Name(s)

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Project Number

J0804

Project Title

The Golden Spiral in Hurricanes: Does It Predict Severity?

Abstract

Objectives/Goals
I wondered if the Golden/Fibonacci Spiral, which is present in many parts of nature, was present in hurricanes and, if so, would it predict the severity of a hurricane. My hypothesis was if a Golden/Fibonacci Spiral is present in a hurricane the hurricane will be more severe compared to a hurricane with a tighter or looser spiral.

Methods/Materials
I researched hurricanes, including a personal expert interview. Then I collected data about hurricanes from 2002 to 2012, all in September, the most popular hurricane month. I used satellite images of each hurricane and with geometric measurements I calculated how much tighter or looser the spiral in the hurricane was compared to the Golden/Fibonacci Spiral. After this, I evaluated whether there was a correlation between my data points of each hurricane the percent variance from a Golden/Fibonacci Spiral.

Results
I determined there is no correlation (0.06171) between amount of rainfall and a hurricane#s likeness to a Golden/Fibonacci Spiral, a slightly higher, but not significant correlation (0.328564) between # of days as a hurricane and a hurricane#s variation to a Golden Spiral. The speed of wind (0.513176) and barometric pressure (-0.47057) were the most correlated to a hurricane#s likeness to a Golden/Fibonacci Spiral, although still not a high correlation. I confirmed that the variance from the Golden Spiral became greater as the distance of the spiral from the eye of the hurricane became greater.

Conclusions/Discussion
The data did not support my hypothesis that the presence of the Golden/Fibonacci Spiral would predict a more severe hurricane than a hurricane with a tighter or looser spiral. The data shows the more severe a hurricane is, defined as greater wind speed and lower barometric pressure, the less like a Golden Spiral it is. The visual process with which I defined the spirals created some bias within my results. If I did this project again, I would broaden my data to evaluate more hurricanes, keep the time of the satellite image constant, and investigate use of computer imaging to define the spirals.

Summary Statement

There is not a strong correlation between the presence of the Golden Spiral and the severity of hurricanes.

Help Received

Parents helped edit report. Science teacher introduced to experts, and advised in background research.