GFCS
GLOBAL FRAMEWORK FOR CLIMATE SERVICES

Climate Information Services for Development Planning and Practice

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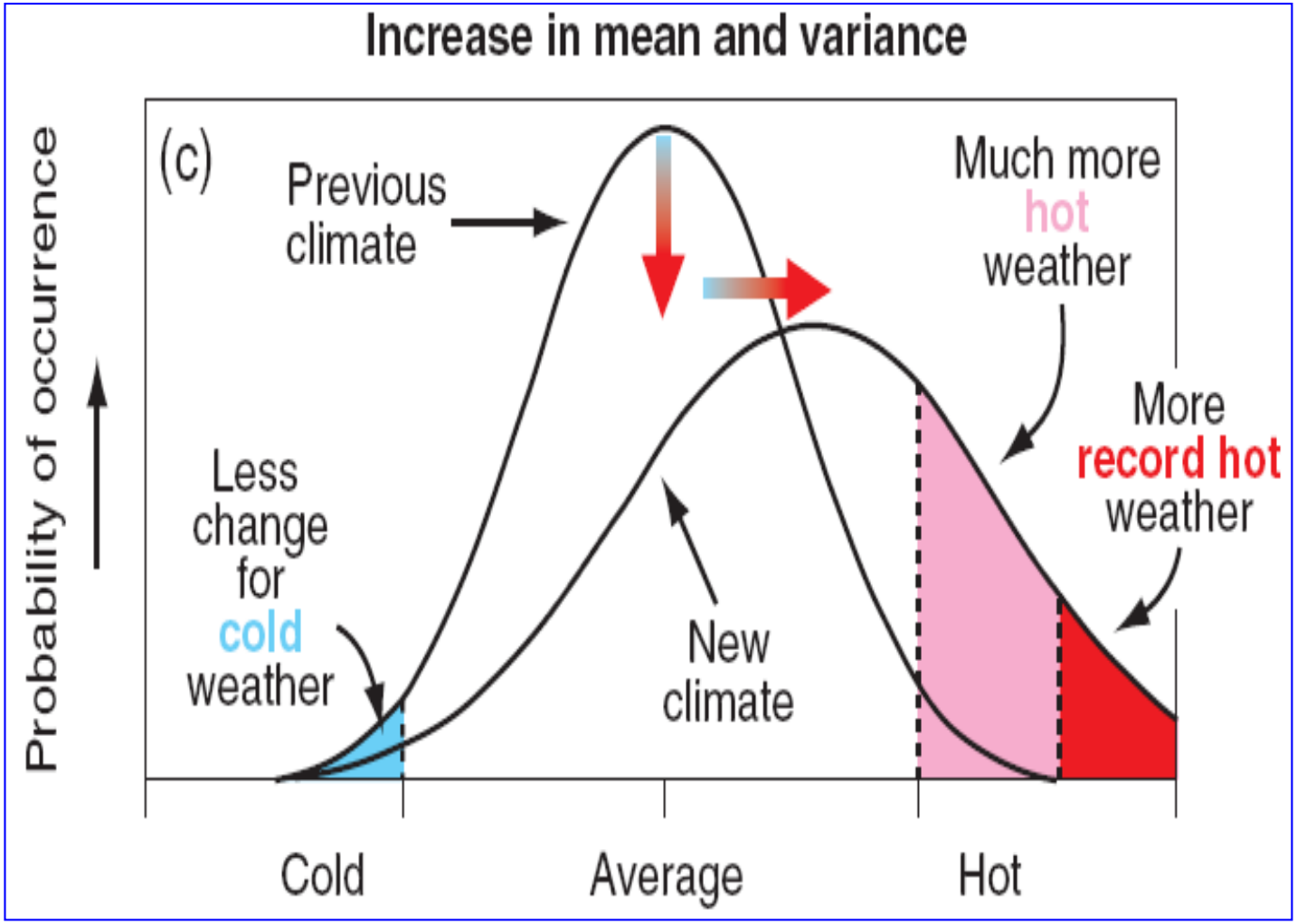
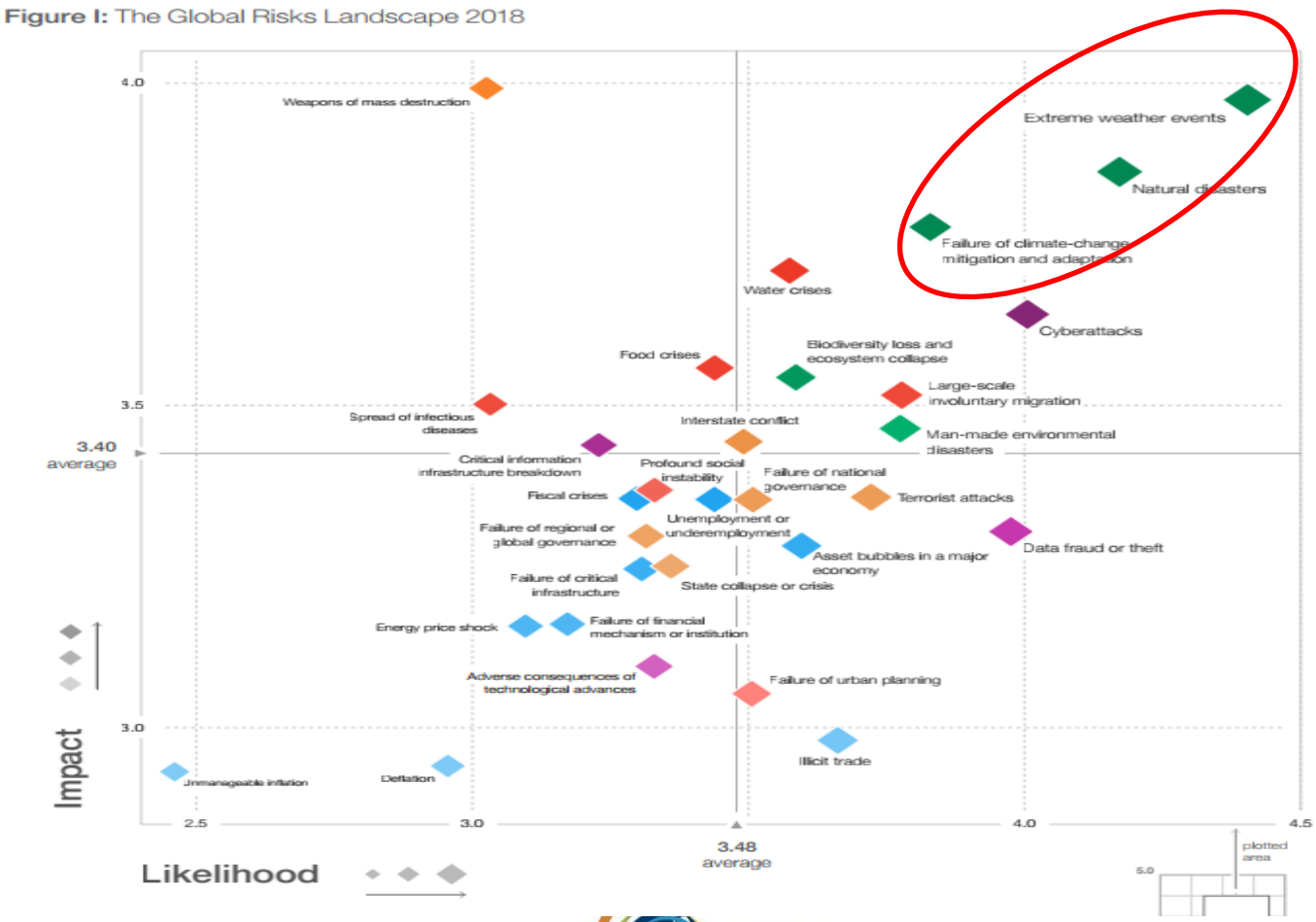
http://gfcs-climate.org/

Concern


Increase in mean and variance
(c)
Previous climate
Much more hot weather
More record hot weather
Less change for cold weather
New climate
Probability of occurrence
Cold
Average
Hot

Major development risks



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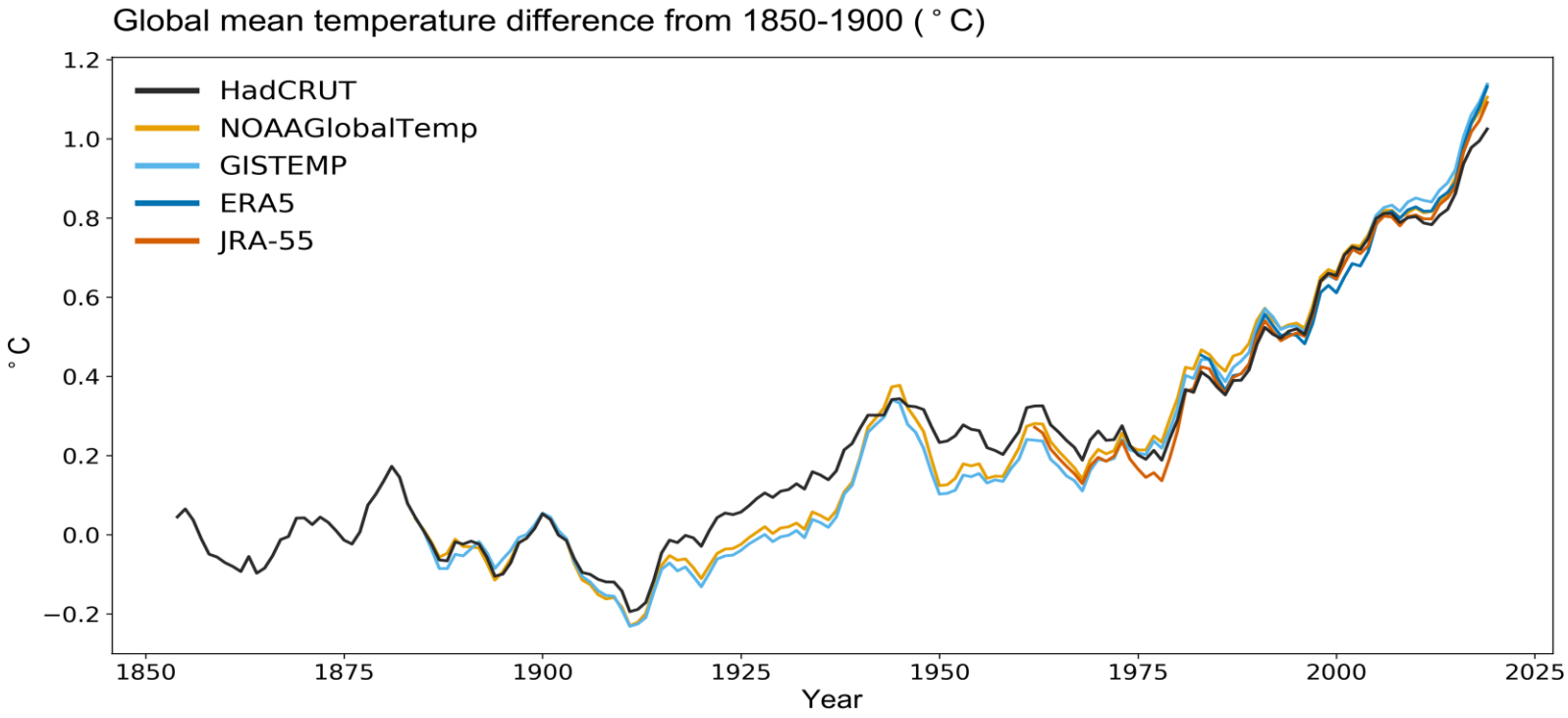
Global Temperature – warmest 5 year period

Met Office

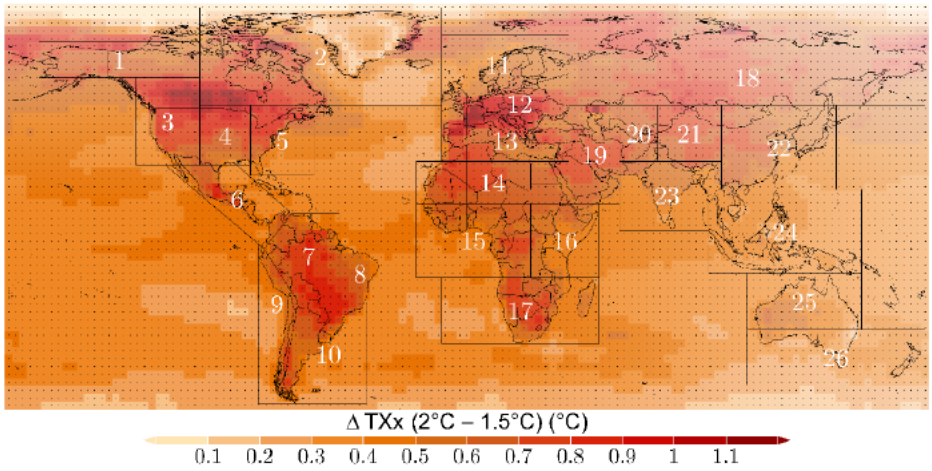


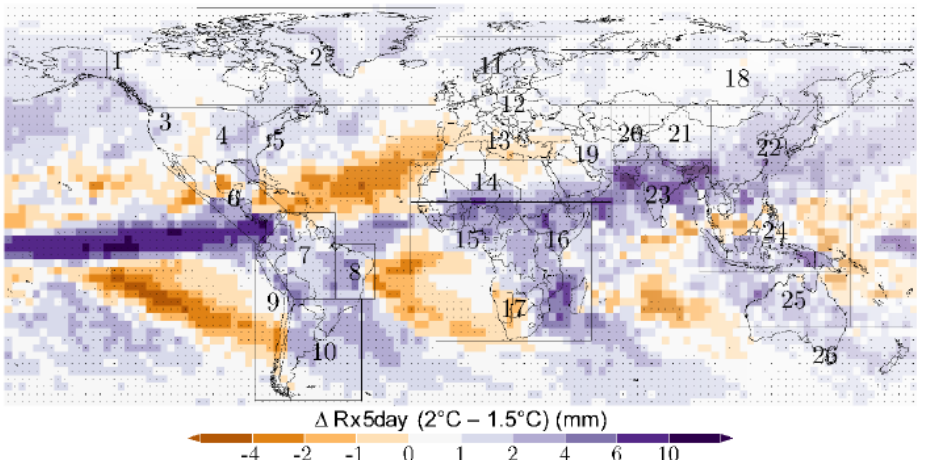
2015-2019: 1.1°C ± 0.1°C above 1850-1900

0.2 °C warmer than 2011-2015

SR 1.5 - What's in this report for Sub-Saharan Africa

Worst impacts on sustainable development will be felt among poor urban dwellers in African cities





- For hot extremes, the strongest warming is found in Southern Africa
- Large increases in hot extremes happen in many densely inhabited regions
- Over southern Africa, models agree in a positive sign of change for temperature, with temperature rising faster at 2°C (1.5ºC-2.5°C) compared to 1.5°C (0.5ºC-1.5°C). Areas of the south-western region, especially in South Africa and parts of Namibia and Botswana are expected to experience the highest increases in temperature

- The western part of southern Africa is projected to become drier with increasing drought frequency and number of heatwaves towards the end of the 21st century.
- At 1.5°C, a robust signal of precipitation reduction is found over the Limpopo basin and smaller areas of the Zambezi basin in Zambia, as well as over parts of

Western Cape in South Africa, while an increase is projected over central and western South Africa, as well as in southern Namibia-

- At 2°C, the region is projected to face robust precipitation decreases of about 10–20% and increases in the number of CDD (cumulative dry days), with longer dry spells projected over Namibia, Botswana, northern Zimbabwe and southern Zambia. Conversely, the number of CWD (cumulative wet days) is projected to decrease, with robust signals over Western Cape.
- Projected reductions in stream flow of 5–10% in the Zambezi River basin have been associated with increased evaporation and transpiration rates resulting from a rise in temperature (Section 3.3.5; Kling et al., 2014), with issues for hydroelectric power across the region of southern Africa

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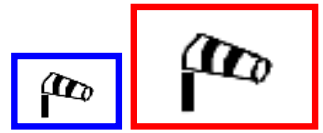
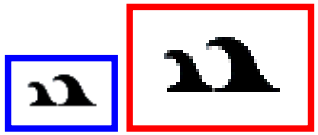
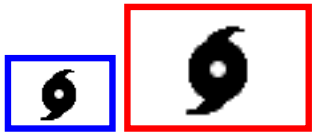
Concern...



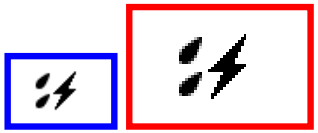
Strong Wind



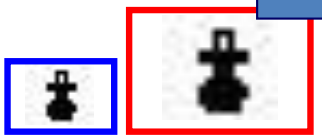
Coastal Marine Hazards



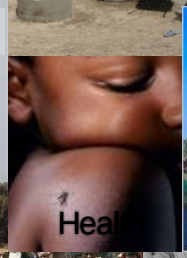
Tropical Cyclones



Heavy rainfall / Flood



Heatwaves



Intensity

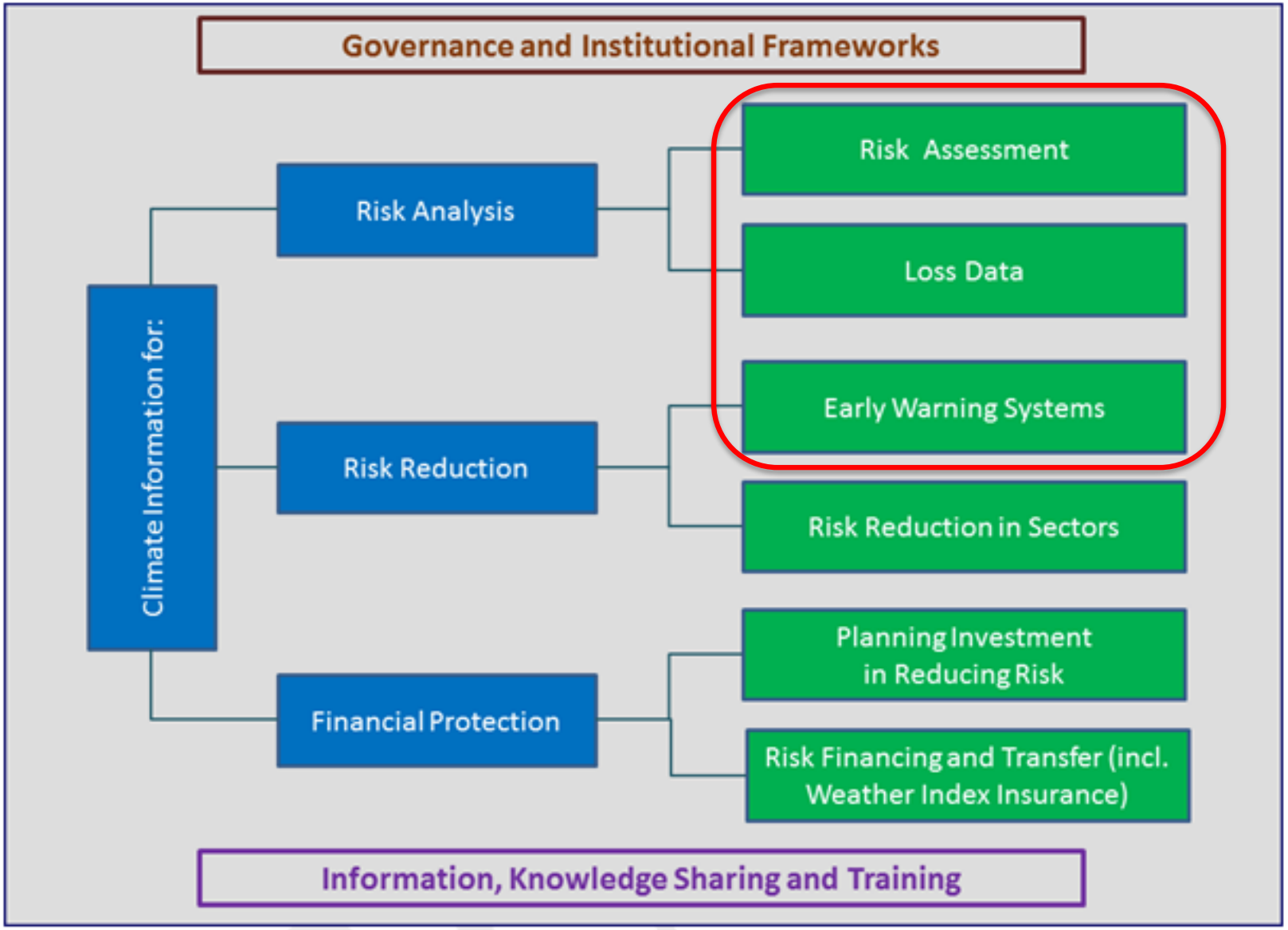
Frequency

Hazards' intensity and frequency are increasing

Vulnerability and exposure on the rise !

Need for > coping Mechanisms & Adaptation

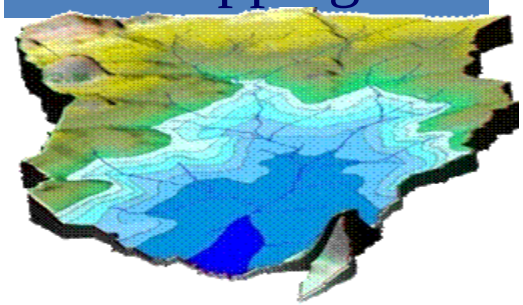
Adaptation starts with Disaster Risk Reduction



Simplified Schematic: Hazard / Risk Assessment

(statistical and forward looking)

Hazard Analysis and Mapping

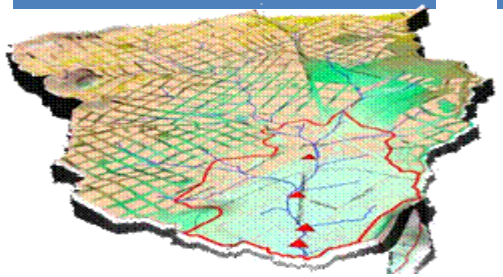


Heavy Precipitation and flood mapping

Need for historical and real time hazard data

meteorological, hydrological and climate forecasts and trend analysis

Exposure and Vulnerability



Assets:

- ✓ population density
- ✓ agricultural land
- ✓ urban grid
- ✓Infrastructure
- ✓Businesses
- ✓etc

Need for historical loss and damage data, Development and engineering information

Potential Loss Estimates

Number of lives at risk

$ at risk

- ✓Destruction of buildings and infrastructure
- ✓Reduction in crop yields
- ✓Business interruption
- ✓etc

Decisions

- ✓Policy and planning
- ✓Disaster Risk Financing
- ✓EWS
- ✓Sectoral Risk Managment

What are Climate Services?

- The accumulation of knowledge about the past, present and future of the climate system;
- The development and delivery of a range of "products" and advice based on this knowledge about the past, present and future climate and its impacts on natural and human systems
  - Historical climate data sets
  - Climate monitoring
  - Climate watches
  - Monthly/Seasonal/Decadal climate predictions
  - Climate change projections
- The use and the effective application of these products to help achieve the desired results.

A Climate service: Providing climate information in a way that assists decision making by individuals and organizations. A service requires appropriate engagement along with an effective access mechanism and must respond to user needs.

Photo Credits: NASA, Pedro Sanchez, Renzo Taddei

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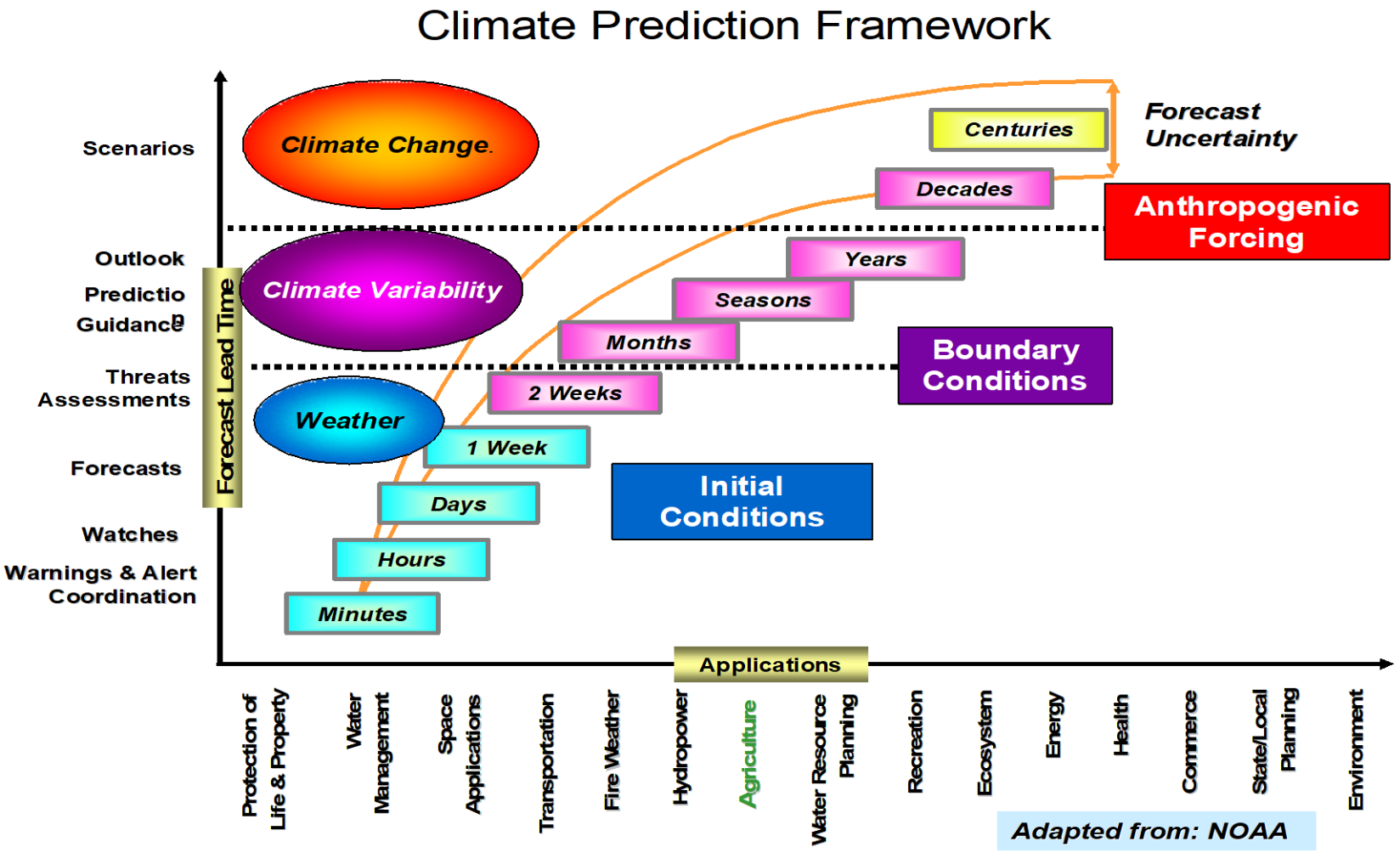
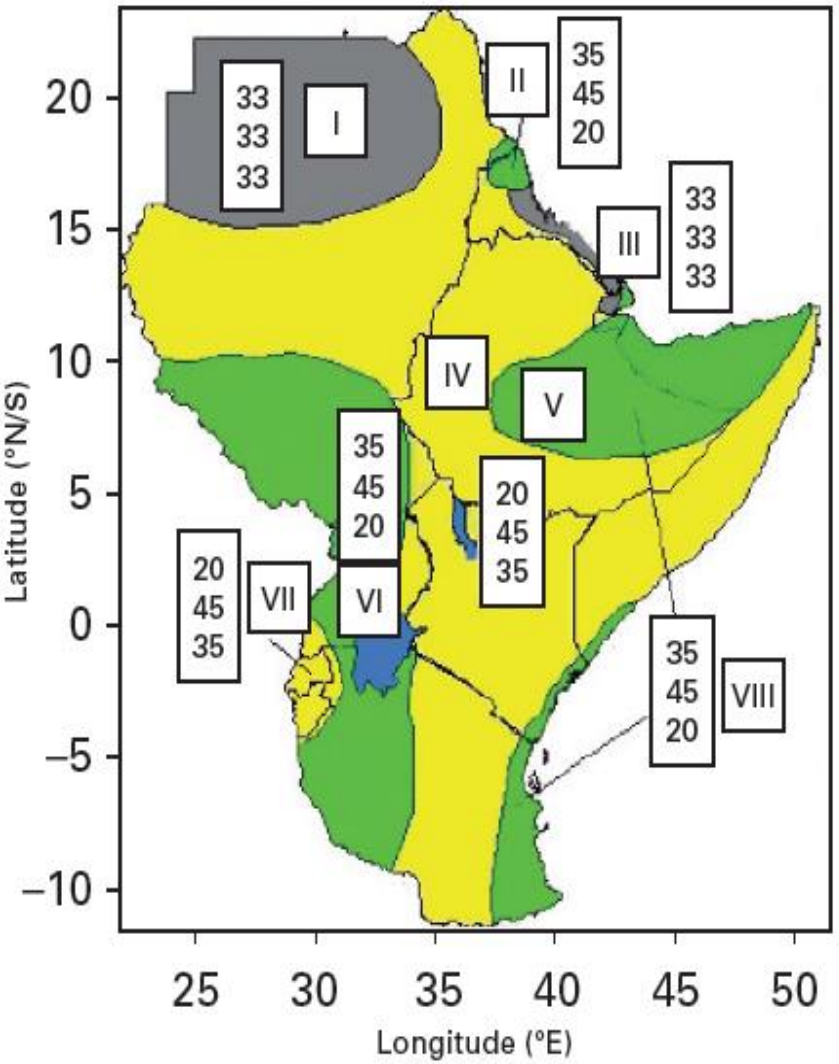
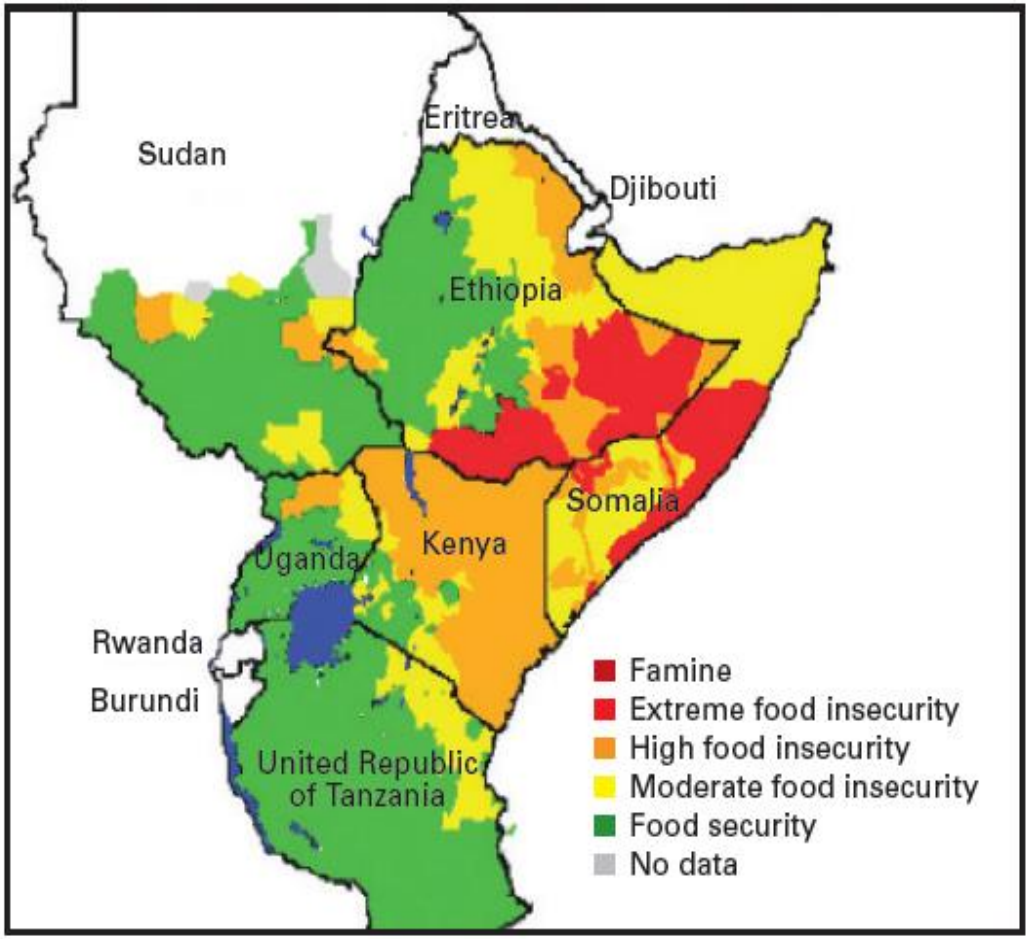
Seamless hydrometeorological and climate services



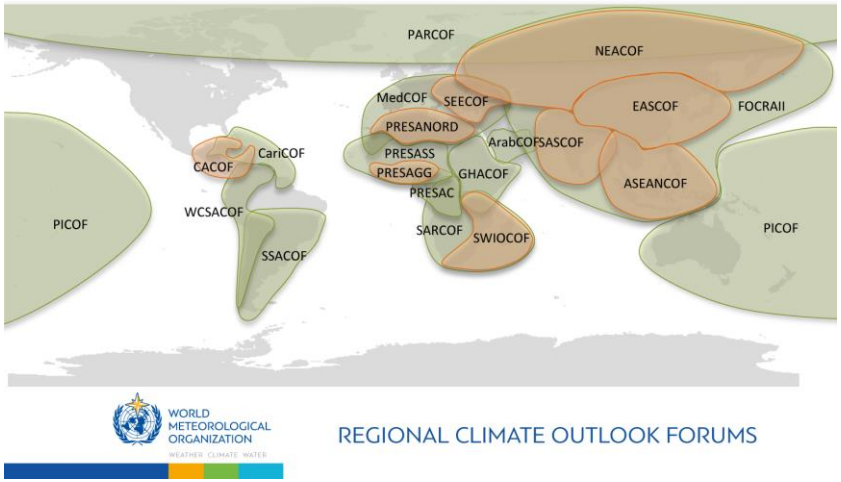
Application for Agriculture





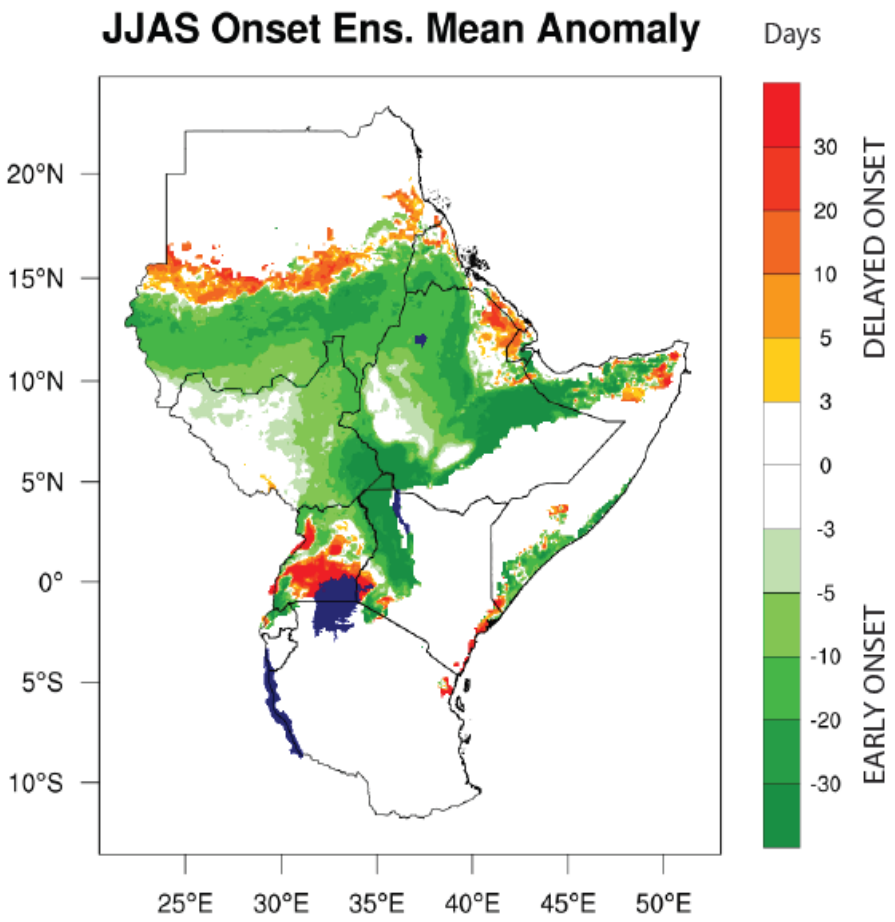
Food Security Outlook for Horn of Africa based on seasonal forecast

Regional Climate Outlook Forums

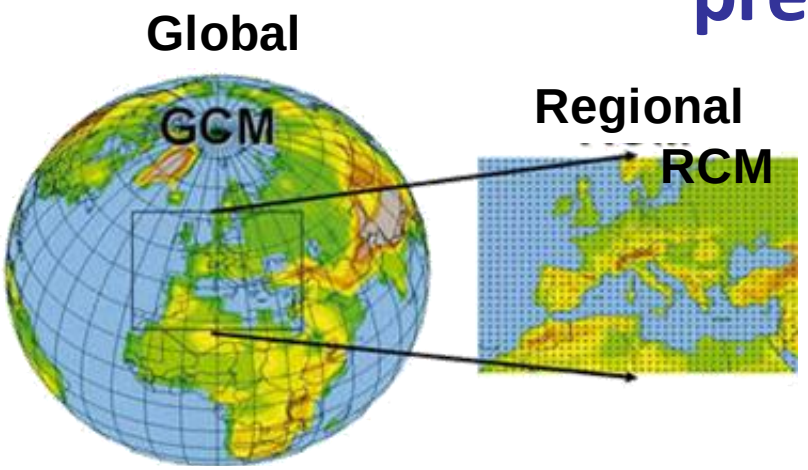


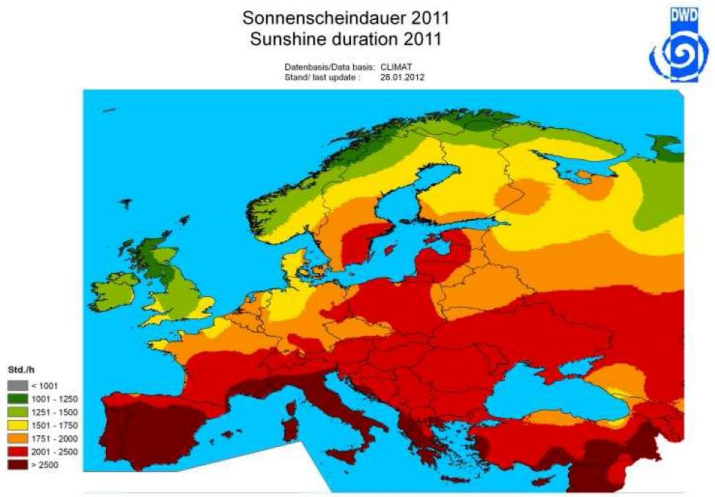
RCOF Next generation

- ✓ Objective seasonal forecasts
- ✓ > product portfolio using standardized operational practices
  - climate monitoring,
  - forecast verification,
  - sub-seasonal products, and
  - climate change-related products such as observed trends and attribution of extreme events



Examples of climate services based on predictions

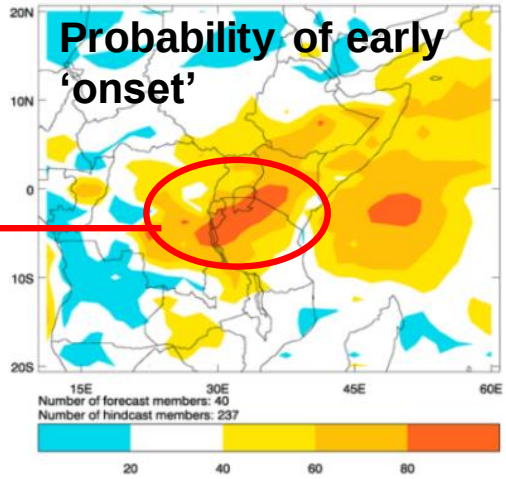


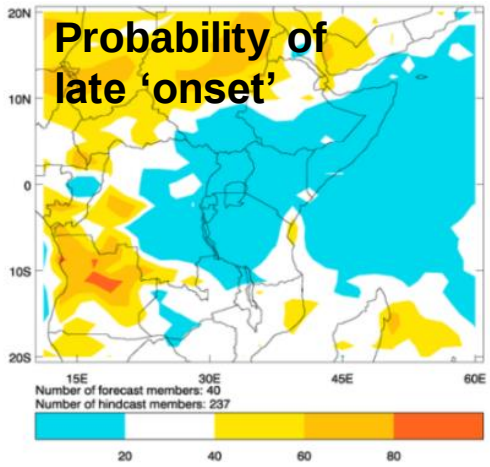


- Expected future temperature
- Precipitation scenarios
- Changing frequency of extreme weather events
- Sea-level changes
- Snow, glacier and sea ice coverage
- Growing seasons
- Potential impacts of climate change on the natural environment and major business and public sectors

New trial user products: onset prediction and monitoring

Early onset predicted most likely

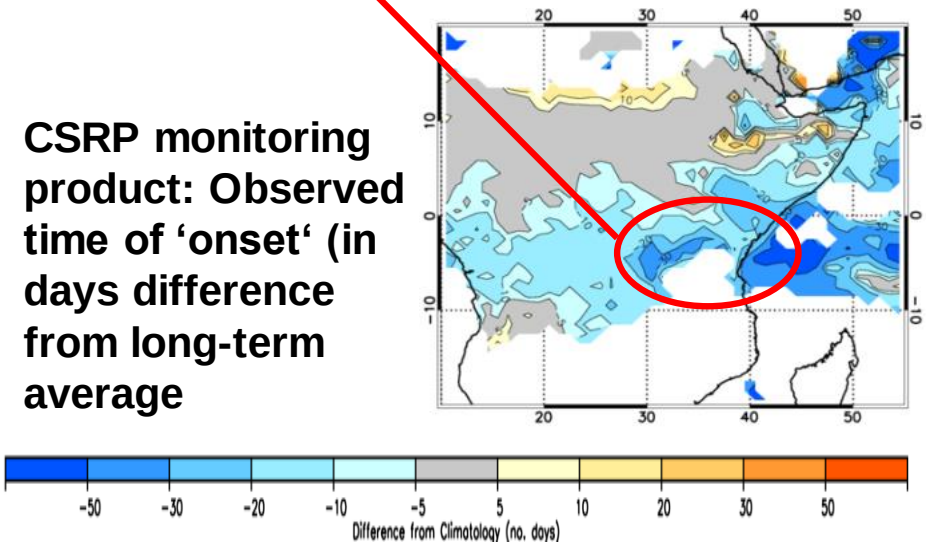




Prediction is based on local time of arrival of 20% of long-term seasonal average

Early onset occurred

CSRP monitoring product: Observed time of 'onset' (in days difference from long-term average



Greater Horn of Africa, short-rains season 2011 – 1 month lead time prediction

- **Assessment over retrospective cases indicates forecast can discriminate early/late onset in ~70% of cases (Tanzania/Kenya)**
- **Onset forecasts being trialled at regional centres in East, West and southern Africa**

Decision-making across timescales

Begin planning and monitoring of forecasts

Update contingency plans

Sensitize communities

Enable early-warning systems

Continue monitoring

Adjust plans

Warn communities

Local preparation activities

Activate response

Instruction to communities to evacuate, if needed

Climate is what you expect, weather is what you get

Mark Twain

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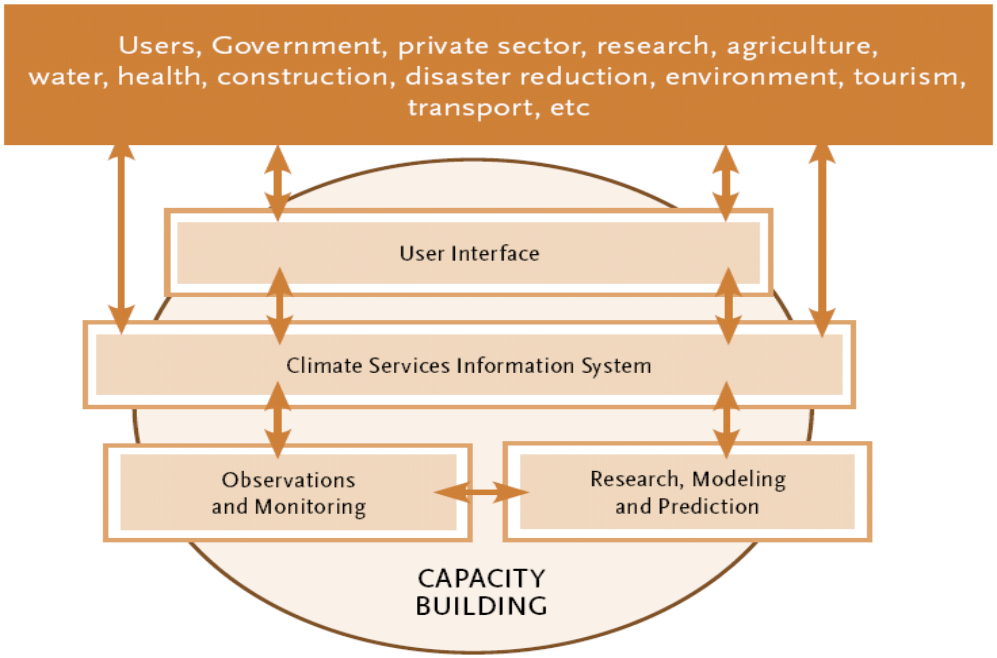
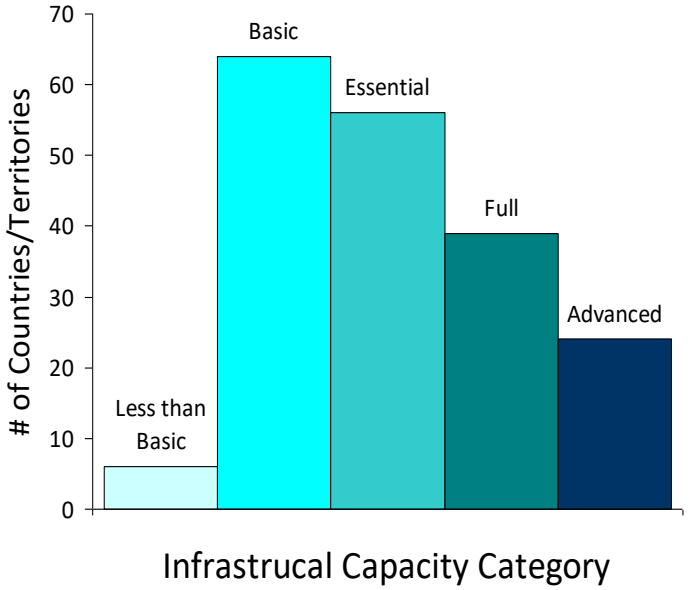
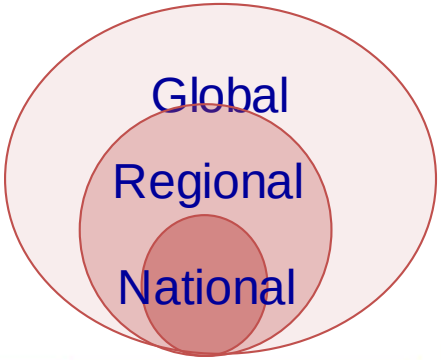
GFCS Pillars







Many countries lack the infrastructural, technical, human and institutional capacities to provide high-quality climate services.

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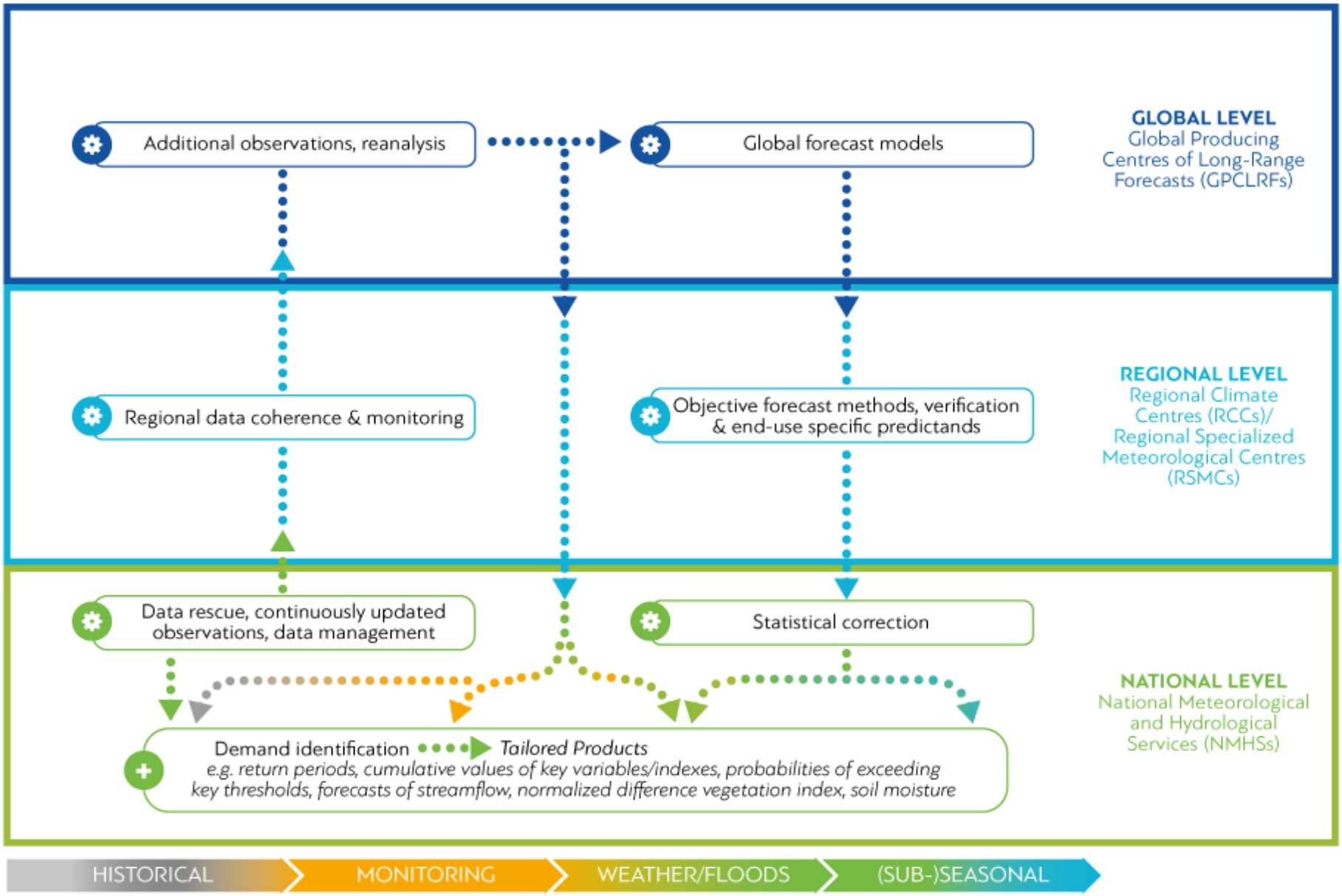
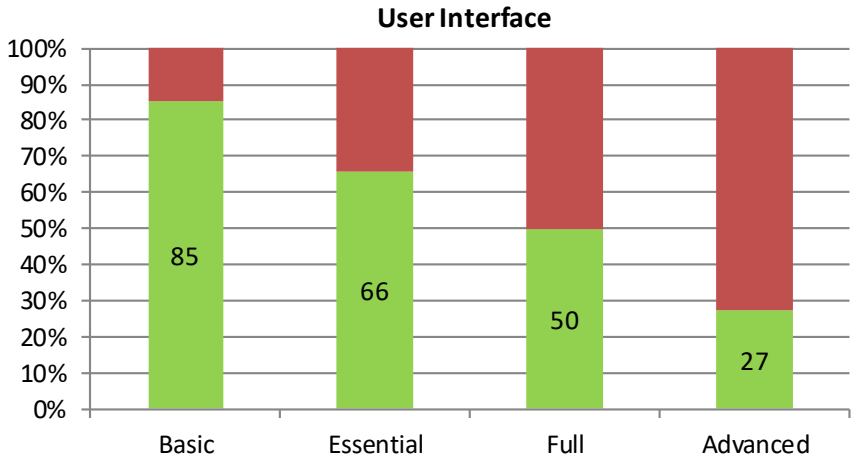
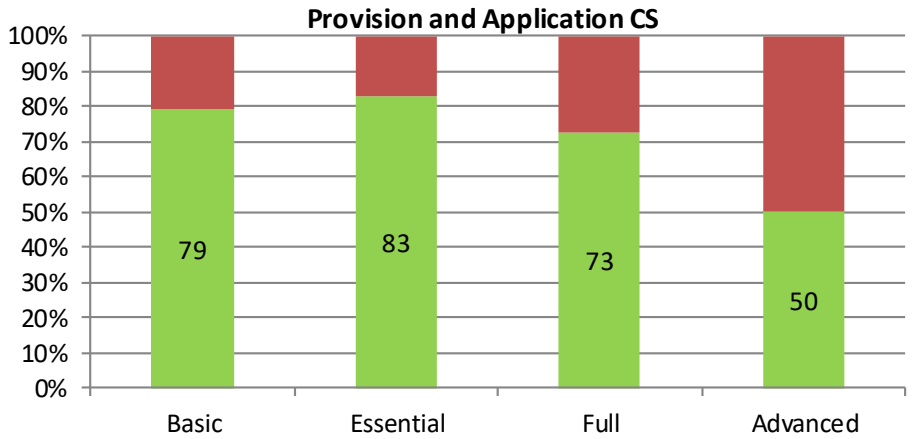
WMO REGIONAL CLIMATE SERVICES INFORMATION SYSTEM (CSIS-R)

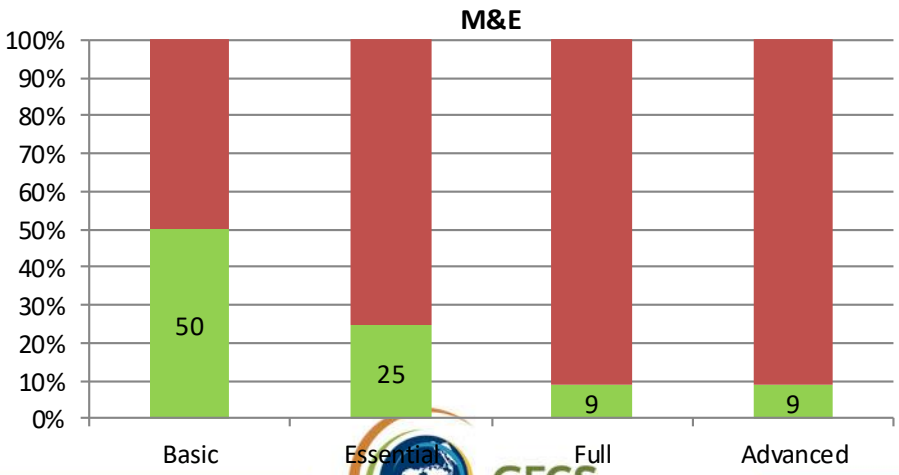


National level capacities

Service Delivery and Overall







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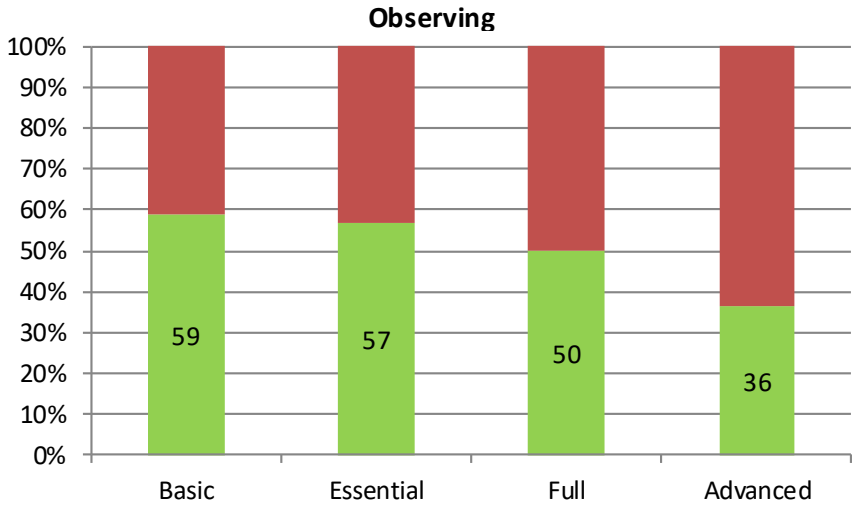
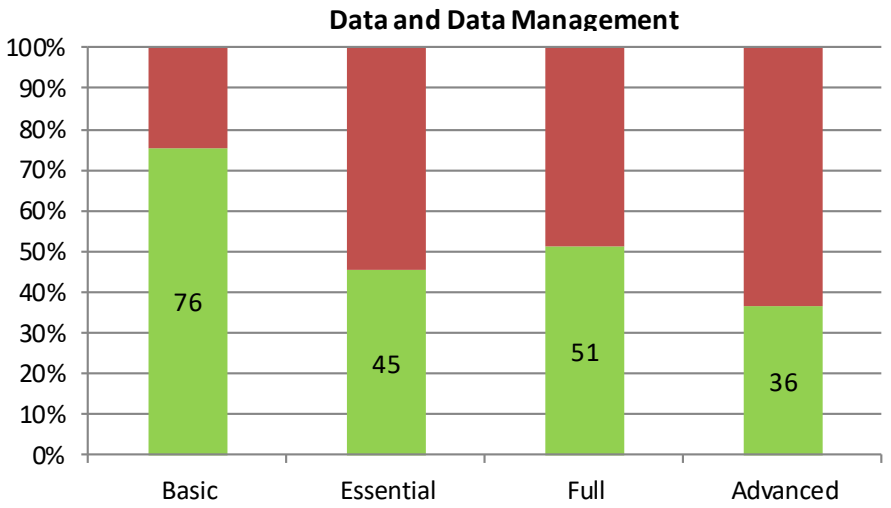
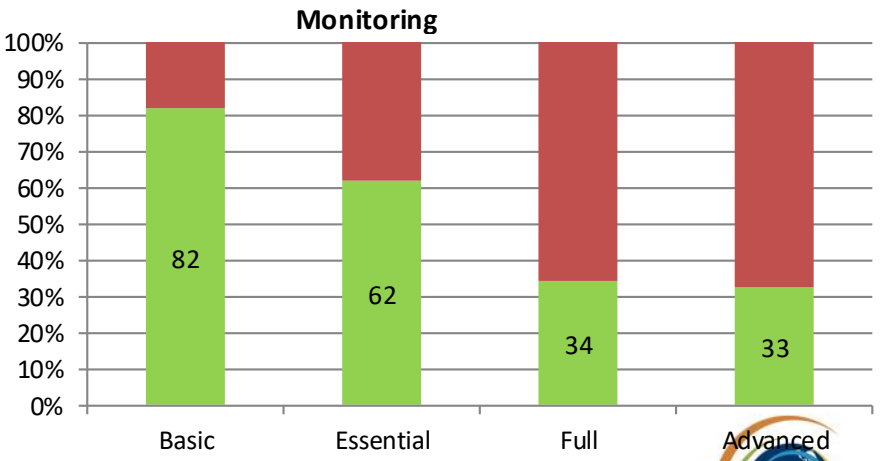
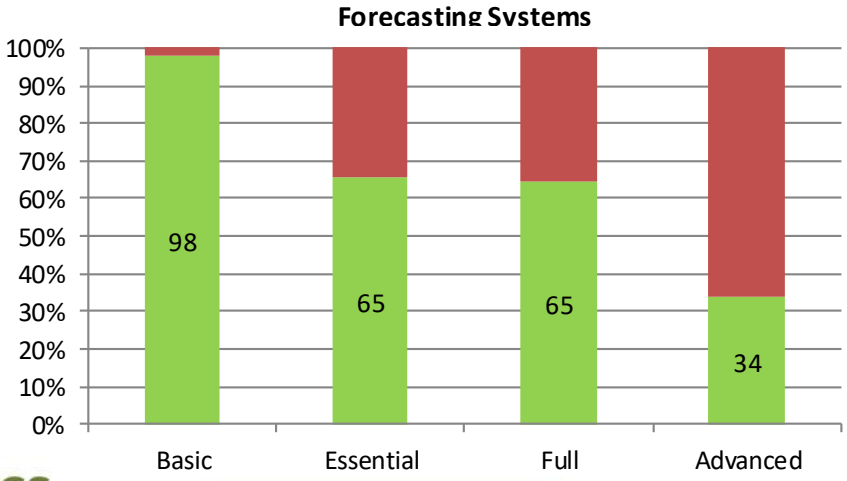
National level capacities

Basic Systems









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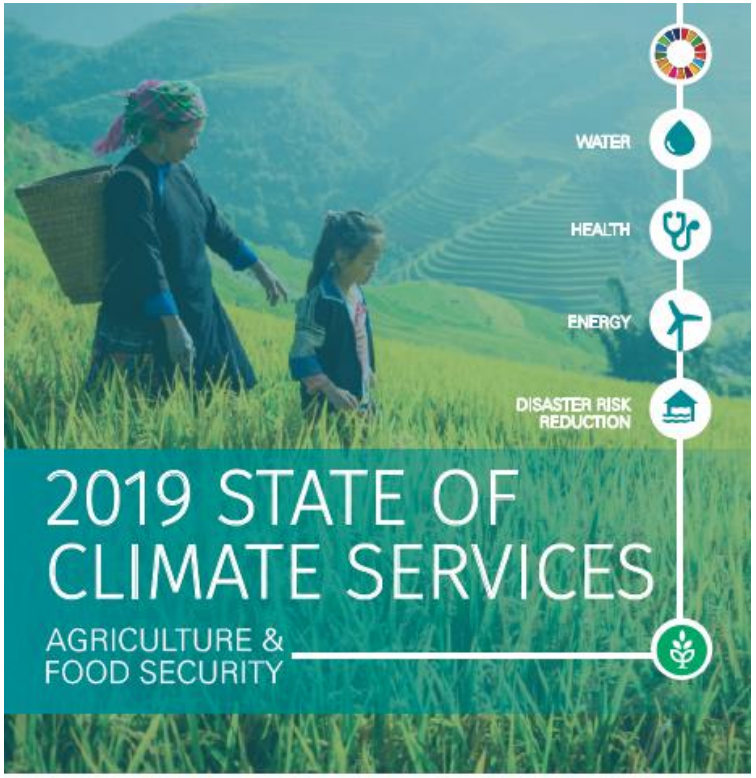
In 2018, the meeting of the Parties to the Paris Agreement (Decision 11/CMA.1) at the 24th Conference of the Parties to UNFCCC called on the WMO through the GFCS) to regularly report on the state of climate services with a view to "facilitating the development and application of methodologies for assessing adaptation needs"



WORLD METEOROLOGICAL ORGANIZATION

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GFDRR

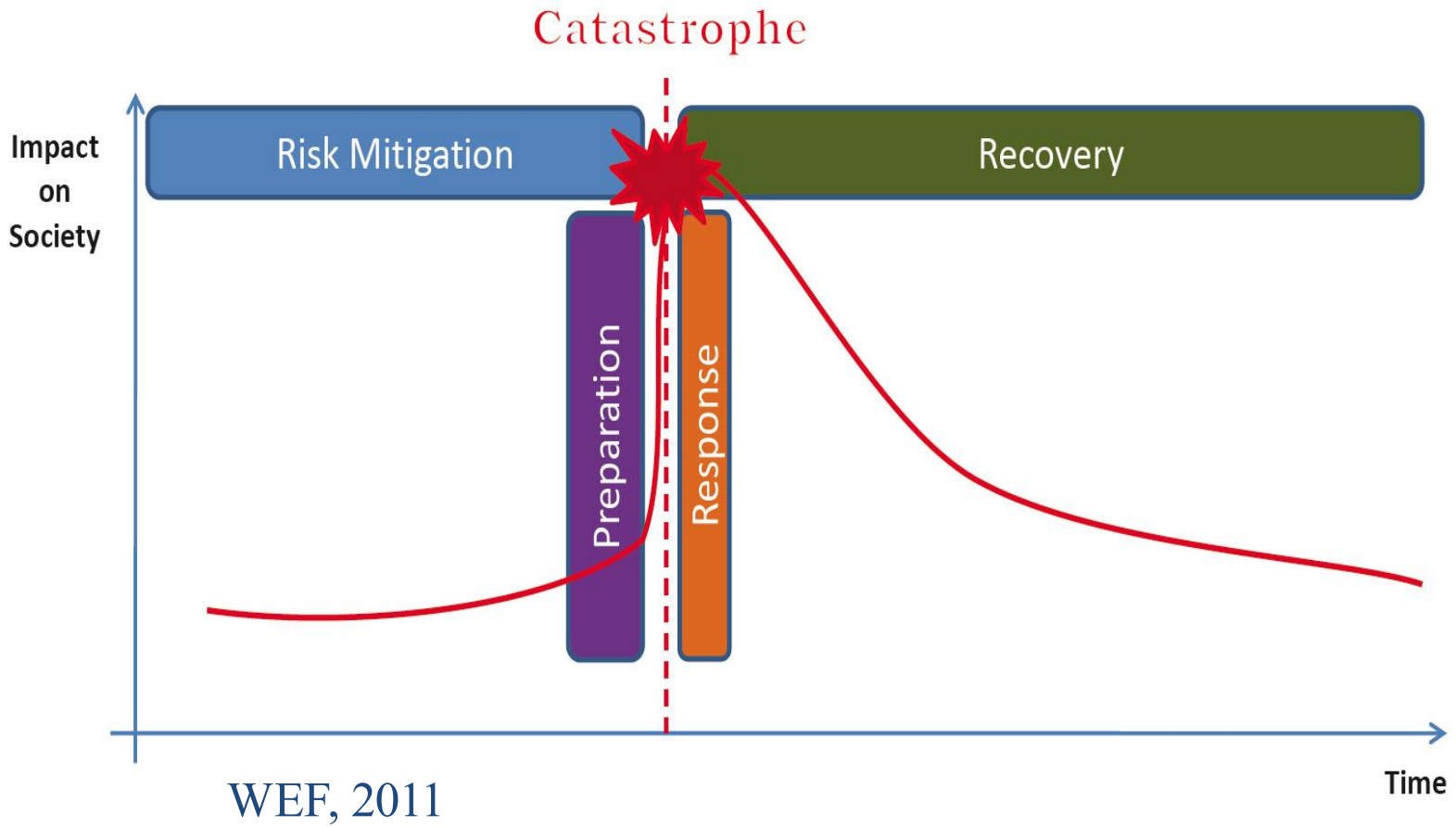
The inaugural 2019 State of Climate Services Report focuses specifically on agriculture and food security. It examines six core components of climate services including: basic systems, service delivery, provision and application of climate services, and monitoring and evaluation.

Adapting to future changes

- **Dealing with extreme events today (incremental adaptation)**
  - Better drought and flood management
  - Planning and emergency preparedness and response to extreme events
  - flood and floodplain management and control
  - Sitting of critical infrastructure such as hospitals, schools, etc
  - Risk Assessment/health system risk management
  - Epidemiological Surveillance & environmental Monitoring
  - Health Services (heat health warning systems, malaria waning system, etc…)
  - Improved food security

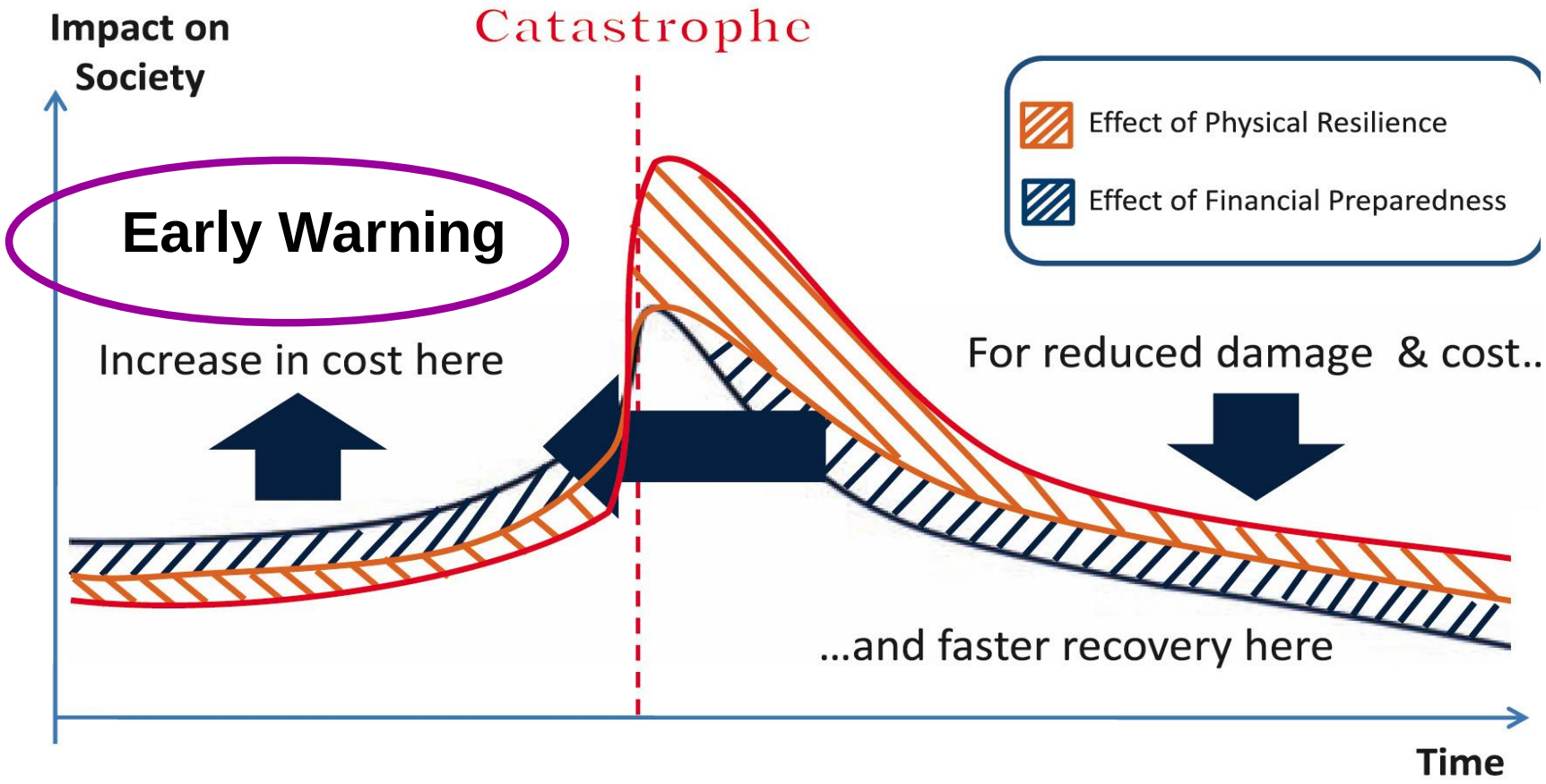
- **Preparedness to potential events in the future (transformational adaptation)**
  - switching crop types
  - shifting locations for producing certain crops and livestock
  - shifting farming systems new to an area
  - exploring alternative livelihood strategiess inputs to hydrological characterisation (e.g. precipitation, evaporation, etc)
  - planning, design, development and operation of infrastructure
  - planning, design, development and operation of water supplies
  - design and operation of irrigation and drainage systems;
  - studies associated with power generation, fisheries an conservation, navigation and recreation.

Building resilience



WEF, 2011

Building resilience



- WEF, 2011 (adapted)

Summing-up

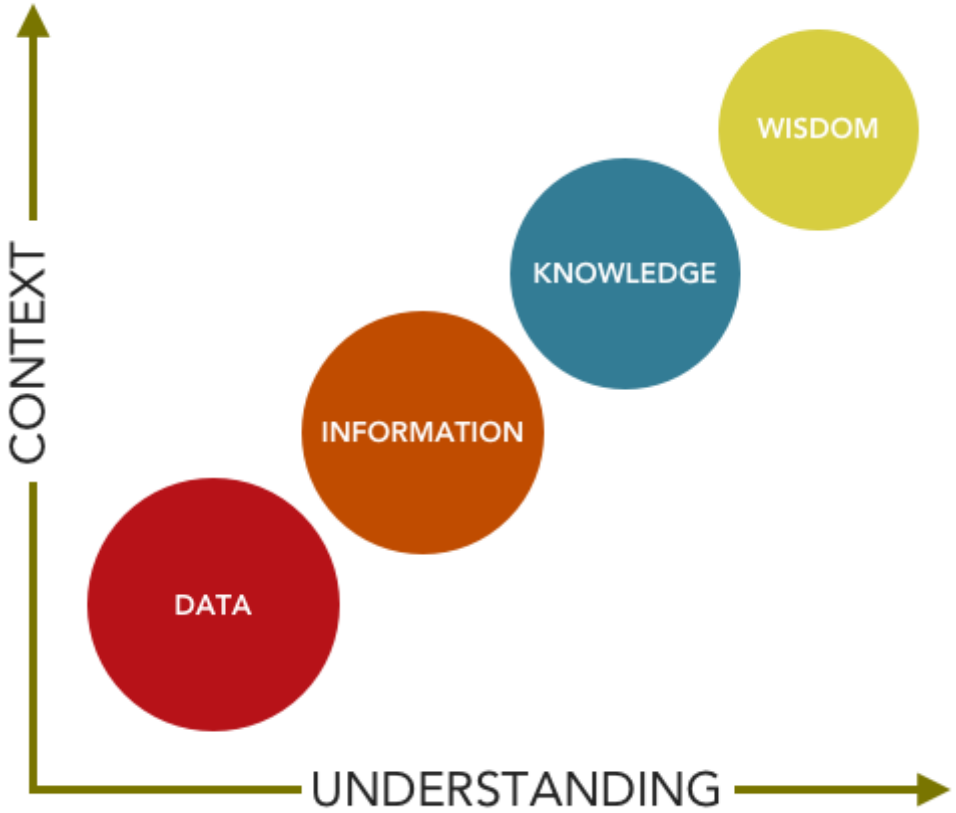
- ✓ **3 closely-related issues:**
  - ➢ ***Adaptation to climate variability and change***
  - ➢ ***Disaster risk reduction***
  - ➢ ***Sustainable development & societal benefits***

- ✓ **Requirements:**
  - ➢ ***Reinforcing developing countries' adaptive capabilities***
  - ➢ ***Multidisciplinary partnerships across all sectors***
  - ➢ ***Capacity building to be seen as an investment, not an expenditure***

A key opportunity:

- ➢ **A Global Framework for Climate Services**

Data or information?



WMO OMM

Thank you for your attention