Shades of climate risk

Categorizing climate risk for investors

Physical risks in North-America

°CICERO Climate Finance

Top risks [1,2]		Key message	Observed Impacts	Projected Impacts towards 2050 (for a range of scenarios between 2°C and Business-as-Usual)[3]	Examples of Impacted Sectors	Shade of Risk
Extreme weather events 	Cyclones (tropical hurricanes)	High risk in case of combined hurricane and flooding	Atlantic tropical hurricanes have become stronger but likely not more frequent[4]	Across all scenarios: Coastal flooding. More damaging with increasing sea level. [5] Damage caused by wind. Atlantic tropical hurricanes likely to become stronger[6]	Infrastructure in coastal areas, Industry (supply chain)	Coastal regions (combined hurricane and flooding)
Flooding[7] 		Increases in urban drainage flooding.	Spatially varying trends, but in many regions very likely increase (medium to high confidence)	Across all scenarios: Increase in maximum day precipitation, especially in the north (medium to high confidence). Inconsistent signal in the southern parts and for some heavy precipitation metrics (low confidence)	Transportation infrastructure, industry (supply chain)	Urban areas
Drought 		Drought likely to increase in Southwest. Decline in stored water reserves from less water from melting snowpack in Western USA and Canada.	Inconsistent trends, both likely increase and decrease in dryness (low to high confidence). More frequent low-snow years.	Across all scenarios: Inconsistent signal, but increased dryness in the southern part (low to medium confidence). Increased water stress in southwest and southeast.	Agriculture	Southwest and southeast Rest of North America

Sea level rise 	Increased inundation of flooding, erosion, and salinity levels along coast. Risks increase in combination with hurricanes.	Current global observed change 3.2 mm/year	+22 cm (16 to 32 cm) sea level rise globally in 2050 compared to 1986-2005 almost regardless of emission scenario (medium confidence). Northern Atlantic ocean to raise up to 30% more.	Transportation, infrastructure (ports) and energy (nuclear, oil) in coastal areas	low-lying areas
Heat stress[8] 	Likely more frequent, longer, and more intense heat waves. Some regions have seen increases in hot days already, e.g. West North America	Spatially varying trends, but increase in warm spell duration seen for some regions (low to medium confidence). Some area have likely to very likely seen increases in hot days (high confidence), West North America is the region where changes are best observed. Spatially varying trends in other (medium confidence)	Across all scenarios: Likely more frequent, longer, and more intense heat waves (high confidence). Very likely increase in hot days (high confidence)	Agriculture, health and labour productivity[9]	

Legend:

Immediate attention required: impacts are already observed with a significant probability to increase

Some attention is required: impacts are expected in the next few years

Caution: impacts could manifest towards mid-century

[1] Romero-Lankao, P., et al. (2014). North America. In V. R. Barros, et al. (Eds.), Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 1439-1498). Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
[2] Hewitson, B. C., et al. (2014). Regional context. In V. R. Barros, et al. (Eds.), Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 1133-1197). Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
[3] Based primarily on RCP2.6 and RCP8.5. If 2050 impacts were not available (based on 2046-2065), based on interpretation of 2071-2100 model results
[4] Elsner et al. (2008). The increasing intensity of the strongest tropical cyclones.
[5] Woodruff et al. (2013). Coastal flooding by tropical cyclones and sea-level rise. Nature, 504, 44-52 (05 December 2013), doi:10.1038/nature12855
[6] Knutson et al. (2015). Global Projections of Intense Tropical Cyclone Activity for the Late Twenty-First Century from Dynamical Downscaling of CMIP5/RCP4.5 Scenarios
[7] Extreme precipitation definition used is frequency of 'very wet days,' defined here as the 90th percentile of daily precipitation on wet days
[8] Extreme heat events definition used is frequency of 'warm days,' defined here as the 90th percentile daily maximum temperature
[9] Climate change and labour: impacts of heat in the workplace. UNDP (2016)