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Background Report: Weather Extremes Explained

Extreme weather events are defined as infrequent, above average in severity and duration, and resulting in severe impacts.

Quantitatively evaluated based on:

- Probability of occurrence (or return frequency)
- Absolute threshold
- Event duration
- Spatial area affected

With the rise in anthropogenic activity, heat waves, heavy precipitation, and other extreme events are projected to increase in frequency and severity in the future, impacting various communities and ecosystems across the globe. The prediction of such events, however, is extremely challenging and based on several factors, including both **natural climate variability** and **human-induced climate change**. Uncertainty in projections of extreme weather events remains prevalent within the climate science community and varies based on type of weather extreme.

Type of Weather Extreme	Confidence in Role of Human-Induced Climate Change & Future Projections
Tornadoes	Low Confidence <ul style="list-style-type: none">- Difficulty in identifying long-term trends due to poor documentation prior to 1950- Too geographically small to be well simulated by climate models
Hurricanes	Medium Confidence <ul style="list-style-type: none">- Hurricane activity has increased since the early 1980s- Rising ocean surface temperatures and sea levels are expected to intensify hurricanes- Connection to event frequency remains uncertain- Climate models project changes in hurricane tracks
Floods	Low Confidence in national projections High Confidence in regional trends <ul style="list-style-type: none">- Heavy rainfall and changes in snowmelt timing are likely to cause more intense and more frequent floods in certain regions- Land use could also be a factor
Extreme Precipitation	High Confidence <ul style="list-style-type: none">- Extreme precipitation events have increased since the 1950s- Higher temperatures cause more evaporation of water into the air, leading to more intense and more frequent precipitation- Natural variability and weather cycles such as El Niño could also have an effect

Works Cited

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U.S. Global Change Research Program. *Climate Change Impacts in the United States: U.S. National Climate Assessment*. Washington, DC: U.S. Global Change Research Program, 2014. Web.