Geophysical Research Abstracts
Vol. 18, EGU2016-3287, 2016
EGU General Assembly 2016
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Effect of Air-Sea coupling on the Frequency Distribution of Intense Tropical Cyclones over the Northwestern Pacific

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Effect of air-sea coupling on the frequency distribution of intense tropical cyclones (TCs) over the northwestern Pacific (NWP) region is investigated using an atmosphere and ocean coupled general circulation model (AOGCM). Monthly varying flux adjustment enables AOGCM to simulate both subseasonal air-sea interaction and realistic seasonal to interannual SST variability. The maximum of intense TC distribution around 20-30°N in the AGCM shifts equatorward in the AOGCM due to the air-sea coupling. Hence AOGCM reduces northward intense TC distribution bias seen in AGCM. Over the NWP, AOGCM-simulated SST variability is large around 20-30°N where the warm mixed layer becomes shallower rapidly. Active entrainment from subsurface water over this region causes stronger SST cooling and hence TC intensity decreases. These results suggest that air-sea coupling characterized by subsurface oceanic condition causes more realistic distribution of intense TCs over the NWP.