

Potential changes of typhoon movement near Taiwan under a global warming climate

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The potential change of intensity, occurrence probability and tracks for the Typhoons is one of the important scientific issues under global warming. Because Taiwan is a mountainous island oriented nearly north-south, typhoon's motion near Taiwan is affected by topographically phase-locked convection. This effect can cause the duration time to change and increase the accumulated rainfall in Taiwan. Due to the interaction between typhoons and topography, simulations from General circulation models (GCMs) fail to account for this phenomenon as expected because of lower resolution. To study future changes in TC motion, the tracks were simulated by the National Science and Technology Center for Disaster Reduction (NCDR), which are conducted dynamical downscaling experiments with 5km WRF models from Hiram models. Compare the vary of typhoons under climate change, besides changing for intensity, the moving of typhoons is sped up caused the landing duration time is decreased. Furthermore, The deflection of tracks near the terrain has played a crucial role in the accumulated precipitation. the simulations reveal that future TCs have less deflection angle and duration time decreased. To discuss the mechanism for vary of TCs moving, we use the PV tendency to realize the contribution in horizontal advection (HA), vertical advection (VA), and diabatic heating (DH). the result indicates that the importance of the HA term is significantly reduced under global warming because of the disappear channel effect.

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