

How much is the precipitation amount over the tropical coastal region?

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Motivated by observational evidence of rainfall concentration near tropical coastlines with diurnal cycle, we quantified annual mean precipitation amount in the tropics (latitudes lower than 37°) obtained as a function of coastal distance, and compared them between land and ocean sides (Ogino et al., 2016). The data is from the Tropical Precipitation Measurement Mission (TRMM). Precipitation amount peaks at the coastline and decreases rapidly over a distance of 300 km from the coastline on both sides of the coastline (Fig. 1). The precipitation inside the "coastal region" (defined by distance <300 km from the coastline) accounts for approximately 34% of the total over the whole tropics, while that outside the coastal region accounts for 52% and 14% on the ocean and land sides, respectively. Since the coastal regions are about 29% of the total tropical areas, the precipitation per unit area inside the coastal regions is higher than that outside. Examining the grid number variation in the coastal regions with respect to the annual precipitation amount resulted in the finding that more than 90% of the annual precipitation with the amount of 3500 mm/yr or more occurs exclusively in the coastal regions, indicating that precipitation systems unique to coastal regions are needed for producing the highest annual precipitation on the Earth. The results above were obtained from the precipitation data over the whole tropics. The regional difference will be discussed in the presentation.

References

Ogino, S.-Y., M. D. Yamanaka, S. Mori, and J. Matsumoto (2016), How much is the precipitation amount over the tropical coastal region?, *J. Clim.*, 29(3), 1231-1236, doi:10.1175/JCLI-D-15-0484.1., <http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-15-0484.1>

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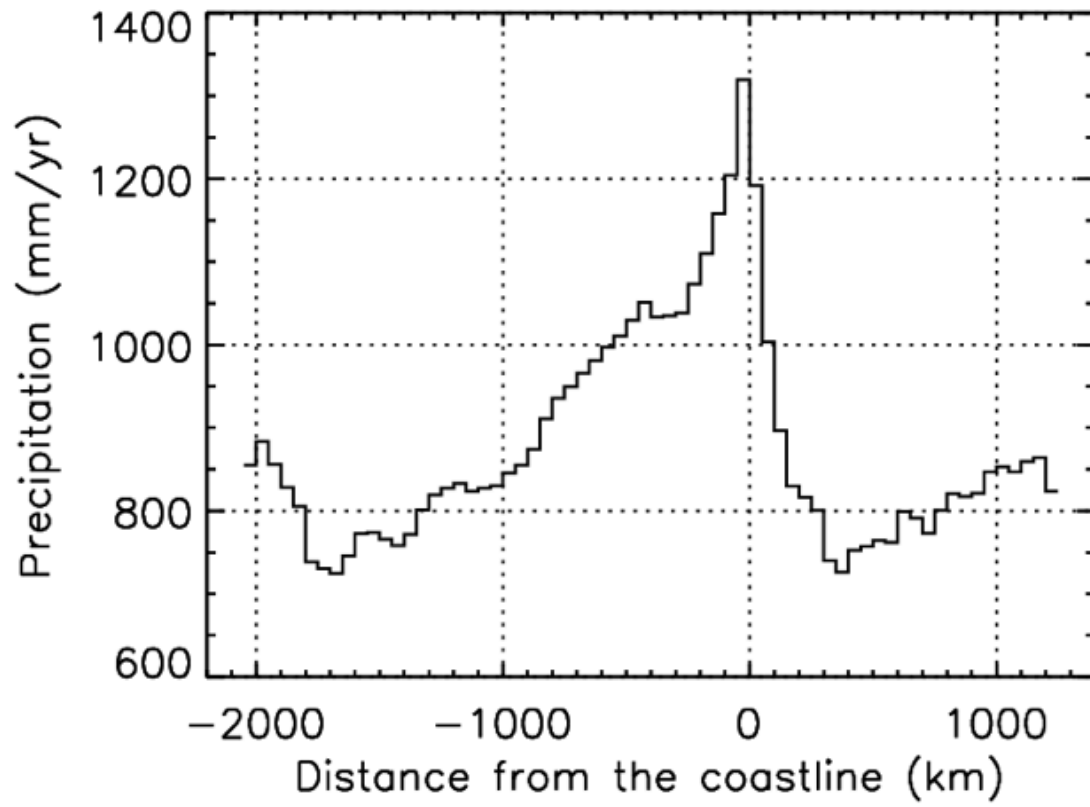


Figure 1. Relationship between precipitation amount and distance from the coastline.