The IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

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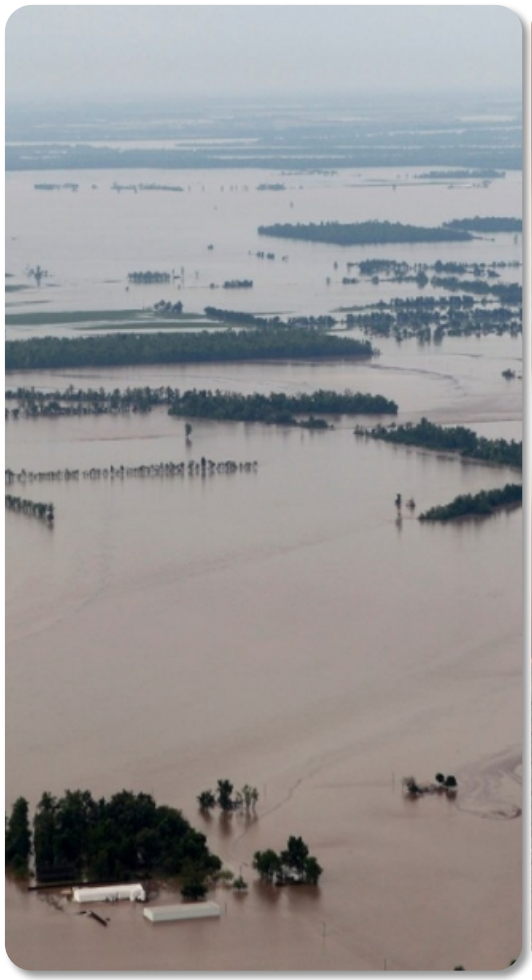
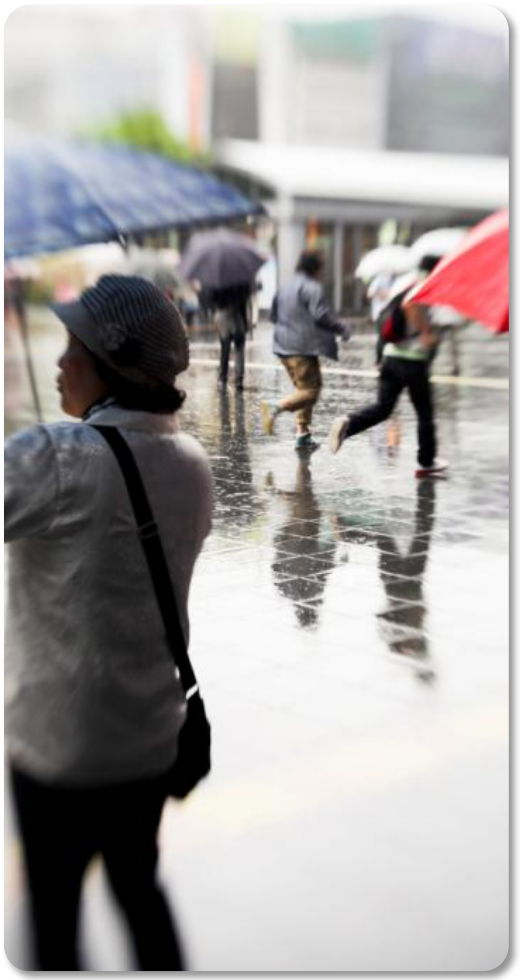
A changing climate leads to changes in extreme weather and climate events



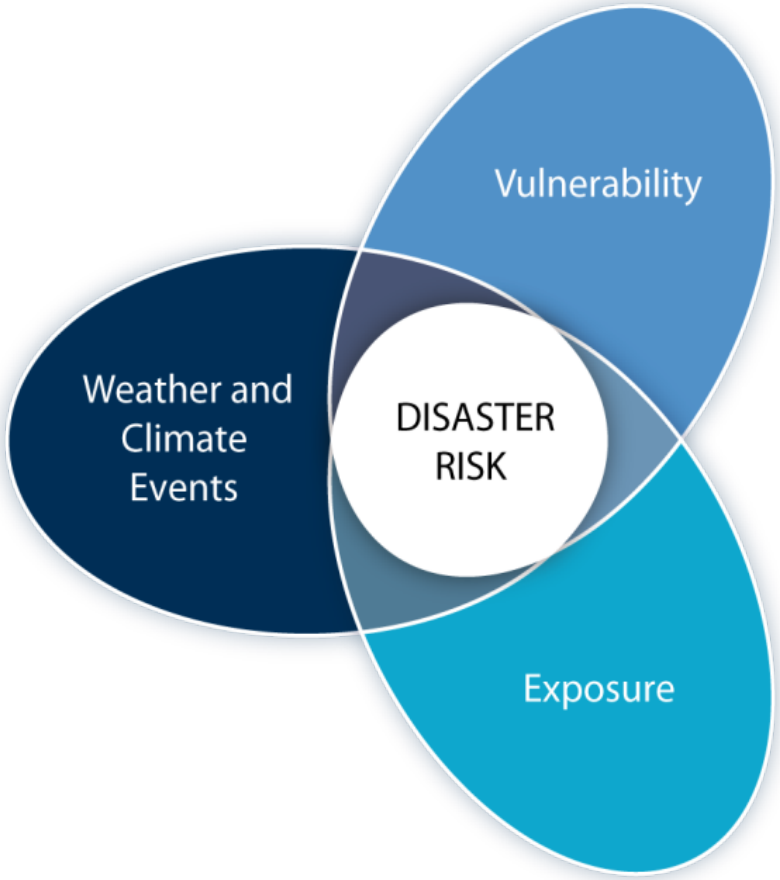
Impacts from weather and climate events depend on:

nature and severity of event

vulnerability

exposure

Socioeconomic development interacts with natural climate variations and human-caused climate change to influence disaster risk



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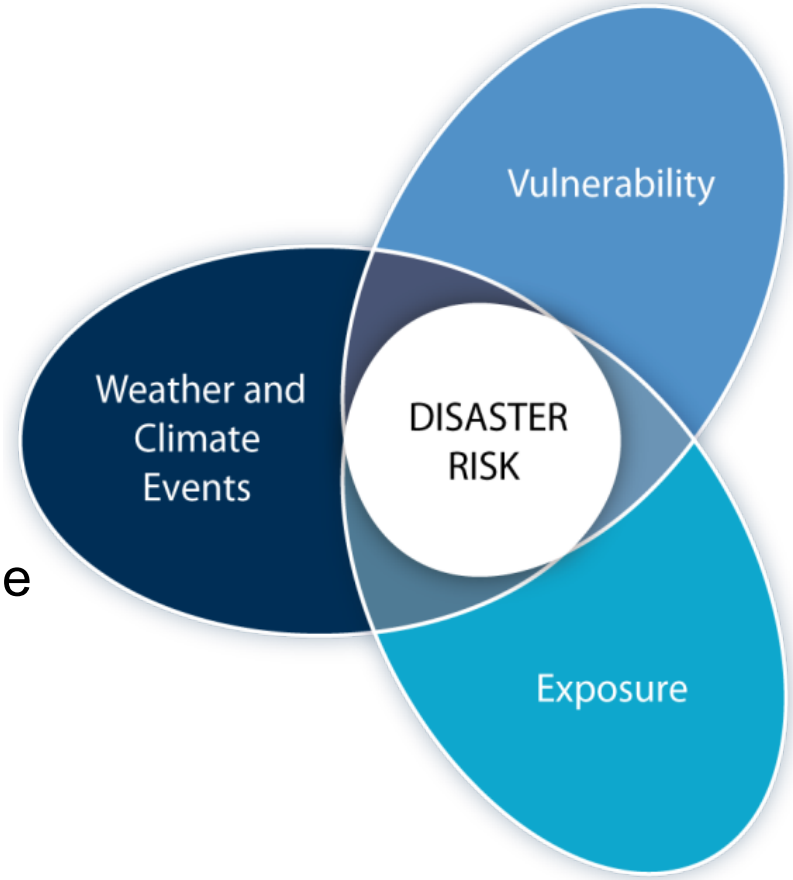
Disaster Risk:

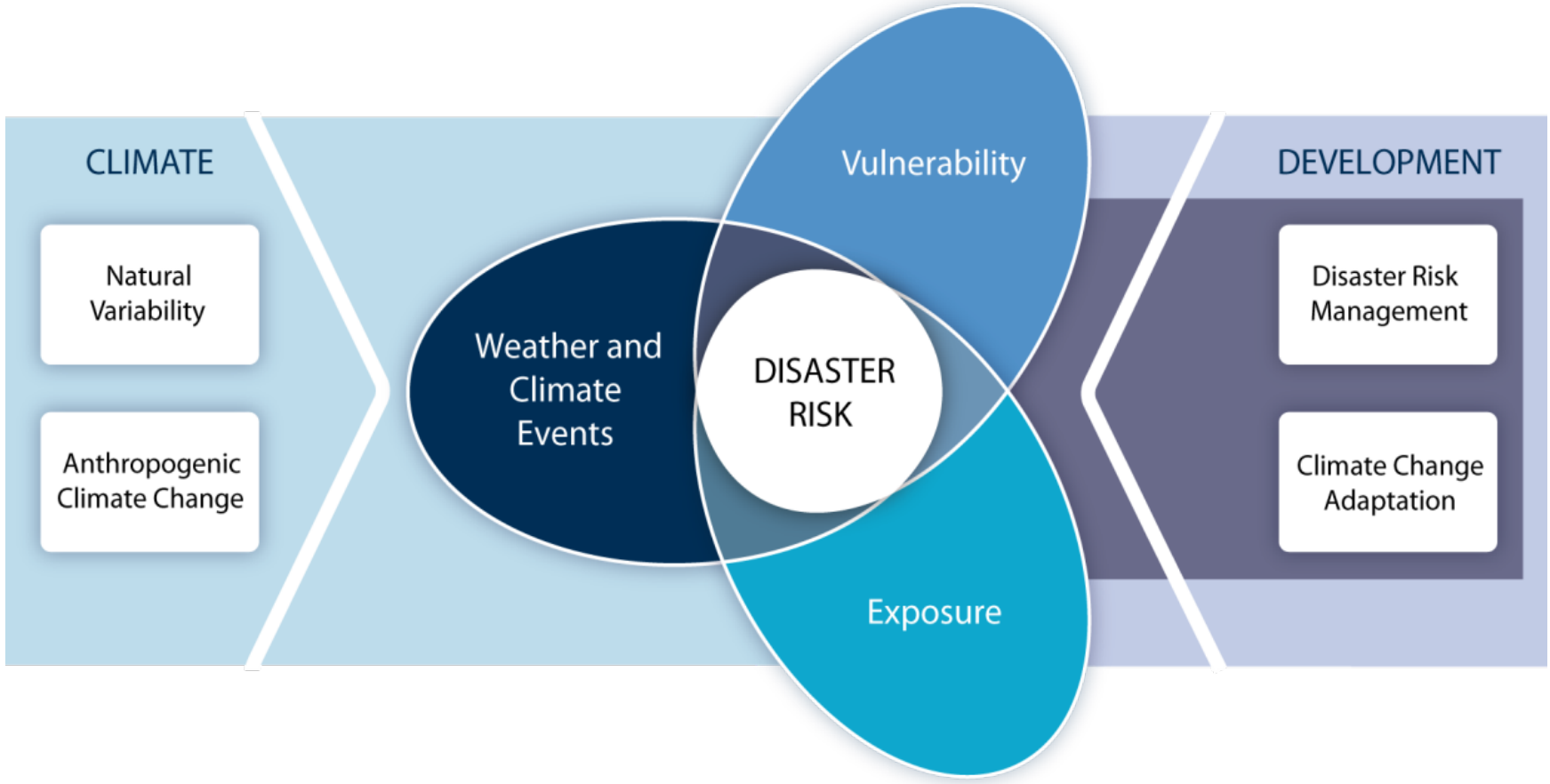
the likelihood of severe alterations in the normal functioning of a community or society due to weather or climate events interacting with vulnerable social conditions



Vulnerability:

the predisposition of a person or group to be adversely affected

Increasing vulnerability, exposure, or severity and frequency of climate events increases disaster risk



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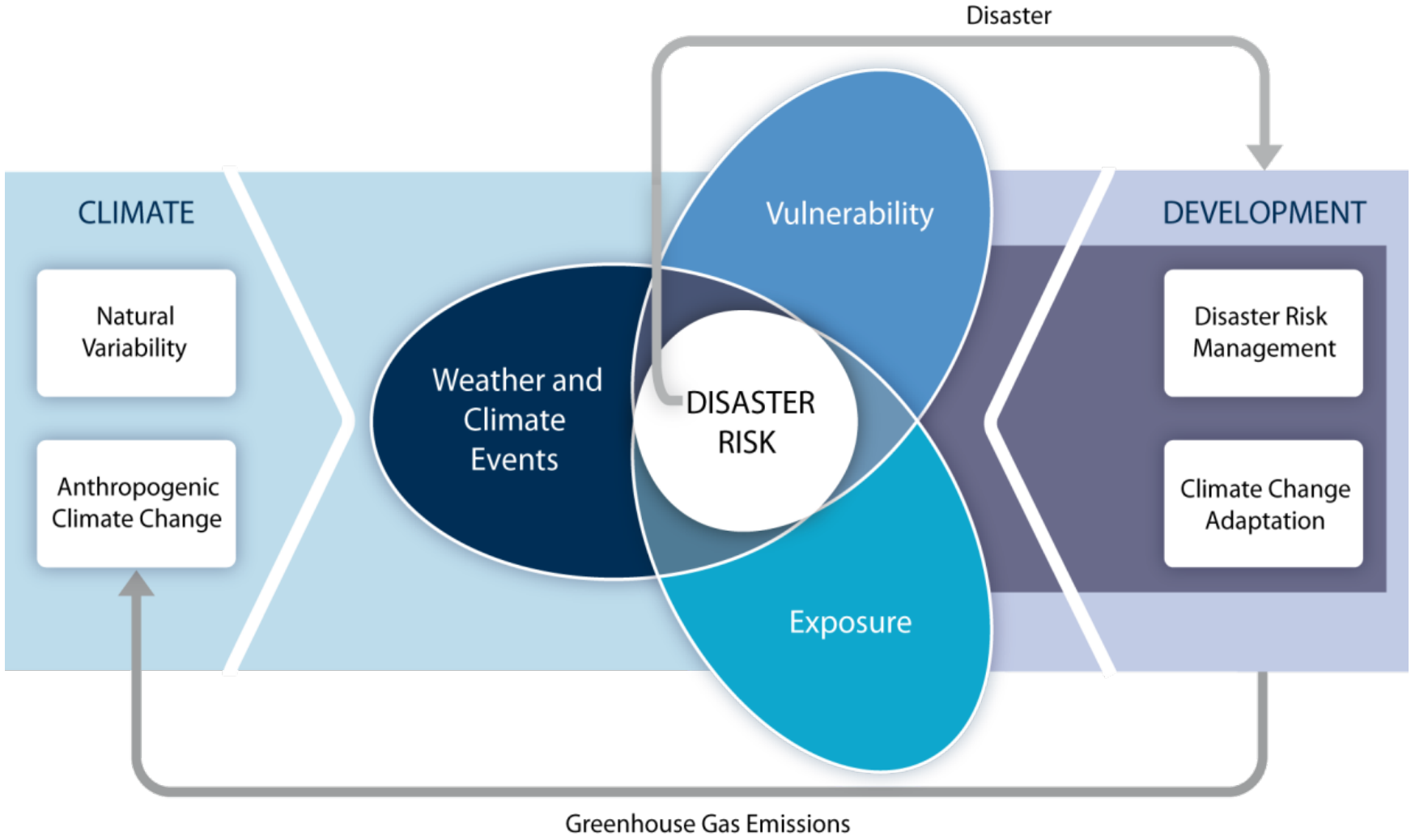


Disaster risk management and climate change adaptation can influence the degree to which ***extreme events translate into impacts*** *and* ***disasters***

For exposed and vulnerable communities, even non-extreme weather and climate events can have extreme impacts

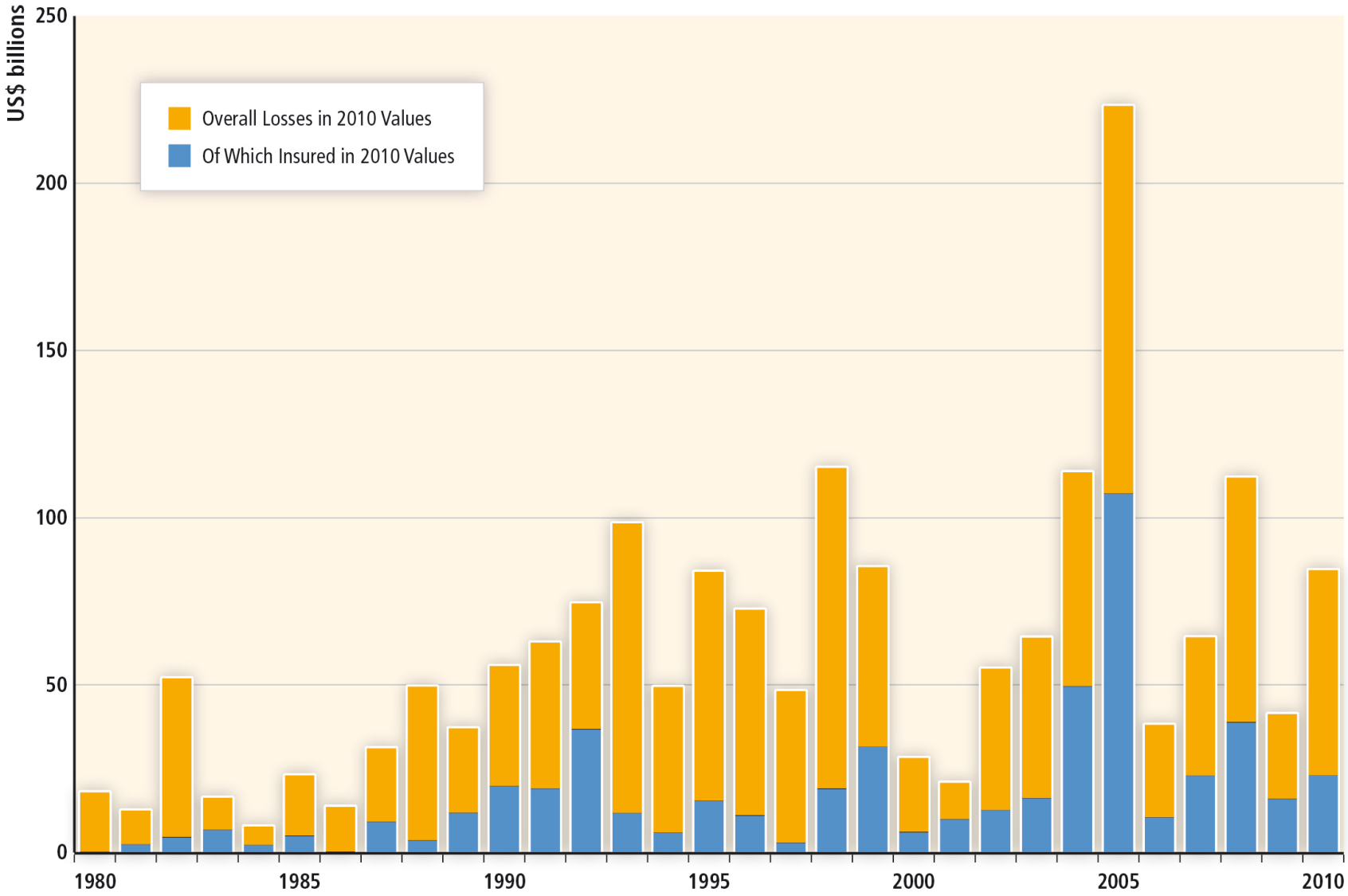
- Africa's largest recorded cholera outbreak
- over 90,000 affected
- over 4,000 killed
- began following onset of seasonal rains
- vulnerability and exposure increased risk

Case Study: Zimbabwe
2008

Impacts of climate extremes can be felt locally or regionally

AGRICULTURE	**"Mongolian herdsmen face starvation"** *March 14, 2000,* ***BBC World News***
ENERGY	**"Heatwave hits French power production"** *August 12, 2003,* ***The Guardian***
WATER	**"Drought returns to haunt Ethiopia"'** *May 19, 2008,* ***Reuters***
PUBLIC HEALTH	**"Cholera confirmed in Pakistan flood disaster"** *August 14, 2010,* ***Associated Press***
TOURISM	**"Alpine resorts feel heat during record warm spell"** *December 08, 2006,* ***CNN World News***
TRANSPORTATION	**"Flash flooding causes train to derail"** *July 30, 2001,* ***Chicago Sun Times***

Economic losses from climate-related disasters have increased, with large spatial and interannual variations

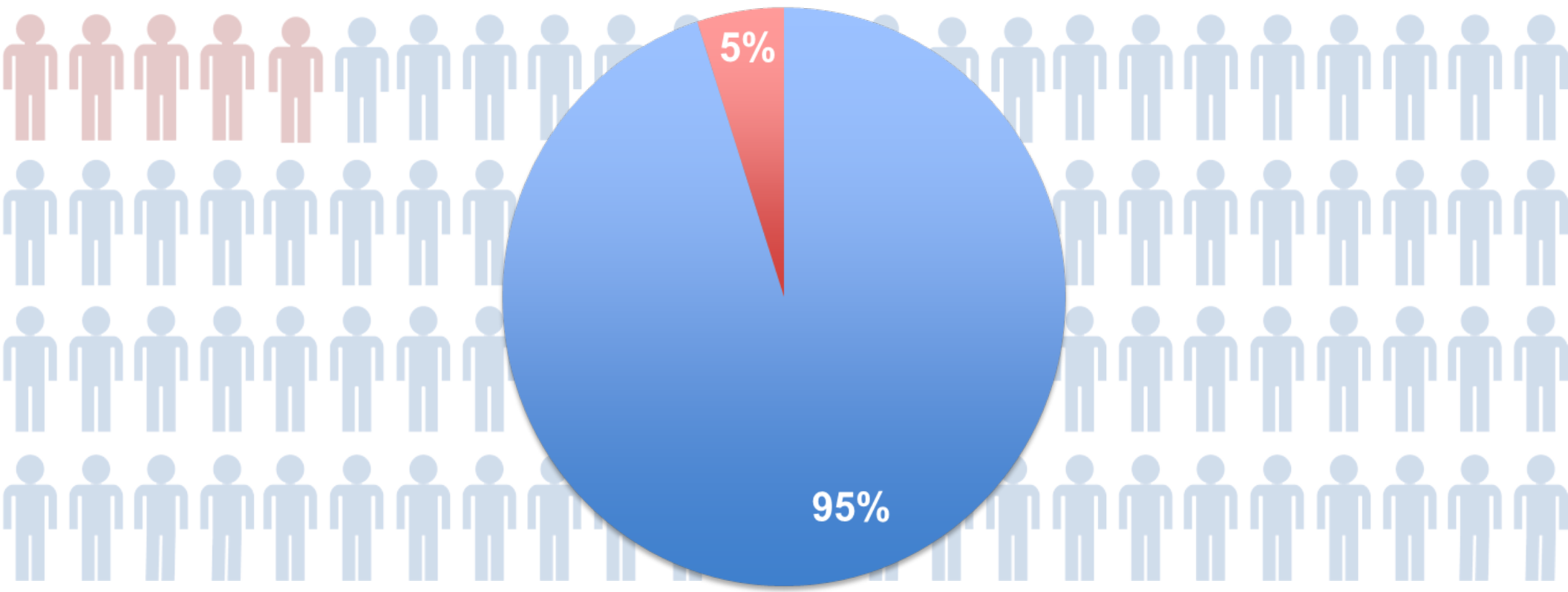


Data from Munich Re, 2011

Increasing exposure of people and assets has been the major cause of changes in disaster losses

Economic disaster losses are higher in developed countries

Fatalities are higher in developing countries

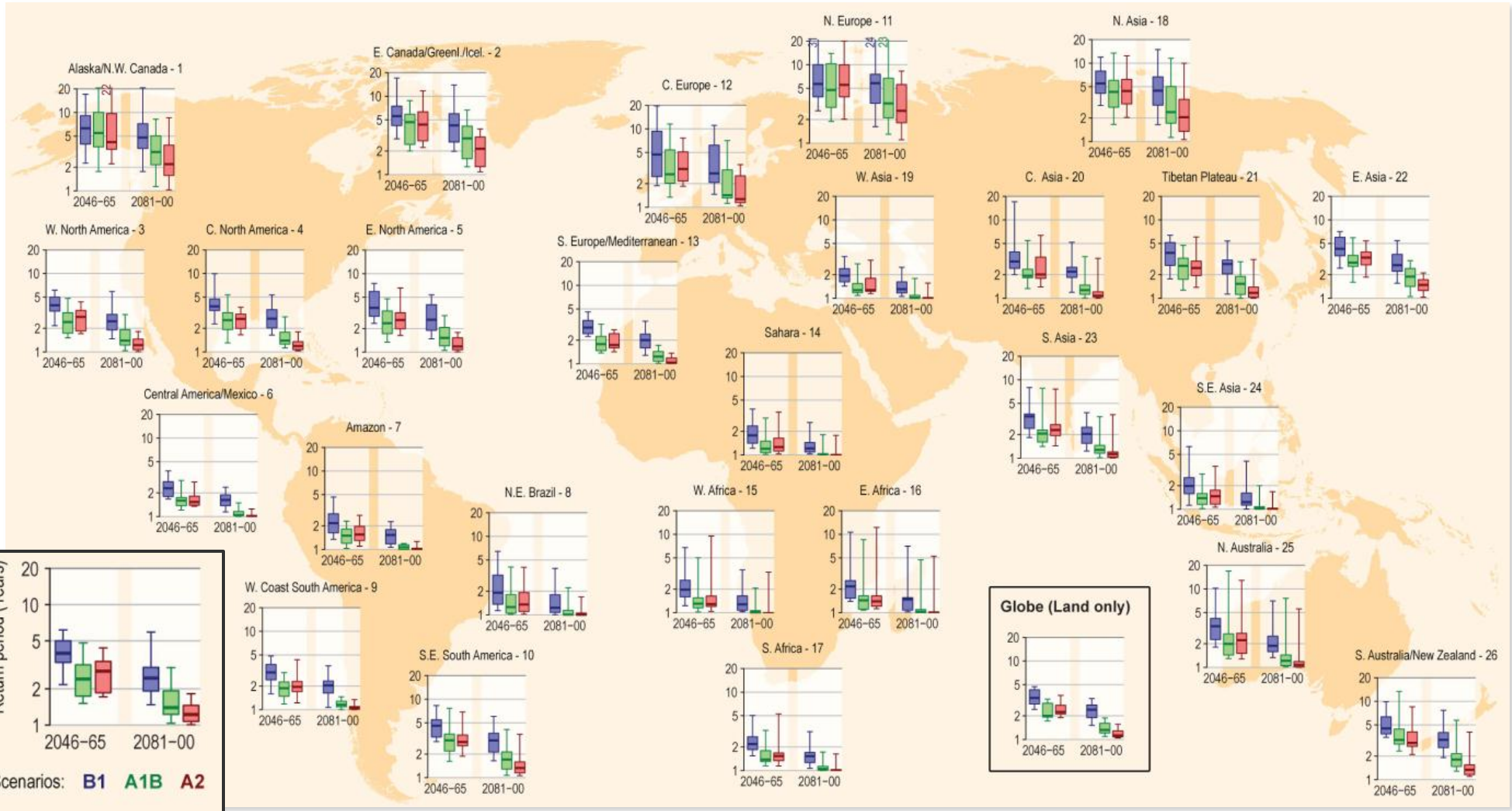


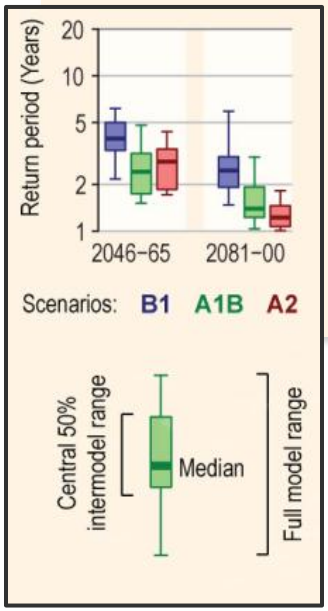
From 1970-2008, over **95%** of natural-disaster-related deaths occurred in developing countries

Since 1950, extreme hot days and heavy precipitation have become more common

There is evidence that anthropogenic influences, including increasing atmospheric greenhouse gas concentrations, have changed these extremes

Climate models project more frequent hot days throughout the 21st century





In many regions, the time between "20-year" (unusually) warm days will decrease

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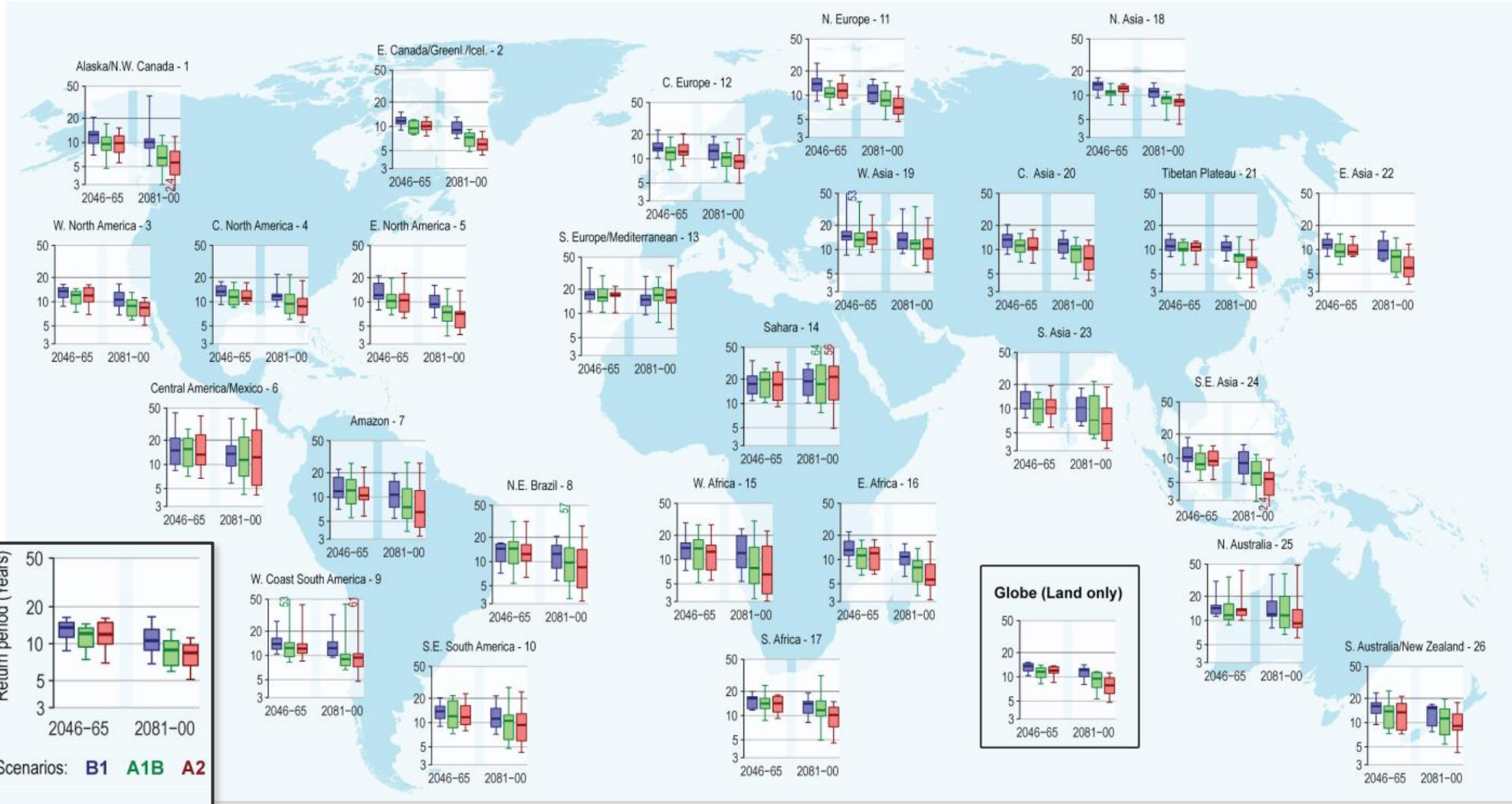
Climate models project there will be more heavy rain events throughout the 21st century



In many regions, the time between "20-year" (unusually intense) rainstorms will decrease

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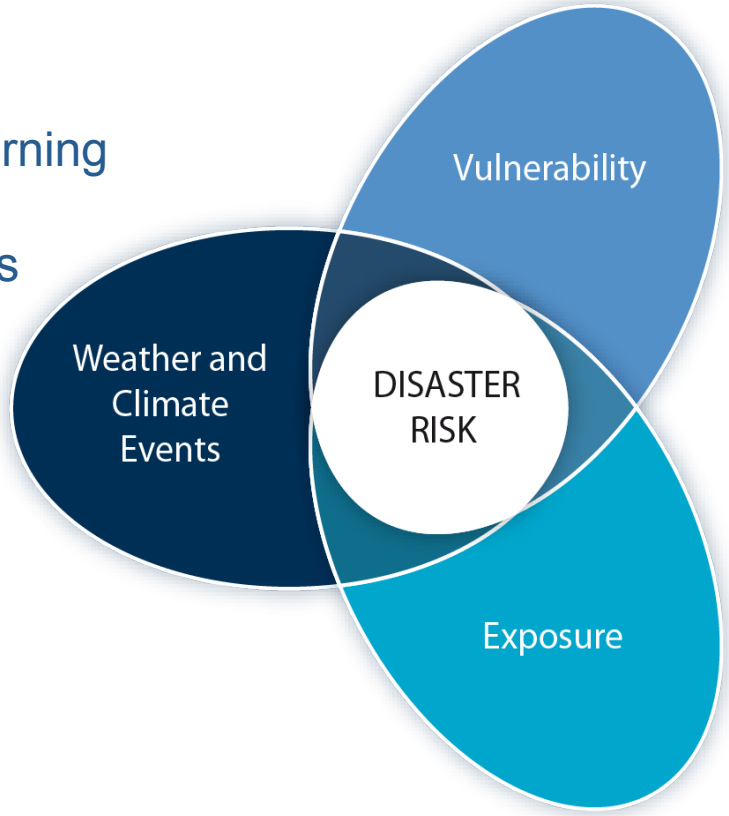
Information on vulnerability, exposure, and changing climate extremes can together inform adaptation and disaster risk management

- poverty reduction
- better education and awareness
- sustainable development

- improved forecasting for warning systems
- reduction of greenhouse gas emissions



- asset relocation
- weather-proofing assets
- early warning systems

Short-term actions don’t always provide long term risk reduction

Permafrost thaw

- permafrost requires sub zero temperatures
- melt affects roads, building foundations, airport infrastructure
- infrastructure maintenance needed
- short-term risk reduction won’t eliminate long-term melt risk

Effective risk management and adaptation are tailored to local and regional needs and circumstances

- changes in climate extremes vary across regions
- each region has unique vulnerabilities and exposure to hazards
- effective risk management and adaptation address the factors contributing to exposure and vulnerability

Managing the risks: heat waves in Europe

Risk Factors

- lack of access to cooling
- age
- pre-existing health problems
- poverty and isolation
- infrastructure

Risk Management/ Adaptation

- cooling in public facilities
- warning systems
- social care networks
- urban green space
- changes in urban infrastructure

Projected: *likely* increase in heat wave frequency and *very likely* increase in warm days and nights across Europe

Managing the risks: hurricanes in the USA and Caribbean

Risk Factors

- population growth
- increasing property value
- higher storm surge with sea level rise

Risk Management/ Adaptation

- better forecasting
- warning systems
- stricter building codes
- regional risk pooling

Projected globally: *likely* increase in average maximum wind speed and associated heavy rainfall (although not in all regions)

Managing the risks: flash floods in Nairobi, Kenya

Risk Factors

- rapid growth of informal settlements
- weak building construction
- settlements built near rivers and blocked drainage areas

Risk Management/ Adaptation

- reduce poverty
- strengthen buildings
- improve drainage and sewage
- early warning systems

Projected: *likely* increase in heavy precipitation in East Africa

Managing the risks: sea level rise in tropical Small Island Developing States

Risk Factors

- shore erosion
- saltwater intrusion
- coastal populations
- tourism economies

Risk Management/ Adaptation

- early warning systems
- maintenance of drainage
- regional risk pooling
- relocation

Projected globally: *very likely* contribution of sea level rise to extreme coastal high water levels (such as storm surges)

Managing the risks: drought in the context of food security in West Africa

Risk Factors

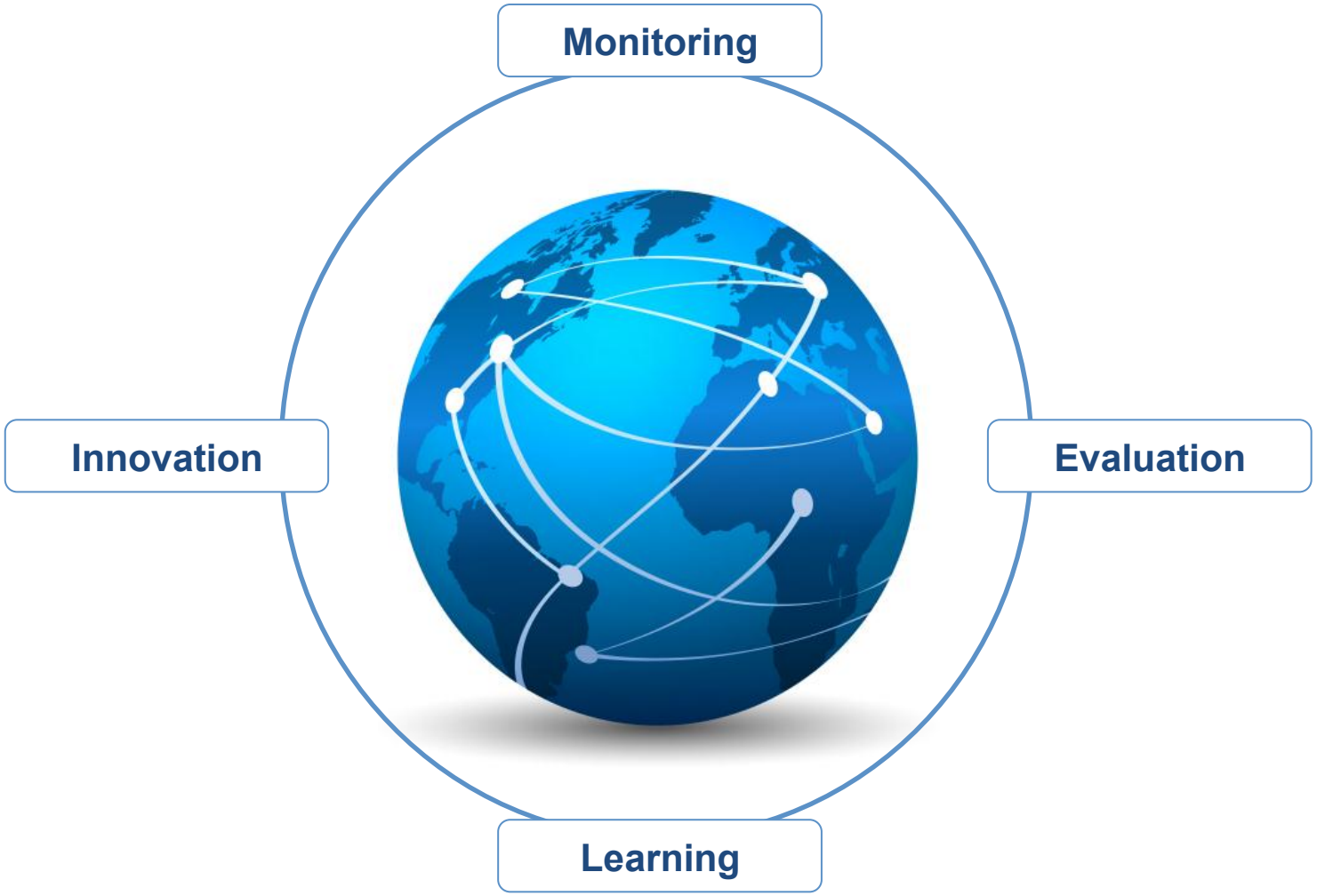
- more variable rain
- population growth
- ecosystem degradation
- poor health and education systems

Risk Management/ Adaptation

- improved water management
- sustainable farming practice
- drought-resistant crops
- drought forecasting

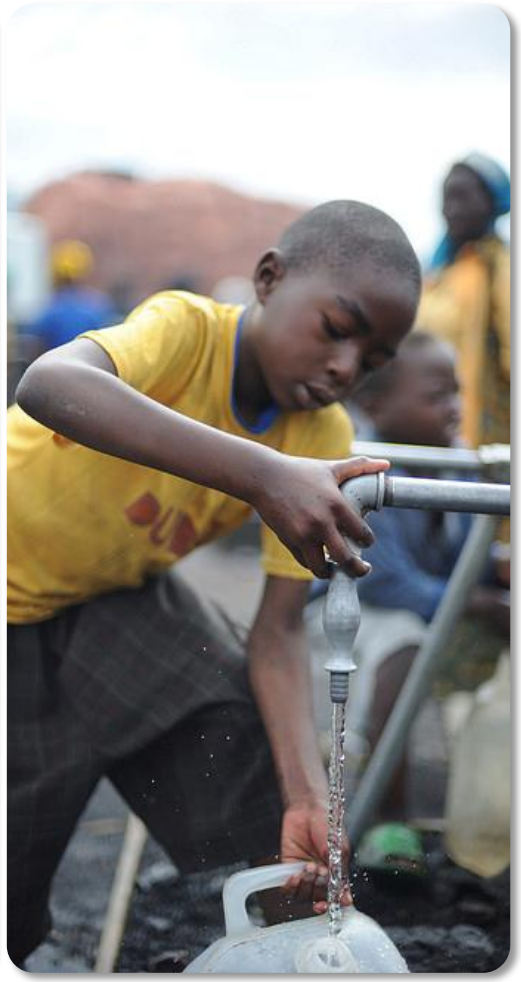
Projected: *low confidence* in drought projections for West Africa

Managing risks of disasters in a changing climate benefits from an iterative process



Learning-by-doing and low-regrets actions can help reduce risks now and also promote future adaptation

There are strategies that can help manage disaster risk now and also help improve people's livelihoods and well-being



The most effective strategies offer development benefits in the relatively near term and reduce vulnerability over the longer term

IPCC Assessment Reports: The Process