

Response and Recovery from Urban Flooding

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HOW DOES **CLIMATE CHANGE** **AFFECT FLOOD RISK?**

WARMER & WETTER ATMOSPHERE

A warmer atmosphere can hold more moisture – approx 7% more for every degree of warming.

MORE ENERGY FOR STORMS

The extra heat in the atmosphere means there is more energy for weather systems that generate intense rainfall.



MORE INTENSE DOWNPOURS

More moisture in the atmosphere means we get more of our rainfall in the form of short, intense downpours. This increases the risk of flash flooding.

COASTAL FLOODING

Climate change is also increasing risks of coastal flooding due to higher sea levels.

CLIMATE CHANGE INCREASES FLOOD RISK BY



RIISING SEA LEVELS

Higher seas increase the likelihood of storm surge and sunny day tidal flooding in many coastal communities

INCREASING EXTREME PRECIPITATION

Warmer temperatures increase evaporation of moisture into the air. They also allow the air to hold more moisture and dump more water during storms

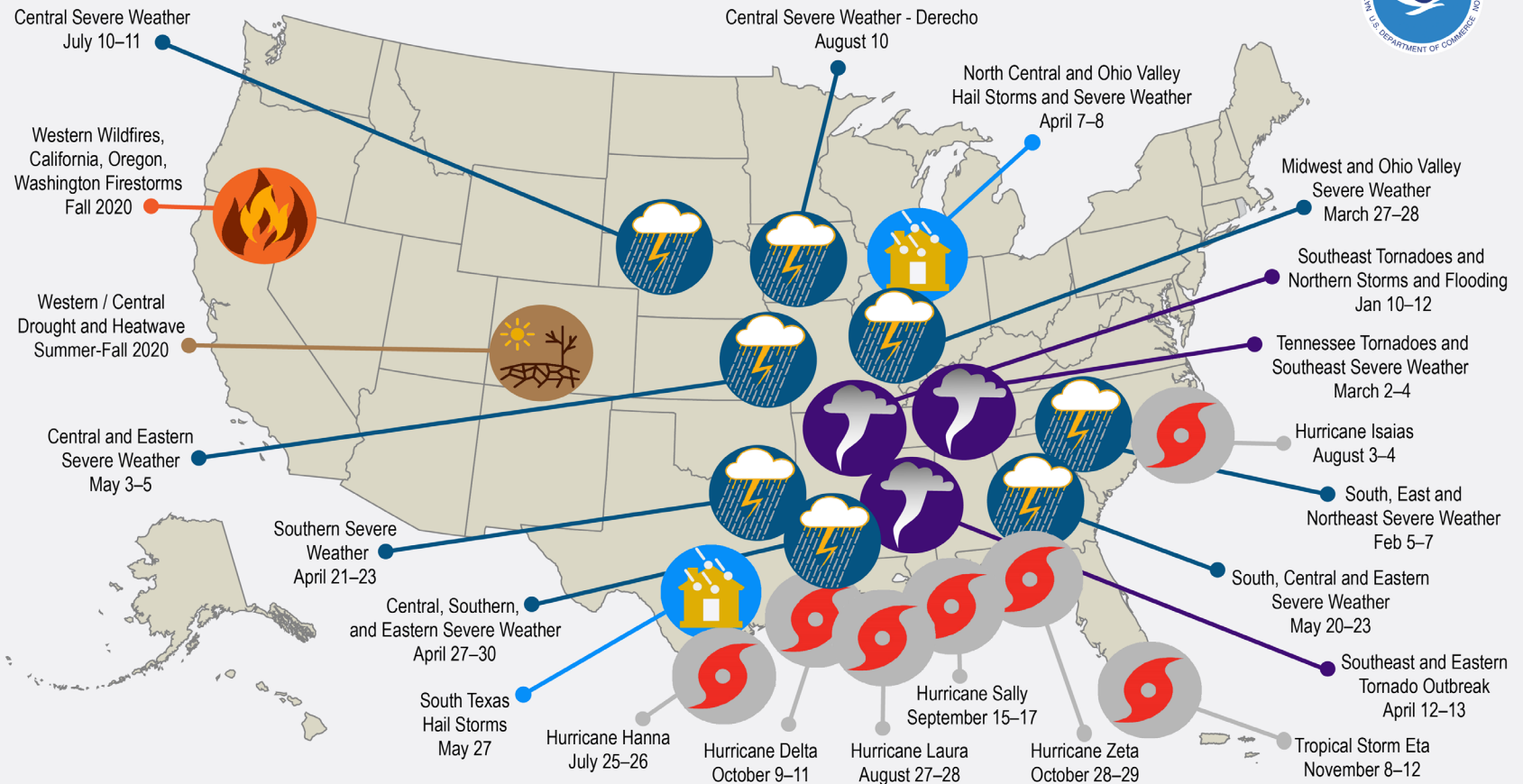
INCREASING TOTAL PRECIPITATION

Climate change is likely increasing overall precipitation in the Midwest and Northeast, as well as storm precipitation in the Gulf of Mexico states

CHANGING SNOW PATTERNS

Long-term climate warming is causing shifts toward less snow, more rain, and earlier snowmelt, increasing early-season runoff and flood risk

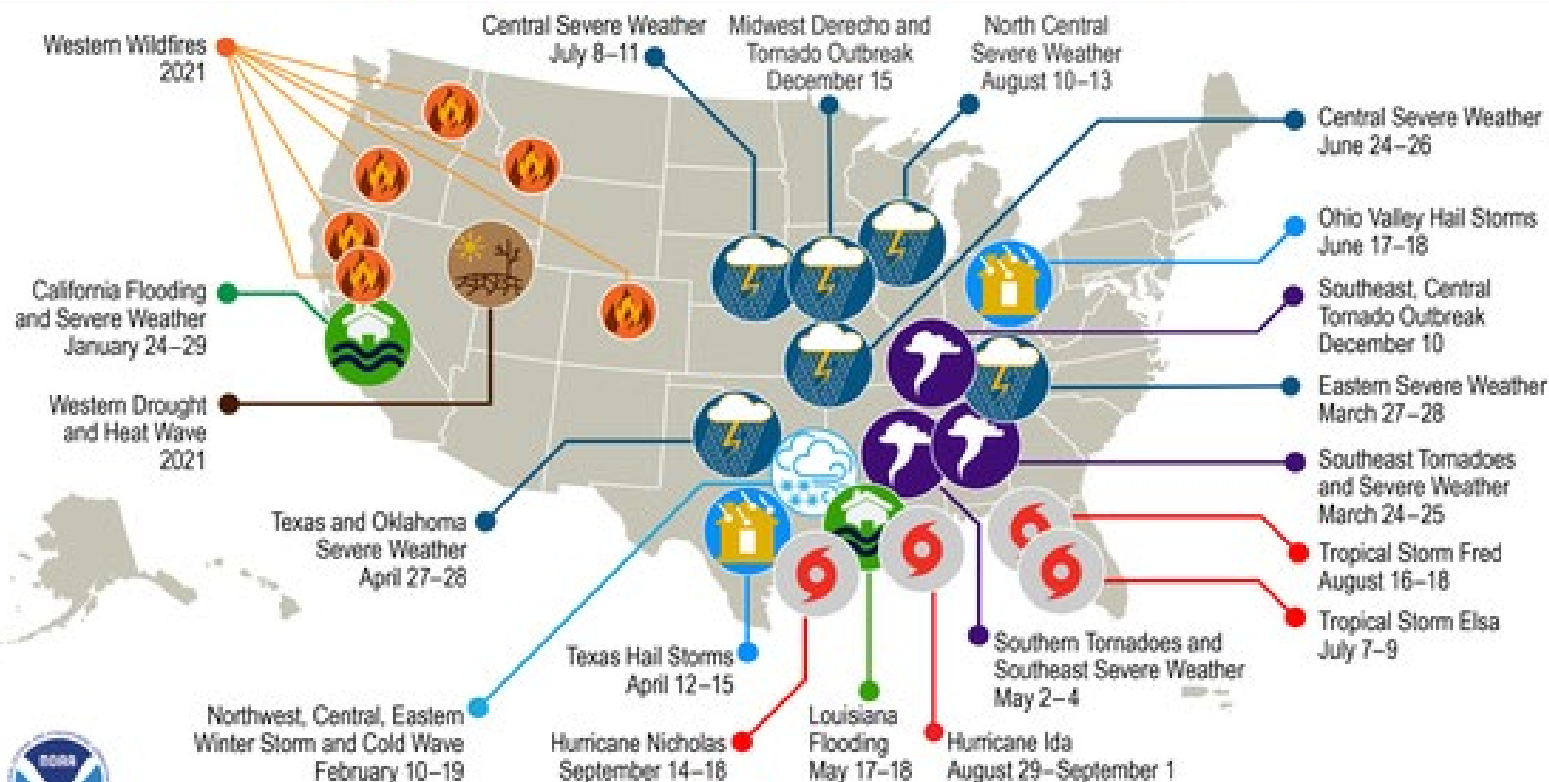
U.S. 2020 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 22 separate billion-dollar weather and climate disasters that impacted the United States during 2020.









U.S. 2021 Billion-Dollar Weather and Climate Disasters

 Drought/Heat Wave
  Flooding
  Hail
  Hurricane
  Tornado Outbreak
  Severe Weather
  Wildfire
  Winter Storm/Cold Wave



This map denotes the approximate location for each of the 20 separate billion-dollar weather and climate disasters that impacted the United States in 2021

U.S. 2022 Billion-Dollar Weather and Climate Disasters

 Drought/Heat Wave
  Flooding
  Hail
  Hurricane
  Severe Weather
  Tornado Outbreak
  Wildfire
  Winter Storm/Cold Wave



This map denotes the approximate location for each of the 15 separate billion-dollar weather and climate disasters that impacted the United States January – September of 2022.

Health impacts of severe weather events

Acute:

- Injuries and fatalities

Intermediate:

- Interrupted medical care
- Infectious diseases
- Respiratory disease (wet, moldy buildings)

Long-term

- Homelessness
- Displacement
- Mental health consequences

H. Frumkin, University of Washington

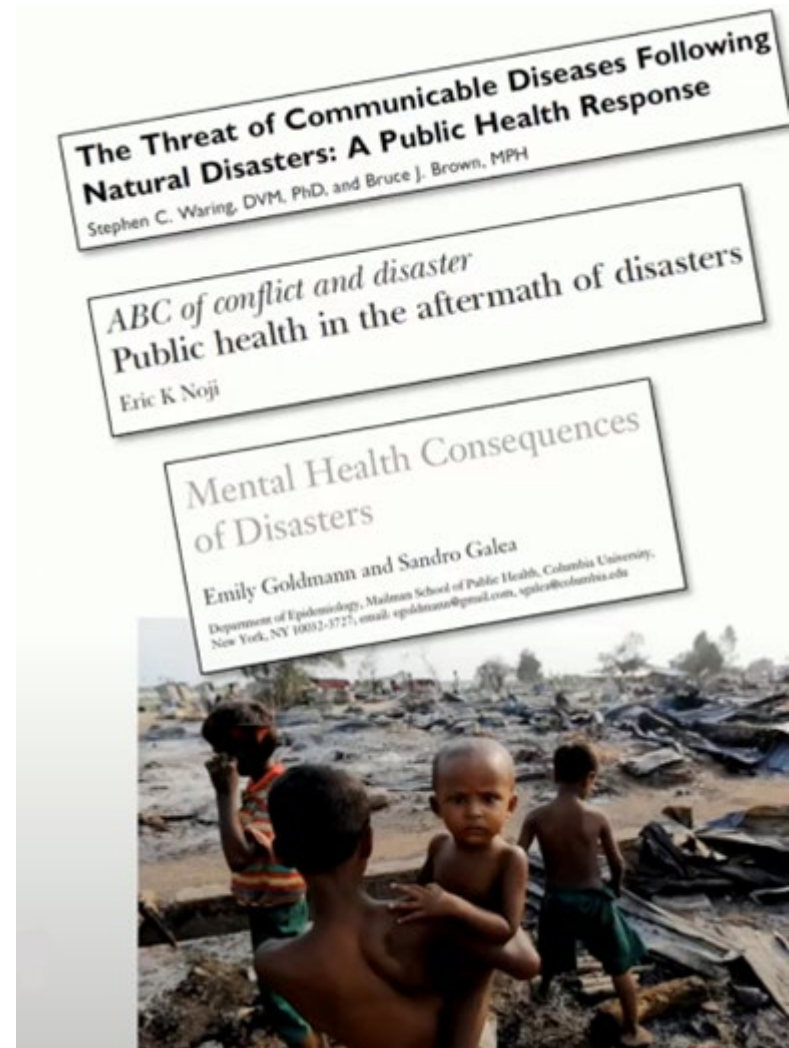
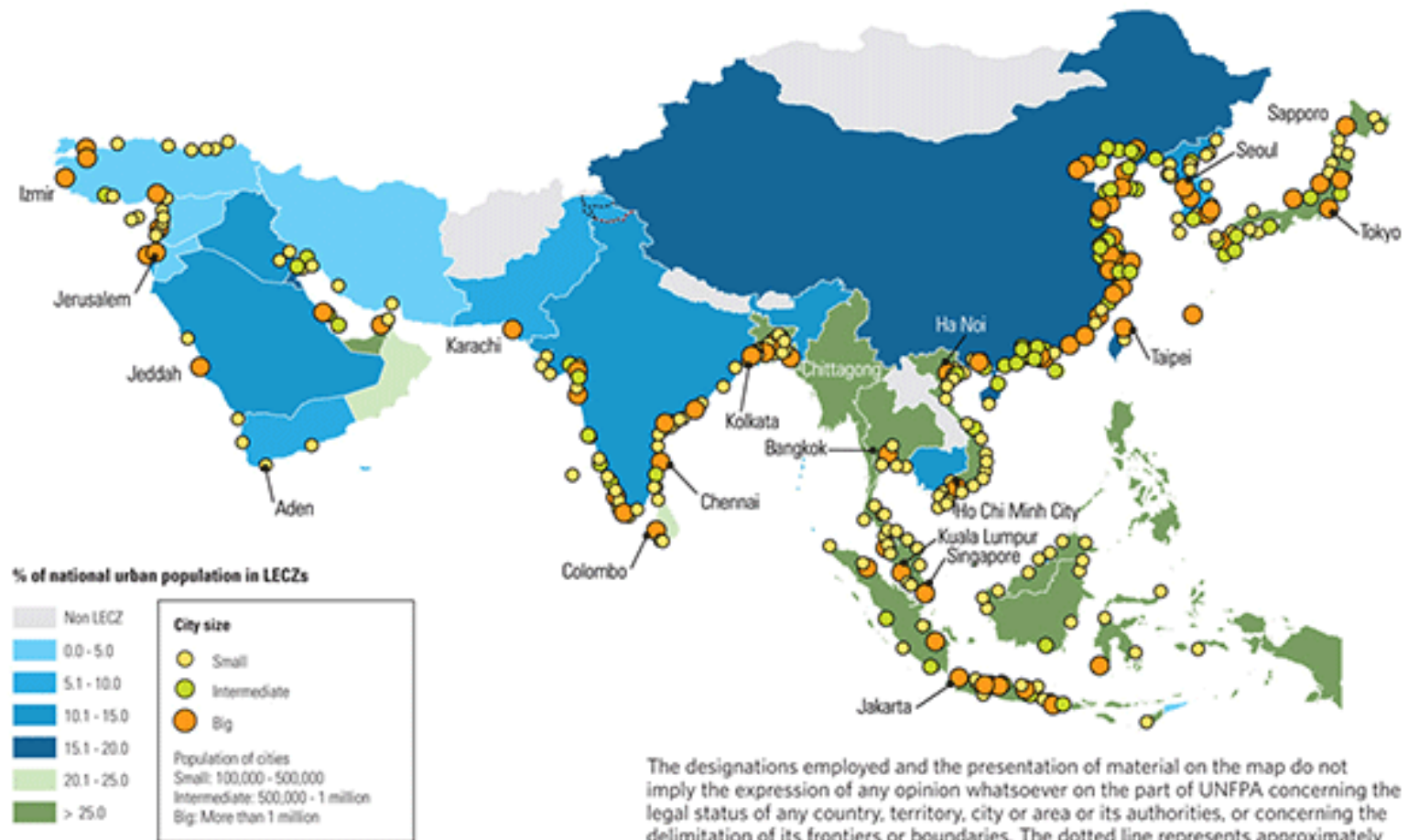


Figure 4.3: Cities at low-elevation coastal zones (LECZs)



Source: UN Habitat.

The designations employed and the presentation of material on the map do not imply the expression of any opinion whatsoever on the part of UNFPA concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

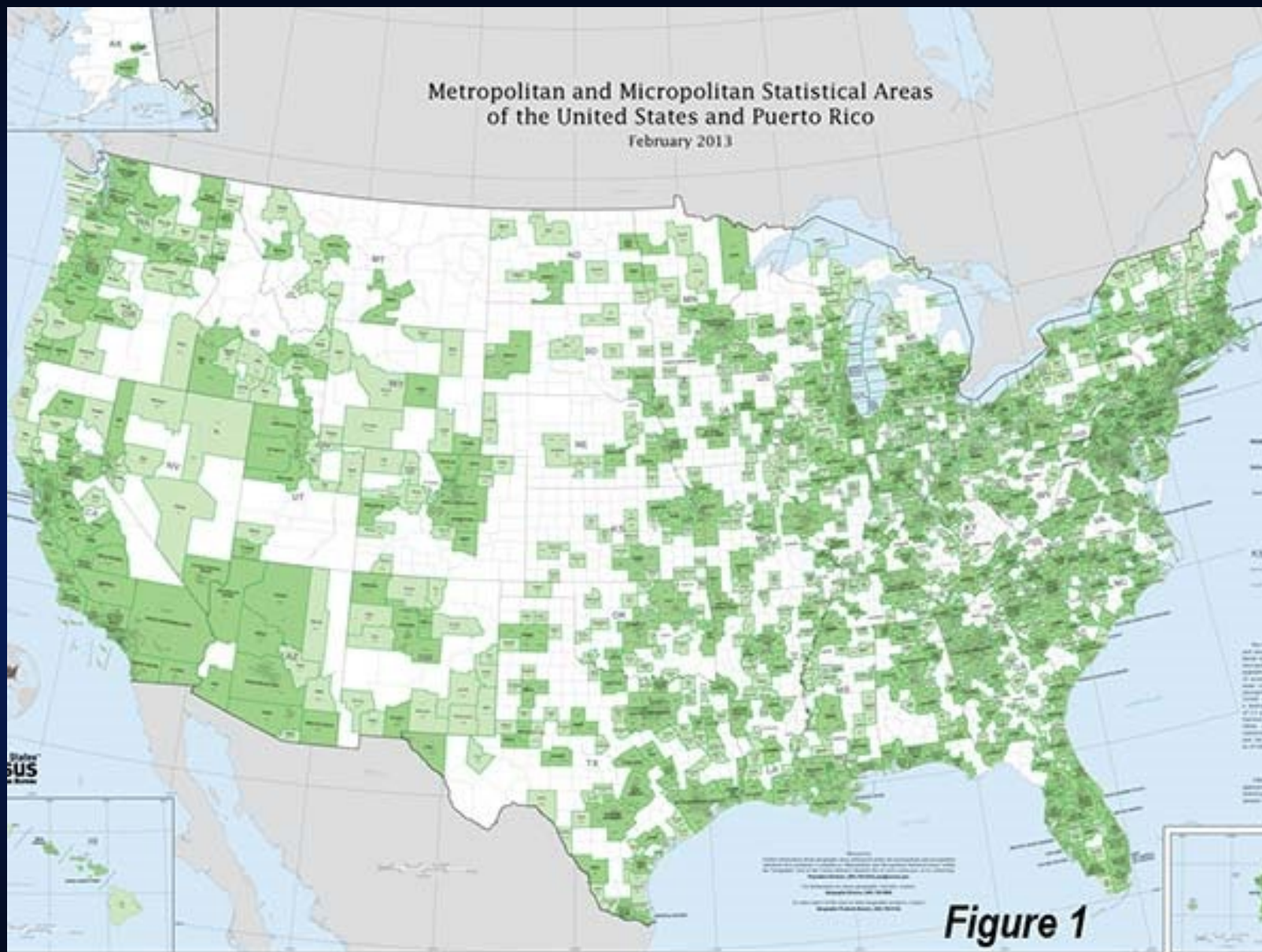
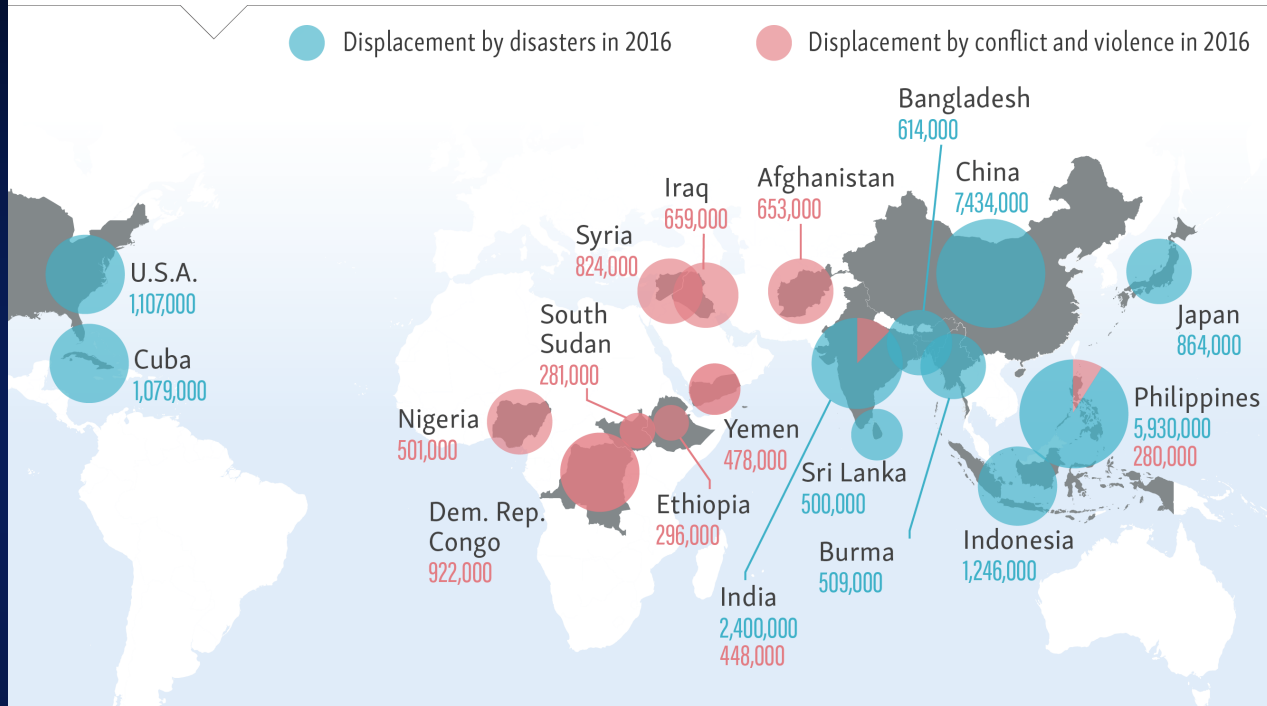


Figure 1

INTERNAL DISPLACEMENT WORLDWIDE

In 2016, more than 31 million people were displaced within their own countries due to conflicts or natural disasters. Which countries were affected the most?



2016 KEY FACTS



Three times more people were displaced by disasters than conflicts



Internally displaced people outnumbered refugees by two to one



One person was forced to flee their home every second in 2016

TOP CAUSES OF DISPLACEMENT

Philippines



Typhoons (Nock-Ten and Haima)

China



Yangtze River floods

India



Bihar floods

Cuba



Hurricane Matthew

Indonesia



Peak rainy season

Source: Global Report on Internal Displacement by the International Displacement Monitoring Center and the Norwegian Refugee Council, 2017

Displacement related to disasters worldwide in 2014

- Top 20 events with high absolute and per capita displacement
- Top 10 countries with high absolute and per capita displacement

