

2021 Central Europe floods Luca Molini



Precipitation data: Extended version of E-OBS. Graphic credits: © Deutscher Wetterdienst 2021 (Last update: 19.08.2021). Geodata: © GeoBasis-DE/BKG 2020 (Last update: 01.01.2020).

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Deutscher Wetterdienst

R E S E A R C H FOUNDATION



Deadliest floods in Europe

In the last 20 years



- 230+ people have died in the floods, 190+ in Germany, 40+ in Belgium
- 10+ billions € damages (source: Berenberg)
- "one of the greatest natural disasters our country has ever known" Belgian Minister of Home Affairs



Aristotle overview

operational since 2016

□ 19 institutions across Europe, including two international organizations (ECMWF and CSEM)

□ 6 natural hazards

- forecastable hazards: severe weather, **flooding**, forest fire

European Natural Hazard Scientific Partnership"

- non-forecastable hazards: *earthquakes, tsunami, volcanoes*





Aristotle overview

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 Goal: providing multi-hazard impact-oriented assessments to ERCC-AT to coordinate preparatory and response actions within and outside Europe to natural disasters - part of UCPM mandate

European Natural Hazard Scientific Partnership"

Likelihood	High	monitor	prepare	act
of impact	Medium	nil	monitor	prepare
	Low	nil	nil	monitor
Decision Matrix		Sub-national Resources	National Resources	International Resources
		Required resources		



Flood hazard group



Guidelines

- Operational times are Monday to Friday, 09-17 and Saturday/Sunday, 09-15 Brussels time. The same routines are followed on public holidays.
- Emergency reporting is provided for both European and Global domains, 7 days per week.
- Weekly Monitoring Reports are prepared on Monday / Wednesday / Friday, for Europe and Global.
- Only events assessed at the Monitor (yellow) level or higher are reported to the ERCC. However, if the ERCC have
 specifically asked for green events to be included then they should be.
- The operational service for flooding will provide advice for catchment areas larger than 2000km2 in Europe through EFAS and larger than 5000 km2 through GloFAS for the rest of the world.
- Flash flooding should not be reported, unless its extent is significant <u>and</u> embedded within large scale riverine flooding.



Riverine flooding

- 6-hourly
- 1.5km grid spacing
- 2 deterministic
- + 2 probabilistic
- A>1000 km²



Impacts • ECMWF-ENS median vs flood protections flood inundation + exposures (pop.)















Likelihood of impact = **High**

- Forecasts showed high likelihood (>60%) of exceeding 5 year return period
- High model skill in this area
- Lead time < 48 hrs
- Local authorities had already issued warnings
- Reports of flooding in some areas were already being received

Required resources = **National**

- Affected countries have very high coping capacities
- Multiple countries where flood impacts were possible

Prepare level declared

	High	Monitor	Prepare	Act
Likelihood of Impact	Medium	nil	Monitor	Prepare
	Low	nil	nil	Monitor
Decision Matrix		Sub-national resources	National resources	Inter-national Resources
		Required resources		





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Courtesy of Calum Baugh (ECMWF)

MAIN DETAILS						
Area	Central Europe (Switzerland, W Germany, France, Belgium, and The Netherlands)	Operation mode	Proactive			
Event start	14 July 2021, 16:00 UTC	Event end				
Report created	14 July 2021, 09:32 UTC	Report finalized	14 July 2021, 11:54 UTC			

Resources

national

national

Forecast return period of ERIC

COSMO-LEPS 2021-07-14 00:00 UTC





Conclusions

- Flood and flash flood signals were already significant 48-72 hours before the event
- A pro-active emergency report was provided ahead of an event (~12 hours)
- Most of the impacts (casualties, in particular) occurred in a very localized area
- The assessment focused on riverine floods as no flash flood-induced impacts were available back then
- Having more routinely updated forecast information would be helpful to extend
 the Aristotle FL service



Thank you!



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