8.4 Long-term precipitation biases and evaluation of simulated rain characteristics in the Pacific Northwest.

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For the past ten winters, precipitation has been underpredicted over coastal regions of the Pacific Northwest using the University of Washington real-time WRF system. These results are independent of model horizontal grid spacing. The regions experiencing undeprediction have higher average wintertime temperatures, and thus we hypothesize that deficiencies in WRF warm rain processes may be to blame for the underprediction.
The OLYMPEX field campaign provides a unique data set for the evaluation of simulated microphysics and precipitation in complex terrain. Using OLYMPEX observations, we assess precipitation microphysics from the WRF-ARW model using surface rain gauge and Parsivel disdrometer data across various spatial and temporal scales for the Pacific Northwest. The winter of 2015-2016, when OLYMPEX was taking place, exhibited coastal underprediction. Analysis of disdrometer data during the period demonstrates that Thompson microphysics produces reasonable liquid water content simulations in spite of overpredicted median volume diameters and underpredicted normalized intercept parameters compared to observations. Additionally, two extreme precipitation events during OLYMPEX are further analyzed with a variety of other modern microphysics choices to show that the aforementioned biases are not unique to the Thompson scheme.