

Sendai Framework and hydrological activities within WMO DRR framework



WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

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Outline

- Sendai Framework and hydrology
- WMO DRR Roadmap
- MHEWS
- GMAS and CAP
- UUID and cataloguing of extreme events

Sendai Framework for DRR

- 3rd WCDRR – SFDRR (visit: www.preventionweb.net)



Target A

Global Target A: Substantially reduce global disaster <i>mortality</i> by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015.	
A-1 (compound)	Number of deaths and missing persons attributed to disasters, per 100,000 population.
A-2	Number of deaths attributed to disasters, per 100,000 population.
A-3	Number of missing persons attributed to disasters, per 100,000 population.
	<i>The scope of disaster in this and subsequent targets is defined in paragraph 15 of the SFDRR and applies to small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters caused by natural or man-made hazards, as well as related environmental, technological and biological hazards and risk.</i>

Target B

Global Target B: Substantially reduce the number of *affected people* globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015.

B-1 (compound)	Number of directly affected people attributed to disasters, per 100,000 population.
B-2	Number of injured or ill people attributed to disasters, per 100,000 population.
B-3	Number of people whose damaged dwellings were attributed to disasters.
B-4	Number of people whose destroyed dwellings were attributed to disasters.
B-5	Number of people whose livelihoods were disrupted or destroyed, attributed to disasters.

Target G

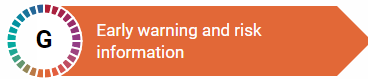
Global Target G: Substantially increase the availability of and access to *multi-hazard early warning systems and disaster risk information and assessments* to the people by 2030.

G-1 (compound)	Number of countries that have multi-hazard early warning systems.
G-2	Number of countries that have a multi-hazard monitoring and forecasting systems.
G-3	Number of people per 100,000 that are covered by early warning information through local governments or through national dissemination mechanisms.
G-4	Percentage of local governments having a plan to act on early warnings.
G-5	Number of countries that have accessible, understandable, usable and relevant disaster risk information and assessment available to the people at the national and local level.
G-6	Percentage of population exposed or at risk from disasters protected through pre-emptive evacuation following early warning.

Footnote to indicator G-6: Member States in a position to do so are encouraged to provide information on the number of evacuated people.

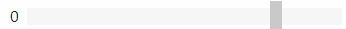


Reporting – Sendai Monitor



Recommended: Rate the quality of your country's multi-hazard early warning system

Multi-hazard monitoring and forecasting systems

	2017	SCORE
Score of the multi-hazard early warning systems	0  1.00	0.8329

Quality of multi-hazards monitoring and forecasting systems

HAZARDS	2017	SCORE	WEIGHT	MONITOR	FORECAST	MESSAGES	PROCESS
Drought	2017	0.5	<input type="text" value="0.01"/>	<input type="text" value="0.75"/>	<input type="text" value="0.25"/>	<input type="text" value="0.5"/>	<input type="text" value="0.5"/>
Epidemics	2017	0	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Epizootics	2017	0	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Explosion	2017	0	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Extreme temperature	2017	0.88	<input type="text" value="0.05"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>
fire	2017	0	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Flash flood	2017	0.81	<input type="text" value="0.24"/>	<input type="text" value="0.75"/>	<input type="text" value="0.75"/>	<input type="text" value="0.75"/>	<input type="text" value="1"/>
Flood	2017	0	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Heat wave	2017	0	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Industrial disaster	2017	0	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Landslide	2017	0.06	<input type="text" value="0.05"/>	<input type="text" value="0.25"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

HAZARDS

Drought
Epidemics
Epizootics
Explosion
Extreme temperature
fire
Flash flood
Flood
Heat wave
Industrial disaster
Landslide
Nuclear incident
Pandemics
Pollution
Ponding flood
Power outage
Radiation contamination
Rail accident
Rain
Riverine flood
Road accident
Rock fall
Urban flood
Wildfire
Wind



WMO DRR Roadmap

- CG-17 and EC-69 (2017)
- <http://www.wmo.int/pages/prog/drr/documents/roadmap/index.html>

The vision of the WMO DRR Roadmap is that **WMO and the NMHSs of its Members are recognised as an authoritative and effective support mechanism within the national, regional and global DRR arenas with regard to weather-, water- and climate-related hazards.**

WMO DRR Roadmap

Such a NMHS – supported by WMO’s structures as a whole – is able to:

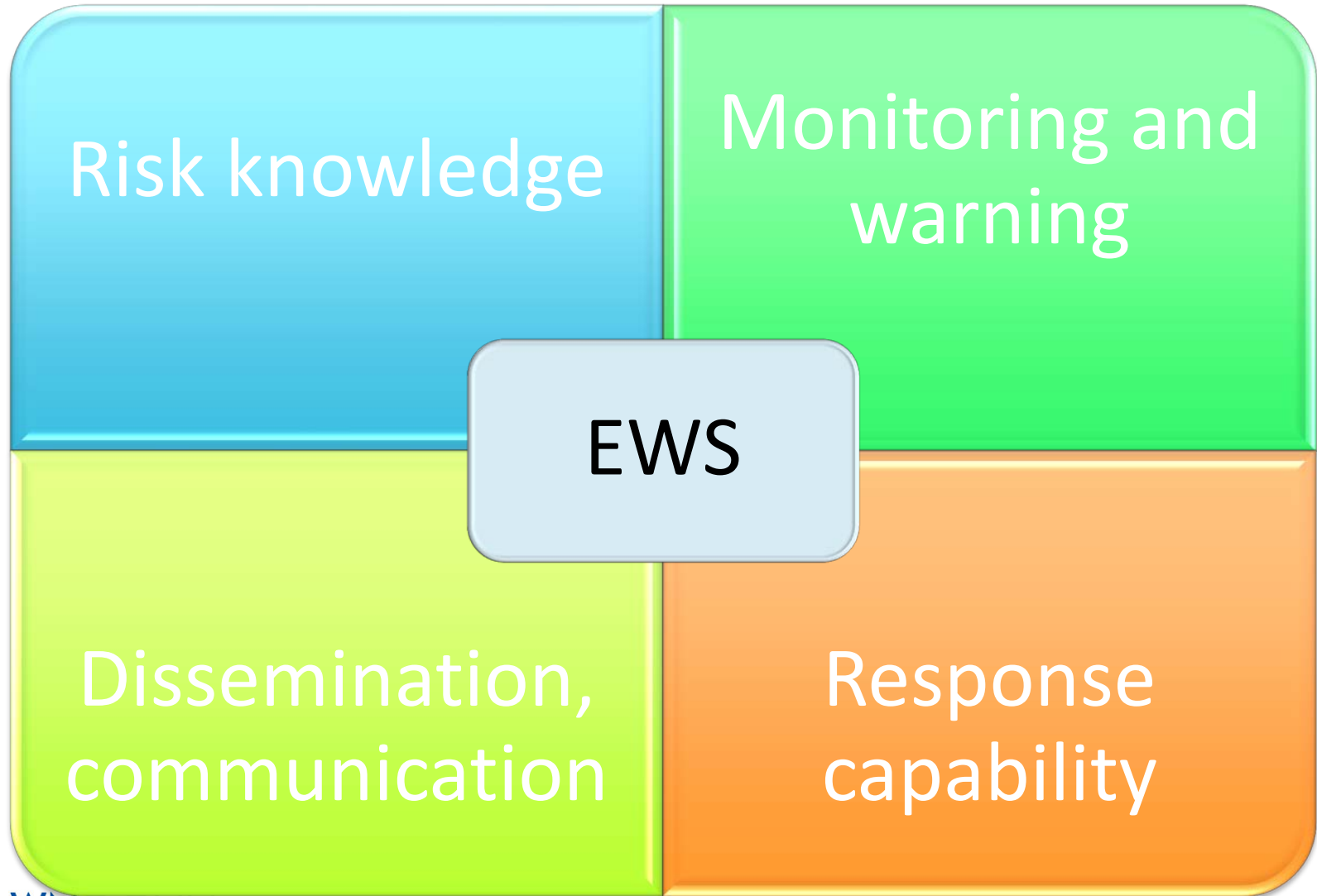
- **Co-design, co-produce, and co-deliver** together with other NMHSs and partners user-driven **services that support DRM measures** in multiple sectors and at various spatial and temporal scales;
- Fully link vulnerability and exposure data to standardized hazard information in data processing, production, and service delivery in order to contribute to and use **impact-based forecasts and risk-informed warnings of multiple hazards within the framework of MHEWS**;
- Advance and apply science (natural and social) and technology to support the **development and delivery of such products and services for DRR**; and,
- **Sustain its core operations**, also after having been affected by disasters themselves.

Multi-Hazard Early Warning System

EWS is an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.

MHWES address several hazards and/or impacts of similar or different type in contexts where hazardous events may occur alone, simultaneously, cascadingly or cumulatively over time, and taking into account the potential interrelated effects. A multi-hazard early warning system with the ability to warn of one or more hazards increases the efficiency and consistency of warnings through coordinated and compatible mechanisms and capacities, involving multiple disciplines for updated and accurate hazards identification and monitoring for multiple hazards.

Multi-Hazard Early Warning System



MHEWS – a checklist

Disaster risk knowledge

- Are key hazards and related threats identified?
- Are exposure, vulnerabilities, capacities and risks assessed?
- Are roles and responsibilities of stakeholders identified?
- Is risk information consolidated?

Detection, monitoring, analysis and forecasting of the hazards and possible consequences

- Are there monitoring systems in place?
- Are there forecasting and warning services in place?
- Are there institutional mechanisms in place?

Warning dissemination and communication

- Are organizational and decision-making processes in place and operational?
- Are communication systems and equipment in place and operational?
- Are impact-based early warnings communicated effectively to prompt action by target groups?

Preparedness and response capabilities

- Are disaster preparedness measures, including response plans, developed and operational?
- Are public awareness and education campaigns conducted?
- Are public awareness and response tested and evaluated?



MHEWS – a checklist

Detection, monitoring, analysis and



Early warning and risk information

Recommended: Rate the quality of your country's multi-hazard early warning system

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Epizootics	2017	0	0	0	0	0	0
Explosion	2017	0	0	0	0	0	0
Extreme temperature	2017	0.88	0.05	1	1	1	0.5
fire	2017	0	0	0	0	0	0
Flash flood	2017	0.81	0.24	0.75	0.75	0.75	1
Flood	2017	0	0	0	0	0	0
Heat wave	2017	0	0	0	0	0	0
Industrial disaster	2017	0	0	0	0	0	0
Landslide	2017	0.06	0.05	0.25	0	0	0

Multi-Hazard Early Warning System



global platform for
disaster risk reduction

Geneva, Switzerland, 13-17 May 2019

<https://mhews.wmo.int/en>



WORLD
METEOROLOGICAL
ORGANIZATION

MHEWC-II

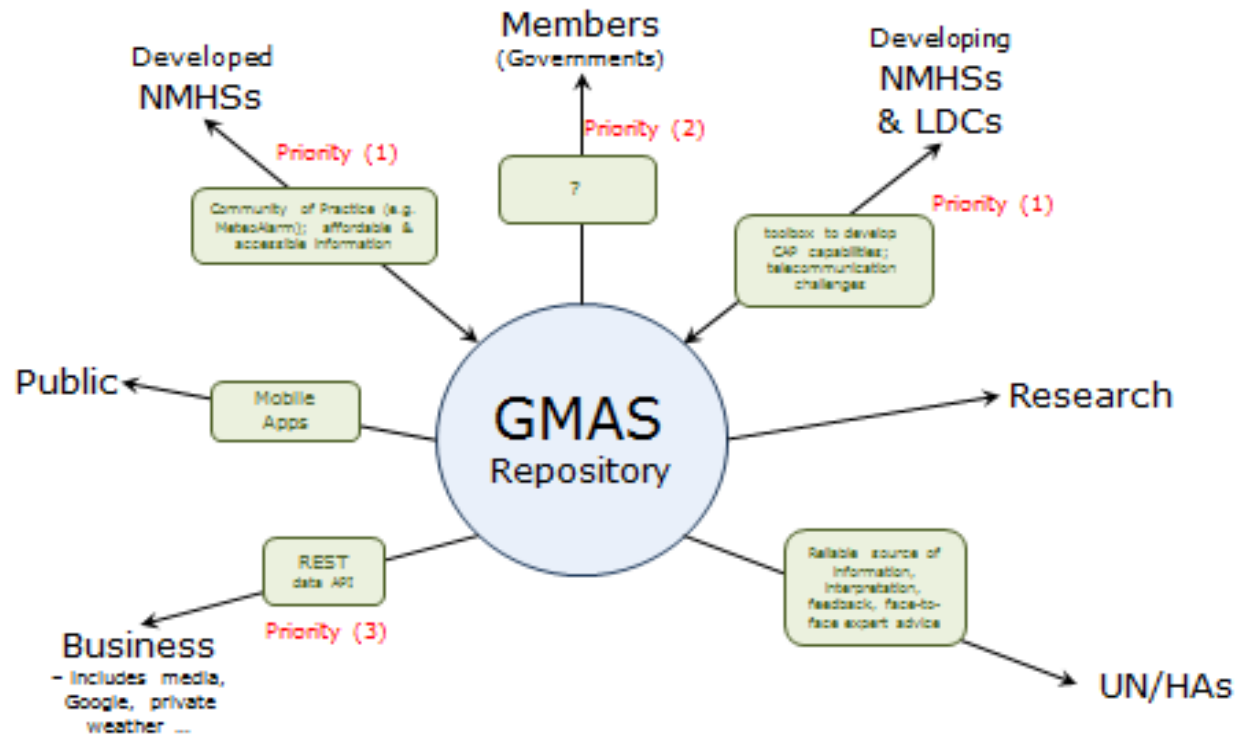
The Second Multi-Hazard Early Warning Conference
13-14 May 2019, Geneva, Switzerland

By the International Network for
Multi-Hazard Early Warning Systems (IN-MHEWS)

GMAS and CAP

- MHWES Conference in 2017 and EC-69
- **GMAS is the WMO framework for *substantially increasing and enhancing the availability of, and access to, official and authoritative multi-hazard early warnings,***

GMAS and CAP



- 1) Repository - resilient
 - Governance
 - NMHS - comms
- 2) UR – Members
- 3) Next development

GMAS and CAP

It will proactively respond to international agreements by:

- Improving warning information through **harmonization/cross-border cooperation**,
- Providing a highly visible and accessible **repository of official/authoritative warnings**,
- **Improving visibility of NMHSs** as national alerting Authorities and WMO
- Providing a target and focus for capacity development **investments** by development agencies

GMAS and CAP

For those **Members who already have an advanced warning system**, it will aid harmonization and sharing of good practices.

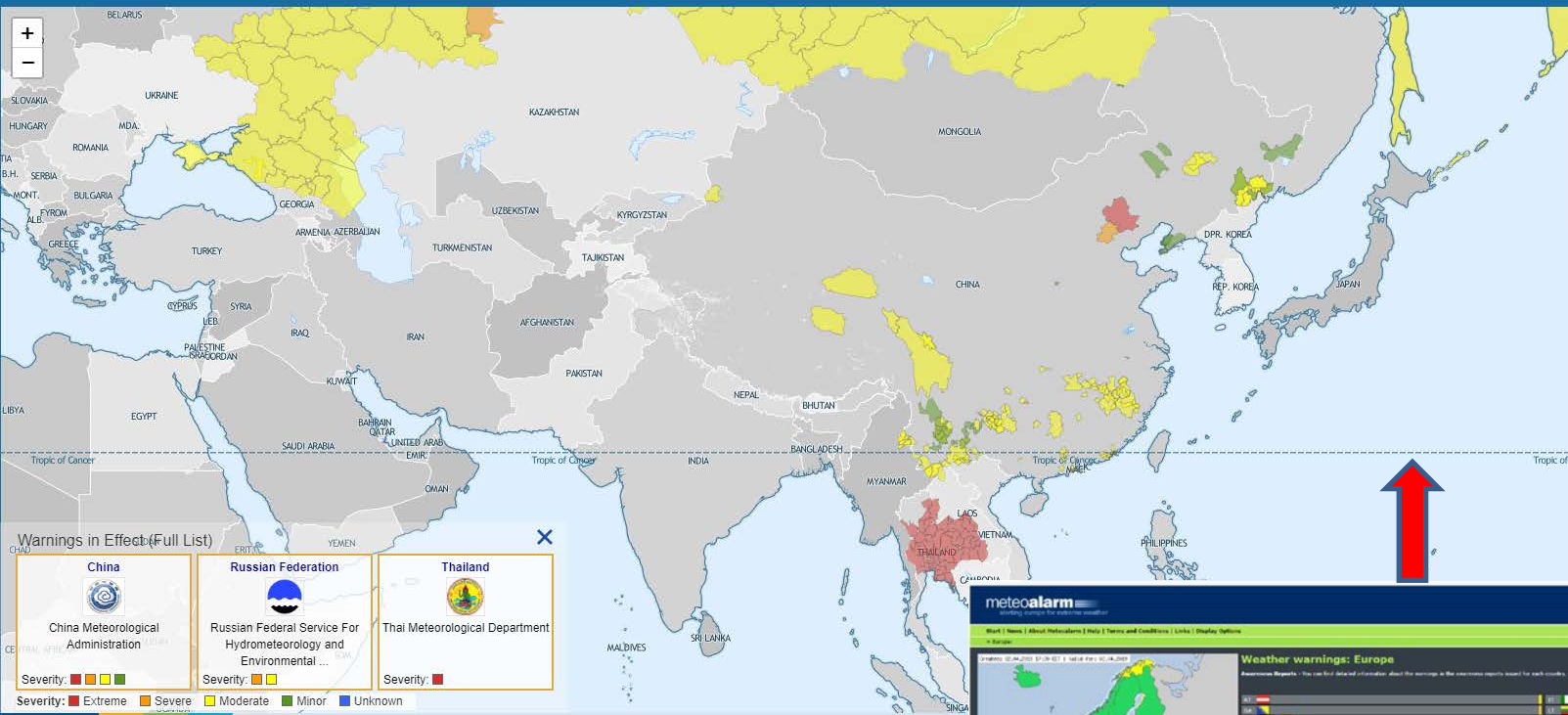
For all and especially those **Members who do not have an advanced warning system** it will :

- provide a roadmap for capacity development,
- Encourage harmonization of warning information to take global mobility into account,
- help improving outreach to the public and those at risk,
- Leverage existing and future infrastructure, WMO mechanisms and knowhow,
- Recognize and highlight the ownership of Members,
- Secure the sustainability of NMHSs' key mandates.



WMO Pilot Project to Enhance the Capability of Meteorological Disaster Risk Reduction in RAI (Asia) (GMAS-A)

Home | RAI Members | Links | About | Member Login



Blizzard
Qinghai Province
3 hours ago

Icy Road
Qinghai Province
3 hours ago

Warnings in Effect (Full List)

- China**
China Meteorological Administration
Severity: Extreme, Severe, Moderate, Minor, Unknown
- Russian Federation**
Russian Federal Service For Hydrometeorology and Environmental ...
Severity: Moderate, Minor, Unknown
- Thailand**
Thai Meteorological Department
Severity: Extreme

Country	Warning	Severity
AT	None	None
BE	None	None
BG	None	None
CH	None	None
CY	None	None
CZ	None	None
DE	None	None
DK	None	None
EE	None	None
ES	None	None
FI	None	None
FR	None	None
GB	None	None
GR	None	None
HR	None	None
HU	None	None
IE	None	None
IT	None	None
LT	None	None
LU	None	None
LV	None	None
MT	None	None
NL	None	None
NO	None	None
PL	None	None
PT	None	None
RO	None	None
SE	None	None
SI	None	None
SK	None	None
TR	None	None
UA	None	None
UK	None	None
US	None	None

Flood warning →

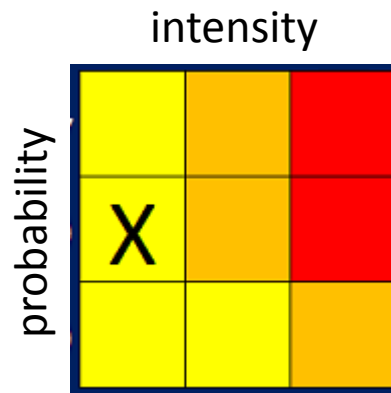


GMAS and CAP

CAP – Common alerting protocol

- Agreed as recommended protocol
- Push to become WMO standard
- No other similar hydrological standard for warnings known
- It works for hydrology – Meteoalarm.... With some ‘obstacles’ of course

<http://alert-hub-dashboard-hko.s3-website-us-west-2.amazonaws.com/template.html>



CAP – Google Public Alerts

Google Public Alerts

Enter a location

Map

Layers Legend Details

Flood Warning for Jefferson Co, WI

...The Flood Warning continues for the following rivers in Wisconsin... Rock River...

2019-04-02-15-55...xml

2019-04-02-15-55...xml

2019.03.06 - IPTT...docx

2019.02.26 - Cg...docx

2019.02.26 - Cg...docx

2019.01.24-GMA...docx

2018.01.23 - Cg...docx

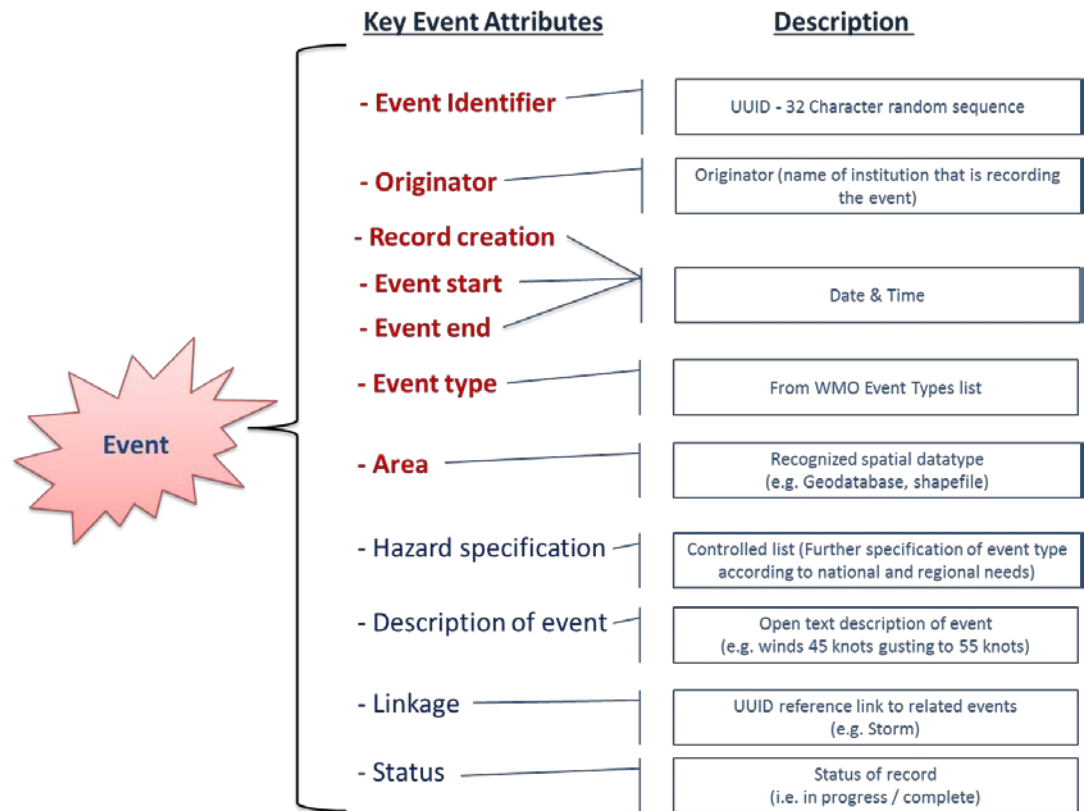
Show all

<!-- http-date = Tue, 02 Apr 2019 03:50:00 GMT -->
<identifier>NOAA-NWS-ALERTS-
WI125CF1BF91F8.FloodWarning.125CF1EDBA60WI.MKXFLSMKX.6ea80718615e00bf4681600409be150f</identifier>
<sender>w-nws.webmaster@noaa.gov</sender>
<sent>2019-04-02T10:50:00-05:00</sent>
<status>Actual</status>
<msgType>Alert</msgType>
<scope>Public</scope>
<note>Alert for Jefferson (Wisconsin) Issued by the National Weather Service</note>
<info>
<category>Met</category>
<event>Flood Warning</event>
<urgency>Expected</urgency>
<severity>Moderate</severity>
<certainty>Likely</certainty>
<eventCode>
<valueName>SAME</valueName>
<value>FLW</value>
</eventCode>
<effective>2019-04-02T10:50:00-05:00</effective>
<expires>2019-04-05T13:00:00-05:00</expires>
<senderName>NWS Milwaukee (Southern and Southeastern Wisconsin)</senderName>
<headline>Flood Warning issued April 02 at 10:50AM CDT until April 05 at 1:00PM CDT by NWS Milwaukee</headline>
<description>...The Flood Warning continues for the following rivers in Wisconsin...
Rock River At Fort Atkinson affecting Jefferson County Rock River Near Lake Koshkonong affecting Jefferson and
Rock Counties
Fox River At Princeton affecting Green Lake County... </description>
<instruction></instruction>
<parameter>
<valueName>WMOHEADER</valueName>
<value></value>
</parameter>
<parameter>
<valueName>UGC</valueName>
<value>WIC055</value>
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<valueName>VTEC</valueName>
<areaDesc>Jefferson</areaDesc>
<polygon>43,-88.87 42.93,-88.73 42.87,-88.78 42.83,-88.83 42.93,-88.97 42.95,-88.92 43,-88.87</polygon>



UUID and cataloguing of extreme events

- CG-17, RA VI (2018) a pilot by RCC hosted by DWD



UUID and cataloguing of extreme events

Parameter	Format	Description
Event Identifier*	Alphanumeric number	UUID (32 character random sequence)
Originator*	Text	Name of institution that is recording the event
Record Creation*	Date/Timestamp	Date- and time-stamp of event onset
Event start*	Date/Timestamp	
Event end*	Date/Timestamp	
Event Type*	List	Controlled standard list – see Table 2 below
Area*	Recognized spatial datatype	Spatial area Recognized spatial format
Hazard specification	Text	Controlled list
Description	Text (Up to 500 characters)	Open description text. Description of event such as max temp, highest wind speed, severity, local event name and any other information that can assist attribution of loss and damages.
Impacts	Text (Up to 500 characters)	References to initial reported impact
Linkage	Alphanumeric number strings	UUID reference link to source or other events
Status		Indicate status of record

UUID and cataloguing of extreme events

Table.2: Event Types List	
Avalanche	Pollen pollution episode
Cold wave	Polluted air
Drought / Dry Spell	Rain / Wet Spell
Dust storm or sandstorm	Snow
Extra-tropical cyclone	Snowstorm
Flood	Space weather
Fog / Haze	Storm surge / Coastal flood
Frost	Thunderstorms
Hail	Tornado
Heat wave	Tropical cyclone
High UV Radiation	Tsunami
Icing	Volcanic Ash
Landslide / Mudslide	Wild land fire / forest fire
Lightning	Wind

Conclusions

- There's a momentum in DRR activities at the WMO with strong integration scope
- Hydrology included in developing these initiatives, but...

...with the reform, we need to keep it or, better, even elevate the involvement of hydrology in the WMO and its crosscutting activities.

Key message to take home (repeating)

- Chy-ext agreed on the benefit/need to establish a Hydrological coordination mechanism (Hydrological Assembly/group)
- This is not a duplication nor replacement of any Technical Commission – but strategic tool to involvement and strategic input/contribution from hydrology community

Key message to take home (repeating)

- Go to your PR and/or HA to promote the need for and benefits of having Hydrological Assembly well before CG-18 in June
- ICCED meeting in Prague 15-16 April
- Come to CG-18 and Hydrological Assembly



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Thank you

