Programming an Analysis of the Effects of the El Niño-Southern Oscillation Cycle on the Development of Hurricanes and Their Translation Speed

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This study investigates the relationship between the El Niño-Southern Oscillation Cycle (ENSO) and the number and strength of hurricanes in any recent year, as well as their translation (movement) speed. The ENSO cycle is a repeating cycle of an alternating weather pattern, focused over the Pacific Ocean. Most especially, the sea-surface temperature rises, which could be devastating if the rise in temperature creates more hurricanes. Records of the increased sea-surface temperatures were accessed, and the data was analyzed. The same was done, but with hurricane frequency, and major hurricane frequency. Once completed, programming resulted in plots of the data for visual comparison. Additionally, a correlation was calculated between the hurricane frequency data and the ENSO data, as well as between the major hurricane frequency and ENSO data. The values for the hurricane frequency correlation, split into four groups of three months each and labeled as “seasons” in order, are as follows: 0.0453, -0.2117, -0.3796, and -0.4146. In addition, the values for the major hurricane frequency are 0.0003, -0.2242, -0.3068, and -0.3565. Furthermore, a program was completed that could calculate the duration and average movement speed of a hurricane by using the haversine formula, with the line of best-fit equation representing the trend as Speed = -0.03275t + 81.78, with t as the year. This slope is negative, indicating a slowdown of hurricane translation speed. Finally, this set of translation speed data was also correlated with the ENSO data for an r-value of -0.0168.

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