Supporting Information for "Representing Mesoscale Variability in Superparameterized Climate models"

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Movie S1. A comparison of three simulations, showing a simplified superparameterization setup where the large-scale model consists of only advection. A single wide domain (top), superparameterization with four coupled models (middle), and superparameterization with variability coupling (bottom). The initial state contains a bubble of air with added humidity, which forms a single cloud. With regular superparameterization, the cloud is not advected between the domains. With the addition of variability coupling, clouds are advected between the domains, however their shapes are not preserved. This movie shows the same simulations as in figures 5–7 in the main text.

Movie S2. A comparison of three simulations over Barbados. Regular non-superparameterized OpenIFS (top), superparameterized OpenIFS (middle), and superparameterized OpenIFS with the addition of variability coupling (bottom). In the usual form of superparameterization (middle) clouds are not easily advected into the superparameterized domain. Variability coupling (bottom) increases the amount of cloud condensate in the small-scale models. This movie shows the same simulations as in figures 1, 3, and 8 in the main text.

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