EUMETNET Meteoalarm and CAP

CAP Workshop 2019, 17th – 18th October, Mexico City

Rainer Kaltenberger, ZAMG

ZAMG

meteoalarm
alerting europe for extreme weather

EUMETNET
European Meteorological Services Network

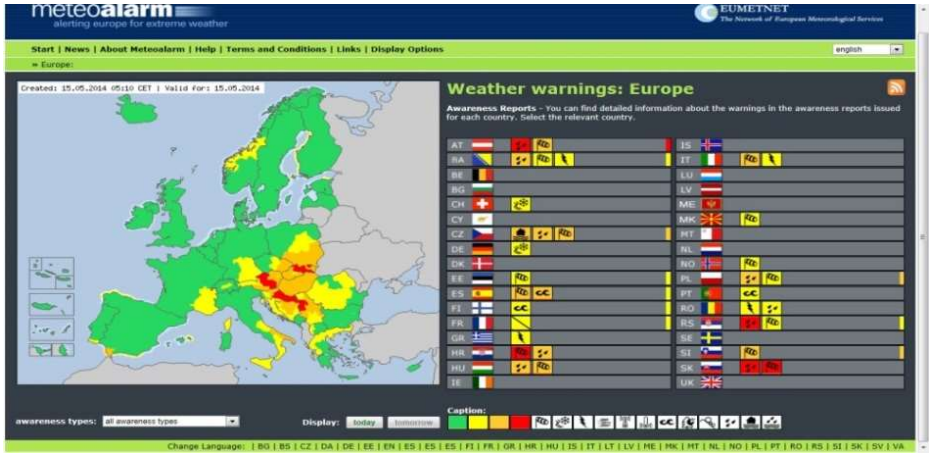
EUMETNET

- **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

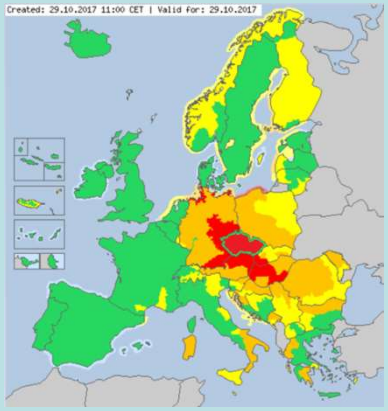
What is Meteoalarm?

- 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



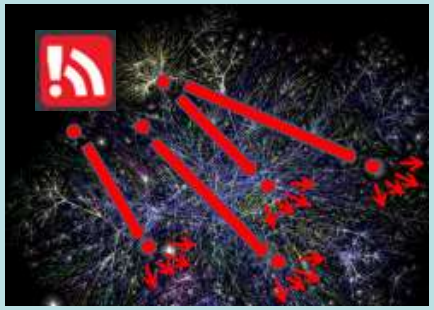
a consistent common warning picture

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

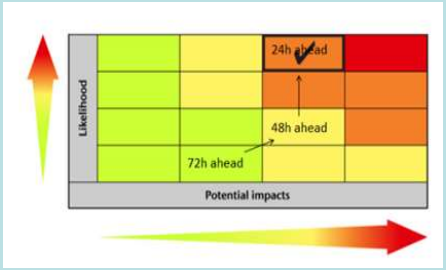
Cascading Effect

EUMETNET
European Meteorological Services Network

The success of Meteoalarm

Lisbon 2018

yearly partner group meetings



Concept of uncertainty

joint development of guidelines and warning concepts

Moldova 2017

integration of new partners

worldwide knowledge transfer

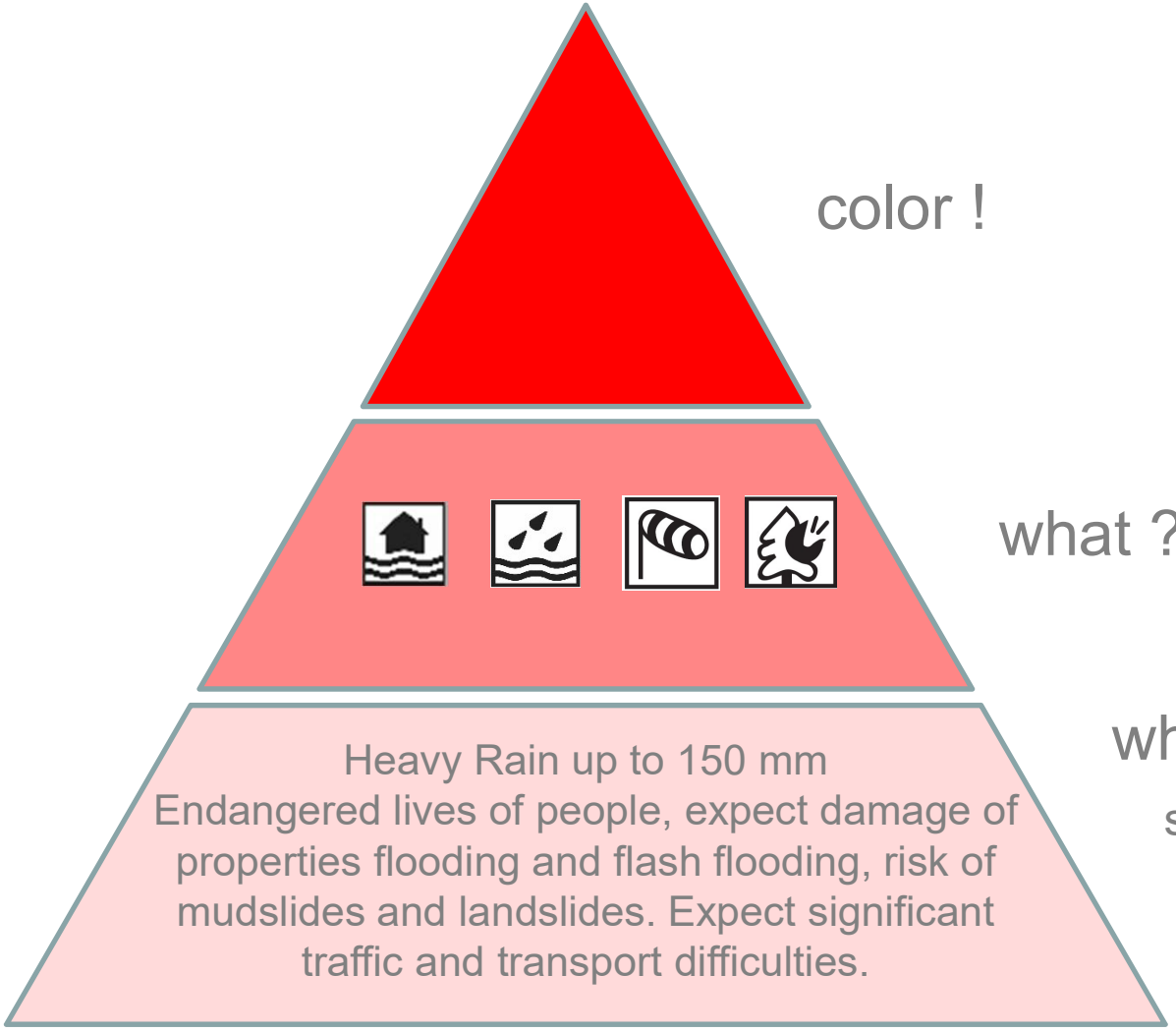
AT BA BE BG CH CY CZ DE DK EE ES FI FR GR HR HU IE IL IS IT LT LU LV MD ME MK MT NL NO PL PT RO RS SE SI SK UK

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!



color !

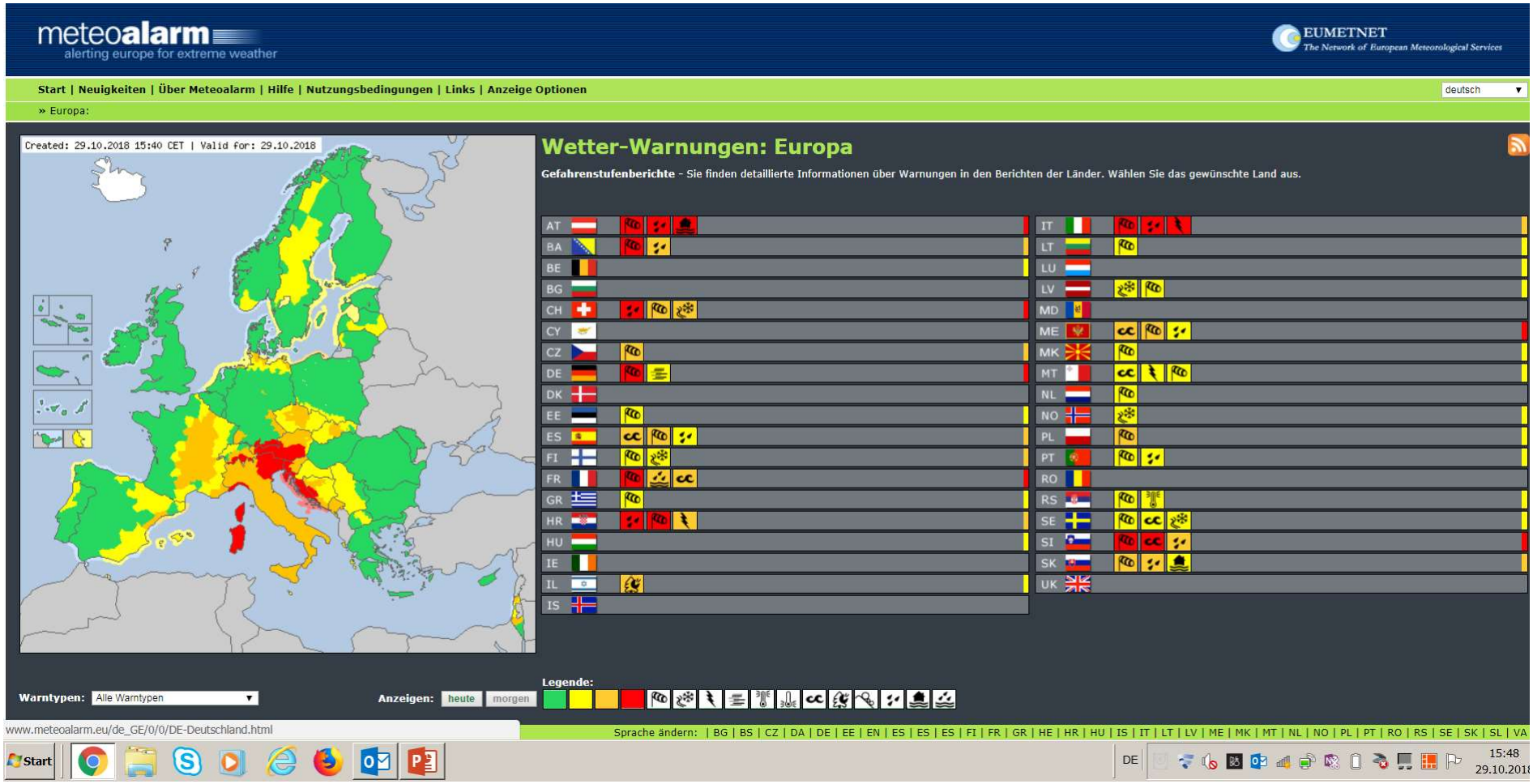
what ?

what happens exactly ?

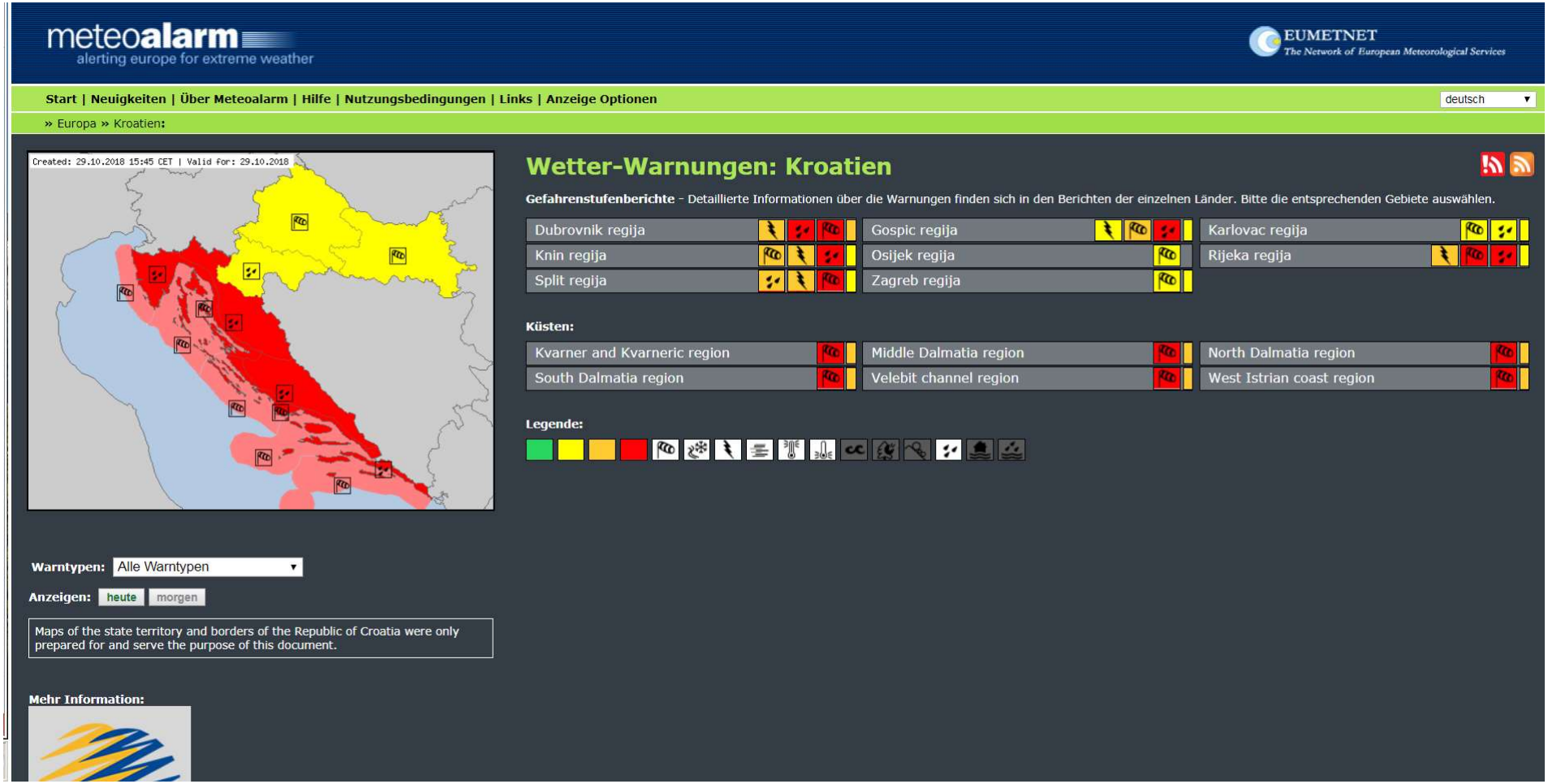
szenarios, impacts and advisories
updates

where, when ?

Storm/Rain October 29, 2018 – European level



Storm/Rain October 29, 2018 - Country level



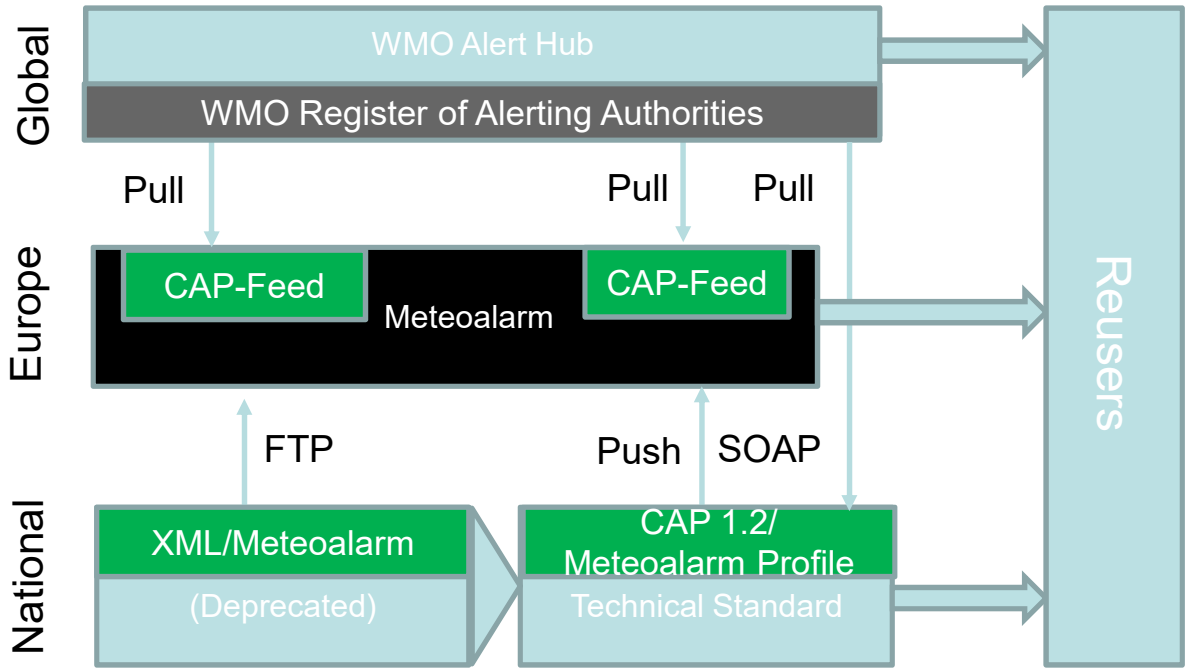
Storm/Rain October 29, 2018 - Regional level

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

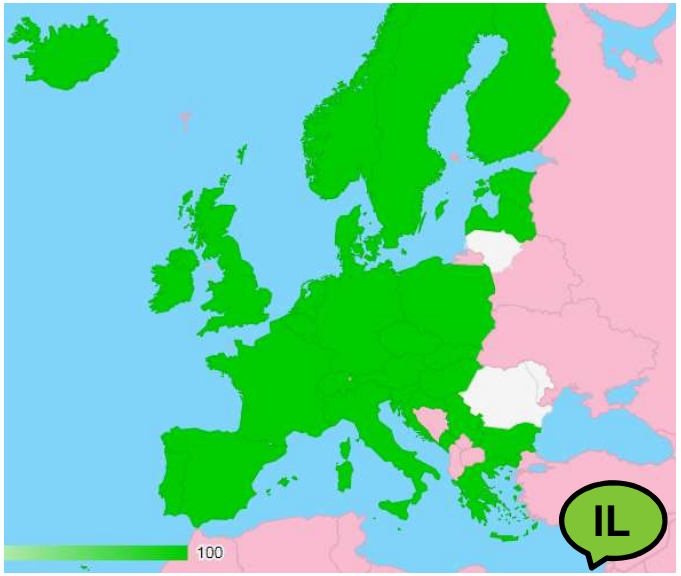
- **37** NMHSs delivering colour-coded warnings for an agreed set of hazards in a standard technical format
- **12** hazards
- **31/37** transmitting CAP alerts to Meteoalarm, 4 are testing
- **34/37** Countries delivering warning texts
- **29/37** Countries delivering English warning information
- **11/37** 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

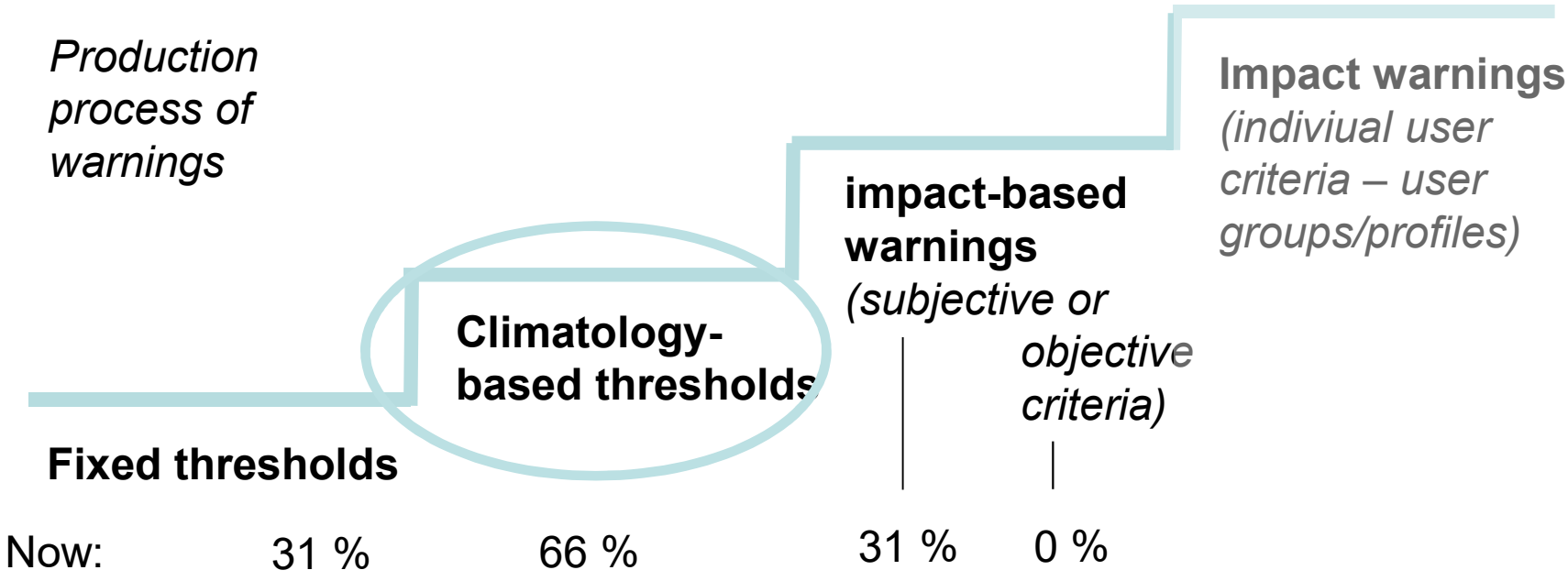
- **Impact-based warning (~ prod. process)** - Assessment of the expected impact scenario, often multi-hazard
- **Impact-warning (~ prod. process)** - User-specific impact scenarios
- **Impact-oriented warning (~ warning format)** ≡ A warning which has a tangible and understandable description of an 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 adressing ***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

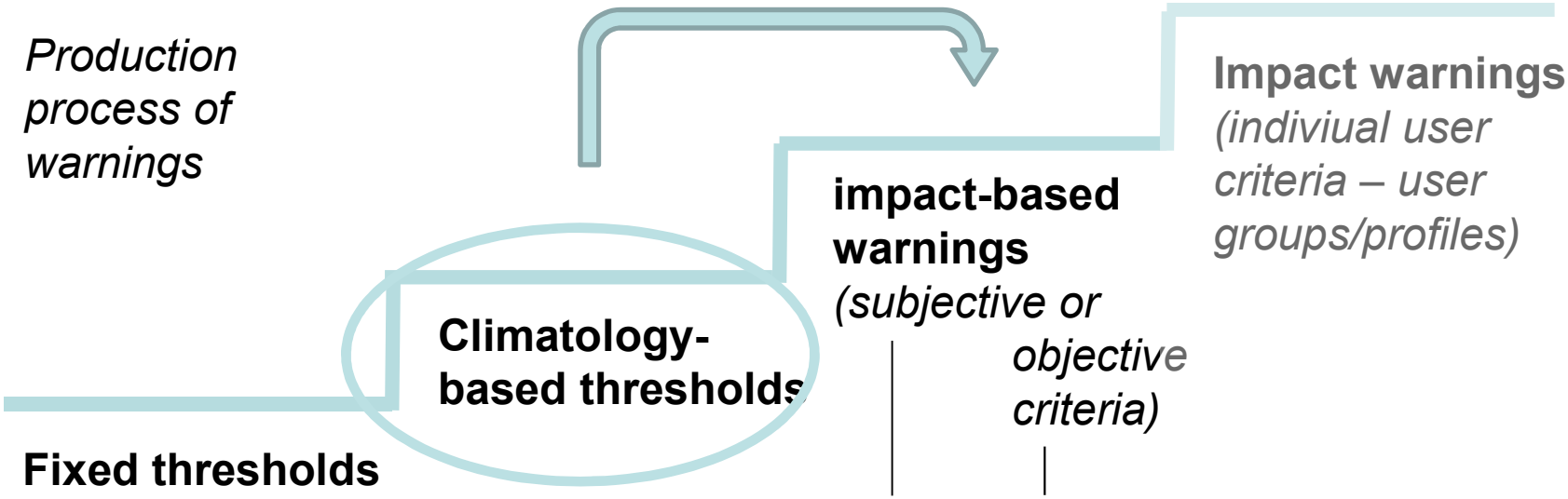
- Carried out a survey among Meteoalarm members in August 2018 – May 2019 (79 questions)
- We received filled out questionnaires from **32/37** partners (**86%** response rate)
- Presentation of results at EMS2019 in Copenhagen (09/2019)
- Publication planned for early 2020



Production process of European NMHSs warnings



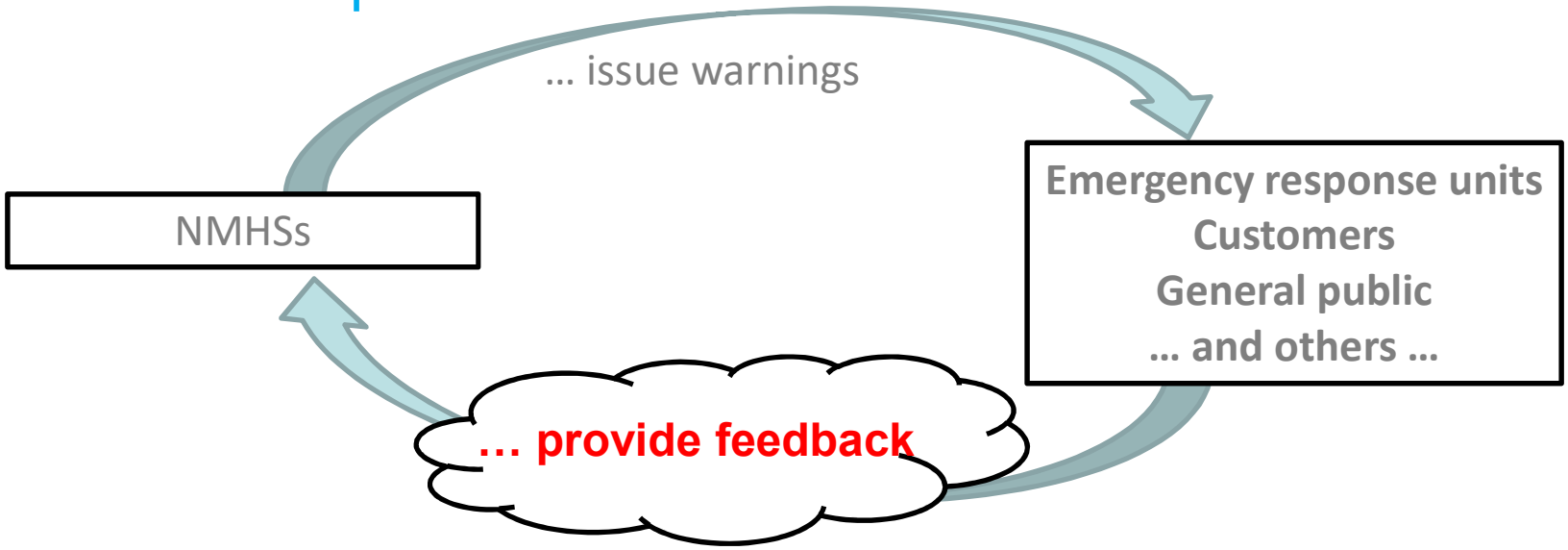
Production process of European NMHSs warnings



Now:	31 %	66 %	31 %	0 %
5 years from now:	9 %	44 %	50 %	47 %

- How do NMHSs climb the step to IbW?
- How do NMHSs adress 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 Subcomitee (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

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