Extreme Weather & Climate Change

An Infographic from the Union of Concerned Scientists

Methodology and Assumptions

The Extreme Weather & Climate Change infographic is based on careful evaluation of the *Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (SREX), the latest authoritative assessment (2012) by the Intergovernmental Panel on Climate Change (IPCC).

The SREX report uses different ways of conveying scientific evidence, agreement and confidence regarding different weather phenomena, including how those phenomena have been changing over the past 50 years. It also examines the degree to which human-caused climate change has played a role in driving those changes.

The report uses traditional likelihood terms defined by the IPCC such as "likely" (66 to 100 percent probability) or "very likely" (90 to 100 percent probability) to describe these relationships as well as expressions of scientists' overall confidence in their findings, which ranged from low to medium to high.

The infographic depicts six phenomena which generate strong public interest or have strong scientific evidence connecting them to climate change. For example, we chose to depict the overall effect of climate change on tropical cyclones (we call them hurricanes to use a term most audiences are more familiar with) rather than provide separate assessments for tropical cyclone wind speed or tropical cyclone frequency in different ocean basins.

Here are the terms used in the SREX report for the following extremes:

Extreme	Observed Changes since (1950)	Attribution of Observed Changes to Human-Caused Climate Change
Heat	very likely	likely
Coastal High Water	likely	likely
Precipitation, Some Regions	likely	medium confidence
Droughts, Some Regions	medium confidence	medium confidence
Tropical Cyclone Wind Speed	likely	low confidence
Tropical Cyclone Overall	low confidence	low confidence
Tornadoes	low confidence	Not Given

In order to make the size of the circles in the infographic relate to the list of combined terms we created a "score" based on the lower range of IPCC likelihood findings. **Likely** connections were given a score of 66 and **very likely** connections a score of 90. The report does not give any such guidance for the confidence terms, so we created another scoring system also based on a 100-

point scale. We assigned **medium confidence** a score of 50 out of 100 and **low confidence** a score of 10. If there was no term assessed (such as with tornadoes attribution) that was assigned a score of zero. Hence tornadoes have the smallest size circle on the infographic while heat waves have the largest.

Here is the combined score for each extreme:

Extreme	Observed Changes Score	Attribution Score	Total Score (Infographic Circle Size)
Heat	90	66	156
Coastal High Water	66	66	132
Precipitation, Some Regions	66	50	116
Droughts, Some Regions	50	50	100
Tropical Cyclone Wind Speed	66	10	76
Tropical Cyclone Overall	10	10	20
Tornadoes	10	0	10

Note that this is the evidence to date regarding extreme events since 1950. In many cases scientists' ability to draw firm conclusions is hampered by changes in historical data-gathering techniques and other factors. For future projections of heat waves, coastal high water, drought and other phenomena, the SREX report typically uses much higher confidence language, in large part because scientists are very confident that temperatures are continuing to increase and the underlying physics point to growing incidences of weather extremes under climate change.