The Impact of Hurricanes on Education

Christopher D'Ambrosio
The Episcopal Academy
Newtown Square, PA

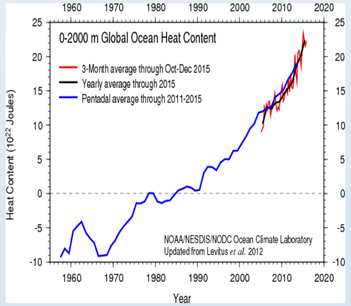
Abstract

The U.S. has been impacted by 188 weather and climate disasters since 1980, with a total economic cost exceeding $1 trillion. These catastrophic events cause long-term damage to communities, including schools. In New Orleans, for example, 110 of 120 public schools were totally destroyed by Hurricane Katrina in 2005. The costs go beyond physical damage to the educational infrastructure; severe storms also cause lost learning time, which is difficult to recover, particularly for the most disadvantaged learners. The more informed schools are about the risks of natural disasters, the better prepared they can be. This will reduce the risk of costly damages and lost learning time.

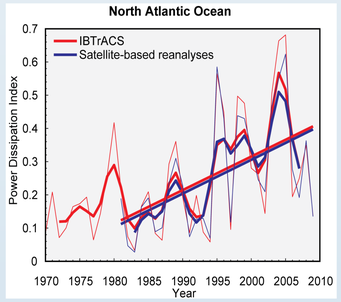
Background

Hurricanes, defined by a wind force >12 on the Beaufort scale (64 knots or 74 mph), threaten the Philadelphia area with some frequency – 24 times since 1866. Current research data shows that hurricane strength increases with climate change & rising temperatures:

Hurricane Strength Increases With Climate Change & Rising Temperatures



National Oceanic and Atmospheric Agency, Ocean Climate Lab, 2012

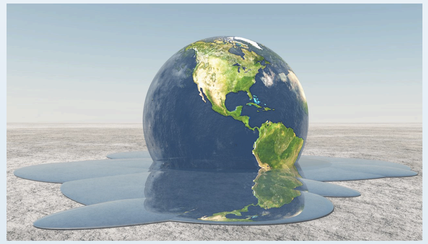


National Climate Assessment and Development Advisory Committee, Third National Climate Assessment report, 2014

Methods

The present study offers a Poisson model to predict the probability of a hurricane impacting my school, the Episcopal Academy, based on (a) the historic record of hurricanes in the Philadelphia area, and (b) the exacerbating effects of climate change, which are expected to increase the magnitude of severe weather events. The analysis uses data from the National Hurricane Center, part of NOAA.

SCENARIO 1: Within a 97 kilometer (60 mile) radius of Episcopal Academy (EA), there were *14 hurricanes* in the past 150 years.



SCENARIO 2: Expanding radius to 145 kilometers (90 miles) of EA, there were *24 hurricanes* in the last 150 years.

Results

Using the Poisson model, there is a 37.3% probability of a hurricane impacting a 97km (60 mile) radius of EA in the next 5 years (Scenario 1)

Applying the Poisson model to the larger radius of 145 kms (90 miles), the probability of a hurricane impacting EA over the next 5 years increases to 55% (vs. 37%). (Scenario 2)

HOWEVER----there is evidence that climate change will further intensify the strength and radius of hurricanes in the future. Storms that historically would have narrowly missed EA will have a higher likelihood of impacting EA in the future due to climate change. So Scenario 2 is probably the most likely, given the effects of climate change.

Conclusion

The results suggest that there is a 55% probability that the Episcopal Academy will be impacted by a hurricane in the next five years. This awareness should motivate school leaders to better prepare for a severe weather event, thereby, lowering the risk of physical damage and lost learning time. This methodology could be used to examine other schools in the Philadelphia region and around the country.