Stakeholder engagement workshop on strengthening the capacities for observation and risk assessment in the context of loss and damage associated with climate change

Linking climate extremes and impacts via cataloguing of hazardous events

Bonn, 29-30 October 2019

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

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Multi-Hazard Early Warning Services Division
WMO

WMO OMM
World Meteorological Organization
Organisation météorologique mondiale

International Meteorological Organization (IMO)

First Congress on Meteorology (Vienne, 1873)

To facilitate the exchange of weather information across national borders

Convention 1947: from IMO to WMO

Conference of Directors (Washington, 1947)

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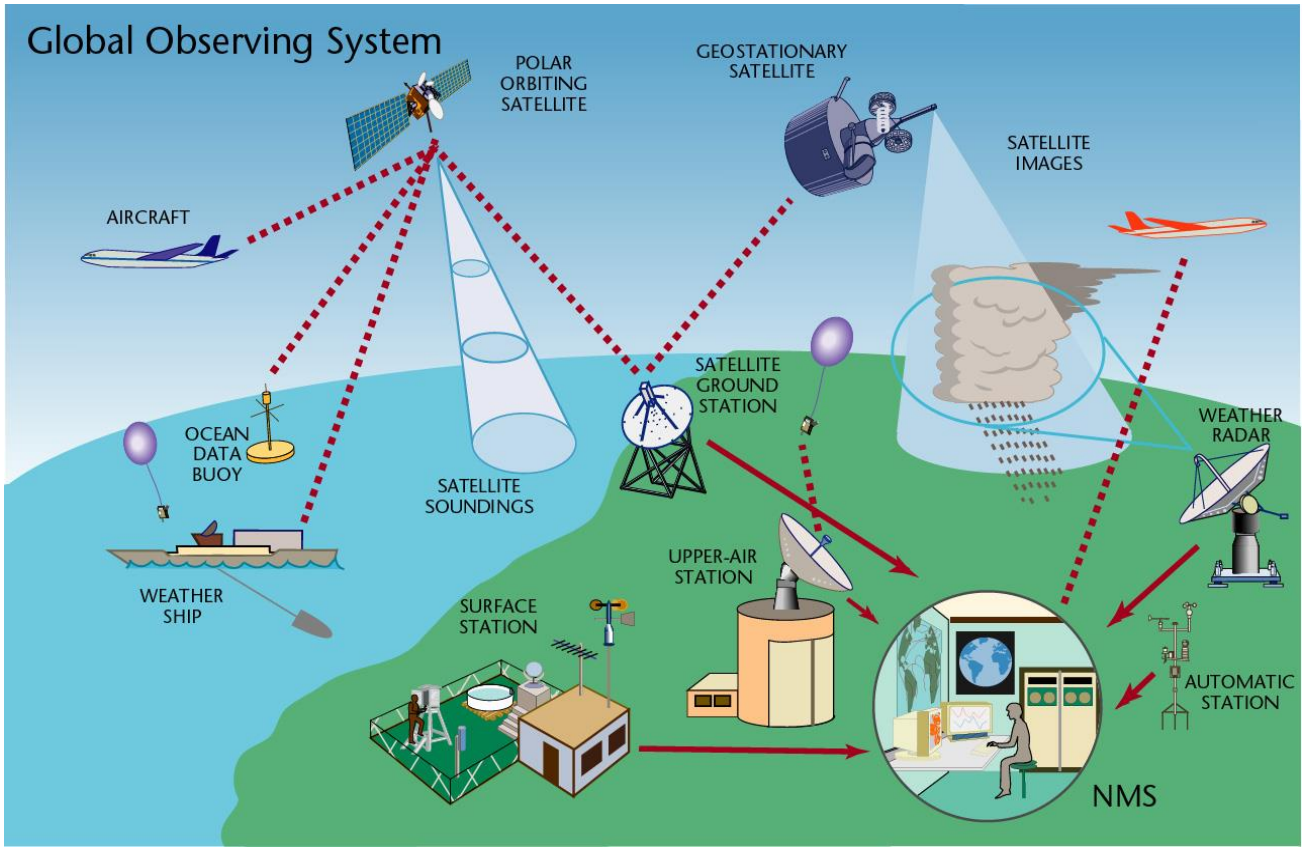
Continuously monitor weather, climate and water with systematic real time data collection and dissemination



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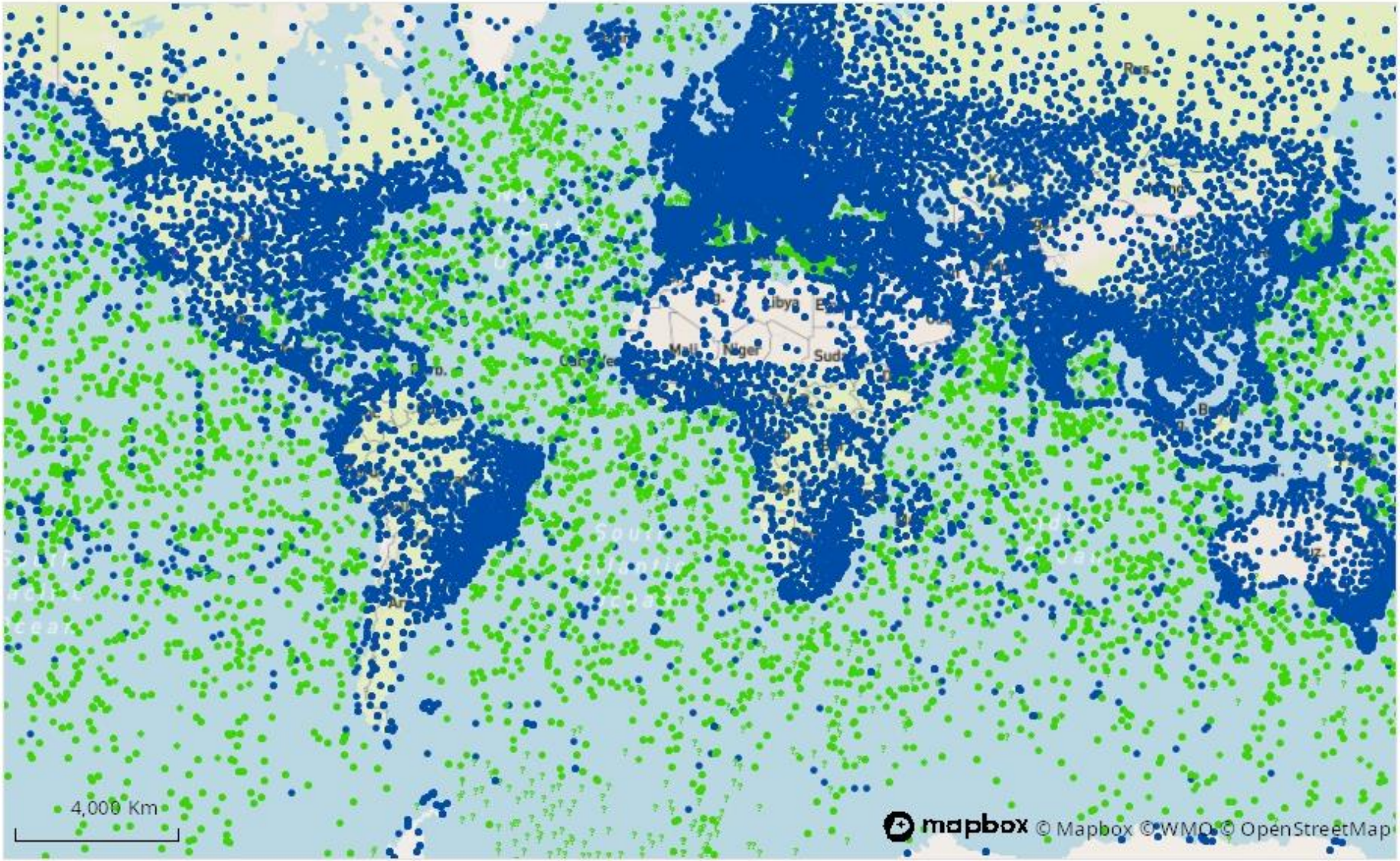


World Meteorological Organization
Weather - Climate - Water

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

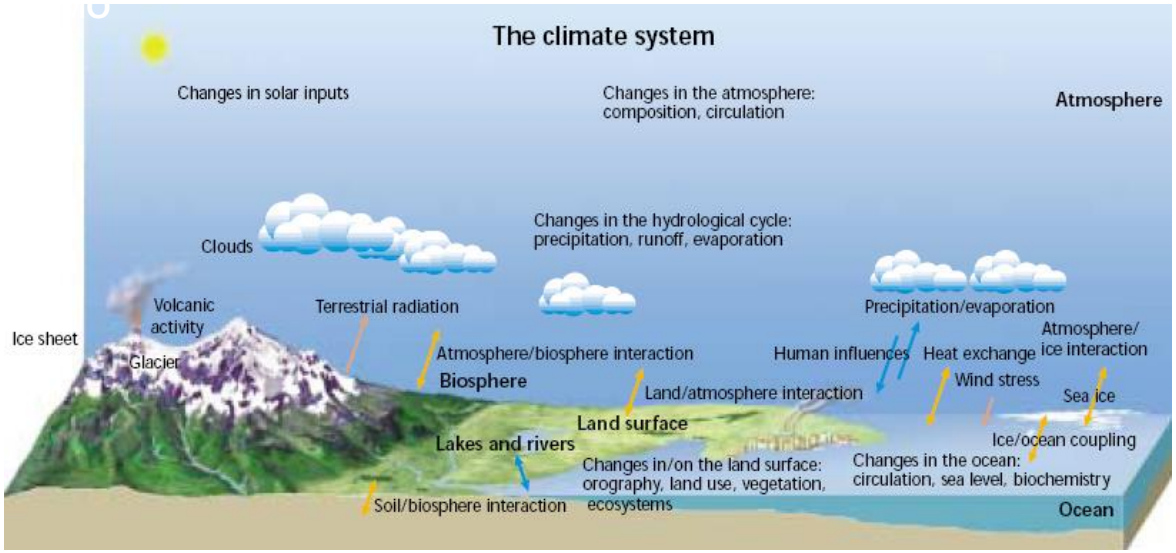
Swiss Confederation

Federal Department of Home Affairs FDHA
Federal Office of Meteorology and Climatology MeteoSwiss

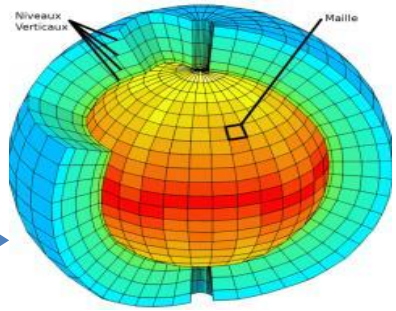
- land or ocean surface
- lake or river
- sub-surface
- air

- ● operational
- ✱ partly operational
- ○ silent
- × closed
- ? unknown

Earth System Data processing and forecasting



Current and predicted weather and climate



Supercomputer

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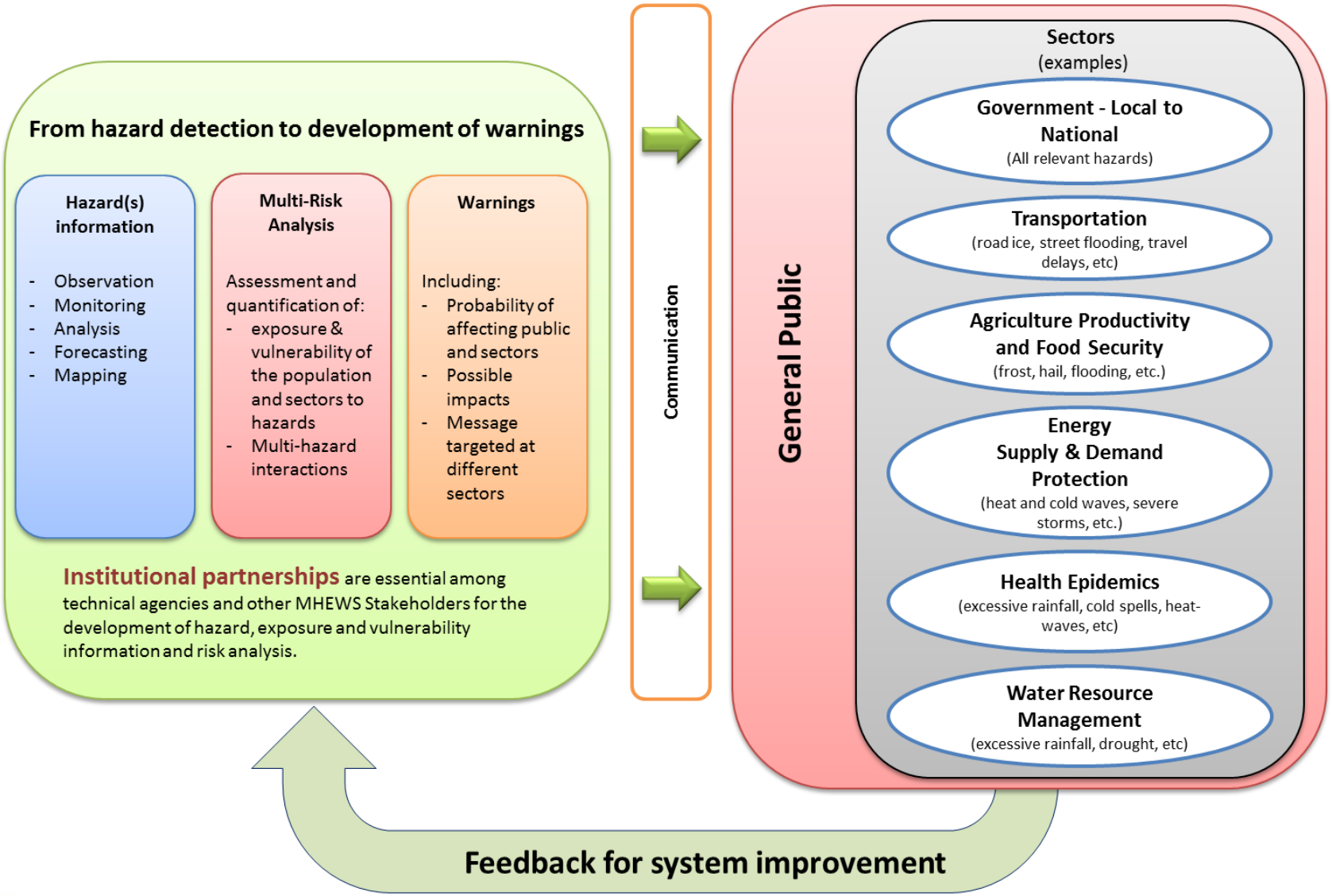
National Multi-Hazard Early Warning System

Warnings that Utilizes and Incorporates Impact & Risk information to Identify and Inform Specific At-Risk Groups



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Warning → Communicate → Prepare and Respond

WMO Cataloguing of Hazardous Events" (WMO-CHE)

Cataloging of weather, climate, water and space weather events as a standardized operational process

WMO OMM

Recording Event /impact

Issue

In many cases the attribution and context of a recorded loss is not accurately associated to the causal hazard.

Example:

Typhoon Haiyan

November 2013, Philippines and Vietnam

Characteristics

-Max wind: 230 Km / h

-Costal surges: up to 5 metres

Initial reported loss and damage

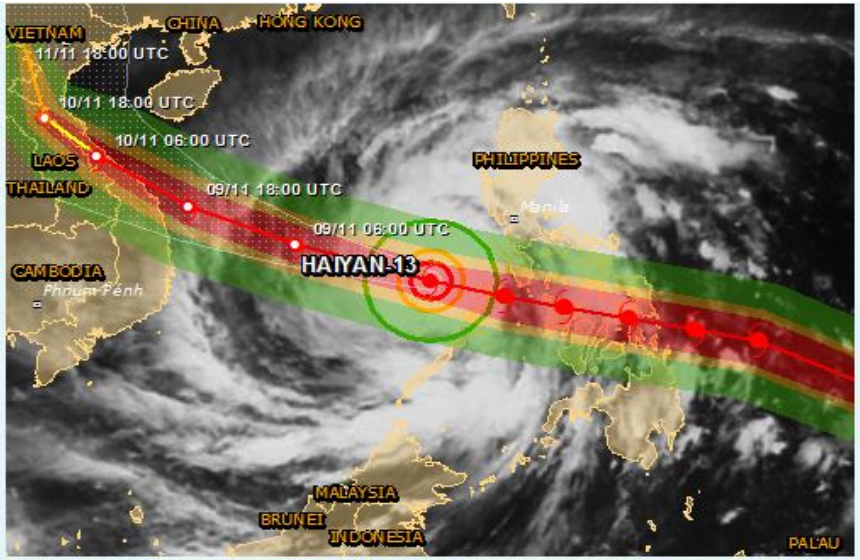
-More than 6352 deaths with 1071 still missing

- 14 millions people affected

- 850 million USD damage

How are loss and damages attributed to the each causal hazard in a systematic and authoritative way? (Wind, storm surge, rain, flooding, disease outbreak, loss of power… etc)?

How do we ensure loss and damage is recorded for the lifespan of the hazard (e.g. impacts from all countries Philippines, Vietnam, SIDS)



Cloud map. The map shows the areas affected by tropical storm strength winds (green), 58mph winds (orange) and cyclone wind strengths (red). (*Source: JRC*)

A new Standard for cataloging Hazards

18th Congress (2019) Adopted the cataloguing methodology hereafter referred to as “WMO Cataloguing of Hazardous Events” (WMO-CHE)

Uniqueness of event record - Assigning a universally unique identifier (UUID) number to each event including key attributes of the event into a data record; and,

Events List - A standard living list defining typology of events that could have impact on society.

Scalable - Enables empirical linking of events (e.g. a cyclone, leading to heavy rain, strong winds, storm surge flooding and landslides) to better reflect the larger system (synoptic scale).

Flexible - Provides the flexibility for addressing regional and national specificities

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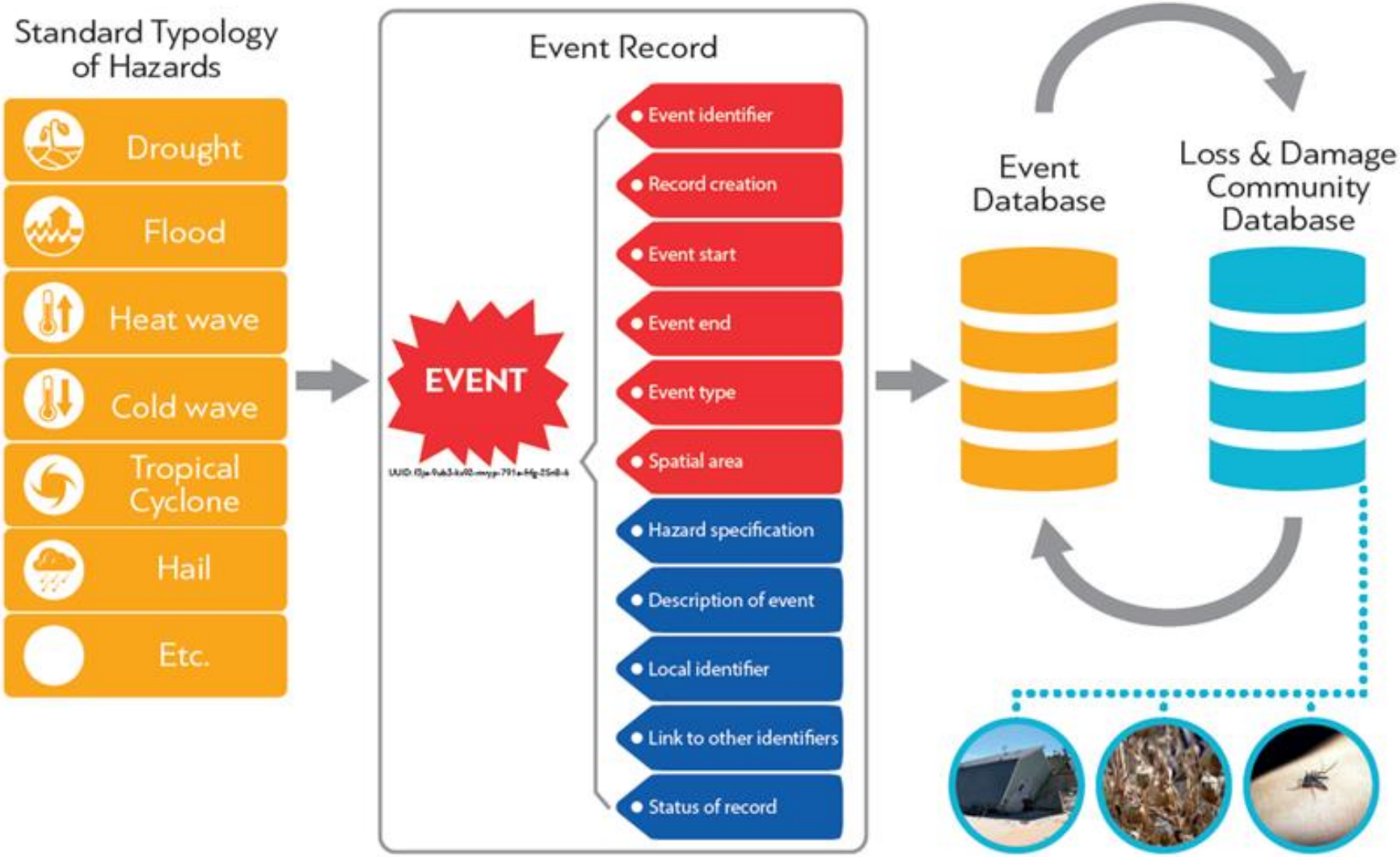
Principles of the cataloging methodology

a. Simple and feasible considering the costs, resource and time to implement
b. Preserve the right of each country to state how they choose to record and warn for hazards
c. Do not categorize hazards or events into groups (e.g. , meteorological, hydrological, climate)
d. Do not quantify and qualify hazard definition or express its severity (e.g. extreme, heavy, high)
e. Align to the Common Alert Protocol (CAP) for warnings to avoid duplication, confusion and misinterpretation

The Cataloguing Methodology



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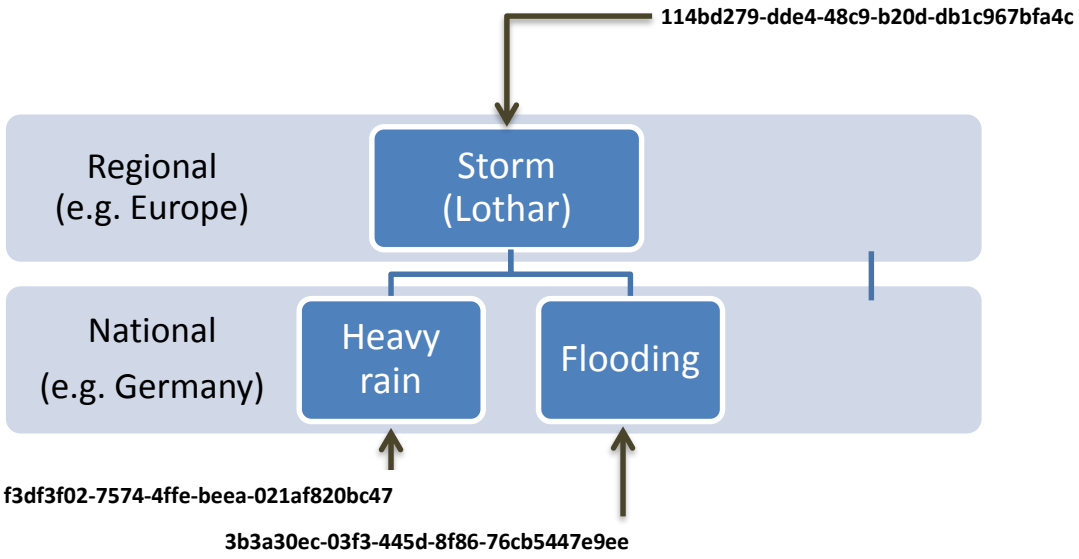
Events list (global common list)

1. Avalanche
2. Cold wave
3. Drought
4. Dry spell
5. Dust storm
6. Sandstorm
7. Extra-tropical cyclone
8. Flood
9. Fog
10. Freezing rain
11. Frost
12. Hail
13. Haze/Smoke
14. Heat wave
15. High Seas
16. Rogue waves
17. High UV radiation
18. Icing
19. Landslide
20. Mudslide
21. Debris flow
22. Lightning
23. Pollen pollution/Polluted air
24. Rain
25. Wet Spell
26. Snow
27. Snowstorm
28. Space weather event
29. Storm surge/Coastal flood
30. Thunderstorms
31. Squall lines
32. Tornado
33. Tropical cyclone
34. Tsunami
35. Volcanic ash
36. Wild land fire/Forest fire
37. Wind

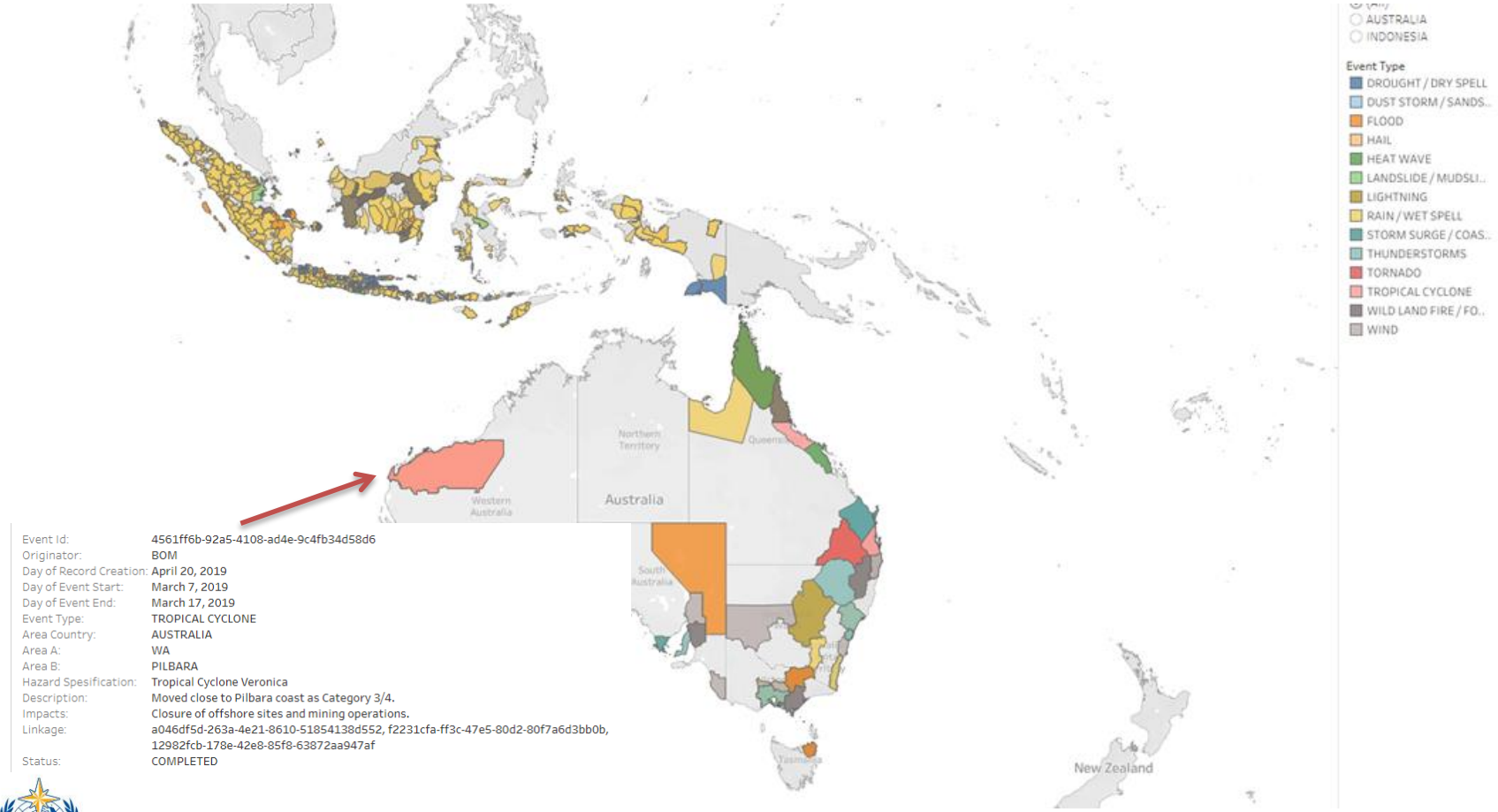
Cascading Event Records

Event UUID: random string of 32 characters



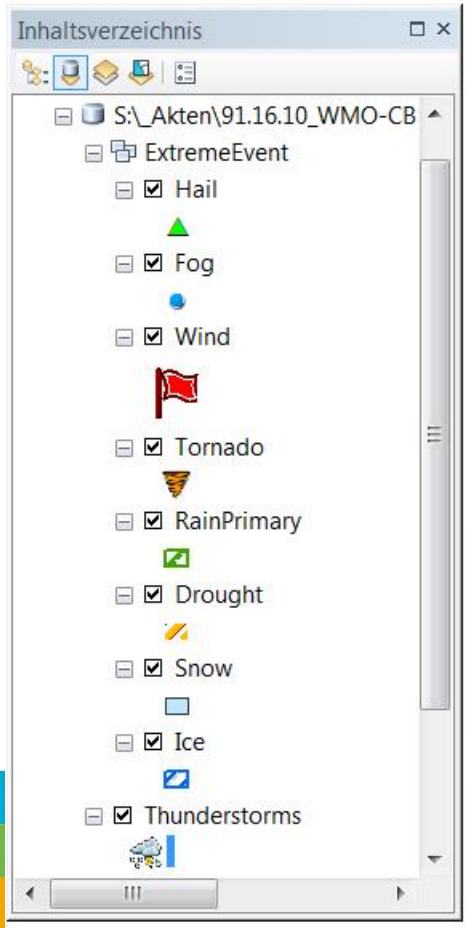
Testing the new Standard
Asia and South Pacific

1,300 records of hazardous events from August 2018 to today.



Link: http://puslitbang.bmkg.go.id/extreme-catalogue.html

in Europe


Inhaltsverzeichnis
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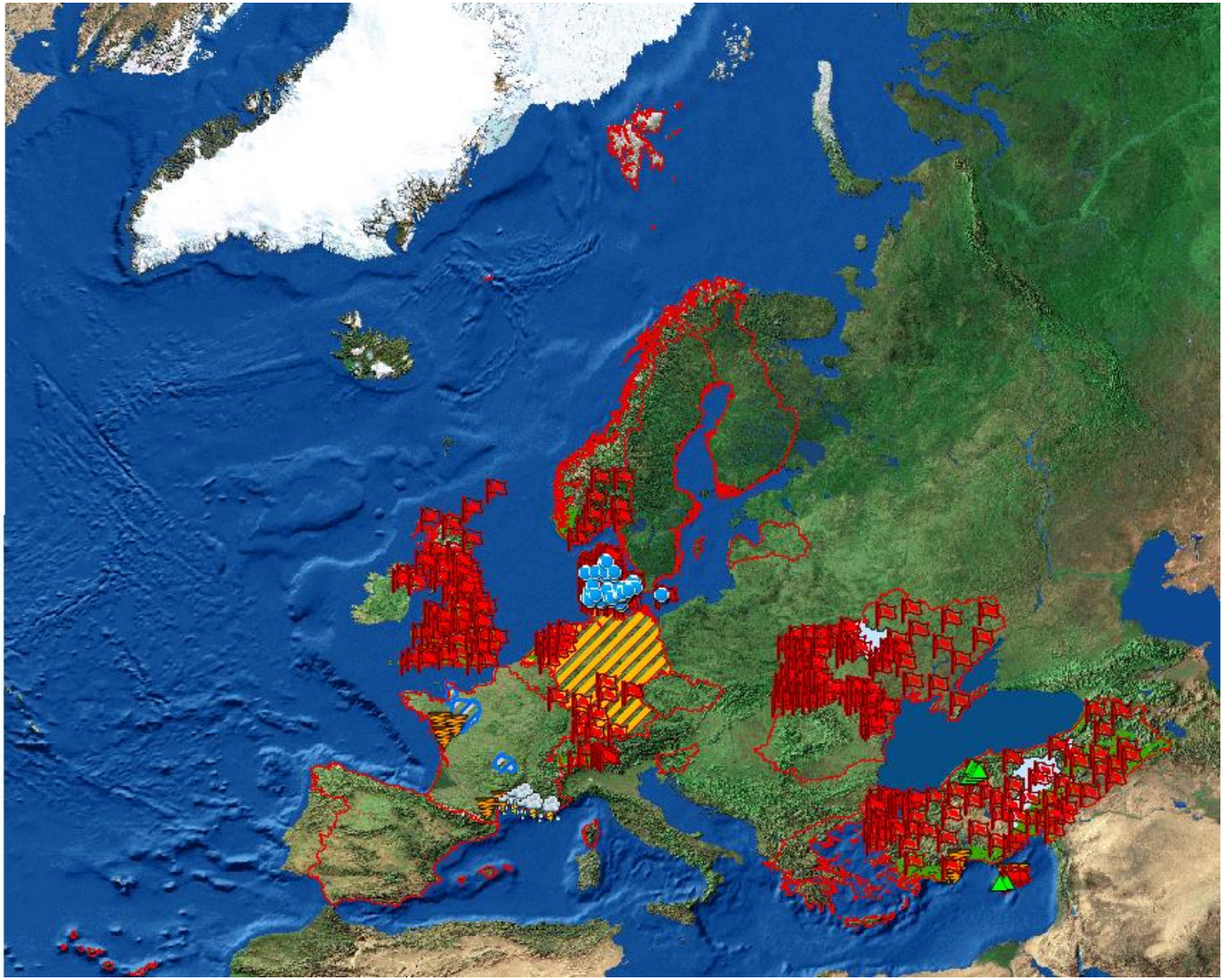
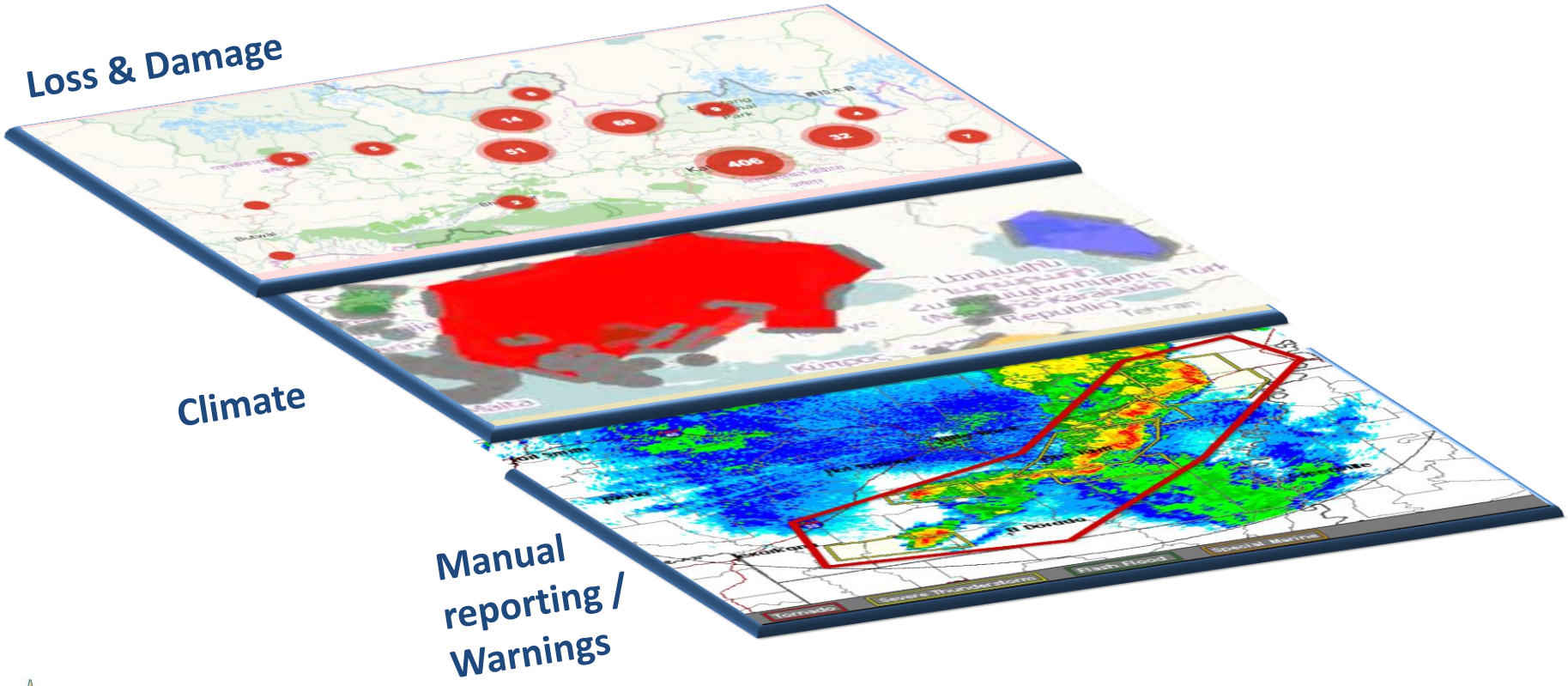
ExtremeEvent
Hail
Fog
Wind
Tornado
RainPrimary
Drought
Snow
Ice
Thunderstorms



Layering of Information Enables New Possibilities for Analysis and Application



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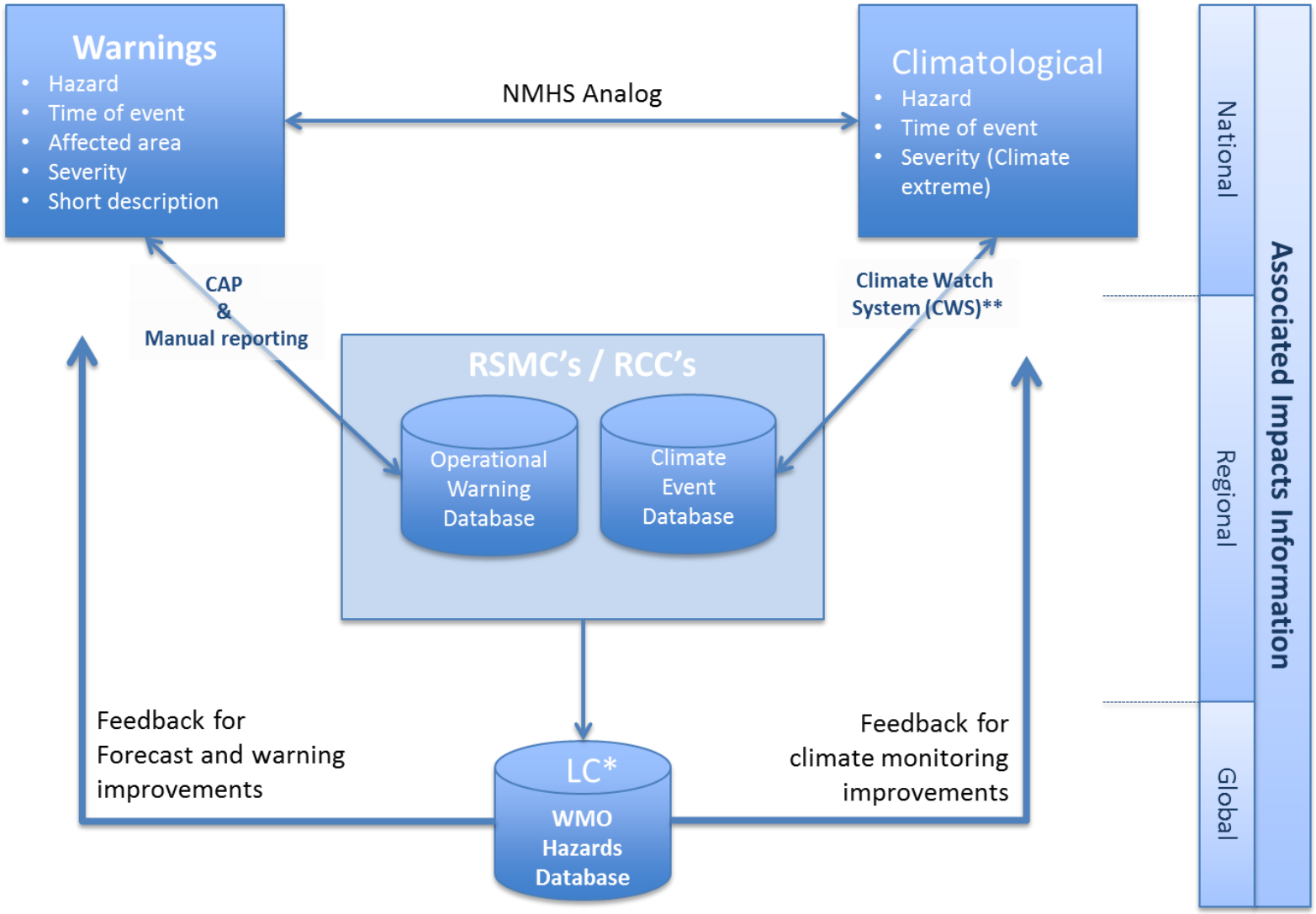
National, Regional and Global system



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* Lead Center for global hazard information

** Information on historical and ongoing extremes

NMHS use cases for disaster loss data

What quality and disaggregated loss and damage data and information would improve:

- Forecast and warning products: Impact based forecasting and inclusion of potential impacts by empirical methodologies during the forecast production process
- Forecast verification processes
- Understanding of the impacts of hazards and especially for slow onset, cascading and complex hazard impacts

Example of applications

- Tracking global policy indicators (Sendai, Paris Agreement, UN-SDG and a contribution to the Warsaw Implementation Mechanism for Loss and Damage)
- Risk management (public and private sector)
  - Risk identification (hazard component, empirical methodology of understanding hazards, how hazards interact with other hazards and their combined impacts)
  - Risk reduction (e.g. empirical methodology to quantify past events as input to developing building standards, land use planning, strengthening MHEWS and disaster planning)
  - Risk transfer (insurance, risk facilities, cat bonds)
- Research
  - Tracking event trends in event frequency, severity and distribution
  - On causal contributions of hazards, exposure and vulnerability to losses

Next Steps…

- Development of an implementation plan and related guidance products for countries and regions (in 2020)
  - Leveraging experiences in countries and regions that have started implementation
  - Strengthening the data partnership between the national loss and damage stakeholders (i.e. disaster risk management authority) and the NMHSs
  - Developing national / regional process for recording, post processing and quality control.
- Further implementation in the South West Pacific and Europe and other regions including South America, Africa, North America… (2020 – 2024)
- Integrating cataloging workflow into the WMO regulatory documents (i.e. manual on GDPFS) and observer and forecaster core competencies.
- Establishing regular review and update process of the WMO Event List

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Thank you

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Additional Slides