



Climate mechanism for stronger typhoons in a warmer world

Nam-Young Kang (1), James B. Elsner (2), and Dong-hyun Shin (1)

(1) National Typhoon Center/KMA, Jeju, S.Korea (nkang.fsu@gmail.com), (2) Geography dept./FSU, Tallahassee, FL, USA (jelsner@fsu.edu)

Violent typhoons continue to have catastrophic impacts on economies and welfare but how they are responding to global warming has yet to be fully understood. Here we use an empirical framework to explain physically why observations support a tight connection between increasing ocean warmth and the increasing intensity of super typhoons in the western North Pacific. We show that the energy needed for deep convection is on the rise with greater heat and moisture in the lower tropical troposphere but that this energy remains untapped when air pressure is high. Accordingly, tropical cyclone formation is becoming less common but those that do form are likely to reach extreme intensities from the discharge of stored energy. These thermodynamic changes to the environment most significantly influence the upper portion of extreme typhoon intensities indicating that super typhoons are likely to be stronger at the expense of overall tropical cyclone occurrences in the western North Pacific.