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Observing convective aggregation

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Convective self-aggregation was first recognized and studied in idealized numerical simulations. While there is a rich history of observational work on convective clustering and organization, there have been only a few studies that have analyzed observations to look specifically for processes related to self-aggregation in models. Here we review observational work in both of these categories and motivate the need for more of this work. We acknowledge that self-aggregation may appear to be far-removed from observed convective organization in terms of time scales, initial conditions, initiation processes, and mean state extremes, but we argue that these differences vary greatly across the diverse range of model simulations in the literature and that these comparisons are already offering important insights into real tropical phenomena. Some preliminary new findings are presented, including results showing that a self-aggregation simulation with square geometry has too broad a distribution of humidity and is too dry in the driest regions when compared with radiosonde records from Nauru, while an elongated channel simulation has realistic representations of atmospheric humidity and its variability. We discuss recent work increasing our understanding of how organized convection and climate change may interact, and how model discrepancies related to this question are prompting interest in observational comparisons. We also propose possible future directions for observational work related to convective aggregation, including novel satellite approaches and a ground-based observational network.