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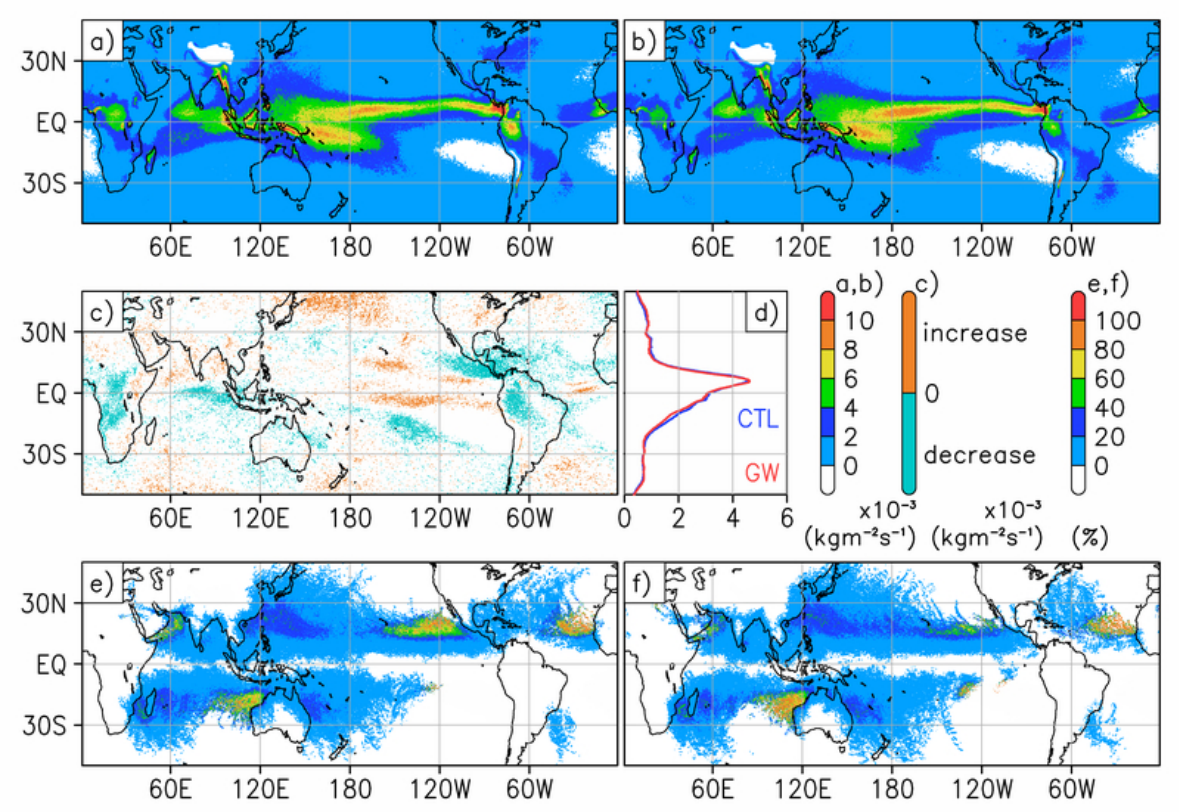

Figure 1. Geographical distributions of the total convective mass flux for the (a) present and (b) global warming condition experiments and (c) the difference. (d) is their zonal average at an altitude of 4 km. (e) and (d) are as in (a) and (b) but for geographical distributions of the ratio of the contribution of the convective mass flux of tropical cyclones to the total convective.

- A diagnostic relation based on the convective mass flux to constrain the global frequency of tropical cyclones is proposed.
- The simulation results with 20-year 14km-mesh NICAM showed that the future reduction in the global frequency is much larger than that of the total tropical convective mass flux.
- Either a future increase in the frequency of stronger tropical cyclones or an areal increase in strong updrafts explains the difference in the global frequency of tropical cyclones.
- This study suggests the future intensification of tropical cyclones leads to the future reduction of their frequency under the constraint that the contribution of tropical cyclone remains the same or smaller.