What the Latest Physical Science of Climate Change Means for Cities and Urban Areas (VI)

SUMMARY FOR URBAN POLICYMAKERS

ABOUT SUP AR6 SUMMARY SERIES

The Summary for Urban Policymakers (SUP) convenes IPCC report authors (in their individual capacities) with local government officials, national governments and business communities to present findings from the IPCC climate reports in accessible and targeted summaries that can help inform and catalyze urgent action at the city and regional scales.

Volume I, *What the Latest Physical Science of Climate Change Means for Cities and Urban Areas*, identified the ways in which human-induced climate change is affecting every region of the world, and the cities and urban areas therein.

KEY MESSAGES

- The climate change crisis is here. Human-induced climate change is increasingly affecting every region and system of the world, including through more intense weather and climate extremes.
- Every region will experience concurrent and multiple changes in climatic impact drivers at higher levels of global warming. In many places, these climatic impact drivers are arriving simultaneously, as compound events, and overlapping with slow-onset drivers.
- The science makes it strikingly clear that cities and urban areas are both sources of climate forcers and important sites for innovation and implementation of adaptation, mitigation, and sustainable development.
- With emissions implied by current policies, global warming would exceed 2°C by around 2050. Even with strong reductions of greenhouse gas emissions, the increase of cumulative CO_2 emissions will result in global warming exceeding 1.5°C in the next 20 years.
- Observed warming is larger over land than the ocean, and therefore some large cities in West and South Asia and smaller cities in the Arctic have already exceeded 2°C (for 1.1°C of global warming).
- Heavy rainfall events are more intense and more frequent in a warming world, and runoff is amplified by urbanisation. Heavy rain events can flood buildings, roadways, subway tunnels and farmlands. Heavy precipitation may overwhelm city transportation and storm water drainage systems, which are typically designed using specific event intensity, duration and frequency that can be exceeded by many climate-induced extreme events.
- With sea level rise, and a larger proportion of the most intense tropical cyclones, cyclones and severe coastal storms will expose cities to compound wind, water, and coastal hazards with the potential for widespread human mortality and damage to housing, transportation and energy infrastructure.
- When combined in close succession, or concurrently in different regions, non-extreme events can lead to extreme impacts that far exceed the impact of individual events in cities.
- The combination of future urbanisation and increasingly frequent extreme climate events, such as heatwaves, with more hot days and warm nights, will have significant implications for heat stress in cities. In the future, urbanisation will intensify urban heat island effects regardless of changes in the background climate.
- The global community has a map of the solution space on climate change and sustainable development, with cities playing a central role in how we adapt and mitigate.
- Future changes to our climate and how they affect us depend on the choices we make in our cities and urban areas today. Our climate is our future.

Please find Volume I and Volume II fact sheets at:

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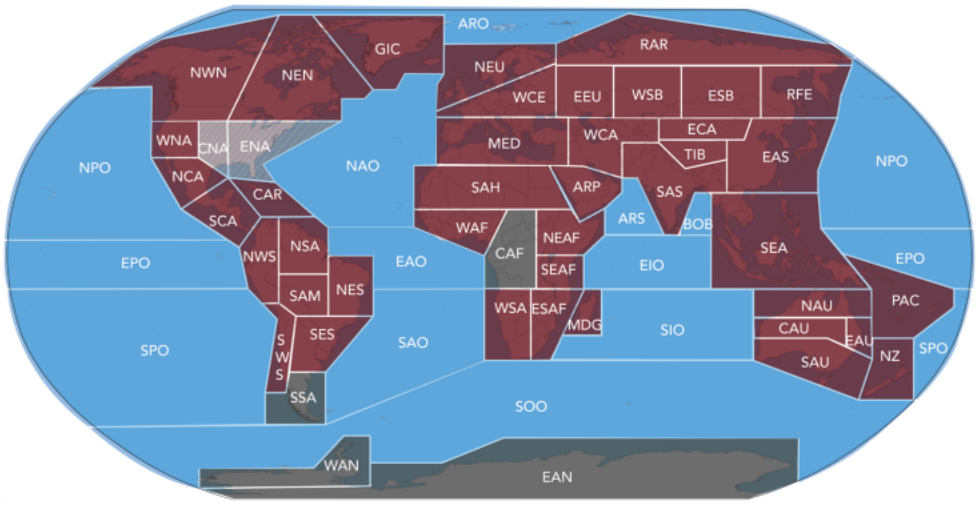
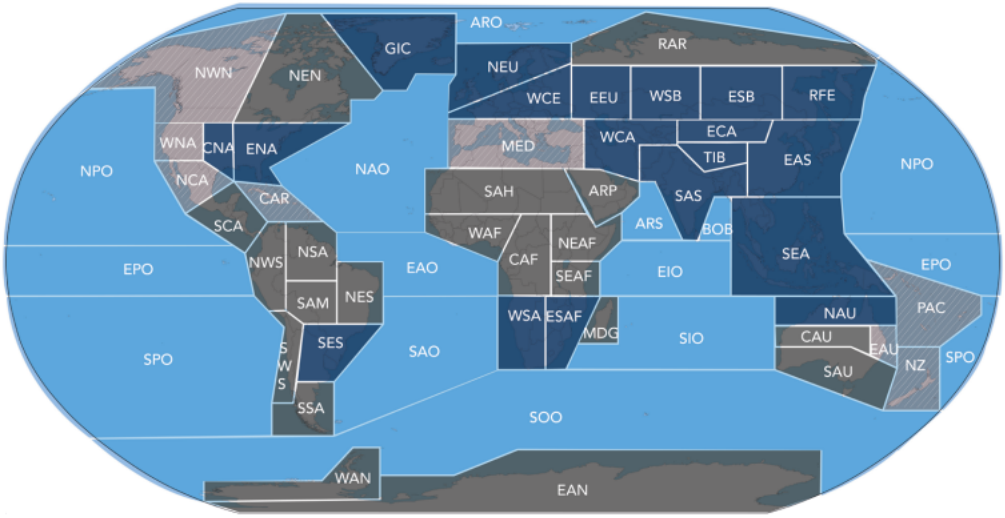
RESILIENCE FIRST
RESILIENCE RISING

Figure 1: Climate change is already affecting every inhabited region across the globe. Human influence contributes to many observed changes (since the 1950s) in weather and climate extremes.



Increase | Low agreement in type of change for the region as a whole | Limited data/or literature

(a) Observed change in **hot extremes**



Increase | Low agreement in type of change for the region as a whole | Limited data/or literature

(b) Observed change in **heavy precipitation**

Source: Derived from IPCC AR6 WGI Summary for Policymakers Figure SPM.3

IPCC AR6 WGI reference regions:

NORTH AMERICA:
NWN - North-Western North America
NEN - North-Eastern North America
WNA - Western North America
CNA - Central North America
ENA - Eastern North America

CENTRAL AMERICA
NCA - Northern Central America
SCA - Southern Central America
CAR - Caribbean

SOUTH AMERICA
NWS - North Western South America
NSA - Northern South America
NES - North-Eastern South America
SAM - South American Monsoon
SWS - South-Western South America
SES - South-Eastern South America
SSA - Southern South America

EUROPE
GIC - Greenland/Iceland
NEW - Northern Europe
WCE - Western and Central Europe
EEU - Eastern Europe
MED - Mediterranean

AFRICA
MED - Mediterranean
SAH - Sahara
WAF - Western Africa
CAF - Central Africa
NEAF - North Eastern Africa
SEAF - South Eastern Africa
WEAF - South Western Africa
ESAF - East Southern Africa
MDG - Madagascar

ASIA
WSB - Western Siberia
ESB - East Siberia
RFE - Russian Far East
WCA - West Central Asia
ECA - East Central Asia
TIB - Tibetan Plateau
EAS - East Asia
ARP - Arabian Peninsula
SAS - South Asia
SEA - South East Asia

AUSTRALASIA
NAU - Northern Australia
CAU - Central Australia
EAU - Eastern Australia
SAU - Southern Australia
NZ - New Zealand

SMALL ISLANDS
PAC - Pacific Small Islands
CAR - Caribbean

OCEANS
ARO - Arctic Ocean
NPO - North Pacific Ocean
EPO - Equatorial Pacific Ocean
SPO - South Pacific Ocean
NAO - North Atlantic Ocean
EAO - Equatorial Atlantic Ocean
SAO - South Atlantic Ocean
ARS - Arabian Sea
BOB - Bay of Bengal
EIO - Equatorial Indian-Ocean
SIO - South Indian-Ocean
SOO - Southern Ocean

POLES
RAR - Russian Arctic
WAN - West Antarctica
EAN - East Antarctica