



Knowledge Transfer for Disaster Risk Reduction

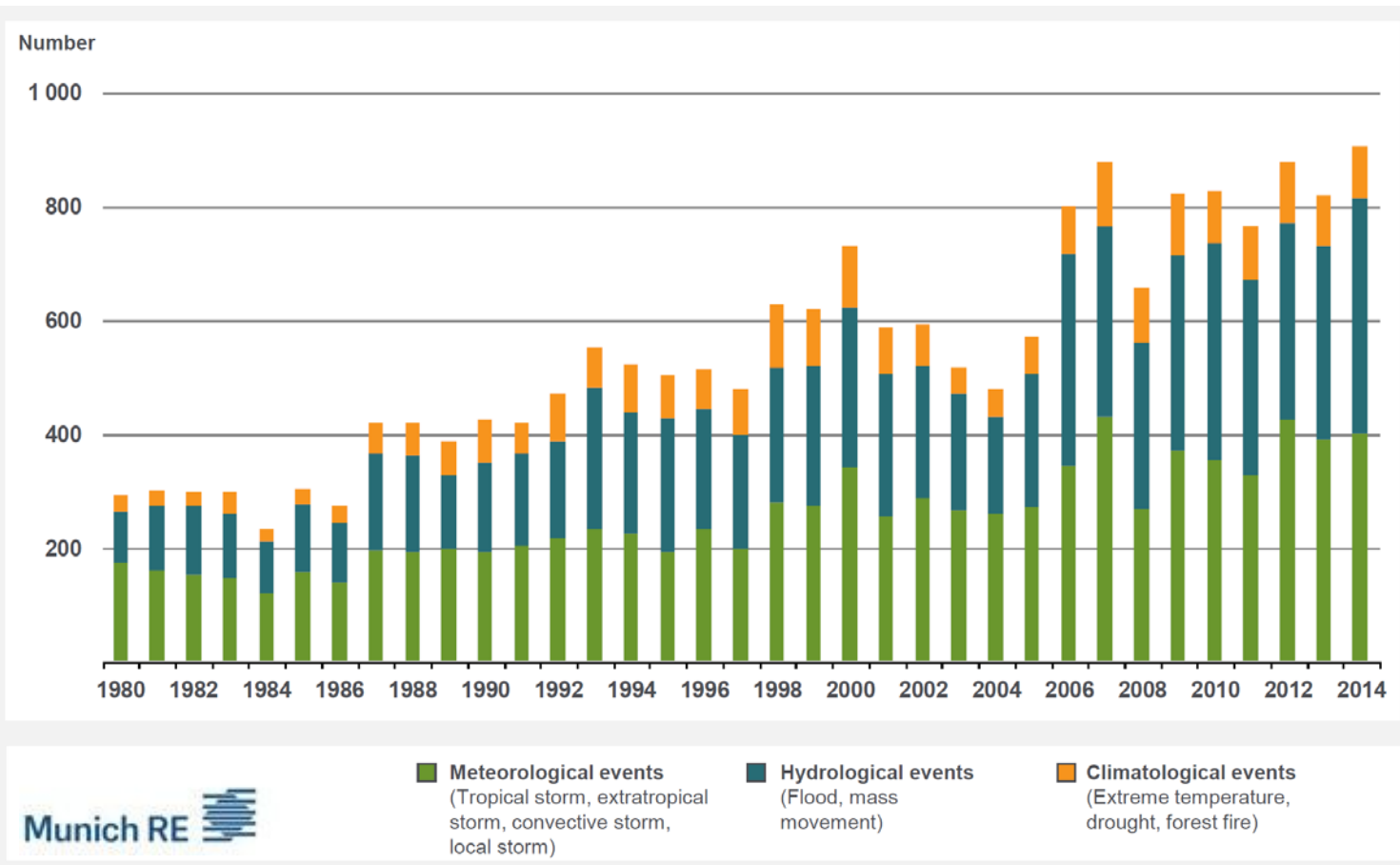
Michael Staudinger

Economic Development Days – May 2017
Vienna University of Economics and Business (WU Wien)

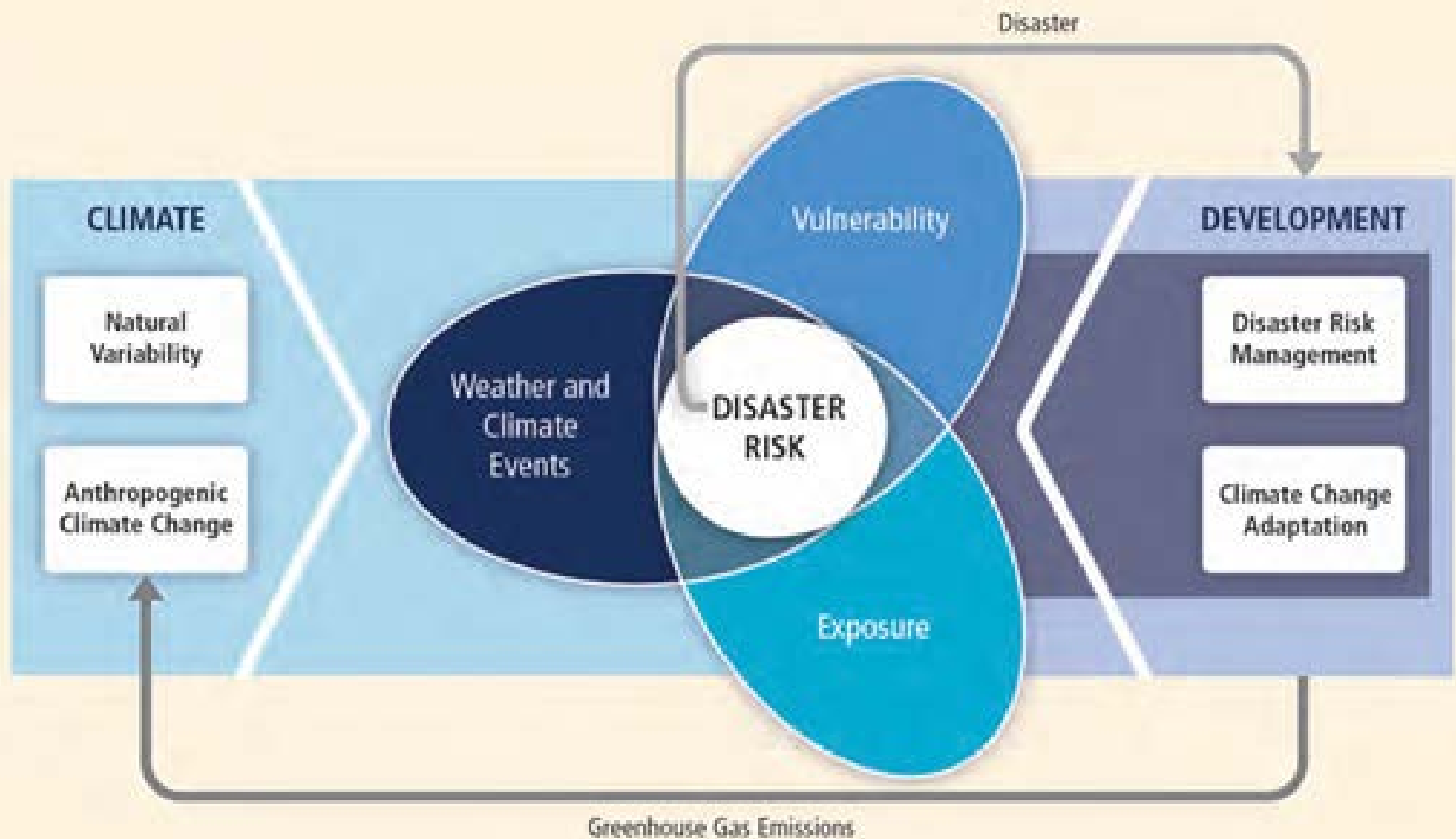
The views and interpretations expressed in this presentation are entirely those of the author. They do not necessarily represent the views of – and should not be attributed to – any former or current employer.

Meteo losses worldwide

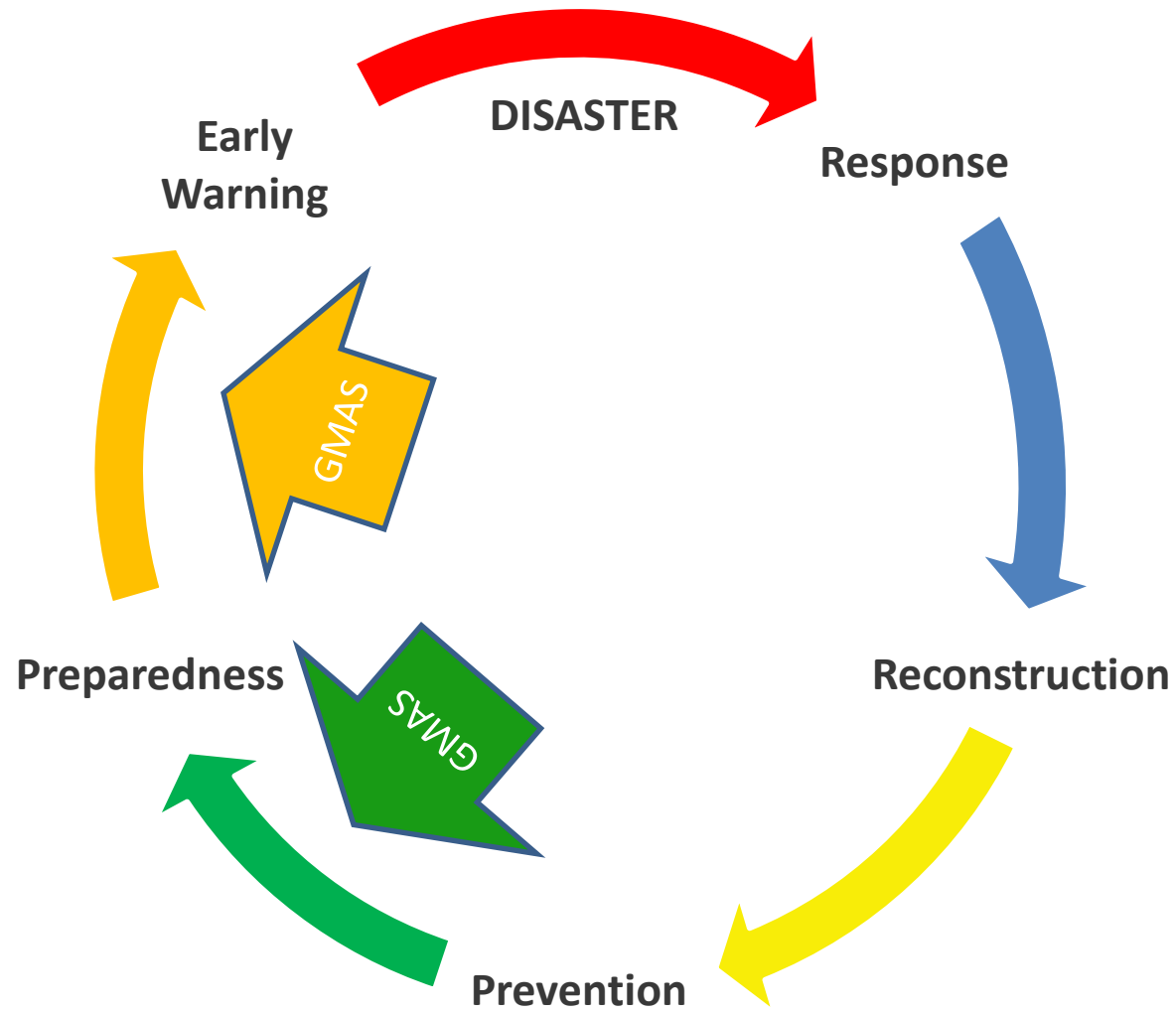
1980 – 2014 number of events



IPCC: disaster risk



UN - ISDR Disaster Cycle



UN - ISDR Sendai Framework of Actions, 2015

Early warning criteria: **users**

To develop and strengthen:

people-centred multi-hazard forecasting and early warning systems,

tailor them to the **needs of users**, including social and cultural requirements

and broaden **release channels** for disaster early warning information

Sendai Framework of Actions 2015

Early warning criteria: **users**

To develop and strengthen:

people-centred multi-hazard forecasting and early warning systems,

tailor them to the **needs of users**, including social and cultural requirements

and broaden **release channels** for disaster early warning information

Imagine how your user thinks, feels and what she/he reacts on!

Sendai Framework of Actions

Definition of warnings

What is a warning?

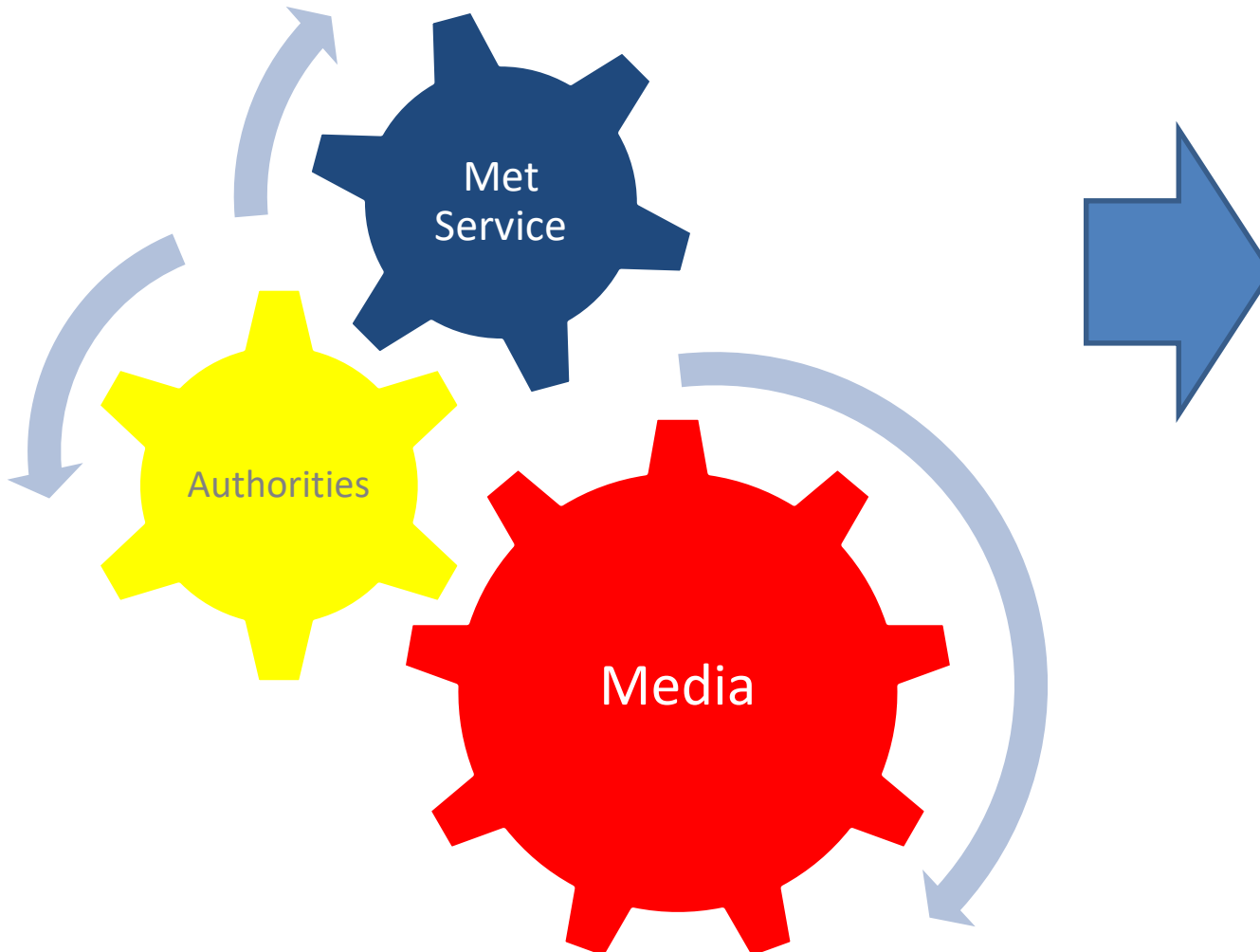
Tangible and understandable description of an expected damage scenario

&

a clear advice what to do

Crisis management – from Science to users

Flow of information



users:

- Local responsables
- Public
- Companies

Warnings – From science to the user

Flow of information – real world

users:

- Local responsables
- Public
- Companies

Warnings – From science to the user

Structured & trusted ways of communication

users:

- Local responsables
- Public
- Companies

Sendai Framework of Actions

90mm in 30 min: How to communicate within the chains of information?



© Fabian Lackner, meteopics

Kids on the street? Event management? Canal system?

Warning situations – necessary Informationen

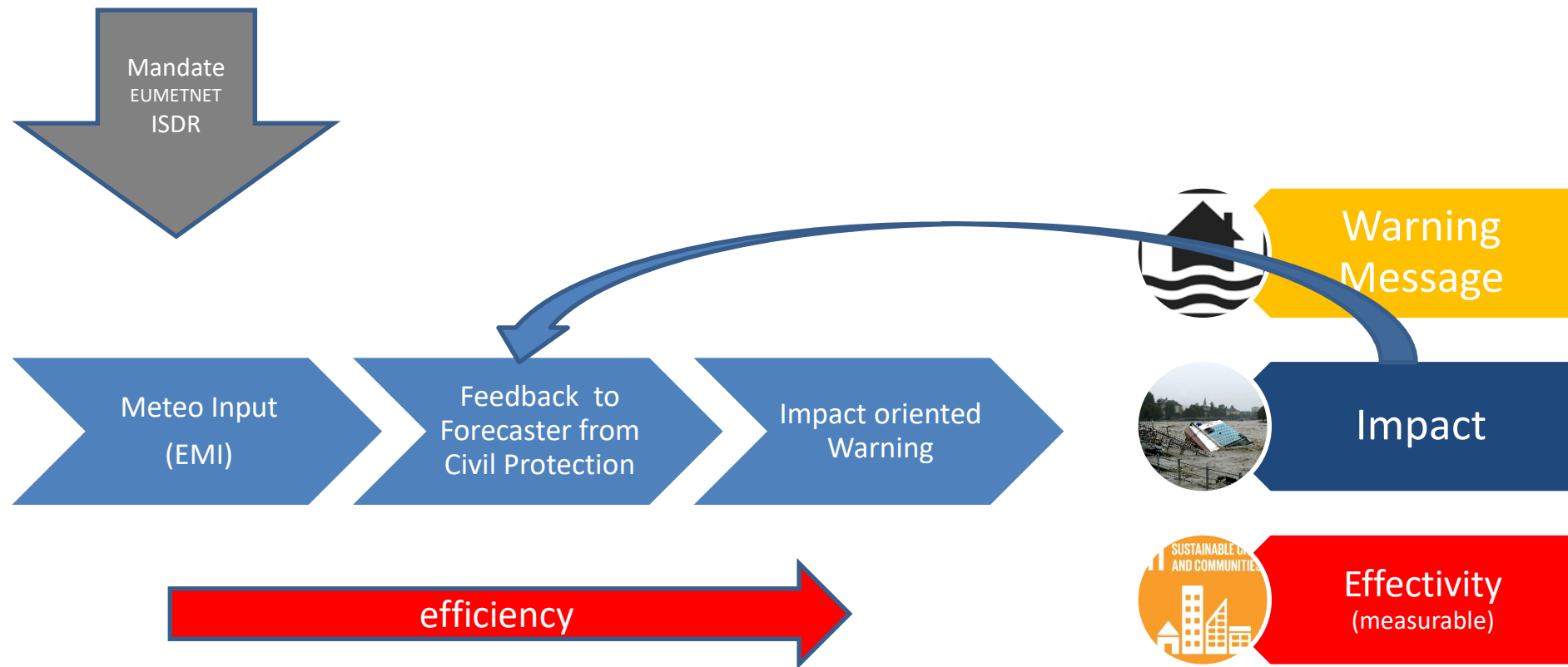
floods



source: BH Landeck

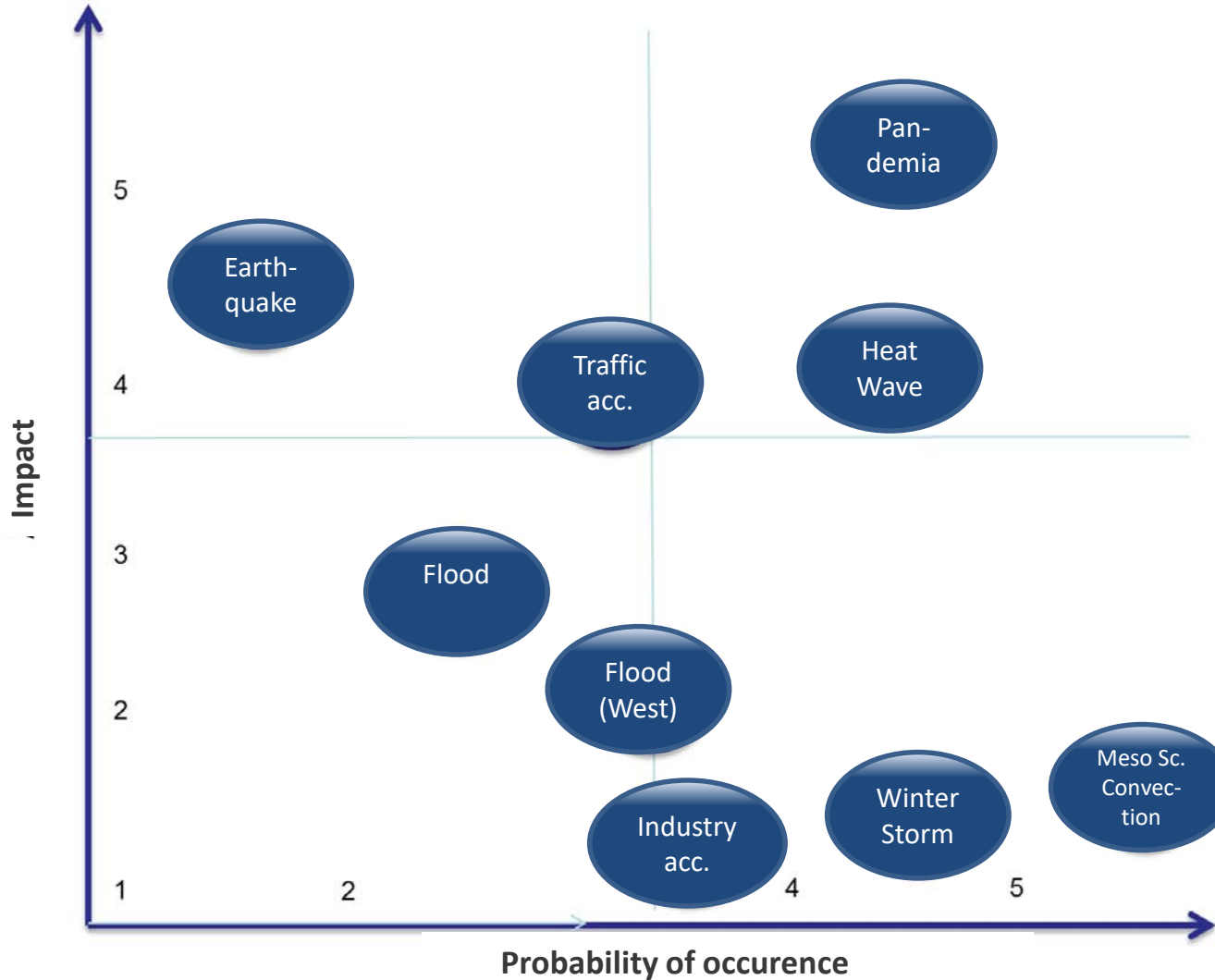
Precipitation, snowline, ground moisture . . .

Standardised European Multihazard Warnings

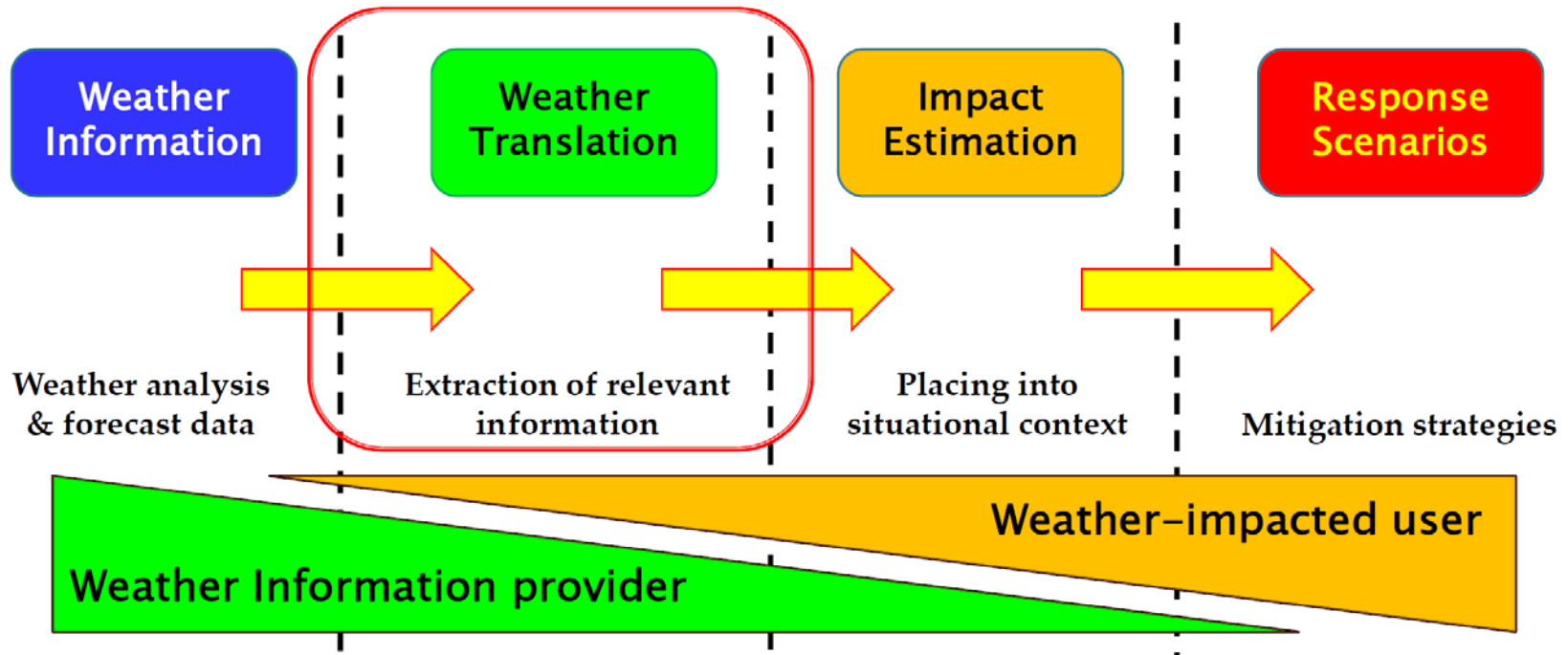


National Risk Analysis

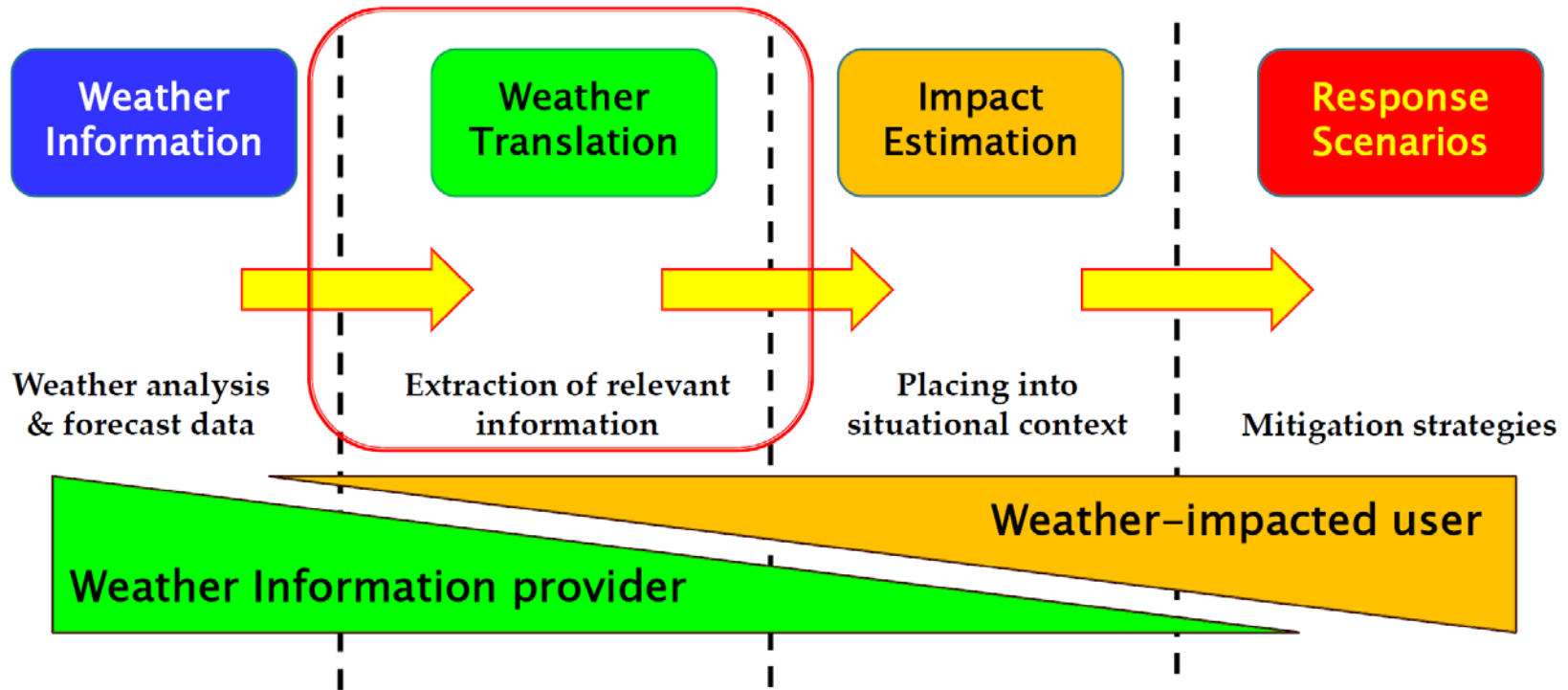
1



Determining Impact – *from weather to response*



Determining Impact – *from weather to response*



Some examples:

Airport operation	Ceiling & visibility (flight categories)	Reduced capacity (arrival rates)	Ground delay programs
Dam operation	Precipitation & runoff (water level)	Overflow or breaking, minimal discharge	Controlled release of water
Power plant operation	Winds below/above critical thresholds	Reduced power generation	Balancing grid with other power sources

Meteoalarm

Eumetnet mandate

1. Make warnings visible in an easy understandable way
2. Harmonize warnings systems across Europe
3. Integrate additional partners countries
4. Reach out to „European“ users (ERCC . . .)

Meteoalarm

meteoalarm
alerting europe for extreme weather

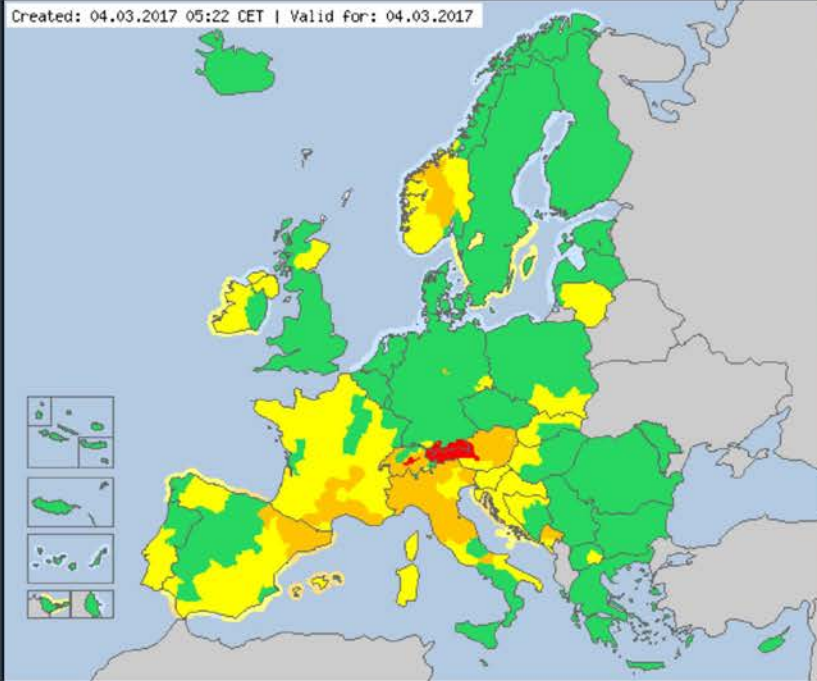
EUMETNET
The Network of European Meteorological Services

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english ▾

» Europe:

Created: 04.03.2017 05:22 CET | Valid for: 04.03.2017



Weather warnings: Europe

Awareness Reports - You can find detailed information about the warnings in the awareness reports issued for each country. Select the relevant country.

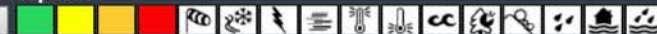
AT					
BA					
BE					
BG					
CH					
CY					
CZ					
DE					
DK					
EE					
ES					
FI					
FR					
GR					
HR					
HU					
IE					
IS					
IT					
LT					
LU					
LV					
MD					
ME					
MK					
MT					
NL					
NO					
PL					
PT					
RO					
RS					
SE					
SI					
SK					
UK					



awareness types:

Display: today tomorrow

Caption:



Meteoalarm

National level

meteoalarm
alerting europe for extreme weather

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» Europe » Bosnia-Herzegovina:

Created: 27.04.2014 18:40 CET | Valid For: 27.04.2014

Weather warnings: Bosnia-Herzegovina

Awareness Reports - You can find detailed information about the warnings in the awareness reports issued for each area. Select the relevant area.

Banja Luka	
Bihac	
Foca	
Livno	
Mostar	
Prijedor	
Sarajevo	
Trebinje	
Tuzla	
Visegrad	 

awareness types:

Display:

more information:

FHMZ

Federalni hidrometeorološki
zavod Bosne i Hercegovine

RHMZ RS

Republički hidrometeorološki
zavod Republike Srbije



Meteoalarm

Subnational level

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english ▾

» Europe » Serbia » Cpem:

Weather warnings: Cpem



valid from 05.09.2015 00:00 CET **Until** 05.09.2015 23:59 CET
Thunderstorms

Awareness Level: **Orange**

en: Local thunderstorms with hail

IMPACT: The risk of thunder stroke, endangered lives of people and animals, operation problems for all electrical devices, the risk of fire initiation and flash flooding, telecommunication problems, possible major damage to the property and in agriculture, especially in combination with strong wind and intensive rainfall.

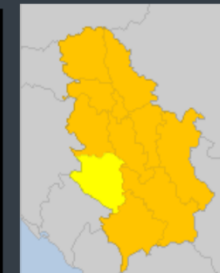
sr: Lokalna pojava grmljavine sa gradom

UTICAJ: Rizik od udara groma, opasnost poživot ljudi i životinja, problemi u radu svih uređaja koja koriste električnu energiju, rizik od izazivanja požara, problemi u telekomunikacijama, moguće veće štete na pokretnoj i nepokretnoj imovini i u poljoprivredi, naročito u kombinaciji sa jakim vetrom i intezivnim pljuskovima.

[Back to Europe:](#)



[Back to Serbia:](#)



valid from 05.09.2015 00:00 CET **Until** 05.09.2015 23:59 CET
Rain

Awareness Level: **Yellow**

en: Rain - at least 20 mm (l/m²) within a 12-hour period

IMPACT: Causing flooding, problems in all agricultural production activities, traffic problems, possible risk of landslides and mudslides. Indirect impact on the safety of people and animals.

sr: Kiša sa količinom padavina većom od 20 l/m² za 12 h

UTICAJ: Izazivanje poplava, i prouzrokovanješteta u vezi sa poplavama, problemi u svim aktivnostima poljoprivredne proizvodnje, problemi u saobraćaju, moguća pojava odrona i klizišta. Indirektni uticaj na bezbednost ljudi i životinja.

Display: [today](#) [tomorrow](#)

Change Language: | [BG](#) | [BS](#) | [CZ](#) | [DA](#) | [DE](#) | [EE](#) | [EN](#) | [ES](#) | [ES](#) | [ES](#) | [FI](#) | [FR](#) | [GR](#) | [HR](#) | [HU](#) | [IS](#) | [IT](#) | [LT](#) | [LV](#) | [ME](#) | [MK](#) | [MT](#) | [NL](#) | [NO](#) | [PL](#) | [PT](#) | [RO](#) | [RS](#) | [SI](#) | [SK](#) | [SV](#) | [VA](#)

Meteoalarm – Flood warnings

Rain & flood situation

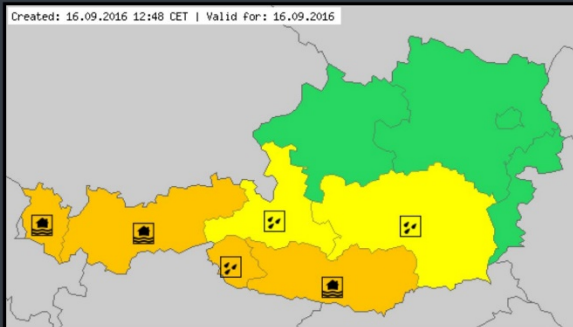
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» Europe » Austria:

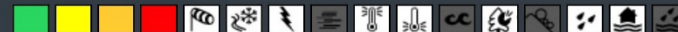


Weather warnings: Austria

Awareness Reports - You can find detailed information about the warnings in the awareness reports issued for each area. Select the relevant area.

Kärnten	 	Osttirol	 
Salzburg	 	Steiermark	 
Tirol	 	Vorarlberg	 

Caption:



awareness types:

Display:

more information:



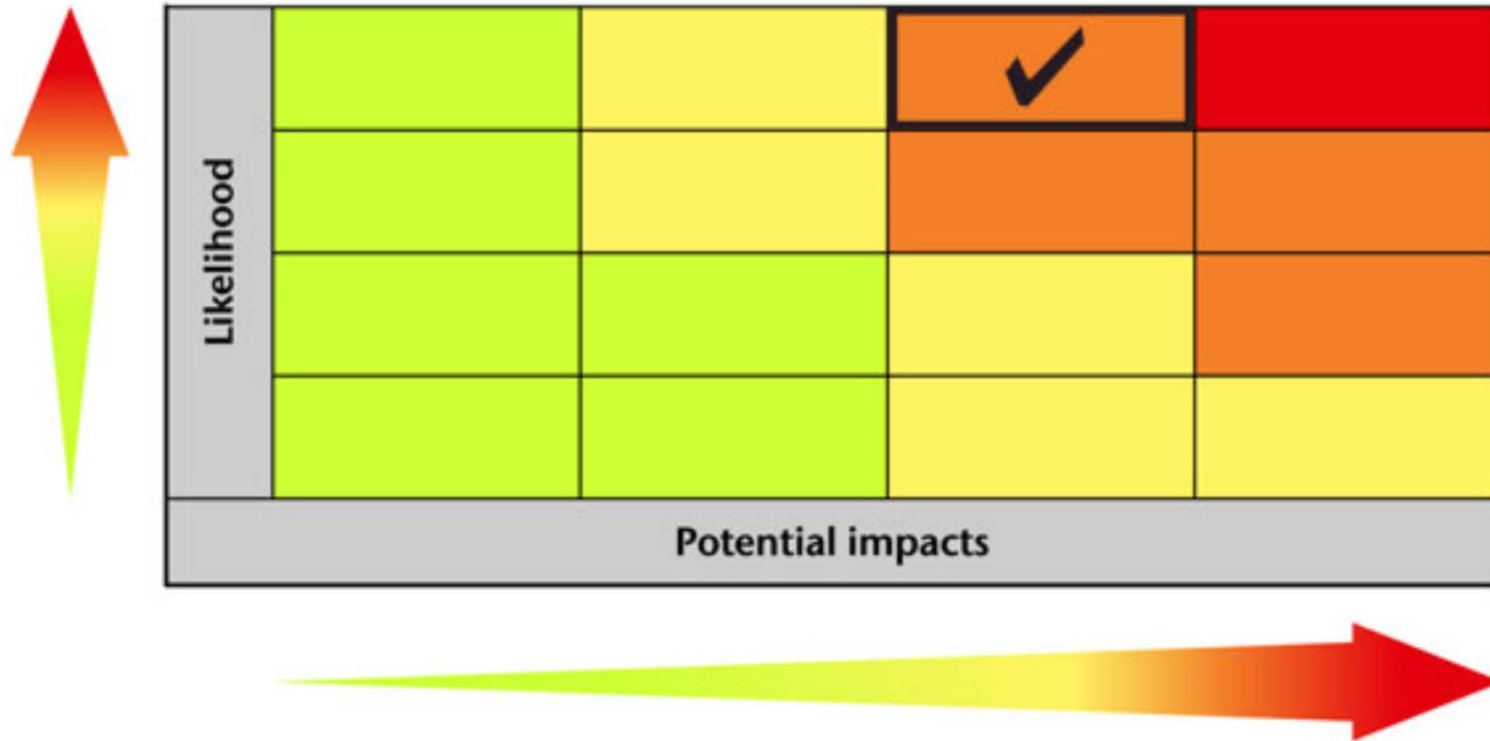
Meteoalarm: 33 Partners

How to harmonize?

Colour	One word	What to do?	Damage / Impact	Used how often? (Area approx. 300 000 km ²)	Meteo Treshholds e.g. Rain (area + impact related)
Green	Weather report	usual phenomena	- - -	usual phenomena	Examples
yellow	Be aware!	caution with exposed activities	exposed objects (avoidable)	> 30 per year	> 54 mm/12h
orange	Be prepared!	keep informed in detail, follow advice of authorities	general damages (not avoidable)	2 to 30 per year	> 80 mm/12h
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)	less then 1/ year + large (5000km ²) scale phenomena	> 140 mm/12h


Meteoalarm

36h ahead: how much certainty do we have?



Intranet – homogenisation of forecaster work

Meteoalarm
Alerting Europe for extreme Weather


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13.03.2008 logged in: Michael Staudinger | [Help\(Wiki\)](#) | [who is online](#) | [logout](#)

Message of today: 2008

Position: [Emma Intranet](#) | [Forum](#) | [Forecasts](#) | [debriefing EMMA](#)

Topic: debriefing EMMA

posted on 01.03.2008 09:43:35 by [Karim Hamid](#)

Hi
 It seems that the storm EMMA (what's the name!) had very similar character
 Behind the frontal systems of this low, a squall line (SQL) moved over West
 SQL was nestled within the dark stripe, the region of high PV-values (exact
 the SQL, with at 3km, winds up to 85 kts. In combination with ground winds
 Here in Belgium there were gusts up to 120 km/h with widespread wind dan
 It seems that the wind damage can be followed from the Netherlands up to
 this countries should be collected, but unfortunately this isn't te case).
 Have a nice day
 Karim Hamid

Weblink: users.fulladsl.be/spb4195/storm18012007.pdf

Attached Images:

Attached Documents:
[lewp.jpg](#)
[lewp2.jpg](#)
[lewp3.jpg](#)
[lewp4.jpg](#)
[lewp5.jpg](#)

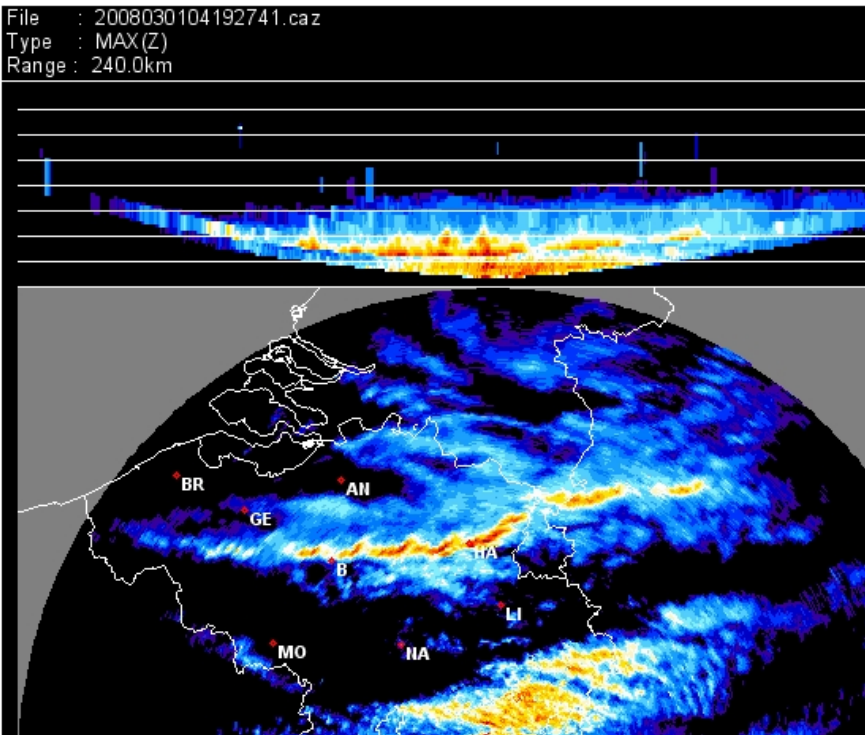
Replies

Author	Header
Jan Sulan	Re:debriefing EMMA Posted: 01.03.2008 14:15:45 First reports from Czech Republic Thanks to thunderstorms max wind gusts were in s damages are serious - many places without electric Also some local floodings.

http://www.meteoalarm.eu/intranet/upload/documents/lewp.jpg - Windows...

http://www.meteoalarm.eu/intra...

File : 2008030104192741.caz
 Type : MAX(Z)
 Range : 240.0km



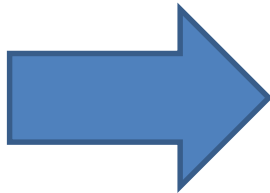
Alert levels used in 2016

Country	Percent %				Days				total
	GREEN	YELLOW	ORANGE	RED	GREEN	YELLOW	ORANGE	RED	
Austria	61.4%	25.8%	12.9%	0.0%	81	34	17	0	132
Belgium	76.1%	16.1%	7.8%	0.0%	166	35	17	0	218
Bosnia	59.4%	32.3%	7.8%	0.5%	129	70	17	1	217
Bulgaria	81.7%	15.1%	2.8%	0.5%	178	33	6	1	218
Croatia	28.4%	45.4%	21.1%	5%	62	99	46	11	218
Cyprus	100%	0.0%	0.0%	0.0%	218	0	0	0	218
Czech Republic	79.4%	15.6%	4.6%	0.5%	173	34	10	1	218
Denmark	97.7%	2.3%	0.0%	0.0%	213	5	0	0	218
Estonia	24.5%	72.6%	2.4%	0.5%	51	151	5	1	208
Finland	31.2%	58.9%	9.9%	0.0%	44	83	14	0	141
Former Yugoslav Republic of Macedonia	60.7%	34.6%	4.7%	0.0%	130	74	10	0	214
France	7%	64.8%	27.2%	0.9%	15	138	58	2	213
Germany	24.1%	31.6%	36.1%	8.3%	32	42	48	11	133
Greece	61.5%	19.3%	17.9%	1.4%	134	42	39	3	218
Hungary	60%	37.7%	2.3%	0.0%	129	81	5	0	215
Iceland	50.5%	49.5%	0.0%	0.0%	109	107	0	0	216
Irish Republic	93.1%	4.6%	2.3%	0.0%	122	6	3	0	131
Irish Republic old	76.7%	18.6%	4.7%	0.0%	66	16	4	0	86
Italy	19%	42.1%	37%	1.9%	41	91	80	4	216
Latvia	36.7%	59.6%	3.7%	0.0%	80	130	8	0	218
Lithuania	6.1%	93.2%	0.8%	0.0%	8	123	1	0	132
Luxembourg	86.6%	12%	1.4%	0.0%	188	26	3	0	217
Malta	74.5%	23.4%	2.1%	0.0%	108	34	3	0	145
Moldova	100%	0.0%	0.0%	0.0%	11	0	0	0	11
Montenegro	3.7%	69.8%	24.2%	2.3%	8	150	52	5	215
Netherlands	39%	58.7%	1.4%	0.9%	85	128	3	2	218
Norway	26.3%	24.9%	44.2%	4.6%	57	54	96	10	217
Poland	57.1%	18%	22.1%	2.8%	124	39	48	6	217
Portugal	52.3%	35.6%	11.1%	0.9%	113	77	24	2	216
Romania	90.8%	7.8%	1.4%	0.0%	197	17	3	0	217
Serbia	32.6%	52.3%	12.4%	2.8%	71	114	27	6	218
Slovakia	60.9%	29.3%	9.3%	0.5%	131	63	20	1	215
Slovenia	38.7%	52.1%	8.8%	0.5%	84	113	19	1	217
Spain	24.3%	46.3%	28%	1.4%	53	101	61	3	218
Sweden	19.9%	75%	5.1%	0.0%	43	162	11	0	216
Switzerland	71.6%	22.5%	6%	0.0%	156	49	13	0	218
United Kingdom	61.1%	35.2%	3.7%	0.0%	132	76	8	0	216

Meteoalarm CAP im/export

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 - <identifier>
 - <sender>
 - <sent>
 - <status>
 - <msgType>
 - <source>
 - <scope>
 - <references>
 - structure
 - update
 - cancel
 - <info>
 - <language>
 - <category>
 - <event>
 - <responseType>
 - <urgency>
 - <severity>
 - <certainty>
 - <effective>
 - <onset>
 - <expires>
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 - <headline>
 - <description>
 - <instruction>
 - <web>
 - <contact>
 - <parameter>
 - <area>
 - <areaDesc>
 - <geocode>
 - Related information

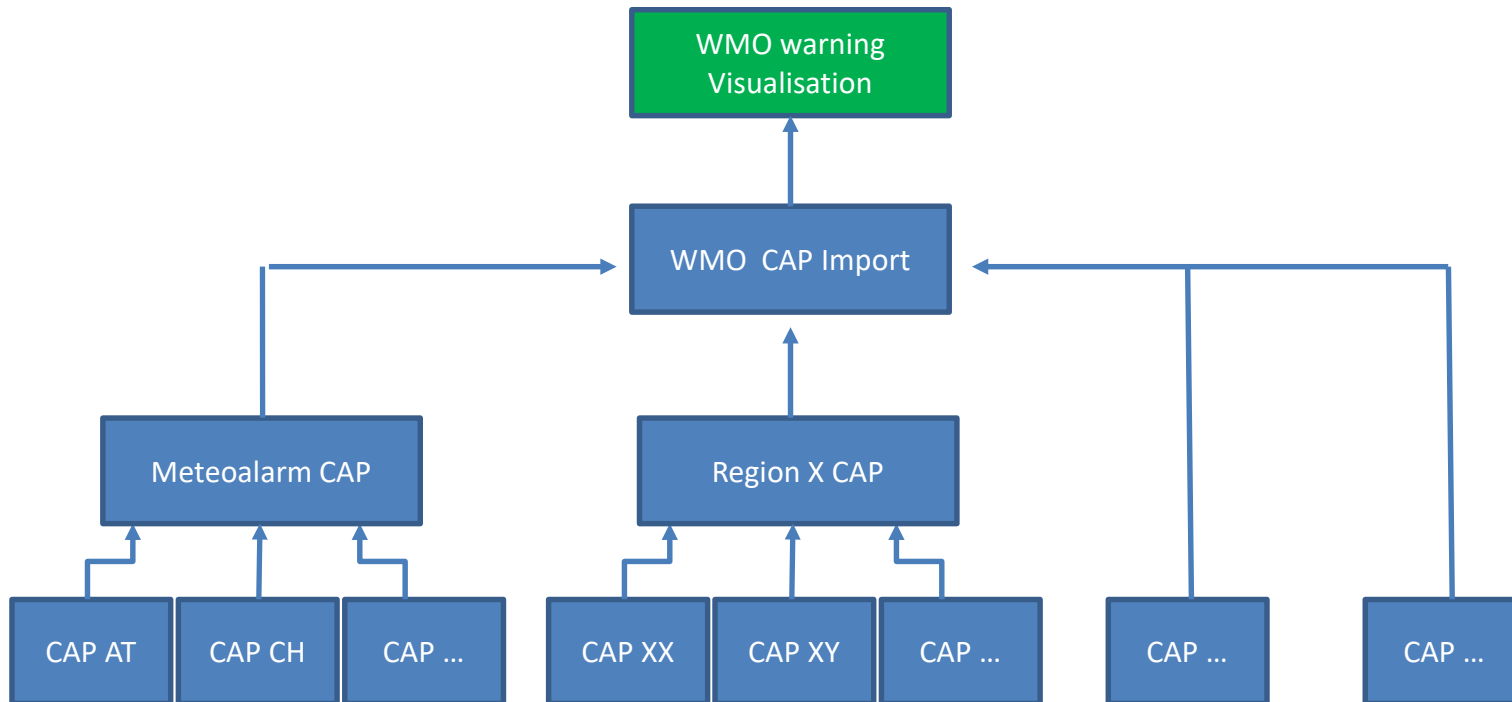


File 1 (1.Alert)

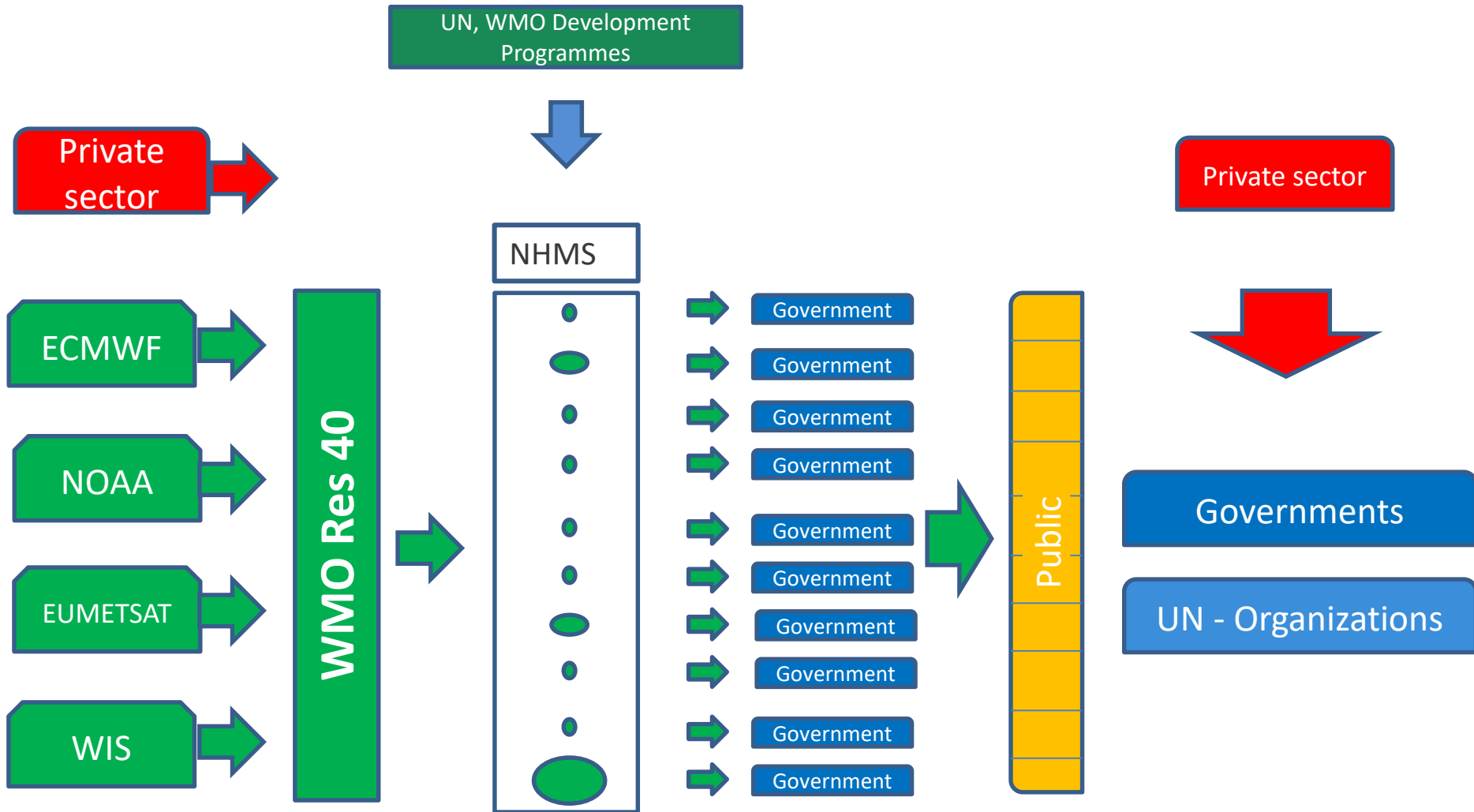
```
<?xml version = "1.0" encoding = "UTF-8"?>
<alert xmlns="urn:oasis:names:tc:emergency:cap:1.2">
  <identifier>2.49.0.3.0.AT.150115080000.52550477</identifier>
  <sender>http://www.zamg.ac.at/warnsys/public/aus_all.html</sender>
  <sent>2015-01-15T00:04:01+01:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  <info>
    <language>de-DE</language>
    <category>Met</category>
    <event>Grüne Gewitter Warnung</event>
    <responseType>None</responseType>
    <urgency>Expected</urgency>
    <severity>Minor</severity>
    <certainty>Likely</certainty>
    <effective>2015-01-15T00:00:00+01:00</effective>
    <onset>2015-01-15T00:00:00+01:00</onset>
    <expires>2015-01-16T00:00:00+01:00</expires>
    <senderName>ZAMG Österreich</senderName>
    <headline>
      Grüne Gewitter Warnung für Österreich - Niederösterreich
    </headline>
    <description>Keine besondere Aufmerksamkeit notwendig</description>
    <web>http://meteoalarm.eu/de_GE/0/0/AT001.html</web>
    <parameter>
      <valueName>awareness_level</valueName>
      <value>1; green; Minor</value>
    </parameter>
    <parameter>
      <valueName>awareness_type</valueName>
      <value>3; Thunderstorm</value>
    </parameter>
    <area>
      <areaDesc>Niederösterreich</areaDesc>
      <geocode>
        <valueName>NUTS2</valueName>
        <value>AT12</value>
      </geocode>
    </area>
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  <info>
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      Green Thunderstorms Warning for Austria - Niederösterreich
    </headline>
    <description>No special awareness required</description>
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      <value>1; green; Minor</value>
    </parameter>
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      <value>3; Thunderstorm</value>
    </parameter>
    <area>
      <areaDesc>Niederösterreich</areaDesc>
      <geocode>
        <valueName>NUTS2</valueName>
        <value>AT12</value>
      </geocode>
    </area>
  </info>
</alert>
```

Co-operation on a global scale

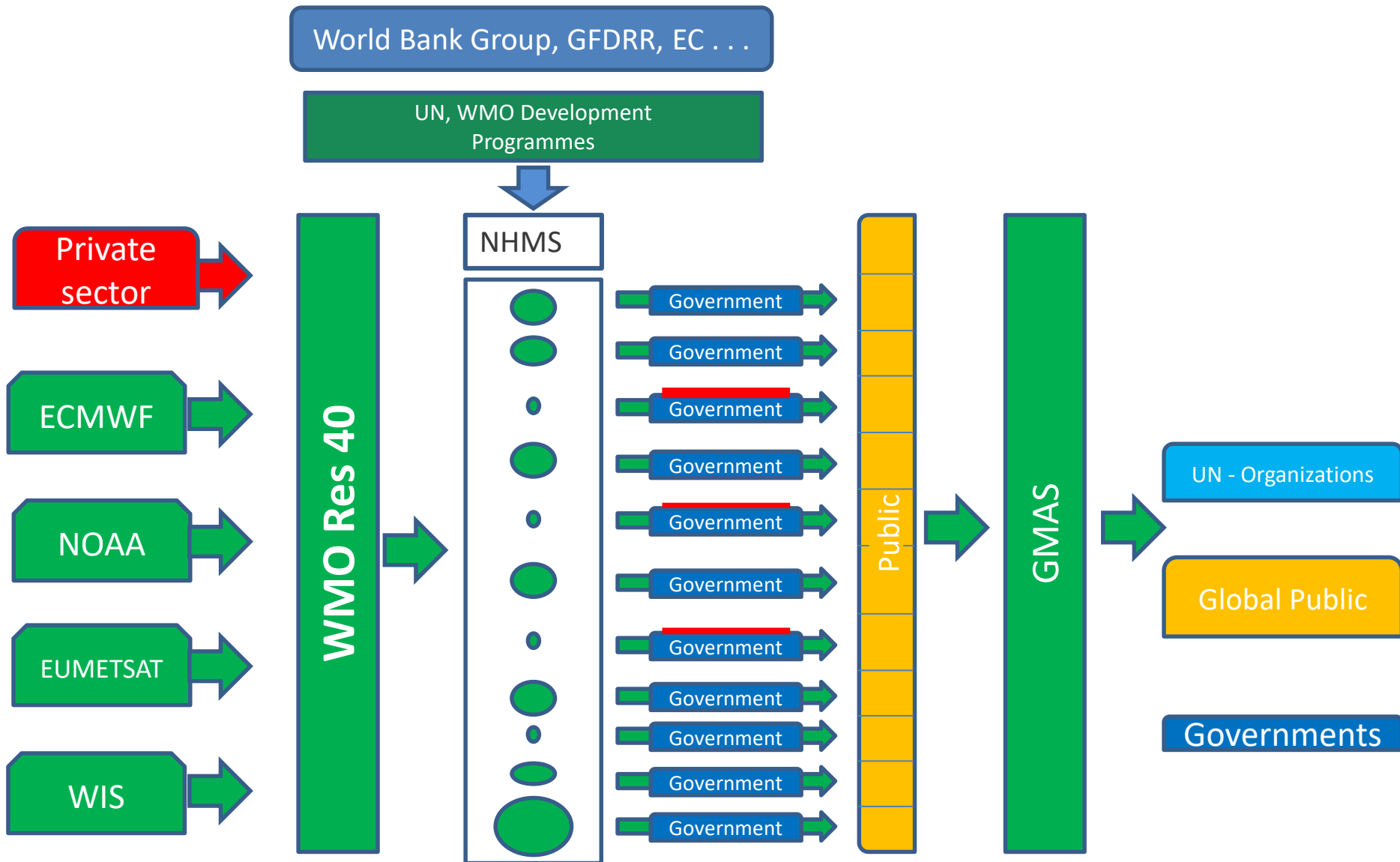
Common warning philosophy



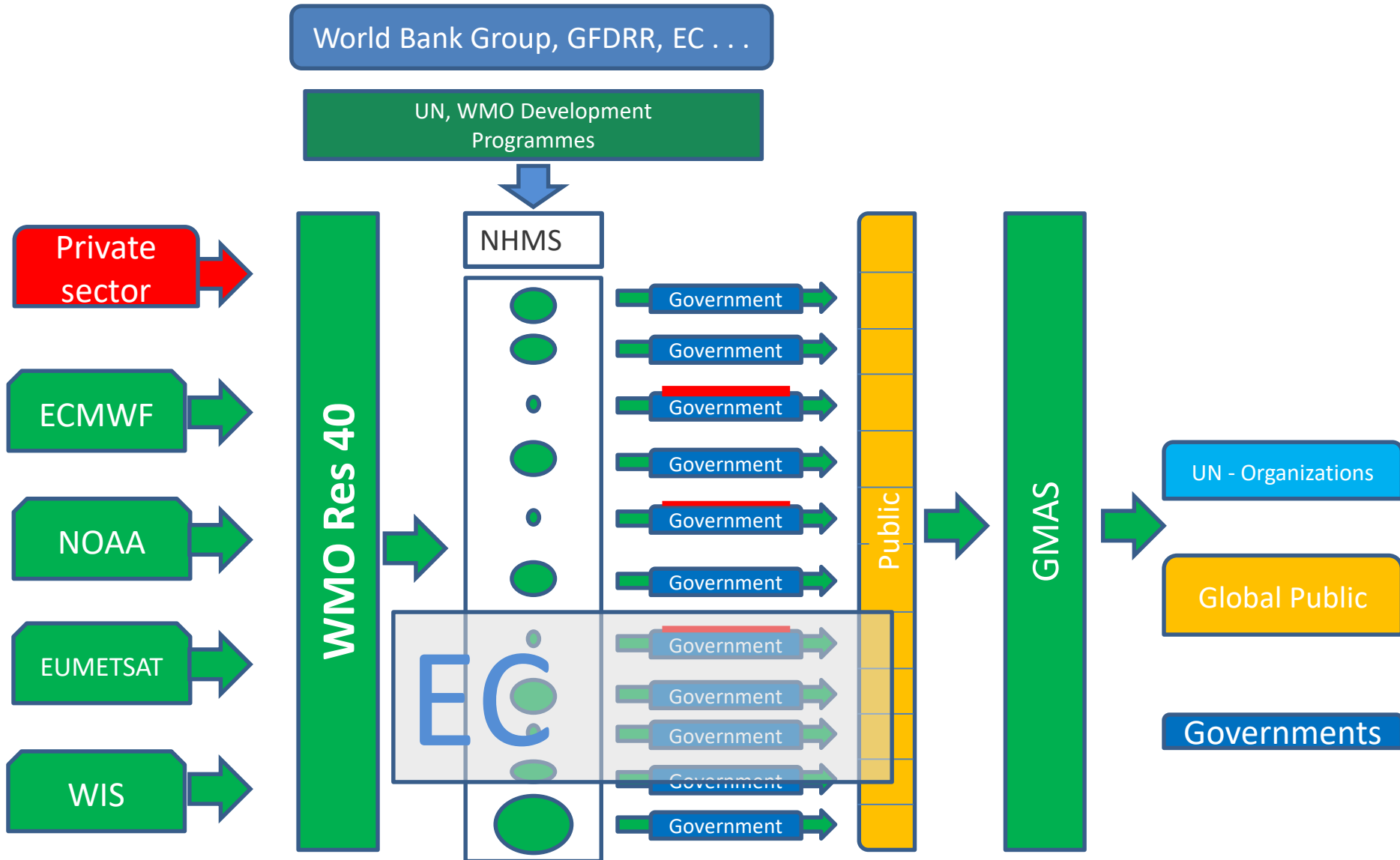
Data flow warnings: now



Data flow of warnings: GMAS (Future)



Data flow of warnings: GMAS (Future)



Service delivery development:



**Un-
developed**

**Development
initiated**

**Development
in progress**

Developed

Advanced

Service delivery development: User Requirements



Un-developed	Development initiated	Development in progress	Developed	Advanced
The users of the services and products are not known	Some or all of the users are known, but this information is not recorded in a formal document	A CSA or SLA is in place with some users, but is often incomplete or out of date, and unlikely to be used	A CSA or SLA is in place for each user, but is not routinely assessed and updated	An CSA or SLA is in place for each user and is routinely assessed and up-dated to ensure that it contains current information. Information is used to facilitate the development of products and services.

Service delivery development: User Requirements / contacts



Un-developed	Development initiated	Development in progress	Developed	Advanced
There is no mechanism for contact with users.	Mechanisms for user contact are in place, but are unreliable. For example, poor Internet access results in e-mails regularly going Unanswered	Users are able to contact NMHSs using a variety of means including e-mail, telephone or post	Users are encouraged to contact the NMHSs through a variety of means. User contact is managed on an ad hoc basis	User contact is managed by a designated individual or team.

Service delivery development: User Requirements



Un-developed	Development initiated	Development in progress	Developed	Advanced
User requirements have not been recorded or documented	Users needs are somewhat understood, but they are not described in the form of user requirements and little detail is provided	An outline of user requirements has been recorded but documentation is limited	Requirements are defined in documents agreed upon with the customer, but are not routinely updated	Requirements are defined in documents agreed upon with the customer and are routinely updated using feedback from users

Service delivery development: Service development



Un-developed	Development initiated	Development in progress	Developed	Advanced
<p>No concept of service exists, products are simply issued</p>	<p>Services do not adapt to changing user needs and new technology. Products are documented with limited descriptive Information</p>	<p>Services are developed and changed as technology allows, but engagement with users is ad hoc. Products and services are documented and the information is used to inform management of changes</p>	<p>User feedback is used to inform management of changes and developments to services. Products and services are consistently documented. SLAs are defined.</p>	<p>Users are consulted to facilitate development of products and services.</p> <p>The service defined in the SLA is agreed upon with the customer based on user consultation.</p>

Service delivery development: Service evaluation



Un-developed	Development initiated	Development in progress	Developed	Advanced
<p>No measures are in place for assessing performance, either in terms of accuracy or service delivery.</p>	<p>Some measures of development are in place.</p> <p>The verification of accuracy and/or service delivery takes place, but no systematic process exists to use this information to improve the service.</p>	<p>Measures of verification and service delivery are in place but are not informed by user requirements.</p>	<p>User requirements are used as data for performance measures.</p> <p>Findings are used to identify areas for improvement. Subsequent actions are taken in an ad hoc manner.</p>	<p>Measures of performance are based on user needs.</p> <p>They are regularly reported and consistently used to inform decisions on improvements.</p>

Service delivery development: Sustain service delivery



Un-developed	Development initiated	Development in progress	Developed	Advanced
No concept exists of service delivery principles	The concept of service delivery has been introduced and an assessment of current status has been undertaken.	An action plan has been created to improve the current level of service delivery and resources have been identified to implement it	The action plan is being implemented to improve service delivery, the outcomes are being monitored	<p>The status of service delivery is reviewed on a regular basis.</p> <p>The action plan evolves in response to the outcome of the reviews.</p>

Service delivery development: Skill development



Un-developed	Development initiated	Development in progress	Developed	Advanced
<p>No concept or communication of service delivery principles exist</p>	<p>No formal training in service delivery is provided, though service delivery principles are informally communicated.</p>	<p>Most members of NMHSs are aware of the importance of service delivery.</p> <p>Some formal training is Provided</p>	<p>All members of staff are fully aware. Formal training is provided.</p> <p>There is an ad hoc process for staff to offer ideas for improvements to service Delivery</p>	<p>There is a culture of providing best possible service delivery.</p> <p>Innovative ideas are routinely integrated into the continual service improvement process.</p>

Meteoalarm

Txs for the attention!