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Curriculum Units by Fellows of the National Initiative

2022 Volume V: Floods and Fires, How a Changing Climate Is Impacting the U.S.

Energy Dynamics of Tropical Cyclones: The impacts of climate change

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by Zachary Meyers

Humanity faces an unprecedented global climate crisis within the next turn of the century. The potential economic and humanitarian consequences threaten our global infrastructure and our children's future, with the most adverse consequences affecting vulnerable populations. Today the District of Columbia experiences frequent flooding events from severe weather. Atlantic tropical cyclones like hurricane Sandy are threatening the east coast as sea surface temperatures continue to warm. It is imperative that students are educated on the complex dynamics of climate shift and the potential socioeconomic outfalls that could arise. In this two-to-three-week unit students will investigate the thermodynamic principles involved in tropical cyclones within the Atlantic Basin as well as analyze correlations associated with tropical cyclone frequency and intensity with sea surface temperatures. Understanding the mechanism associated with heat-exchange coupled with weather development may allow them to grasp additional nuances associated with climate change which will better prepare them for a tumultuous future.

(Developed for Physics, grade 11; recommended for Physics, grade 11)

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