

Potential interface between EM-DAT and WMO: Approach to the implementation of Resolution 9 (Cg-17) Identifiers for Cataloguing Extreme Weather, Water and Climate Events

IEM-DAT Technical Advisory Group Meeting
Washington
24-25 October 2016



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Resolution 9 (Cg-17)

IDENTIFIERS FOR CATALOGUING EXTREME WEATHER, WATER AND CLIMATE EVENTS

THE WORLD METEOROLOGICAL CONGRESS,

Noting:

- (1) The increasing frequency and magnitude of extreme weather, water and climate events and their impacts on different socioeconomic sectors, lives and livelihoods,
- (2) The calls for reducing the losses associated with extreme events in the Sendai Framework for Disaster Risk Reduction 2015-2030, the United Nations Framework Convention on Climate Change Warsaw international mechanism for loss and damage associated with climate change impacts, and the United Nations draft sustainable development goals,

Noting further:

- (1) That developing identifiers for cataloguing weather, water and climate extreme events in cooperation with institutions having competences about possible impact of those weather events can provide an unambiguous reference for associated losses and damages and can promote consistency in the characterization of extreme events,
- (2) That more consistent event characterization in terms of type of event, location, duration, magnitude and timing would allow for better evaluation of the types of losses and damages associated with different types of events, and the most damaging events and thresholds, and trends,

Considering:

- (1) That many National Meteorological and Hydrological Services have developed and are maintaining historical catalogues of extreme events,
- (2) That many countries have established disaster loss and damage accounting systems that could help in monitoring the implementation of the Sendai Framework and other international policies,
- (3) That technical commissions, regional associations and technical programmes are at different stages in addressing the different aspects of extreme weather, water, climate and space weather events such as methodologies and standards for defining the events, indices, and creating web portals for event databases, and that there is a need for better understanding their roles in addressing this issue,
- (4) That an identifier and cataloguing system is an important prerequisite for the Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes and the United Nations Office for Disaster Risk Reduction Global Assessment Reports on Disaster Risk Reduction, and that it could greatly assist the Global Framework for Climate Services by bringing a standardized approach of National Meteorological and Hydrological Services to the analysis and recording of extreme hydrometeorological events in national databases, and by supporting the international exchange and validation of these data,



Decides to **standardize weather, water, climate, space weather and other related environmental hazard and risk information** and **develop identifiers** for cataloguing weather, water and climate extreme events;

Requests **the Executive Council** to provide **oversight** on the standardization of hazard information for loss and damage assessment;

Requests the **Commission for Basic Systems to develop, in collaboration** with all technical commissions and regional associations, a **proposal on standardized identifiers** for cataloguing hazardous events for consideration by the Executive Council;

Requests the Secretary-General to take the necessary actions, within the available budgetary resources, to facilitate the work on this important issue.

Questions we have considered

- ❑ Who are the target users?
 - Stakeholders in developing and maintaining global/regional/national loss & damage databases (such as **EM-DAT**, UNISDR Global Assessment Report, monitoring of implementation of Sendai Framework Agreement on DRR, Sustainable Development Goals (SDGs), UNFCCC, etc.)

- ❑ What information is required?
 - Time and duration, geographic location, type of event, intensity of the event, Hydro-meteorological parameters

- ❑ What is the scope?
 - National, regional and global levels

Monitoring progress – targets and indicators

- **Expected outcome** of the Sendai Framework: → substantial reduction of disaster risk and losses of lives, livelihood, health and assets
- **Goal:** → Prevent new and reduce existing risk and thus strengthen resilience
- **7 global targets:** → g) Substantially increase the availability of and access to MHEWS and disaster risk information and assessments to the people by 2030

How to monitor?

→ Use of indicators for each of the global targets

Being developed for Target g). Working with numerous international partners

Monitoring progress – targets and indicators - Sendai Target g) early warning

No.	Indicator	Methodology	Data
	Recommended - for measurement of the global target		
G-1	Number of countries that have multi-hazard early warning system.	Y	N
G-2	Number of countries that have multi-hazard monitoring and forecasting system.	Y	N
G-3	Number of people who are covered by and have access to multi-hazard early warning system per 100,000	Y	N
G-4	Number of local governments having a preparedness plan (including EWS) or evacuation plan with standard operating procedures.	Y	N
G-5	Number of countries that have multi-hazard national risk assessment / information, with results in an accessible, understandable and usable format for stakeholders and people.	Y	N
G-6	Number of local governments that have multi-hazard risk assessment / risk information, with results in an accessible, understandable and usable format for stakeholders and people.	Y	N

Monitoring progress – targets and indicators - Sendai Target d) infrastructure

No.	Indicator	Methodology	Data
	Recommended - for measurement of the global target		
D-1	Damage to critical infrastructure due to hazardous events.	Y	N
D-2	Number of health facilities destroyed or damaged by hazardous events.	Y	Y
D-3	Number of educational facilities destroyed or damaged by hazardous events.	Y	Y
D-4	Number of transportation units and infrastructures destroyed or damaged by hazardous events.	Y	N
D-4b	Kilometres of road destroyed or damaged per hazardous event.	Y	Y
D-4c	Number of bridges destroyed/damaged by hazardous event.	Y	N
D-4d	Kilometres of railway destroyed / damaged by hazardous event.	Y	N
D-4k	Number of airports destroyed / damaged by hazardous event	Y	N
D-4l	Number of ports destroyed / damaged by hazardous event	Y	N
D-1 bis ¹¹	Number of electricity plants / transmission lines destroyed or damaged by hazardous events.	Y	N
D-5	Number of times basic services have been disrupted due to hazardous events.	Y	Y ¹²

User segmentation of extreme event information

Scope can be divided into two categories:

- 1) Science driven: Focused on climatological extremes of hazards such as heat/cold wave, heavy precipitation, and drought
 - Trigger: Hazard threshold based (departure from normal)

- 2) Loss & damage driven: focused on the human and economic toll of a disaster but also include hydrometeorological attributes such as hazard type (including hierarchy of the hazard), strength, etc. (loss & damage driven)
 - Trigger: Loss of life and/or damage (IMPACT)

Methodologies

Two phases:

1st phase

- Emphasis is on **leveraging existing NMHS processes** and WMO infrastructure
- Hazard definitions: **Acceptance of national definitions**, with understanding that harmonization of definitions is an ongoing activity;

Potential list of hazards and extreme events

I. Weather

- Duststorm
- Sand haze
- Sandstorm
- Sandstorm/Duststorm
- Acid rain
- Black carbon
- Brown clouds
- Pollen pollution episodes
- Polluted air
- Radioactive contamination
- Sulphur rain
- Avalanche
- Blizzard
- Downburst
- Dry spell
- Fog
- Hoar frost
- Gale
- Hail
- Haze
- Heavy precipitation
- Heavy rain

Potential list of hazards and extreme events

I. Weather (ctd)

- Ice storm
- Smog
- Snowstorm
- Squall
- Storm
- Strong gale
- Thunderstorm
- Wet spell
- Volcanian eruption
- Volcanic ash
- Hawaiian eruption
- Plinian eruption
- Strombolian eruption
- Storm surges
- Tsunami
- Cyclone
- Tropical cyclone
- Sub-tropical cyclone
- Extra-tropical cyclone
- Hurricane
- Typhoon
- Severe tropical storm

Potential list of hazards and extreme events

I. Weather (ctd)

- Subtropical Storm
- Tornado
- Tropical storm

II. Climate

- Cold wave
- Heatwave/heat wave
- Drought
- Hydrological drought
- Meteorological drought

Potential list of hazards and extreme events

III. Water

- Annual flood
- Coastal flood
- Estuarine flood
- Flash flood
- Flood
- Flooding
- Fluvial (riverine) flood
- Ice and debris-jam flood
- Landslide/Mudslide
- Mudflow

- Multiple event flood
- Seasonal flood
- Single event flood
- Snowmelt flood

IV. Space weather

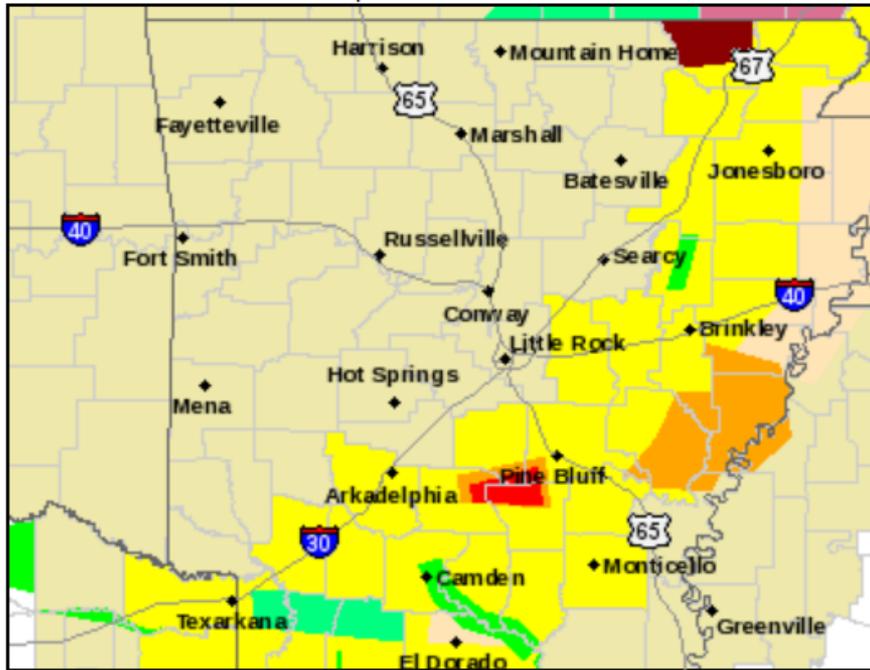
- Coronal mass ejections
- Geomagnetic storms
- Ionospheric storms
- Radio blackout
- Solar energetic particles
- Solar flares
- Solar radiation storm

Methodologies

2nd phase

- Utilization of hydrometeorological and climate **warnings as a proxy for identifying events**
 - Warnings provide a wealth of information about a hazard(s) including hazard, time line, geographical extent, severity, possible impacts, etc.
 - Can be used as a proxy to identify events though post event analysis which includes aggregation and clustering of warnings (temporally and spatially).
 - Clustering of warnings provides data necessary for outlining a geographic extent of possible impacts for which a unique event identifier can be ascribed with metadata of probable hazards, magnitude, and other relevant information.
 - Refinement of the impact area would be conducted through attribution of loss and damage information and warning verification processes.
- Governance
 - **Regional governance** of identifiers and storage of information

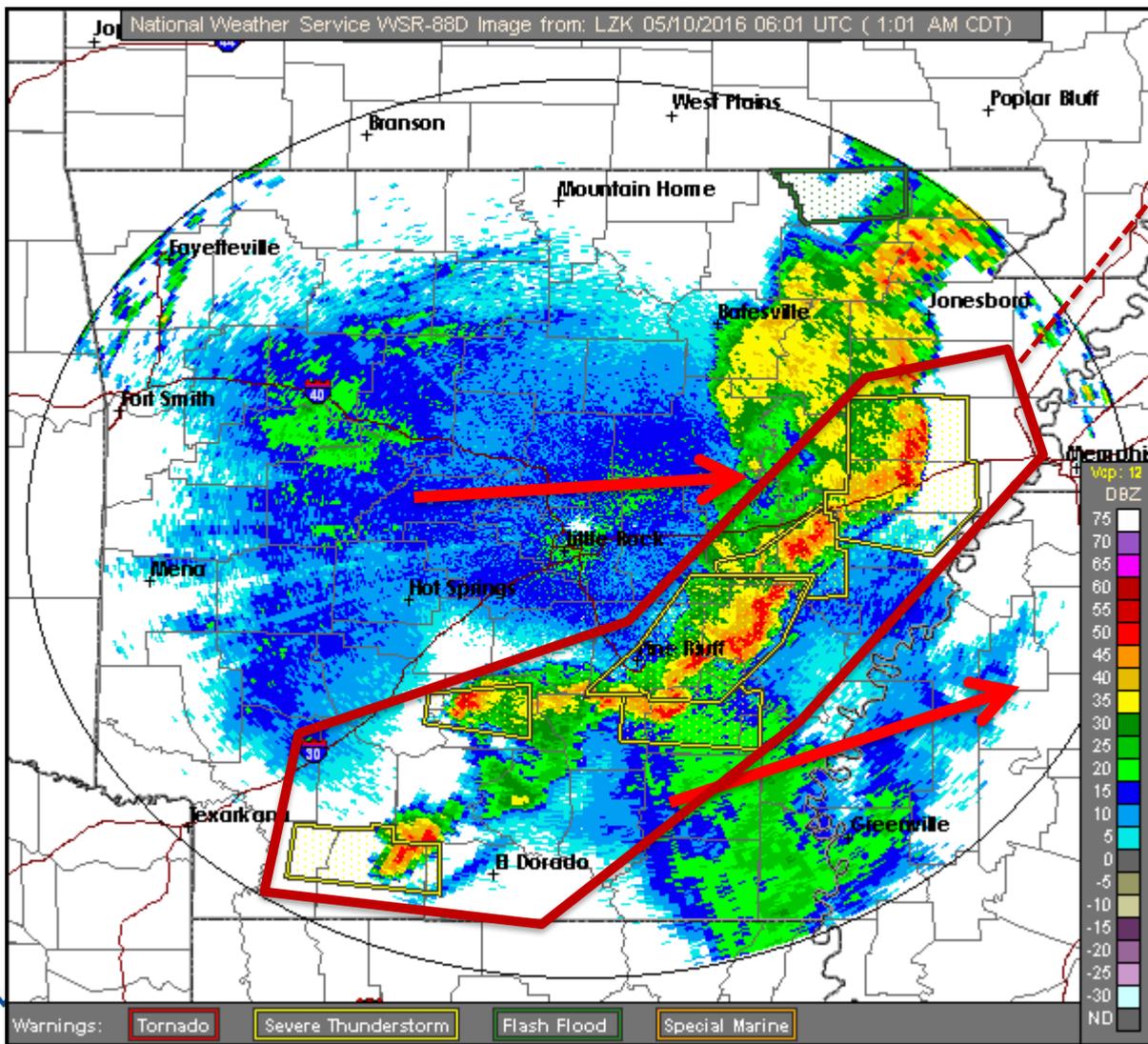
Warnings Provide Useful information



Warnings include information such as:

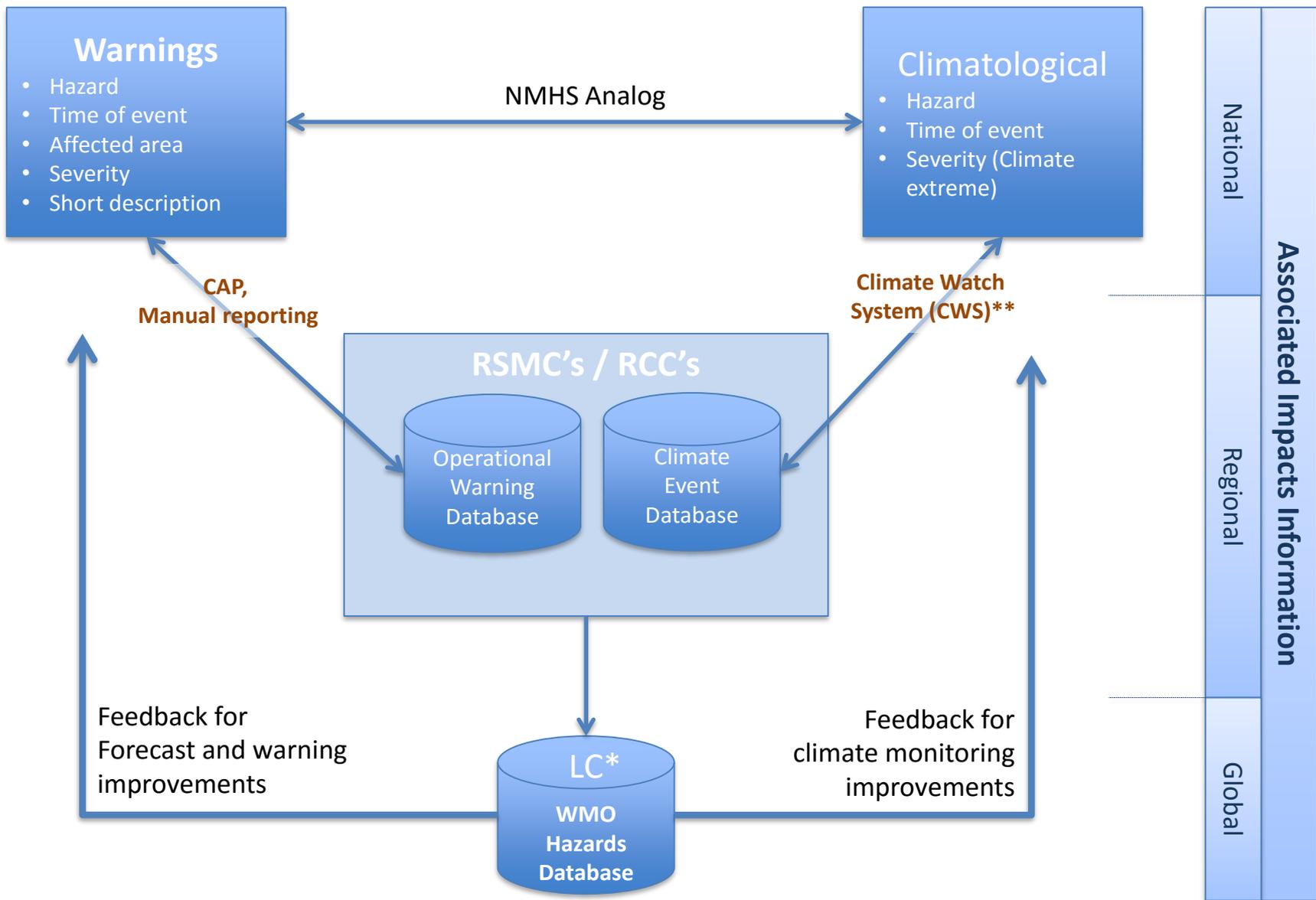
- hazard,
- time of event,
- affected area,
- severity
- short description of possible impacts (for some countries)

Warnings reflect potential impacts of a hazard as it moves

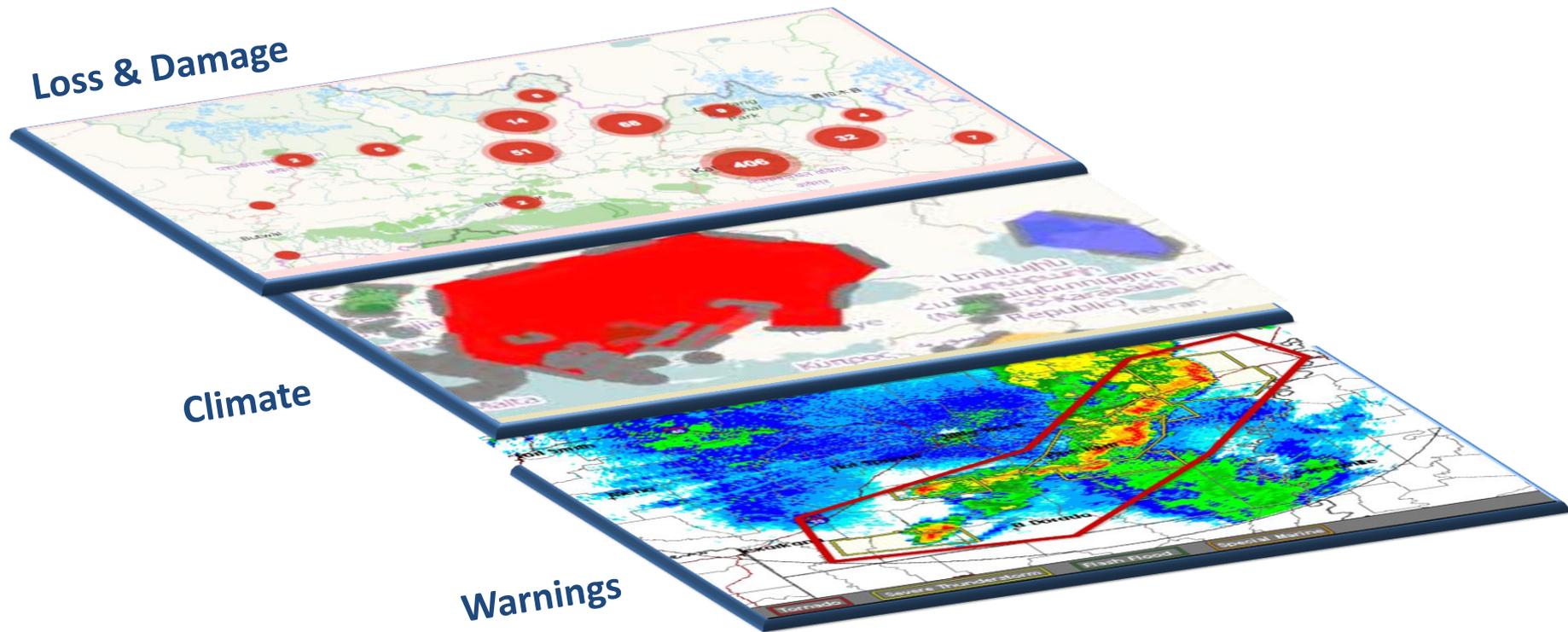


Event Id #

Event area to be extended as system progresses toward the east.



Layering of Information Enables New Possibilities for Analysis and Application



Roadmap for implementation of Congress 17 Resolution 9

Phased approach - phase 1 includes:

- establishing a standardized mechanism for transmission of warnings to a regional database that can be analyzed for events;
- Demonstration project which will include countries in South East Europe – to begin in Q4 of 2016;
- Strengthening capacities of NMHSs engaged in the demonstration project to become CAP enabled and to produce impact based forecasts.



Areas of future collaboration

Following agreement on hazard definitions and identifiers collaboration necessary for:

- Making databases accessible and useful
- Linkages with EM-DAT (and others) on events (types and identifiers)
- Linkages with loss/damage community to achieve 2nd phase – using the data to improve NMHS outputs.
- Other areas?



Thank you Merci



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Elements of a system of standardized identifiers



WMO Inter-Programme Task Team on Cataloguing Extreme Weather, Water and Climate Events (IPTT-CWWCE)



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ToRs: WMO Inter-Programme Task Team on Cataloguing Extreme Weather, Water and Climate Events (IPTT-CWWCE) (slide: 1/2)

- Take stock of the work WMO TCs, RAs and Members have accomplished to date relevant to Resolution 9 (see Annex II, such as the work conducted by the Commission for Climatology's (CCI) Task Team on Definitions of Extreme Weather and Climate Events (TT-DEWCE), the CCI Expert Team on Climate Data Base Management Systems (ET-CDMS) and the work undertaken by CBS and the WMO DRR Services Division);
- Development of a WMO architecture for defining, characterising, coding (unique identifier format and scheme), recording and reporting extreme events and submission to WMO EC-68;

ToRs: WMO Inter-Programme Task Team on Cataloguing Extreme Weather, Water and Climate Events (IPTT-CWWCE) (slide: 1/2)

- Development of a WMO proposal and implementation plan (that leverages the related work of TCs, RAs, and Members) with recommendations for modification as required of WMO manuals and guidelines (e.g. Manual on Manual on the Global Data-Processing and Forecasting System (DPFS) and the WMO Information System (WIS)) for submission to EC-69;
- Conduct of a demonstration project to test the WMO architecture and make refinements to the proposal; and,
- Submission of formal proposal and implementation plan through the PTC-PRA for consultation and to Cg-18 for approval.



Make-up and scope of the IPTT-CWWCE

- To be coordination mechanism across related WMO activities;
- Co-chaired by a representative from the Commission for Basic Systems (CBS) and the Commission for Climatology (CCI);
- TT members are to be experts from TCs that are working on various aspects related to the cataloguing and coding of extreme weather, water and climate events; and,
- Time bound through to WMO Congress 18.