

# EUMETNET Meteoalarm and CAP

*CAP Workshop 2019, 17<sup>th</sup> – 18<sup>th</sup> October, Mexico City*

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## EUMETNET

- **EUMETNET** is an association of 31 European National Meteorological Services
- **EUMETNET** provides a framework to organize co-operative programs between its members in the various fields of basic meteorological activities.
- These **activities** include observing systems, data processing, forecasting, research and development and training.

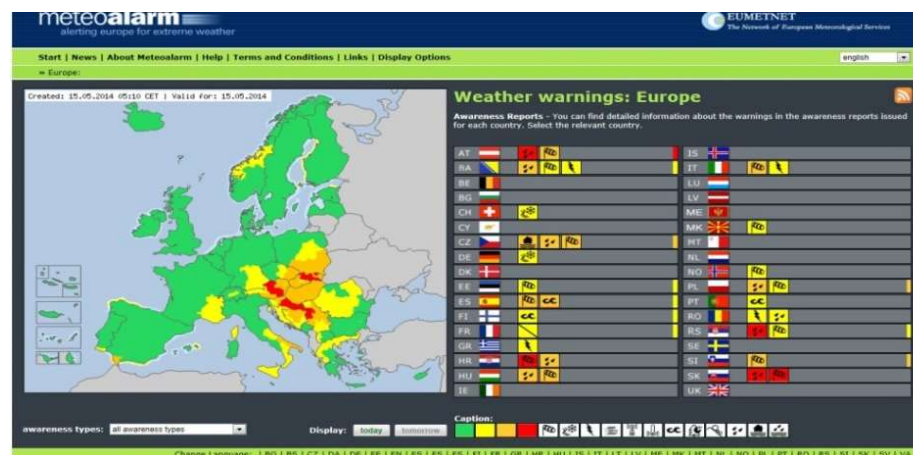
<http://www.eumetnet.eu>



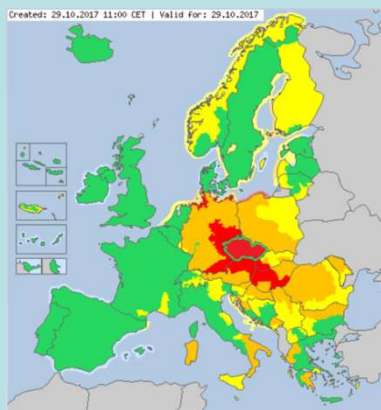
## What is Meteoalarm?

- An **impact-oriented, common framework** to aggregate and display meteorological and hydrological warnings of EUMETNET members
- Making available warnings in an **easy and understandable way** to the general public and to European (re)users
- Multi-hazard programme created in the 2000s, operational since 2007
- Currently **37 NMHSs and national partners** in Europe are participating, programme lead by ZAMG, Austria

<http://www.meteoalarm.eu>

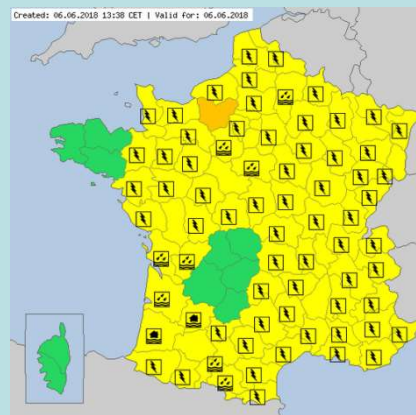


## The success of Meteoalarm



a consistent  
common  
warning  
picture

Cyclone "Hewart"  
2017/10/29



integrated  
regional  
warning  
system in 33  
languages



reach out to  
European  
users

Ops Center of ERCC, Brussels



Dissemination  
of warnings to  
(re)users via  
CAP

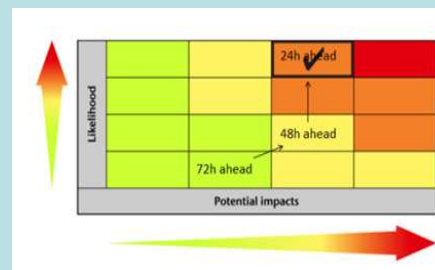
Cascading Effect

# The success of Meteoalarm



yearly  
partner  
group  
meetings

Lisbon 2018



Concept of uncertainty

joint  
development  
of guidelines  
and warning  
concepts



integration  
of new  
partners

Moldova 2017



worldwide  
knowledge  
transfer



## Main Concepts

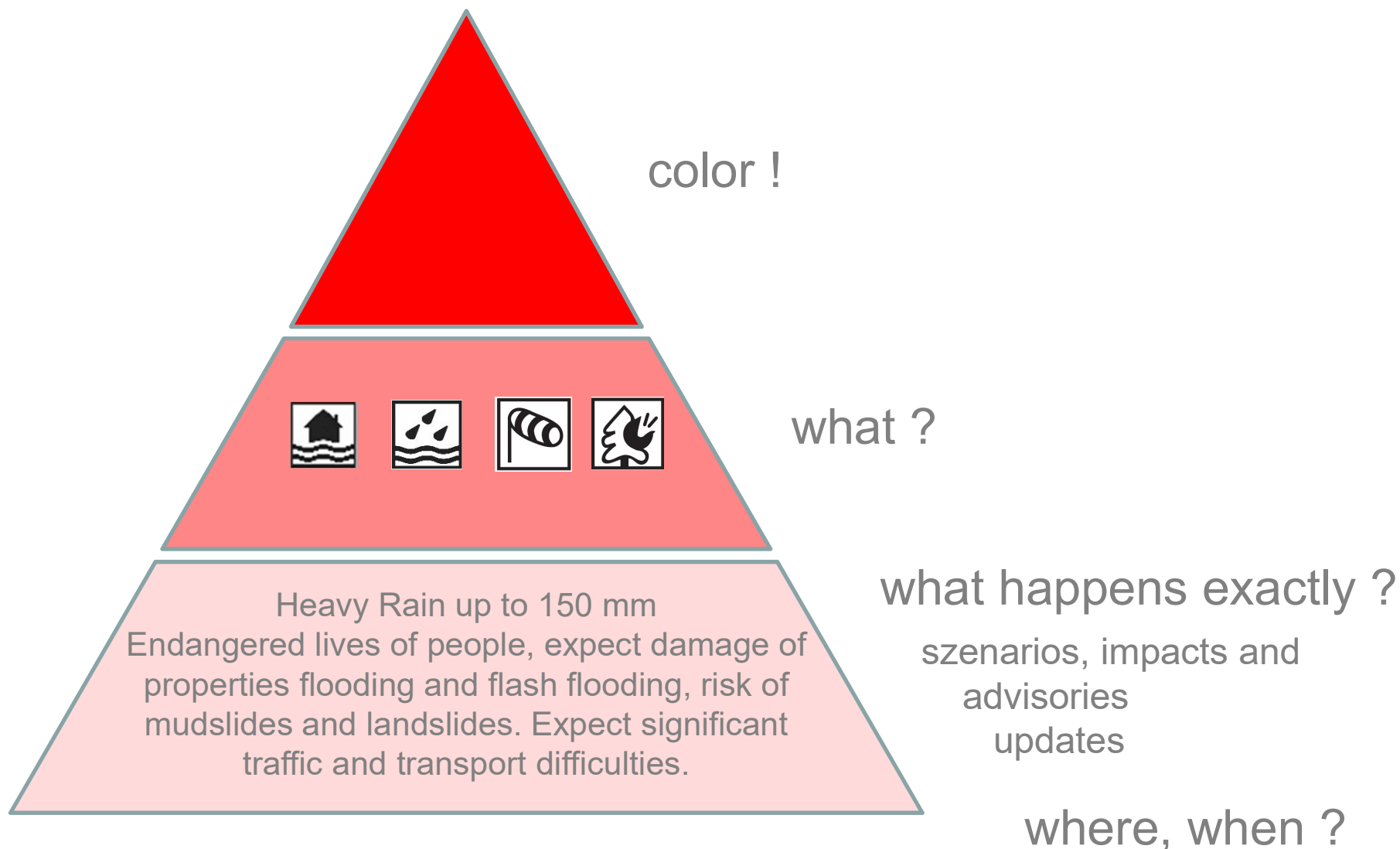
- Added common value through **consistent warning philosophy**, easy and understandable four level color code
- Warning: **tangible and understandable** description of an expected damage scenario (*information on impacts*) and a clear advice what to do (*instructions*)
- Meteoalarm 3 C's:
  - **C**ontent
  - **C**ommunication
  - **C**o-operation

Colour	One word	What to do?	Damage / Impact
Green	Weather report	usual phenomena	- - -
yellow	Be aware!	caution with exposed activities	exposed objects (avoidable)
orange	Be prepared!	keep informed in detail, follow advice of authorities	general damages (not avoidable)
red	Take action!	follow order of authorities under all circumstances!  be prepared for extraordinary measures!	extreme damage and / or casualties extreme damage (mostly) on large areas, threatening life and properties (not avoidable, even in otherwise safe places)

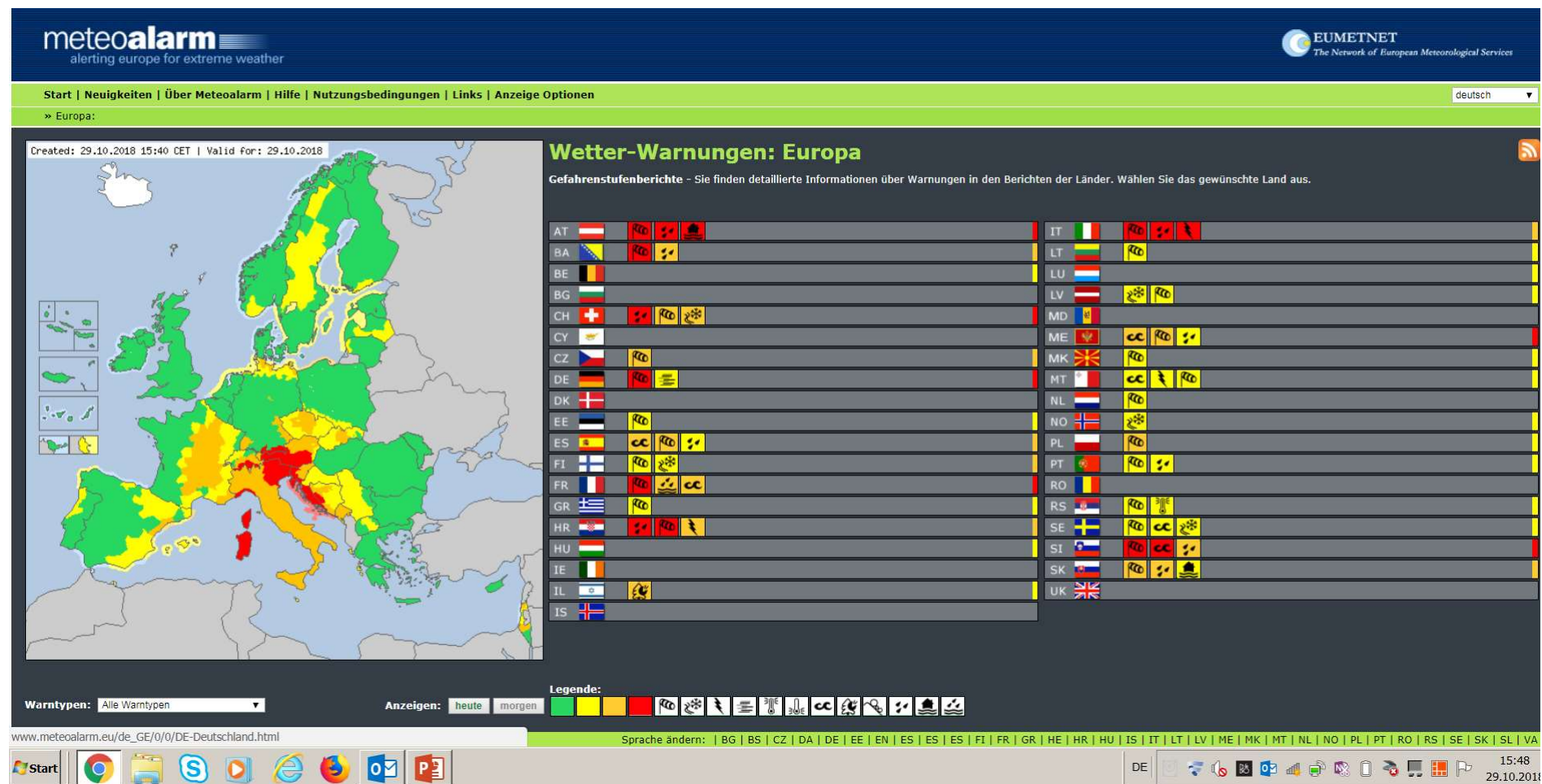




## Information pyramid – put most important message first!




# Storm/Rain October 29, 2018 – European level






# Storm/Rain October 29, 2018 - Country level



alerting europe for extreme weather




The Network of European Meteorological Services

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deutsch






















» Europa » Kroatien:

Created: 29.10.2018 15:45 CET | Valid for: 29.10.2018















## Wetter-Warnungen: Kroatien


**Gefahrenstufenberichte** - Detaillierte Informationen über die Warnungen finden sich in den Berichten der einzelnen Länder. Bitte die entsprechenden Gebiete auswählen.

Dubrovnik regija	  	Gospic regija	  	Karlovac regija	 
Knin regija	  	Osijek regija	 	Rijeka regija	  
Split regija	  	Zagreb regija	 		

**Küsten:**

Kvarner and Kvarneric region	 	Middle Dalmatia region	 	North Dalmatia region	 
South Dalmatia region	 	Velebit channel region	 	West Istrian coast region	 

**Legende:**




Wartypen: Alle Wartypen


Anzeigen: heute morgen

Maps of the state territory and borders of the Republic of Croatia were only prepared for and serve the purpose of this document.

Mehr Information:



# Storm/Rain October 29, 2018 - Regional level



**Gültig von** 29.10.2018 00:00 CET **bis** 29.10.2018 23:59 CET


**Regen**


Gefahrenstufe: **Rot**

hrvatski:  
Mjestimice vrlo obilna kiša. količina oborine 80-140 mm PPODUZMITE MJERE kako bi se zaštitili. Djelujte prema savjetima danim od strane nadležnih službi. Očekuju se izraženije poplave koje će zahvatiti veće područje te poplaviti imovinu uz značajan rizik za živote te mogućnost evakuacija. Vjerojatni su veći prekid i prometovanju te prekid i gubitak energije, komunikacije i opskrbe vodom. Opasni uvjeti za vožnju zbog smanjene vidljivosti te proklizavanja na mokrim kolnicima.

english:  
Heavy rain locally. rainfall 80-140 mm TAKE PRECAUTIONS to protect yourself. Follow advice provided by relevant authorities. Strong flooding is expected in a large area. Properties will be flooded, lives will be at considerable risk, and evacuations are possible. Major traffic interruptions are likely, along with power outages, communication network failures and water supply interruptions. Difficult driving conditions caused by reduced visibility and wet and slippery roads.

Zurück zu Europa:





**Gültig von** 29.10.2018 00:00 CET **bis** 29.10.2018 23:59 CET


**Wind**


Gefahrenstufe: **Orange**

hrvatski:  
Jak i na udare olujan jugoistočni i južni vjetar. srednja brzina vjetra 40-75 km/h; najjači udar vjetra 65-110 km/h BUDITE SPREMNI na poremećaje, oštećenja konstrukcija i rizik od ozljeda zbog iščupanih stabala, polomljenih grana te letećih krhotina. Moguć je prekid prometa i prekid opskrbe električnom energijom.

english:  
Strong SE and S wind with stormy gusts. average wind speed 40-75 km/h; maximum gust speed 65-110 km/h BE PREPARED for disruptions, building damage and risk of injury caused by uprooted trees, broken branches and flying debris. Traffic interruptions and power outages are possible.

Zurück zu Kroatien:





**Gültig von** 29.10.2018 15:00 CET **bis** 29.10.2018 23:59 CET

**Gewitter**

Gefahrenstufe: **Gelb**

hrvatski:  
Mjestimice izraženiji pljuskovi i grmljavina, osobito krajem dana i u noći. vjerojatnost grmljavine 40-70 % BUDITE NA OPREZU zbog mogućih jačih grmljavijskih nevremena. Posebno pripazite u izloženim područjima kao što su planine, šume i livade odnosno otvoreni tereni. Mogući su prekid i u aktivnostima na otvorenom.

english:  
Thundershowers locally, especially in the night. lightning risk 40-70 % STAY ALERT for possible heavy thunderstorms. Be especially careful in high-exposure areas such as mountains, forests, meadows and open grounds. Interruptions in outdoor activities are possible.

Mehr Information:

Anzeigen: **heute** morgen

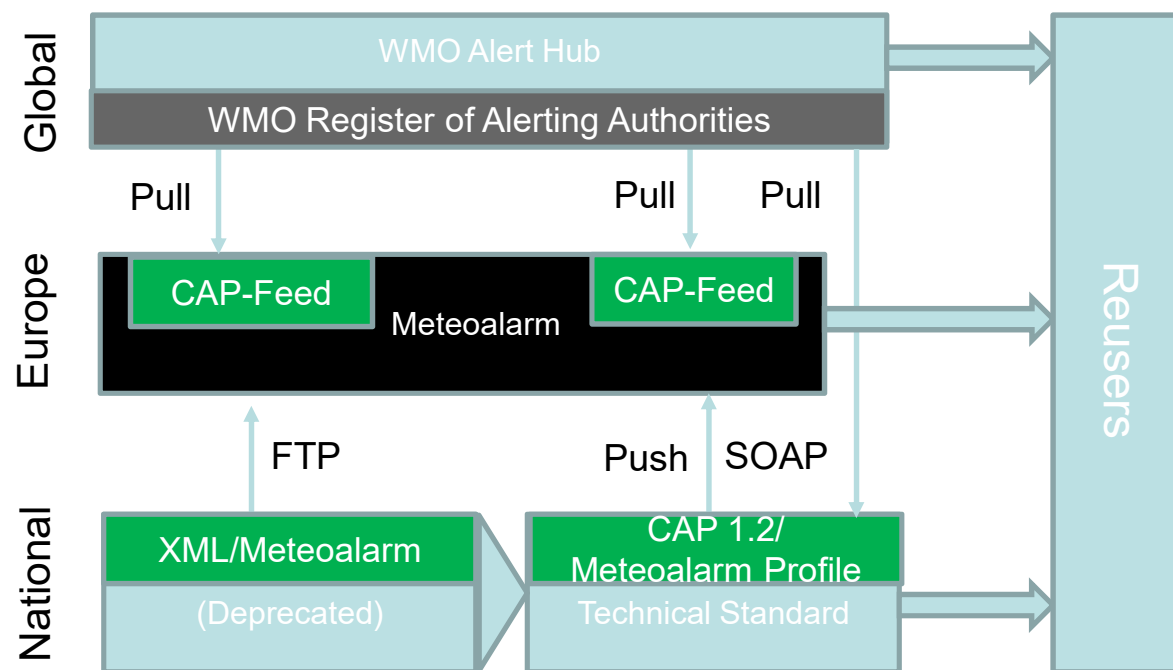
## Community Building



- Yearly partner group meetings, topics include:
  - communication with civil protection
  - integration of national partners (hydro-services,...)
  - impact-oriented warnings (damage description and instructions)
  - exchange of case studies and best-practices
  - promoting use of CAP (since 2014) and WMO RAA
- Led to
  - harmonized format of warnings, best practices
  - enhanced cross-border collaboration
  - 31/37 NMHSs delivering CAP, 4 in testmode (as of 10/2019)

## Data Collection and Dissemination

- Alerts sent by NMHSs via Common Alerting Protocol (CAP)
- Aggregation and dissemination of alerts in real-time via CAP feeds to (re)users of the data (e.g. apps or services by private sector, WMO GMAS, ...)



## Status of warnings in Meteoalarm

- **37** NMHSs delivering colour-coded warnings for an agreed set of hazards in a standard technical format
- **12** hazards
- **31/37** transmitting CAP alerts to Meteoalarm, 4 are testing
- **34/37** Countries delivering warning texts
- **29/37** Countries delivering English warning information
- **11/37** Countries delivering „flood“ or „rain and flood“ warnings
- **18/37** Countries delivering impact-oriented warnings, impact information and/or instructions/advisories)

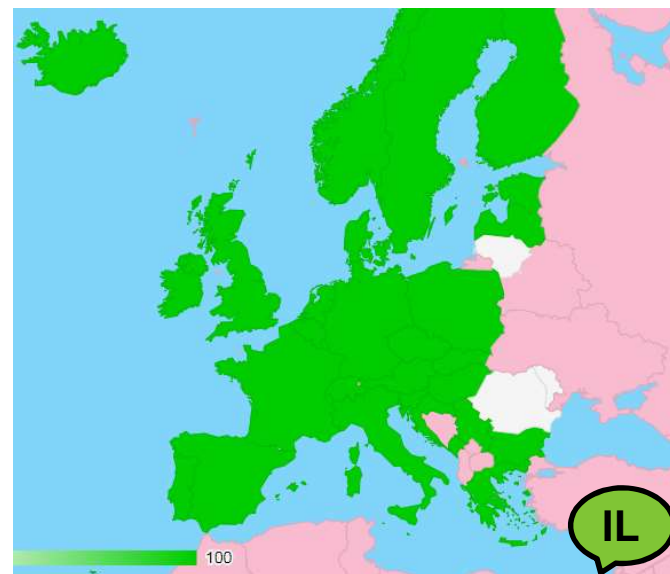
## Warning types: IbW, IW and IoW

- **Impact-based warning (~ prod. process)** - Assessment of the expected impact scenario, often multi-hazard
- **Impact-warning (~ prod. process)** - User-specific impact scenarios
- **Impact-oriented warning (~ warning format)**  $\equiv$  A warning which has a tangible and understandable description of an expected damage scenario (information on impacts) and/or a clear advice what to do (instructions/advisories) (UNISDR Sendai Framework of Actions)
  - Broader term for all warnings addressing ***what the weather will do***
  - Depending on the production process, an IoW may be a climatology-based warning, an impact-based warning, or another type of warning
- Our recommendation is, that NMHSs could start simple with generic damage descriptions/advisories to tell people what the weather will do (IoW)
- Upgrade later to comprehensive IbW-production processes/dynamic texts

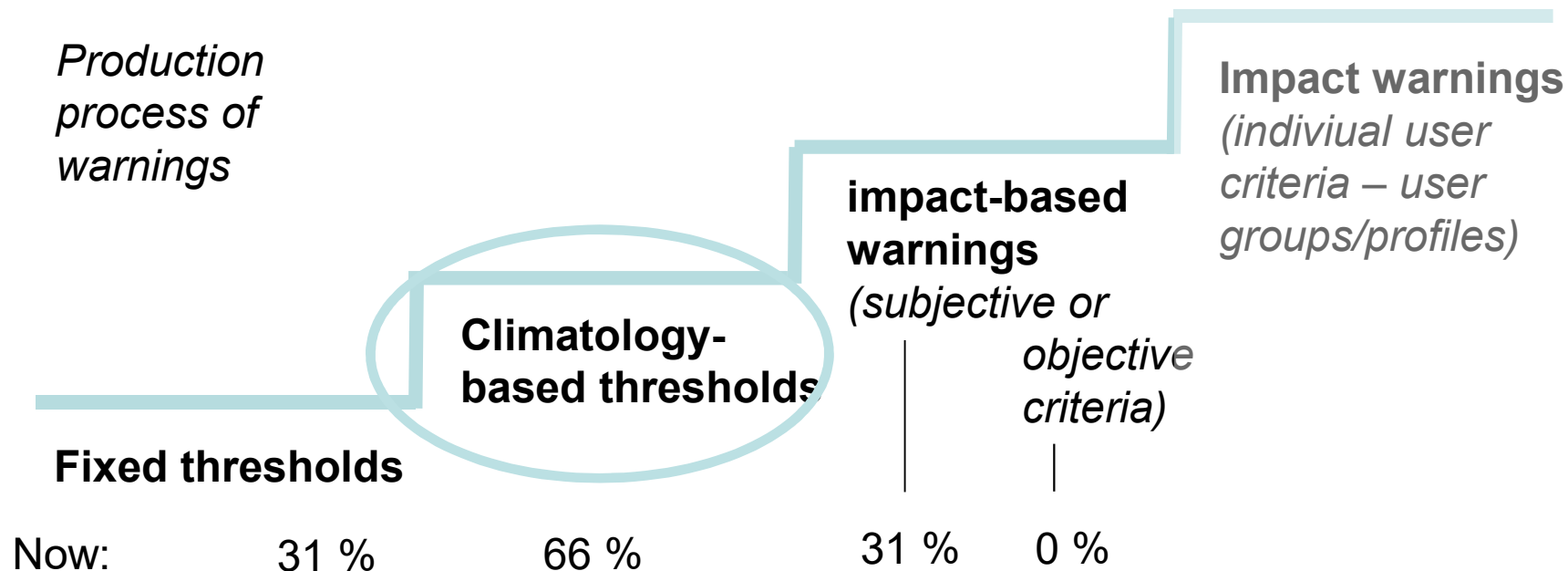


## Meteoalarm survey on IbW/IoW

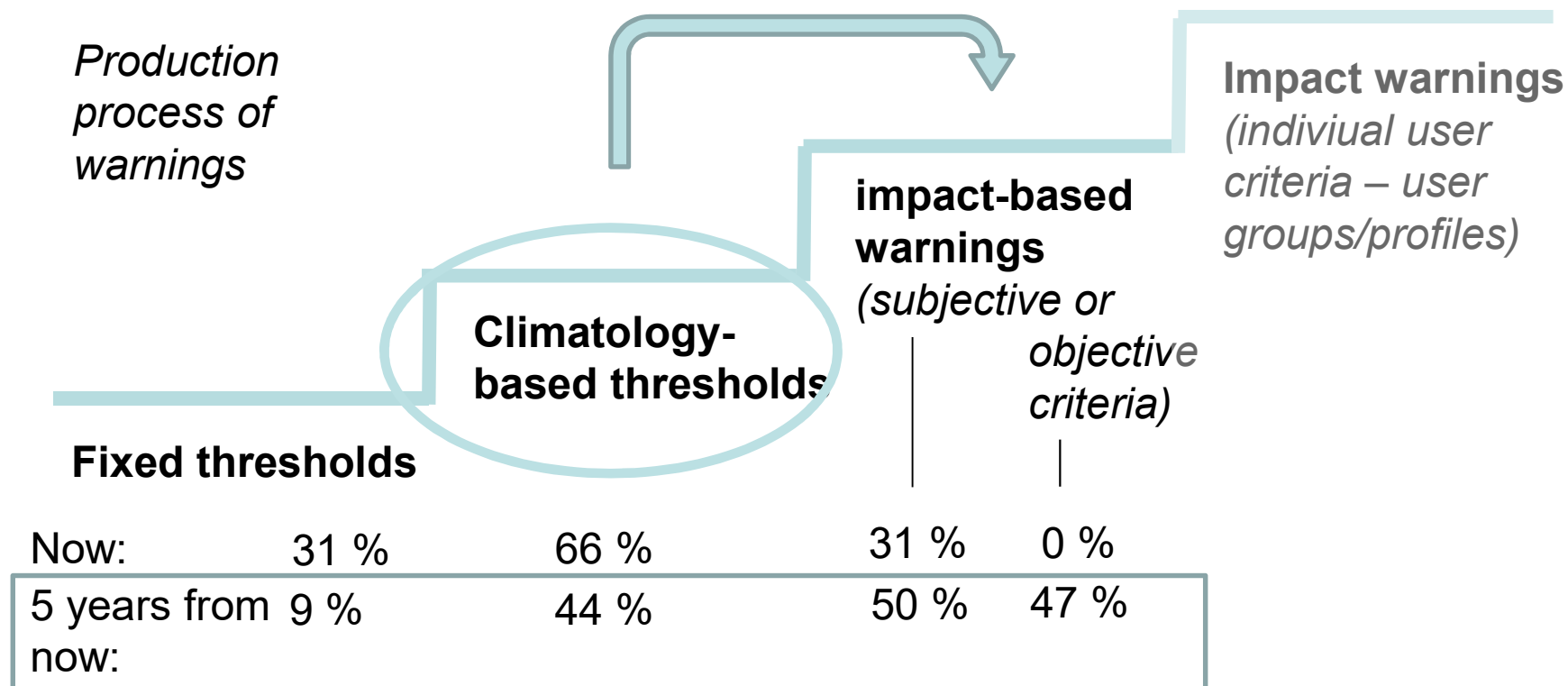
- Carried out a survey among Meteoalarm members in August 2018 – May 2019 (79 questions)
- We received filled out questionnaires from **32/37** partners (**86%** response rate)
- Presentation of results at EMS2019 in Copenhagen (09/2019)
- Publication planned for early 2020



## Production process of European NMHSs warnings

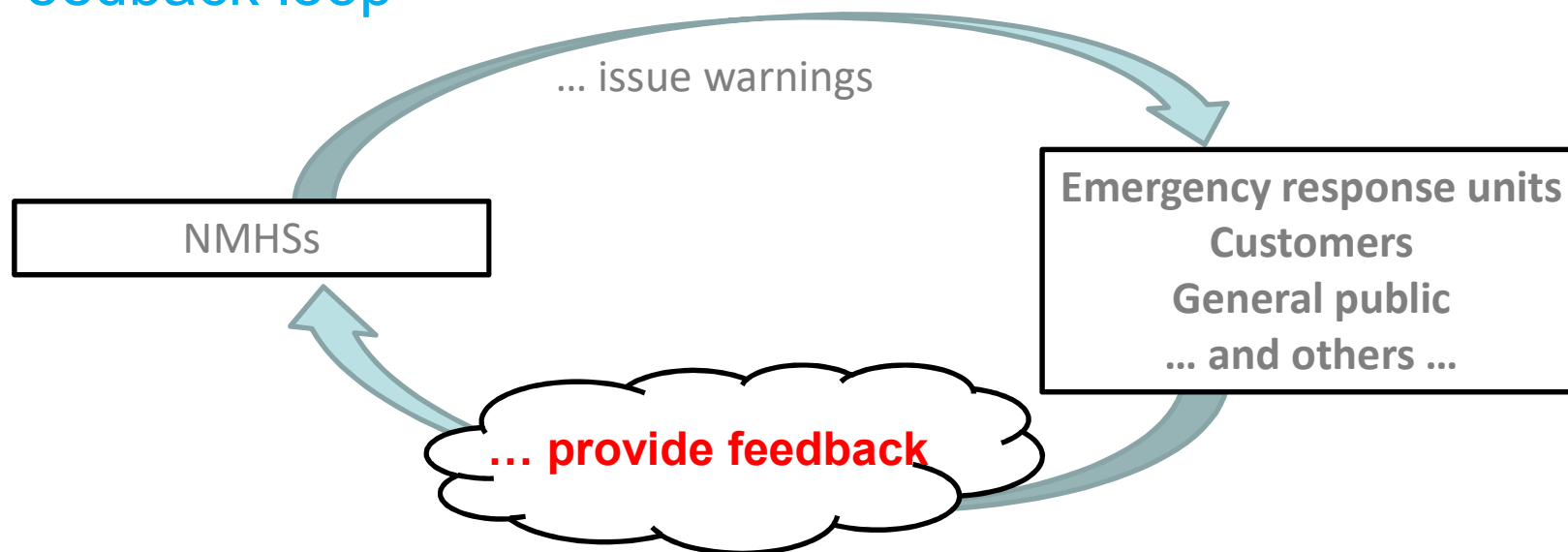


## Production process of European NMHSs warnings



- How do NMHSs climb the step to IbW?
- How do NMHSs address user needs (user groups/user profiles) to get towards IW?

## Feedback loop



- Feedback is often either still missing or not (sufficiently) considered yet!
- It's important for operational meteorologists to know „what happens out there“ in realtime to verify and eventually adapt their warnings
- Real-time availability and international exchange of ground-truth data is important
- Lacking of standards for feedback (crowdsourced) data

## Meteoalarm and CAP – Developments 2018/2019

- Meteoalarm TT on CAP
  - to define mandatory CAP elements for a new Meteoalarm CAP profile
  - to find an agreed position towards OASIS CAP Subcommittee (Event type list)
- Contribution to WMO (CAP/IbW and GMAS)
- Participation in the CAP Workshop 2019 in Hong Kong
- Supporting members to implement CAP

## Meteoalarm and CAP - What next

- Meteoalarm TT on CAP to elaborate on
  - Impact-oriented warnings
    - Use of severity, urgency, certainty and other (optional) elements
    - Work on / share (best-practice) examples
  - How to use CAP for low-likelihood high-impact events (“watches”, including spatial uncertainty) and risks (e.g. wildfire risk)
  - Meteoalarm “Green Warnings”
    - Broad consensus, that Green (Minor) is not considered as an alert – possible outcome: Meteoalarm will not map/redistribute Green (Minor) warnings
  - Alerting polygons vs. geocode – How to represent national borders in polygons?
  - Refinements of Meteoalarm CAP profile where needed
- Contribution to WMO Guidelines/use-cases on CAP/IoW



## Meteoalarm 2.0 - Contentwise

- “Meteoalarm classic” operational since 2007, major redesign required
- Further support EUMETNET members to deliver easy understandable impact-oriented, multi-lingual warnings
- Additional warning parameters
- Incorporation of crowdsourced impact observations
- Worldwide knowledge transfer for regional warning platforms / warning community building
- Support of GMAS (Global Multi Hazard Alert System) concept of WMO

## Meteoalarm 2.0 – Technical Aspects

- Based on microservices architecture and MQTT
- Input: Push via SOAP or REST, or pulling ATOM/RSS CAP feeds of NMHSs, output via push or pull (feeds)
- Focus on re-users of the warnings
- New warning parameters (e.g. drought, pollen,...)
- Possibility to process CAP-polygons
- Currently design phase – Start of implementation by the end of 2019
- Operational in autumn 2020
- Retirement of “old” system thereafter

# Contacts

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