Draft Learning Progression (LP) for Extreme Weather (EW)
MADE CLEAR UM Learning Sciences Research Group
www.ClimateEdResearch.org
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	Level 1 (Lower Anchor) "Informal Accounts"	**Level 2** "Causal Sequences with Hidden Mechanisms"	**Level 3** "School Science Narratives"	**Level 4** (Upper Anchor) "Qualitative Model-Based Accounts"
Potential EW LP indicator based on NGSS Draft "HC" stands for human contribution	HC1: Students are not able to obtain, evaluate, and communicate information that human activities can contribute to the frequency and intensity of some natural hazards.	HC2: Students are able to obtain, evaluate, and communicate information that human activities can contribute to the frequency and intensity of some natural hazards.	HC3: Students are able to analyze data to evaluate claims that human activities can contribute to the frequency and intensity of some natural hazards.	HC4: Students are able to construct and evaluate scientific claims based on evidence that human activities can contribute to the frequency and intensity of some natural hazards.
Potential EW LP indicator based on NGSS Draft "MCS" stands for modifying climate systems	MCS1: Students are not able to use data to identify solutions that may reduce the environmental or societal impacts of a weather-related hazard.	MCS2: Students are able to use data to identify solutions that may reduce the environmental or societal impacts of a weather-related hazard.	MCS3: Students are able to apply scientific knowledge to construct explanations for how humans may predict and modify their impacts on future global climate systems.	MCS4: Students are able to apply scientific reasoning, theory, and models to construct explanations for how humans may predict and modify their impacts on future global climate systems.
Potential EW LP indicator about links between climate change and extreme weather	CCEW 1: Students are not aware that a changing climate leads to changes in extreme	CCEW 2: Students are aware that a changing climate leads to changes in extreme weather and	CCEW 3: Students understand that a changing climate leads to changes in extreme	CCEW 4: Students understand that a changing climate leads to changes in the frequency,

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phenomena based on IPCC Report "CCEW" stands for climate change and extreme weather	weather and climate events.	climate events, though students are not able to consider factors such as frequency, intensity, spatial extent, duration, and timing.	weather and climate events, though students do not consistently consider factors such as frequency, intensity, spatial extent, duration, and timing.	intensity, spatial extent, duration, and timing of extreme weather and climate events, and can result in unprecedented extreme weather and climate events.

References:
Jin, H. & Anderson, C. W. (2012). A learning progression for energy in socio-ecological systems. *Journal of Research in Science Teaching*, *49*(9), 1149-1180.
IPCC Report: http://www.ipcc-wg2.gov/SREX/images/uploads/SREX-SPMbrochure_FINAL.pdf
Next Generation Science Education Standards Draft

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