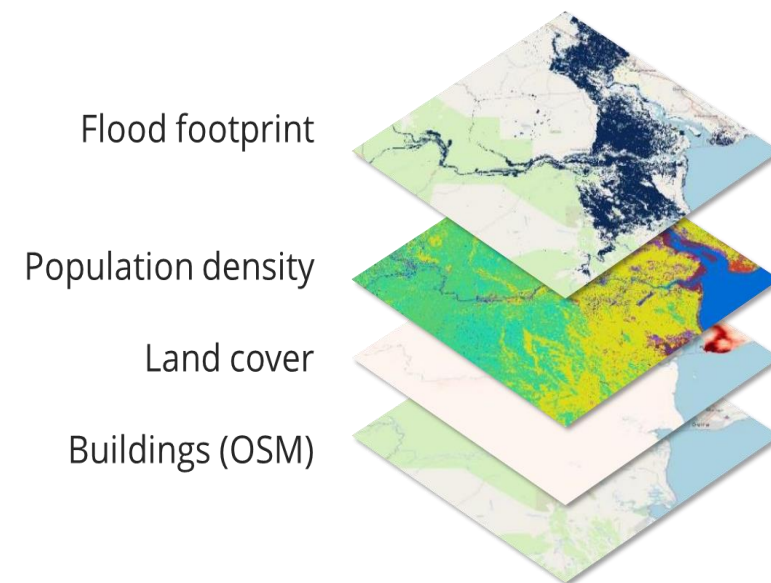
- **Storyline** approach informs policy makers in a **tangible** way
- Ready-made & event-specific impact maps to guide **local adaptation** & **resilience** building
- Improved disaster **preparedness** to trigger informed early action

Impact-based Forecasting & Remote Sensing

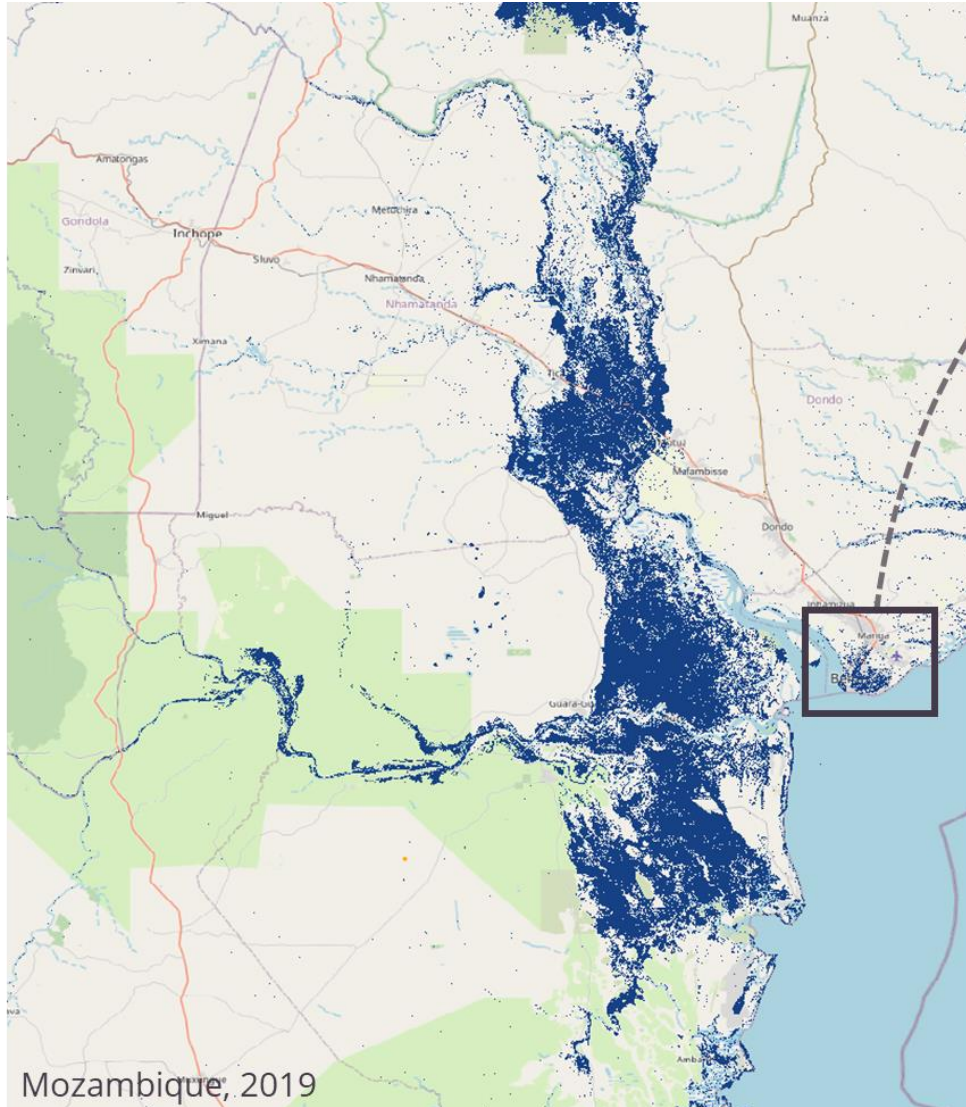
“Evolving from what the weather *will be* to what the weather *will do*”



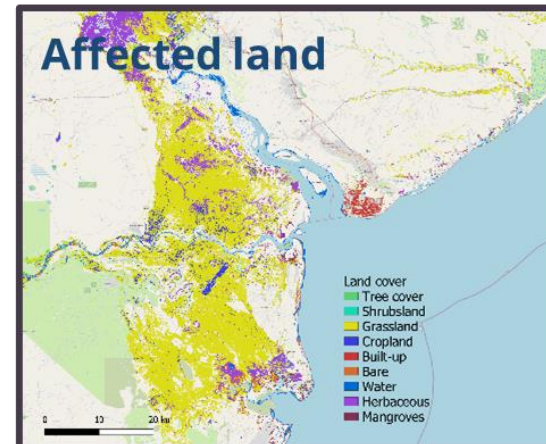
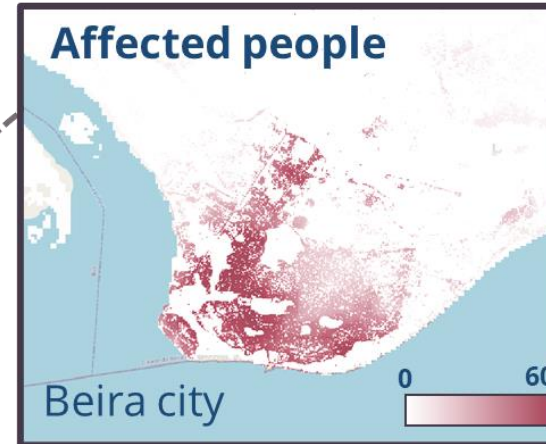
Satellite-derived flood footprint (Sentinel-1 SAR)



A snapshot of the results



Flooding caused by Tropical Cyclone Idai, March 2019



Affected people

Impact reports:
1.85 M⁽¹³⁾

Satellite-derived:
1.87 M

Affected land

Impact reports:
3000 km²⁽¹⁴⁾

Satellite-derived:
3600 km²



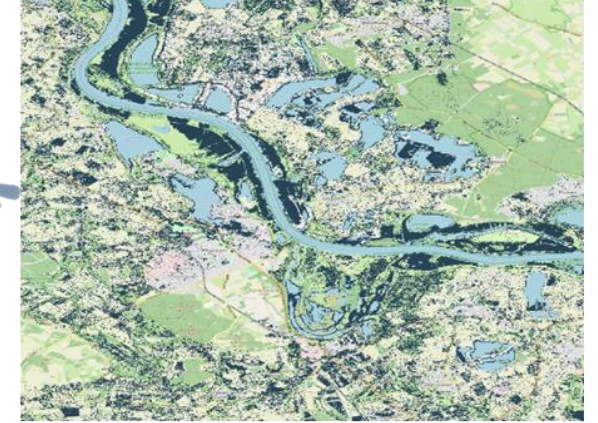
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Approach replicability

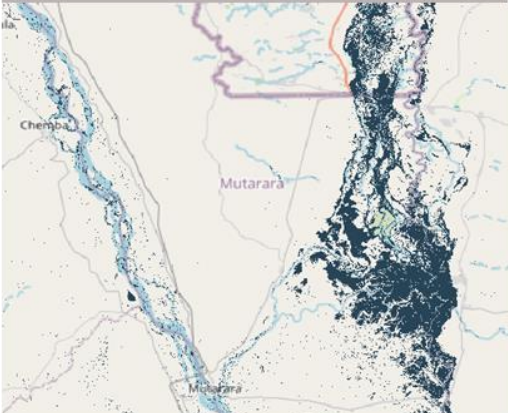
Galicia, Spain (2019)



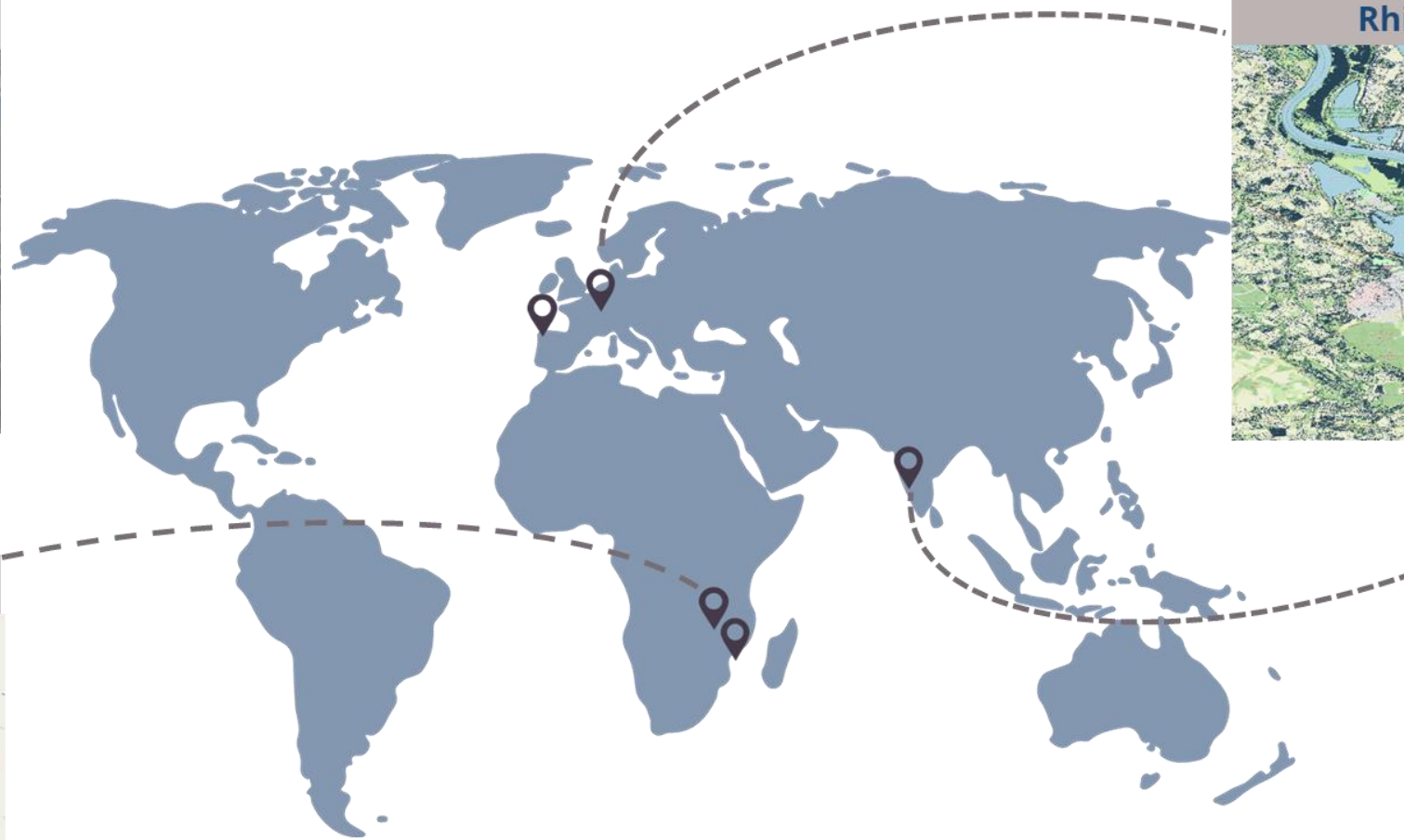
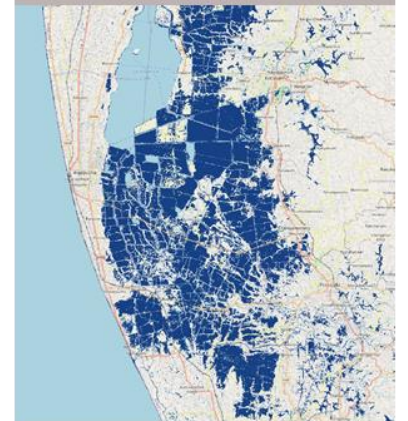
Rhine, Germany (2021)



Zambesi, Malawi (2015)



Kerala, India (2018)



Receipt



Modelled damage for each scenario

Climate + SSP scenario	Modelled direct damages [million EURs]	Increase	(%) Increase
Factual (modelled) 2019	€ 257.00		
Year 2050			
2050 SSP1-2.6 (low) +1.8% Wind; +1.4cm SLR (Climate only)	€ 310.00	€ 53.00	17.10
2050 SSP5-8.5 (median) +5.7% Wind; +35cm SLR (Climate only)	€ 433.00	€ 123.00	28.41
2050 SSP5-8.5 (high) +19% Wind; +35cm SLR (Climate only)	€ 569.00	€ 136.00	23.90
Year 2100			
2100 SSP1-2.6 (low) +21% Wind; +39cm SLR (Climate only)	€ 361.00	€ 104.00	28.81
2100 SSP5-8.5 (median) +33% Wind; +72cm SLR (Climate only)	€ 764.00	€ 403.00	52.75
2100 SSP5-8.5 (high) +33% Wind; +156cm SLR (Climate only)	€ 871.00	€ 107.00	12.28