

Is the weather getting weirder? A physical and statistical study of trends in weather variability

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As the Earth continues to warm overall, changes in the Earth's climate have been observed and include extreme weather events such as heat waves and heavy precipitation events. How extreme are these events and are they occurring more frequently today than in the past? This research will examine the annual cycle of temperature and precipitation and their associated extremes in the greater New York City area. The specific tasks of the project will include calculating the climatological average of temperature and precipitation as well as the daily and weekly temperature fluctuations. Additionally, significant swings in temperature will be compared to precipitation events. Weather station data will be used to calculate daily and weekly variations in temperature and precipitation. This research will involve writing computer code using MATLAB to do time series analyses. The students can expect to learn some programming techniques, but a focus will be placed on understanding statistics and atmospheric physics.