



Thresholds for atmospheric convection in Amazonian rainforests

Mengxi Wu and Jung-Eun Lee

Brown University, Department of Earth, Environmental and Planetary Sciences, United States (mengxi_wu@brown.edu)

The Amazon rainforest is known as the “Green Ocean” for its maritime-like convective clouds. Here, using global 3-D cloud water retrievals from the CloudSat satellite, we further show a unique pattern of Amazonian convection. We observe a sudden regime shift from congestus to cumulonimbus when atmospheric buoyant energy exceeds a threshold in Amazonia and also in savanna/shrubland regions, but not in the Pacific warm pool. Strongest convection in Amazonia occurs during the dry-to-wet transition with a weak plant water stress, leading to highest temperature and highest buoyant energy. Our study suggests that terrestrial biological processes may play a significant role in shaping atmospheric convection.