

User Interface Platforms for Comprehensive Risk Management

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World Meteorological Organization
Organisation météorologique mondiale

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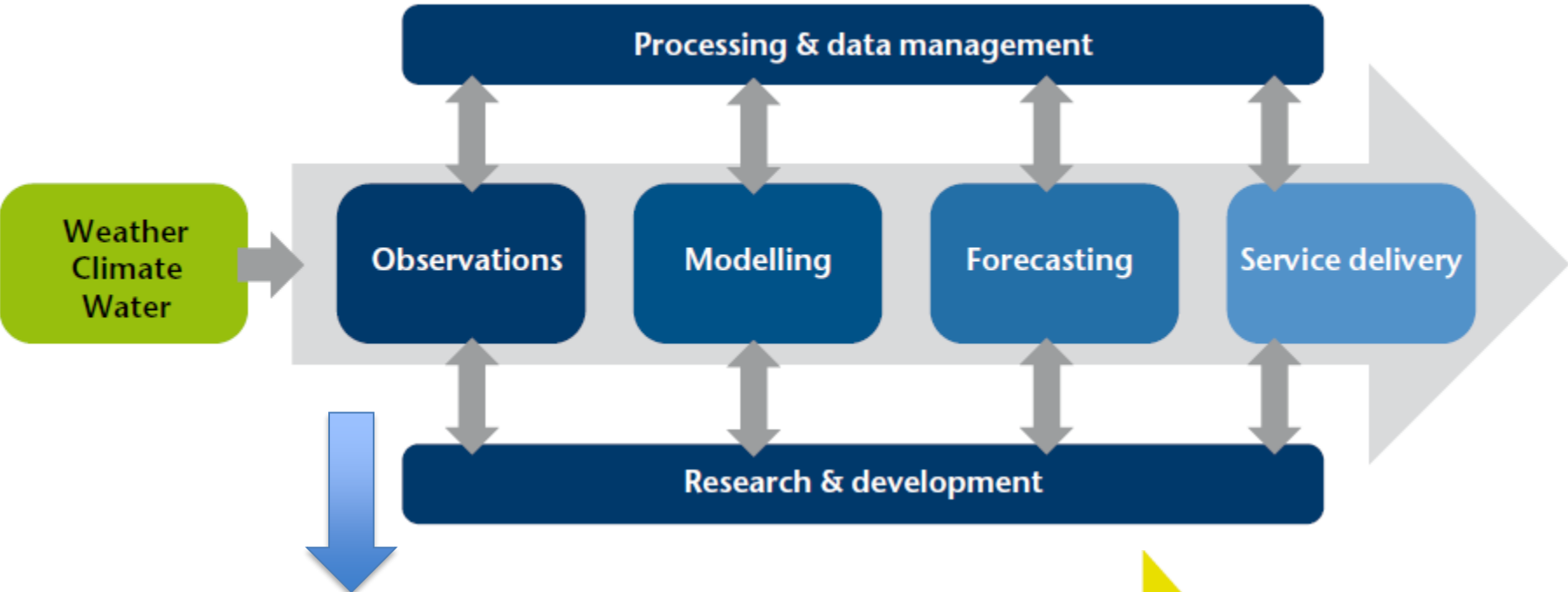
Outline

- User Interface Platforms
- Comprehensive risk management
- West Africa example: Climate Risk and Early Warning Systems (CREWS) initiative
- Cataloguing high-impact events and associated loss and damage

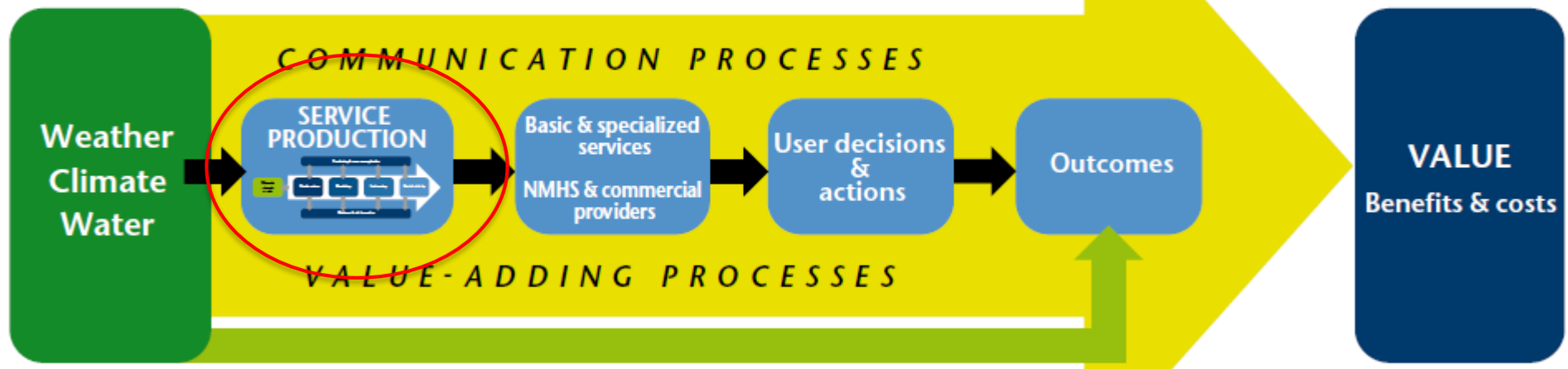
User Interface Platforms

Role and function in the climate
services value chain

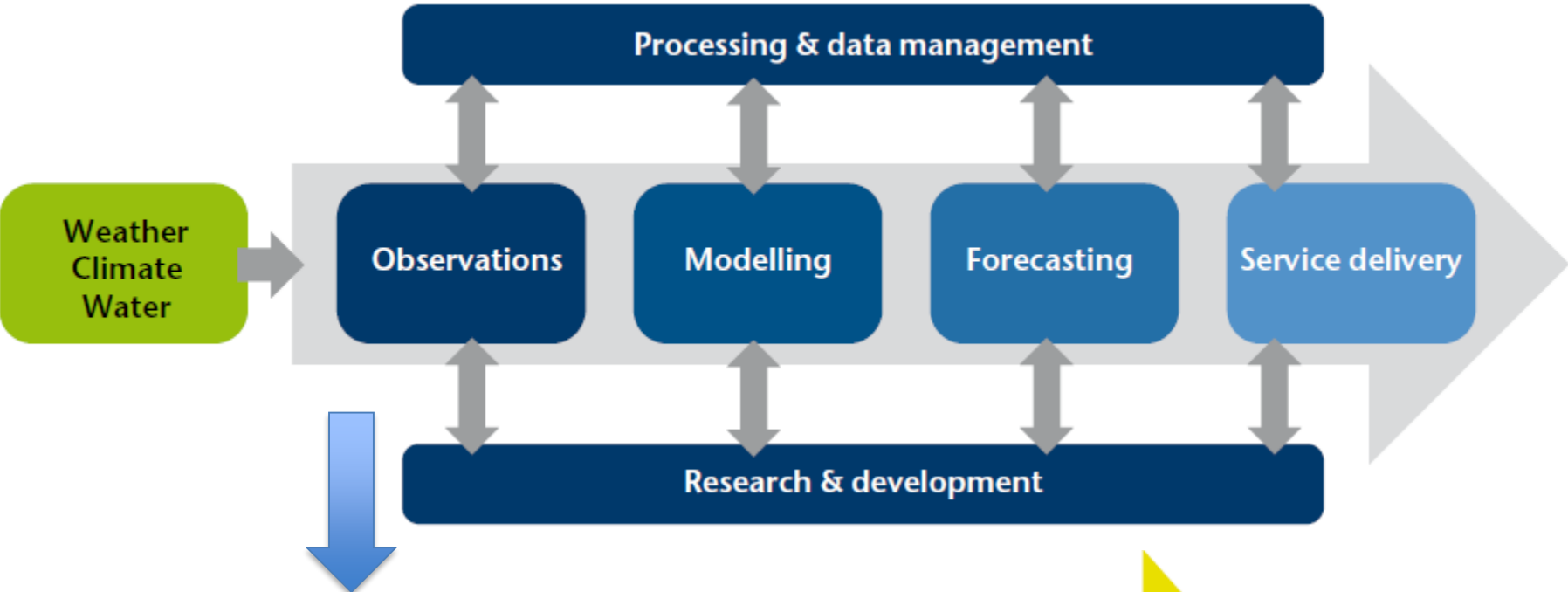
Operational service delivery system



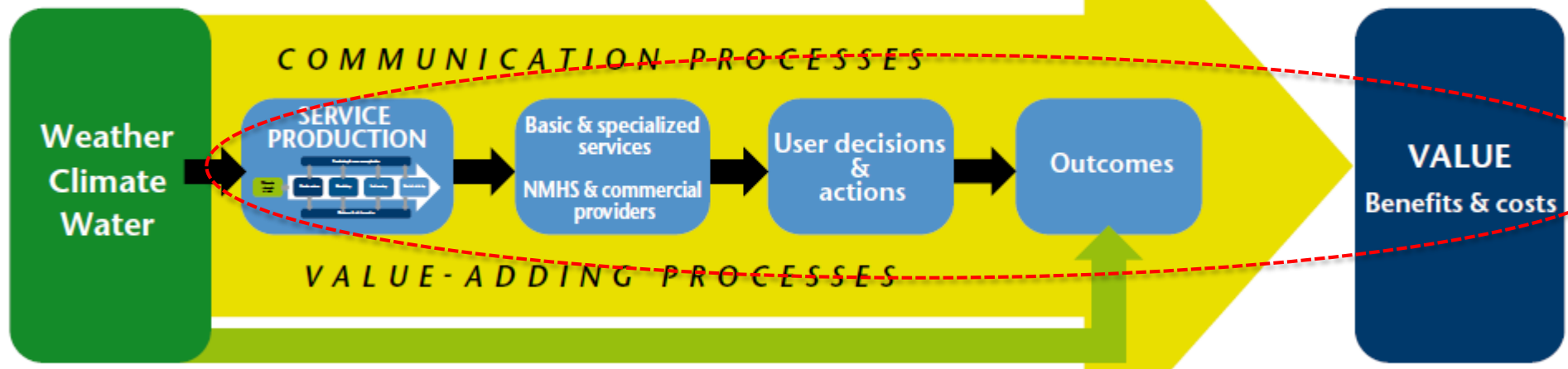
Service delivery value chain



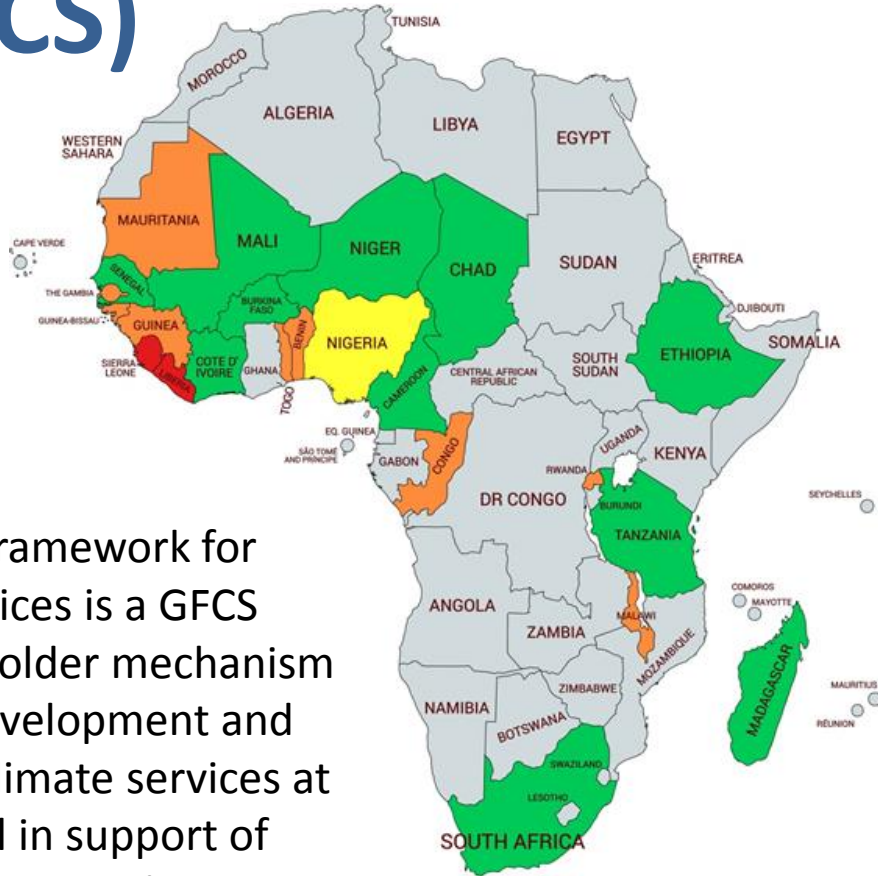
Operational service delivery system



Service delivery value chain



Global Framework for Climate Services (GFCS)



Status of NFCS Implementation

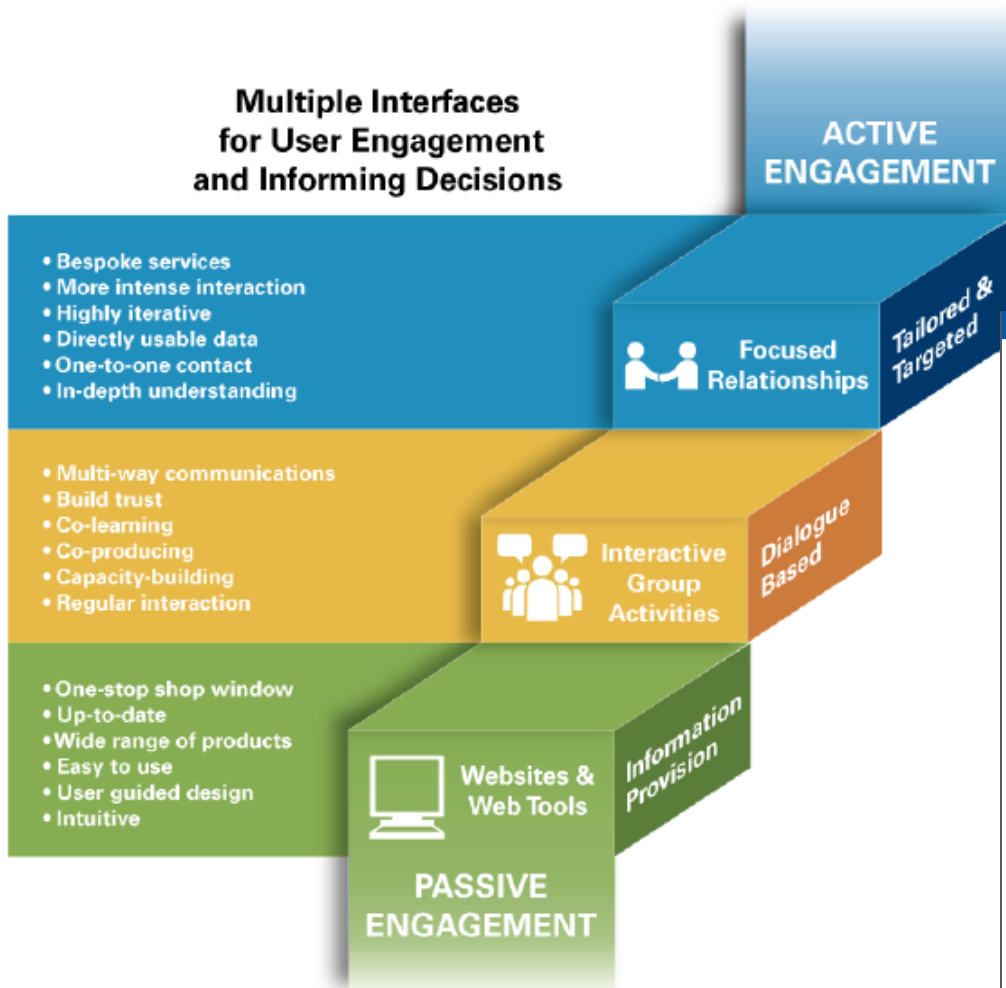
- Conduct Comprehensive Baseline Capacity Assessment for Development of Climate Services
- Support NHMS to Develop Strategic Plan & Engage in a National Consultation process for Climate Services
- Develop National Action Plan
- Begin Implementation of Action Plan, Launch National Framework for Climate Services
- Countries with NFCS providing advanced services



A National Framework for Climate Services is a GFCS multi-stakeholder mechanism to enable development and delivery of climate services at country level in support of adaptation in agriculture, water resource management, health, energy, disaster risk reduction and other climate-sensitive sectors

Other WMO Guidance on Good Practices for Climate Services User Engagement

Multiple Interfaces for User Engagement and Informing Decisions



WORLD METEOROLOGICAL ORGANIZATION

WEATHER CLIMATE WATER

National Climate Outlook Forums and National Climate Forums

Concept Note

Background

A climate service provides “climate information in a way that assists decision-making by individuals and organizations” (WMO, 2014)¹. The service component involves appropriate engagement, an effective access mechanism and responsiveness to user needs. Such services typically generate and provide contextualized information on past, present and future climate and its impacts on natural and human systems, and apply that information for decision-making at all levels of society.

National Meteorological and Hydrological Services (NMHS), as recognized in the Convention of the World Meteorological Organization (WMO), are a fundamental part of the national infrastructure and play an important role in supporting vital functions of governments. NMHSs provide climate and hydrological information products to enable key economic sectors such as agriculture, fisheries, water resources, forestry and health to anticipate, prepare and respond to climate anomalies and extreme events. Severe weather forecasts with one to three days lead-time are useful in responding to hazards to minimize the loss of assets and lives. Operational climate predictions made months up to a season in advance are useful in contingency planning.

For climate predictions to be useful, they need to be assimilated into institutional systems that connect to decision contexts and community level response. The main challenge is to customize information so that it is relevant to the climate sensitive points of the users’ decision-making process. This requires a good understanding of the needs and requirements of these users. Undoubtedly, sustained dialogue to tailor, interpret, translate and communicate probabilistic science based predictions (seasonal forecasts) in decision-



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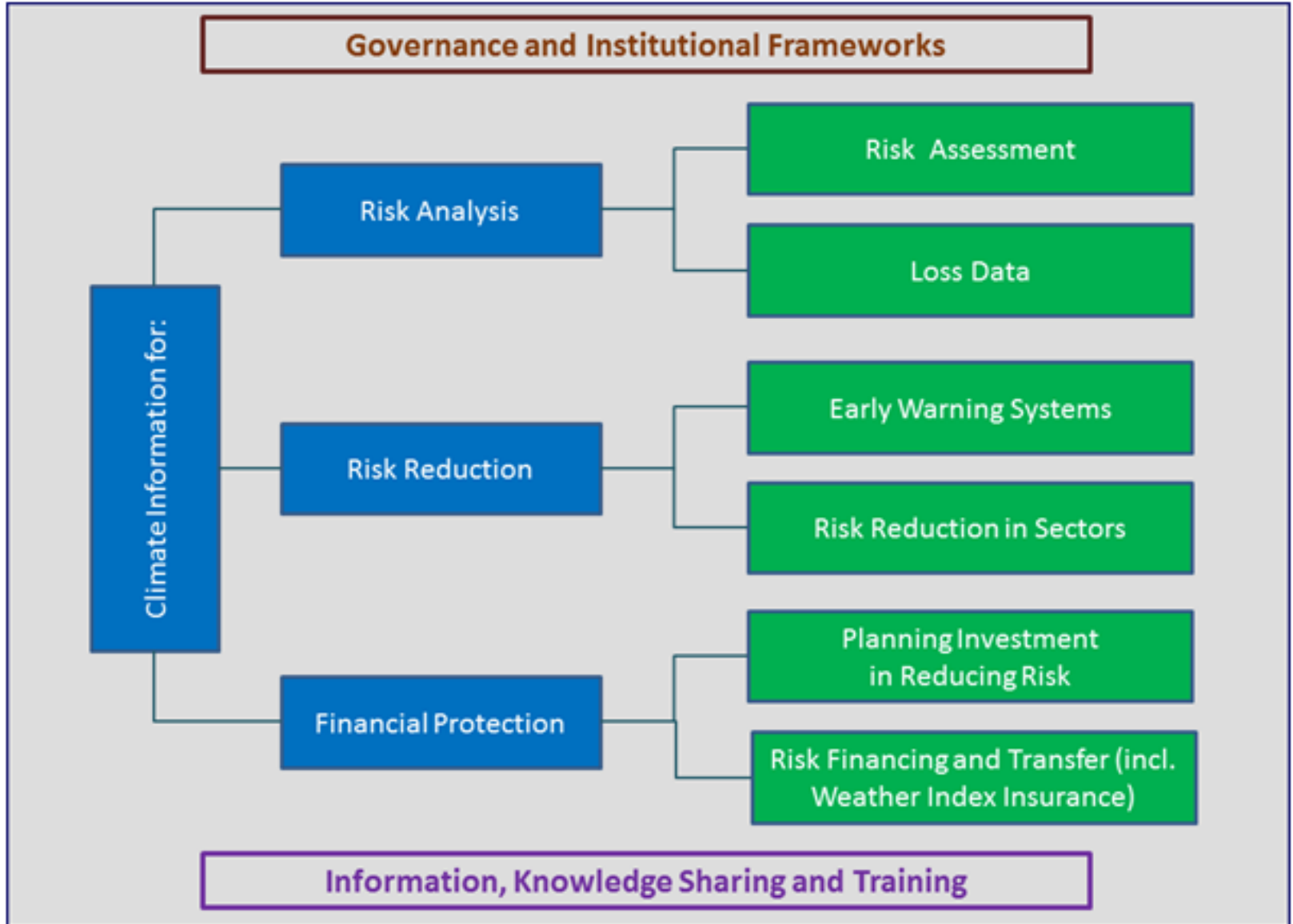
Comprehensive Risk Management

Extracts from the Global Framework
for Climate Services (GFCS)
Implementation Plan



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GFCS CRM Framework



GFCS UIP for CRM

Product-Specific Functions

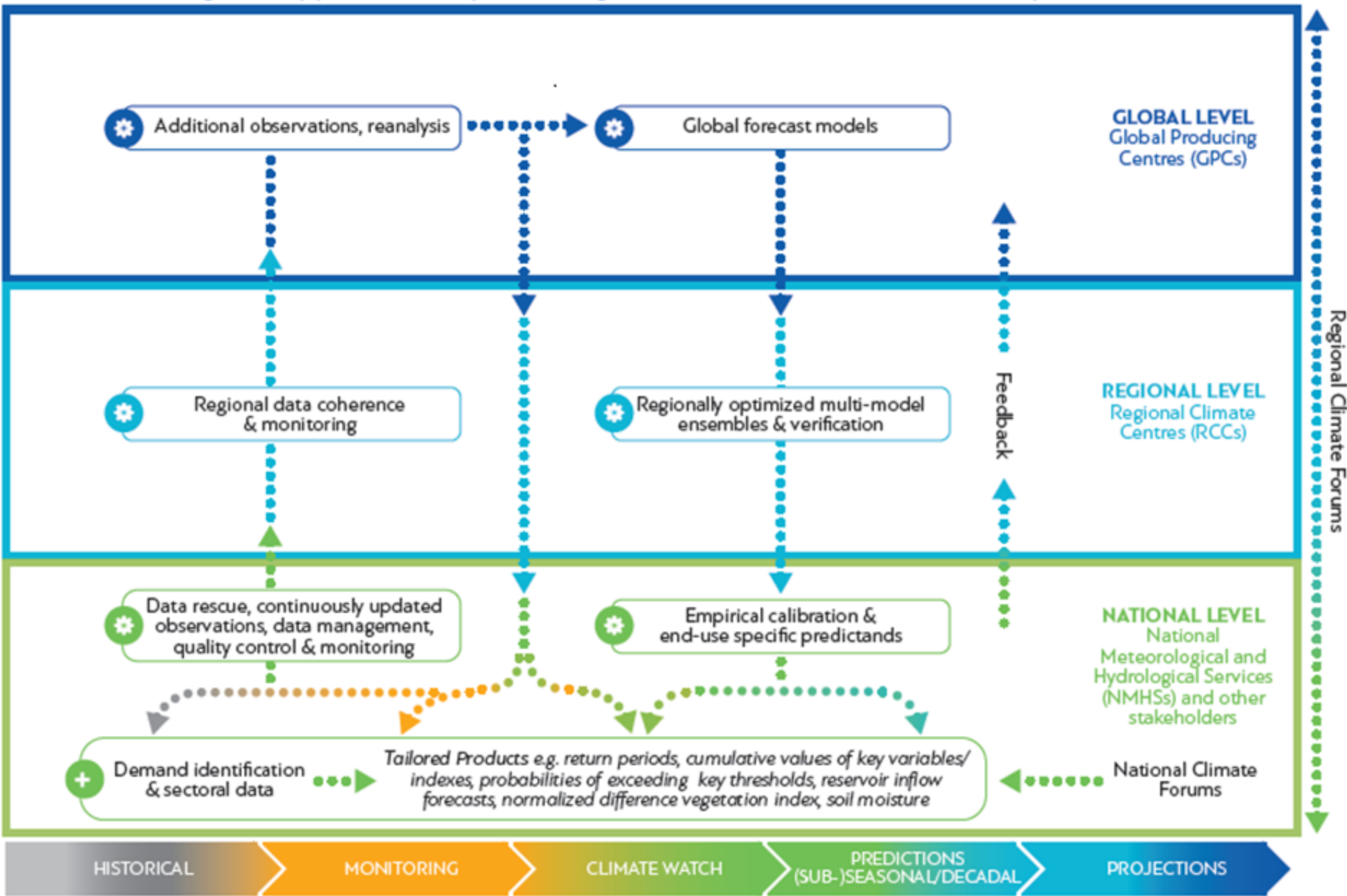
	UIP
Risk Assessment	<ul style="list-style-type: none"> • Provide understanding of risk assessment demand and requirements. • Incorporate relevant climate observations, statistical analysis, forecasts and projections of the weather, hydrological and climate related extremes in risk assessment processes. • Coordinate relevant inputs.
Loss Data	<ul style="list-style-type: none"> • Identify stakeholders and existing processes for loss accounting system implementation. • Identify information channels. • Coordinate relevant inputs.
Early Warning Systems	<ul style="list-style-type: none"> • Risk analysis (multi-hazard, multilevel and multi-sector). • Identify responsible bodies for developing and implementing appropriate measures, warning communication, and awareness and education activities. • Identify information requirements and channels. • Coordinate relevant inputs.

	UIP
Risk Reduction in Sectors, e.g.: <ul style="list-style-type: none"> • Health • Water • Agriculture 	<ul style="list-style-type: none"> • Define requirements. Other sectoral data –non-climate inputs. • Coordinate development of relevant climate products and services in relation to specific application to decision-making. • (See water, health and agriculture Exemplars)
Planning Investment in Reducing Risk	<ul style="list-style-type: none"> • Define requirements for climate services and other non-climate inputs. • Engage stakeholders for implementation – finance and planning ministries, disaster risk management authorities, local authorities and government, private sector etc. • Establish coordination and information channels for relevant inputs.
Risk Financing and Transfer	<ul style="list-style-type: none"> • Quantify risk and inter-correlations. • Define requirements including other non-climate inputs. • Identify stakeholders for implementation – finance ministries, private sector, etc., and information channels. • Coordinate relevant inputs.

Example: West Africa EWS and agrometeorological services

Climate Risk and Early Warning
System (CREWS) initiative

A Regional Approach to Implementing the Climate Services Information System (CSIS-R)



West Africa



Australia



France



Luxembourg (Chair)



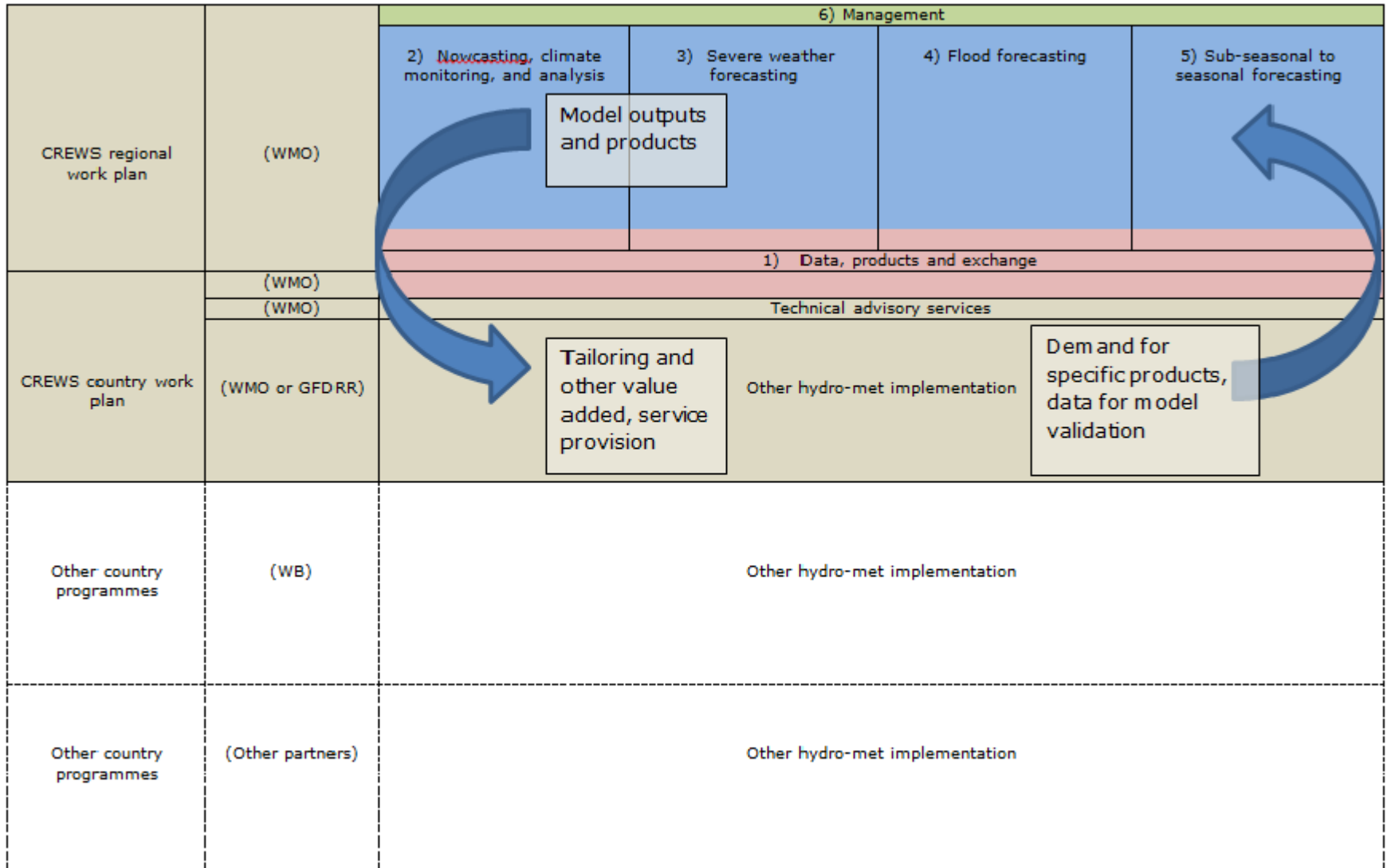
Germany



Netherlands



Switzerland



Cataloguing high-impact events and associated loss and damage

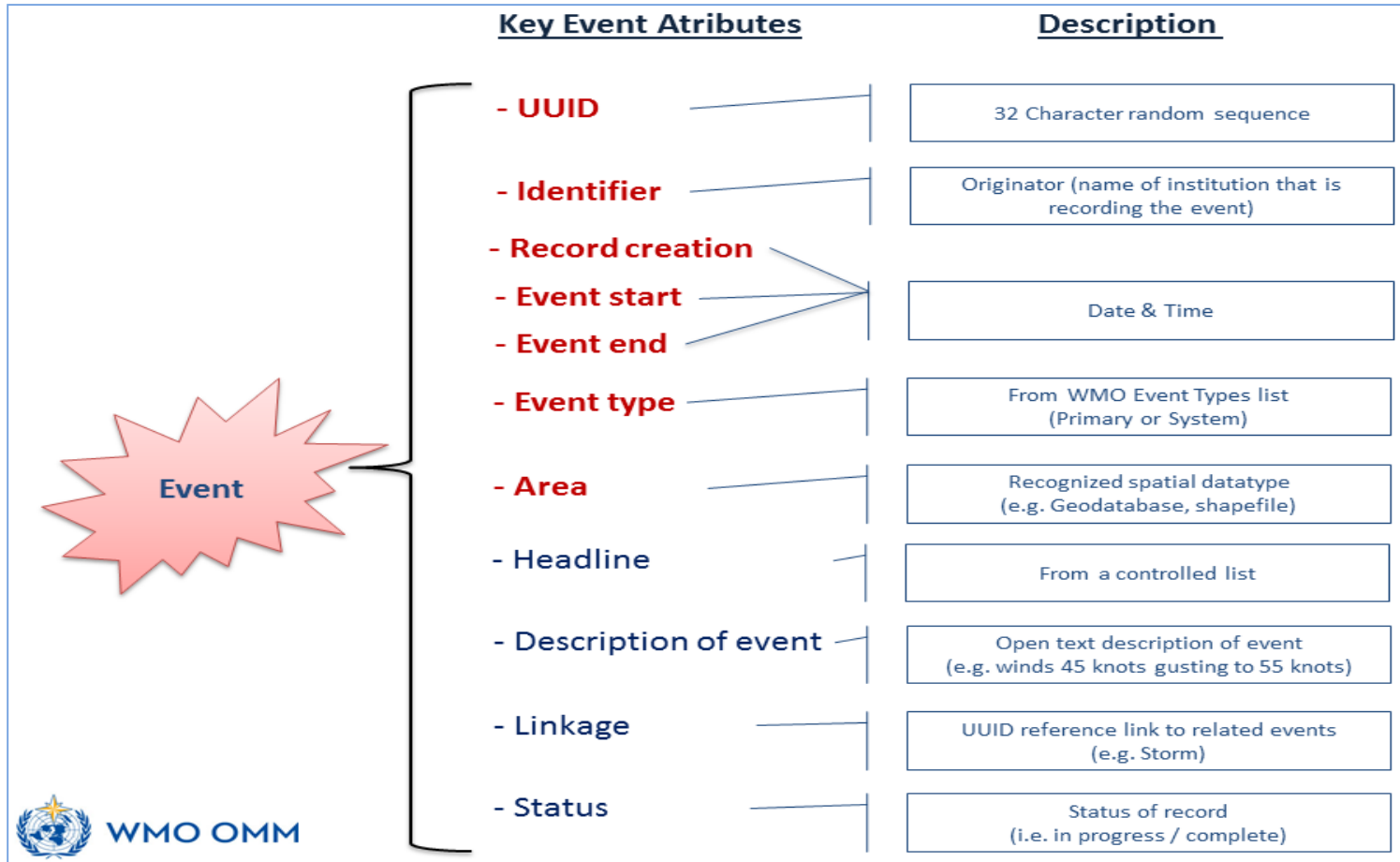
Example from WMO Regional
Association VI (Europe)

Steps of cataloguing hydro-meteorological events within the test phase

- 18 participating countries
- High impact hydro-meteorological events are recorded by countries,
- Data is collected in a standard template provided by RCC Network Europe Node on Climate Monitoring led by DWD (RCC Node-CM),
- Participating countries send event data to RCC Node-CM – once a week/ month,



WMO recommendation for collecting information

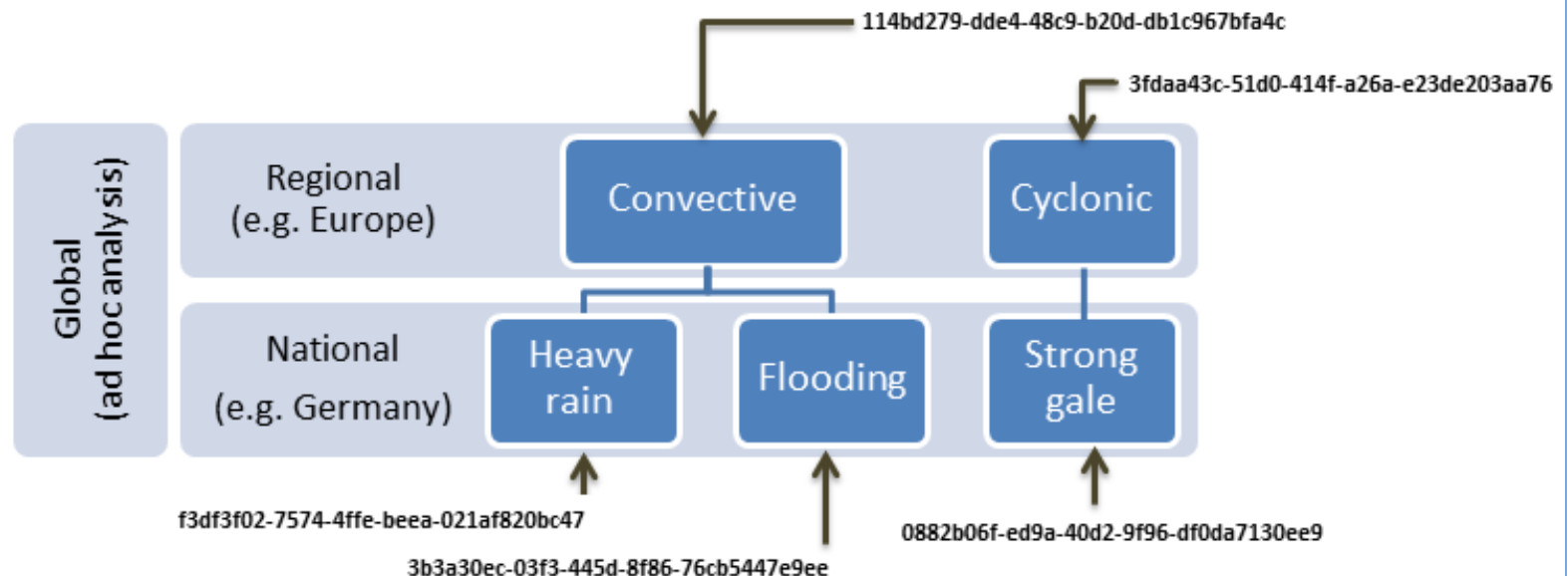


Minimum elements to be recorded during the recording process shown in red.

WMO recommendation for collecting information

Cascading Event Records

Event UUID: random string of 32 characters



WMO recommendation for collecting primary hazards (Event Type) and weather systems

Primary	System
<p> Rain Snow Temperature Hail Fog Wind Frost Ice Haze Dust Sand Lightning Tornado Drought Floods Marine Waves Avalanche Thunderstorms*¹ </p>	<p> Cyclonic (e.g. Tropical, Extra-tropical cyclone, mid-latitude cyclone) Anti-cyclonic Convective (thunderstorms) </p>

The approach of the evaluation

Linkage by system UUID

Wind

UUID	Record Crea	Identifier	Start Time	End Time	Event Type	Event Type sys	Area	Headline	Description	Linkage	Status	Post proc
32fe9aab-555b-4840-b878-7298035dc7f5	14.09.2018	Met Office	17.09.2018	18.09.2018	Wind	Cyclonic	NE-England, N-Ireland	Wind	Storm Helene has brought strong wind to the affected regions	<Null>	Complete	Validated
e380ec81-2ecc-4e49-bced-096bb2a973c8	17.09.2018	Met Office	19.09.2018	21.09.2018	Wind	Cyclonic	Midlands, Tayside&Fif	Wind	Storm Ali has brought a very windy spell of weather with	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
469053f4-be33-11e8-a355-529269fb1459	22.09.2018	Danish Meteorological Institut	21.09.2018	21.09.2018	Marine Waves	Cyclonic	Denmark (Esbjerg, Tøn	Coastal flood	The storm "Knud" passed over Denmark, produced peak	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
46905a5c-be33-11e8-a355-529269fb1459	22.09.2018	Danish Meteorological Institut	21.09.2018	21.09.2018	Wind	Cyclonic	Denmark (Nordjylland,	Subtropical Storm	The storm "Knud" is developed in the North Sea and affect	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
d56f64f1-a516-4f6b-97f9-d9039722cddb	26.09.2018	Royal Netherlands Meteorolo	21.09.2018	21.09.2018	Wind	Convective (thunde	Netherlands (Drenthe,	Squall	Unstable polar maritime airmass brought North-westerly	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
7af52bab-de29-44d5-8fd4-de28fe527eb1	08.10.2018	Met Norway	21.09.2018	22.09.2018	Wind	Cyclonic	Akershus, Aust Agder	Strong gale	Locally strong wind gusts, up to 35 m/s was observed alo	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
9fb9348e-e983-11e8-9f32-f2801f1b9fd1	08.10.2018	Deutscher Wetterdienst (D	22.09.2018	24.09.2018	Wind	Cyclonic	Feldberg, Fichtelberg,	Gale	The storm caused over Germany for violent gusts of wind	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
23ba20e5-fbd5-4522-8651-4c4c18739ebb	23.09.2018	Ukrainian Hydrometeorologic	23.09.2018	24.09.2018	Wind	Cyclonic	West part of territory of	Strong wind	The gust hit with a wind speed of 15-25 m/s on the plain	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
0e1b29c8-e375-4626-8703-d2e99a04fb5	23.10.2018	MeteoLux	23.09.2018	23.09.2018	Wind	Convective (thunde	Sandweiler	Squall	The squall was linked to a cold front accompanied with st	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
64252e40-531c-4a36-917f-fd8a1b63889c	19.09.2018	Met Office	23.09.2018	24.09.2018	Wind	Cyclonic	Almost all regions of E	Wind	A very windy spell crossed England and parts of the Wale	<Null>	Complete	Validated
e7741e1c-c7ad-11e8-abd5-f2801f1b9fd1	04.10.2018	Danish Meteorological Institut	02.10.2018	03.10.2018	Wind	Cyclonic	Denmark (Tønder, Kalu	Gale	A windstorm with a wind speed between 17.5 and 30 m/s	<Null>	Complete	Validated
e6b7120-d9c9-11e8-9f8b-f2801f1b9fd1	27.10.2018	Danish Meteorological Institut	06.10.2018	06.10.2018	Wind	Cyclonic	Denmark (Kalundborg,	Strong gale	The wind storm gusting between 21 m/s and 29.3m/s.	<Null>	Complete	Validated
e6b777e-d9c9-11e8-9f8b-f2801f1b9fd1	27.10.2018	Danish Meteorological Institut	10.10.2018	10.10.2018	Wind	Cyclonic	Denmark (Frederikshav	Strong gale	The wind storm gusting between 20.8 m/s and 28.1 m/s.	<Null>	Complete	Validated
299c7000-ab9d-440a-a7c5-e1dad942a395	21.10.2018	Turkish State Meteorological	15.10.2018	20.10.2018	Wind	Cyclonic	Adiyaman, Aksaray, A	Dust storm	The dust storm reduced visibility and dragging down air qu	<Null>	Complete	Validated
e6700264-d9c9-11e8-9f8b-f2801f1b9fd1	27.10.2018	Danish Meteorological Institut	15.10.2018	18.10.2018	Wind	Cyclonic	Whole Denmark	Gale	The storm with a wind speed between 17.5 and 28 m/s pr	<Null>	Complete	Validated
26554b0-dda4-11e8-9f8b-f2801f1b9fd1	01.11.2018	Danish Meteorological Institut	27.10.2018	27.10.2018	Wind	Cyclonic	Norddjurs (Midtjylland)	Gale	The wind storm gusting between 19.5 m/s and 25.1 m/s.	<Null>	Complete	Validated
26554fa-dda4-11e8-9f8b-f2801f1b9fd1	01.11.2018	Danish Meteorological Institut	28.10.2018	28.10.2018	Wind	Cyclonic	Varde (Syddanmark)	Strong gale	The wind storm gusting between 20.8 m/s and 26.7 m/s.	<Null>	Complete	Validated

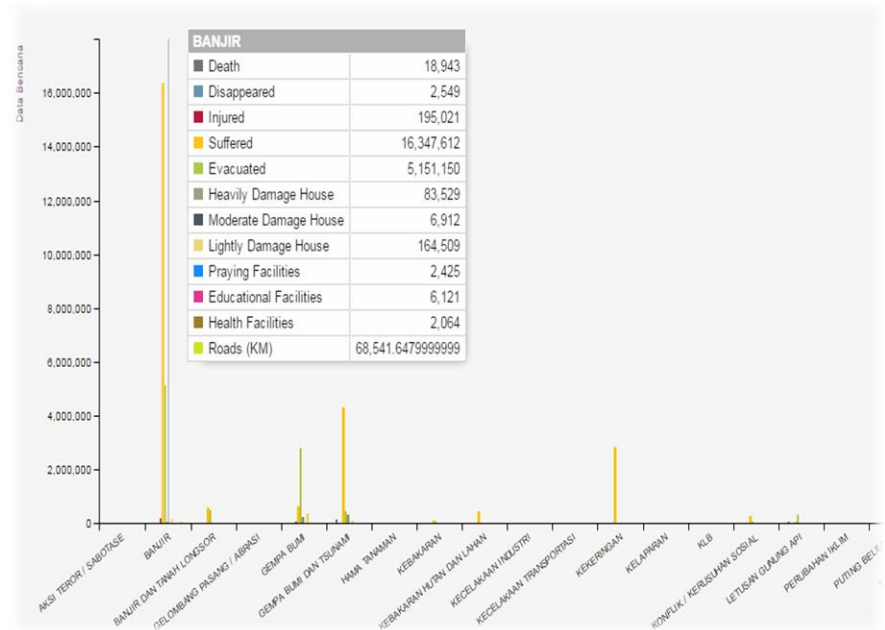
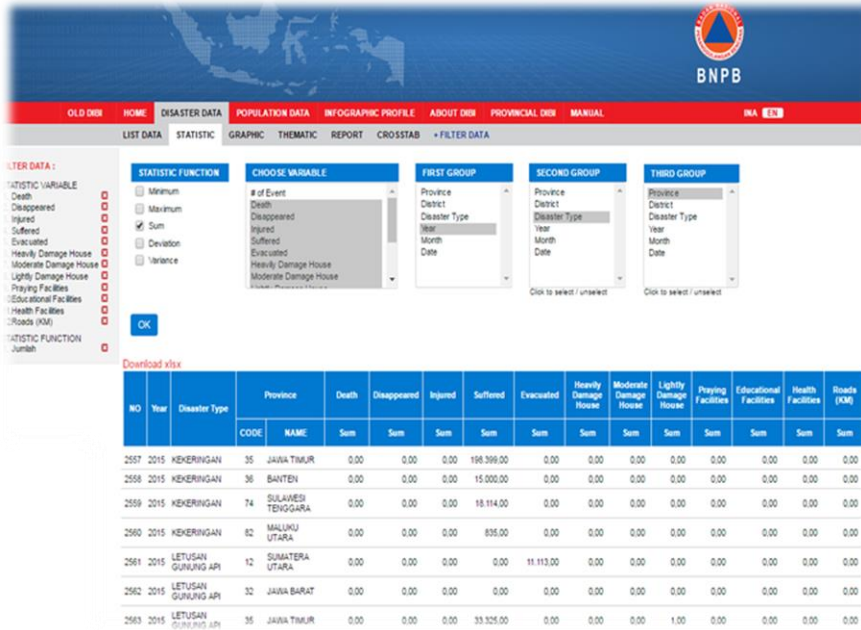
20-25th: Storm Knud/Bronagh/Ali crossed Norway, Denmark, Netherlands, Luxembourg, Germany, UK and Ukraine. Since events reported stem from same weather systems, all related events get the same system ID for linkages.

RainPrimary

UUID	Record Crea	Identifier	Start Time	End Time	Event T	Event Typ	Area	Headline	Description	Linkage	Status	Post proc
f17a204c-9def-4d41-b290-b4934b653e3f	16.10.2018	Met Norway	07.09.2018	08.09.2018	Rain	Cyclonic	Oslo	Heavy rain	Locally heavy precipitation up to 175 mm/72h was observed	<Null>	Complete	Validated
8ea0680c-f2dd-43d4-a940-9750803a6eee	18.09.2018	Met Office	20.09.2018	20.09.2018	Rain	Cyclonic	Wales, NW-England	Heavy rain	An area of persistent and heavy rain was developed across Wal	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
7c499f65-dbeb-4aa1-a421-6eaffb43789e	21.09.2018	Met Office	23.09.2018	23.09.2018	Rain	Cyclonic	Almost all regions of England, Wales	Heavy rain	Almost all regions of England and Wales were affected by the h	<Null>	Complete	Validated
2e9eee81-9fb6-4010-95a8-749422e845b6	16.10.2018	Met Norway	25.09.2018	26.09.2018	Rain	Cyclonic	Rogaland	Heavy rain	Locally heavy precipitation up to 60-90 mm within 6 hours was	0d4bd50e-e98b-11e8-9f32-f2801f1b9fd1	Complete	Validated
68d67992-f1f7-4842-8a5e-4158e461f139	06.10.2018	Turkish State Meteo	04.10.2018	05.10.2018	Rain	Cyclonic	Besikdüzü, Hayrat, Çarşıbaşı, Güney	Heavy rain	The daily precipitation was recorded between 90-136 mm, whic	<Null>	Complete	Validated
928b6db3-521d-4aef-8a96-802ed399bdcc	27.10.2018	Turkish State Meteo	25.10.2018	26.10.2018	Rain	Cyclonic	Batman, Binqol, Bitlis, Hakkari, Mus	Heavy rain	In the affected areas measured 70-203 mm of rain within 36 hou	<Null>	Complete	Validated



Associated losses and damage



Types of disasters: flooding, landslides, high tides / abrasion, earthquakes, tsunamis, fires, drought, spouts, accidents (transportation and industrial), epidemics, terrorism, volcanic eruptions, social conflicts.

Category according to:

- **Event type, time, location** (up to district scale)
- **Impacts:**



BMKG

- People (death, missing, injured, evacuated).
- Damaged facilities: houses (heavy, moderate, light), health facilities, educational facilities, praying facilities, roads.
- Crop damages

Conclusion

- A global operational infrastructure supporting country-level Comprehensive Risk Management already exists but there is scope for considerable strengthening
- Selected specific challenges/opportunities include:
 - Increased national/regional/global integration of the supporting hydro-meteorological operational system
 - More structured stakeholder engagement for co-identification and co-production of priority information and services, and documentation of socio-economic benefits
 - More systematic (less ad hoc and piecemeal) financing



Thank you



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