The Impact of Air Pollution on Tropical Storm Intensification

Alex Yeoh

Wright State University

Air pollution and the subsequent global warming that comes along with it has been shown to cause surface sea temperatures (SSTs) to rise (Borunda, 2019; Deo, A., Ganer, D., & Nair, G., 2011). The impact of rising SSTs are varied and complex, however, many impacts of rising SSTs have been studied. The impacts vary from the number of tropical storms that form, to the intensity of formed storms and the rainfall that entails, to the harm it causes people.

The number of tropical storms that have formed due to an increase in SSTs has increased. Deo, Ganer, and Nair (2011) compared statistics about tropical storms “from 1977 to 2006” and concluded that “Globally, the number of weak (category 1) storms is seen to be increasing significantly” (p. 783) and “that except [east-north pacific basin] (and to some extent [south-west pacific basin]) cyclone activity is increased in recent years in all ocean basins and also in global ocean.” (p. 776). This conclusion was further supported by Diamond and Schreck (2019) where they state, “During the 2018 season, 27 storms reached major HTC status, which is also above the long-term average of 21 and seven more than the 2017 season” (p. S111) and “the 2018 season had 95 named storms, which is above the 1981–2010 average of 46 ” (p. S111). These researchers showed definitively that the number of storms have increased.

Not only has the number of storms increased, the intensity of storms have also increased. Diamond and Schreck (2019) stated, “95 named tropical cyclones … were observed during the 2018 NH season and the 2017/18 SH season …. this number was well above the 1981–2010 global average of 82 TCs as well as the 85 TCs reported during 2017” (p. S111); they also discussed the fact that the number of category 5 storms (which are the most intense) were greater than number that appeared in the two years prior and “only one less than the record of 12 Category 5 TCs set in 1997” (p. S101). A more specific example of this was shown by Trenberth, Cheng, Jacobs, Zhang and Fasullo (2018), who examined the impact of rising SSTs on the intensifying of hurricane Harvey and determined that global warming caused the hurricane to be more damaging than if there was no global warming. Trenberth et al. (2018) also concluded that the increased SST caused a greater amount of rainfall due to the greater amount of water vapor in the hurricane.

The increasing strength of the tropical storms has a very real impact on the lives of many people. A growing number of people will be impacted by this as Deo et al. (2011) explain, “Vulnerability to tropical cyclones is becoming more pronounced because the fastest population growth is in tropical coastal regions.” However, of all these people who will be impacted by the intensifying of tropical storms, a subset will be hit harder than the rest (Milligan, 2018). As Milligan (2018) explains, the poor will be hit the hardest as “Cheaper houses are also less safe, without the strong foundations or reinforcements that can make the difference between a blown-away home and one with some window damage.” A solution is desperately needed to protect not only the poor, but everyone who lives by the coast.

References

Borunda, A. (2019, August 14). Ocean Temperature Rise. Retrieved February 12, 2020, from

https://www.nationalgeographic.com/environment/oceans/critical-issues-sea-temperature-rise/

Deo, A., Ganer, D., & Nair, G. (2011). Tropical cyclone activity in global warming

scenario. *Natural Hazards*, *59*(2), 771–786. https://doi-org.ezproxy.libraries.wright.edu/10.1007/s11069-011-9794-8

Milligan, S. (2018, September 21). Hurricanes Hit Everyone, But the Poor Have the Hardest

Time Recovering. Retrieved February 12, 2020, from https://www.usnews.com/news/the-report/articles/2018-09-21/hurricanes-hit-everyone-but-the-poor-have-the-hardest-time-recovering

Trenberth, K. E., Cheng, L., Jacobs, P., Zhang, Y., & Fasullo, J. (n.d.). Hurricane Harvey Links

to Ocean Heat Content and Climate Change Adaptation. *EARTHS FUTURE*, *6*(5), 730–744. https://doi-org.ezproxy.libraries.wright.edu/10.1029/2018EF000825

H. J. Diamond and C. J. Schreck, 2019: *Tropical cyclones* [in “State of the Climate in 2018”].

*Bull. Amer. Meteor. Soc*., **100** (9), S111–S113, doi:10.1175/2019BAMSStateoftheClimate.1.

H. J. Diamond and C. J. Schreck, Eds., 2019: The Tropics [in “State of the Climate in 2018”].

*Bull. Amer. Meteor. Soc*., **100** (9), S101–S103, doi:10.1175/2019BAMSStateoftheClimate.1.