

NWS19-2019-000100

Abstract for an Invited Paper  
for the NWS19 Meeting of  
the American Physical Society

**Size Matters: Crystals, clouds, climate**

ANN-LISE NORMAN, University of Calgary

Transformation from gas to liquid or solid phase affect the scale at which fog, clouds and precipitation occur and ultimately lead to variability in both weather and climate. Dynamics that affect sea to air transfer, gas to aerosol conversion, and particle growth take place across scales that span from nanometers to global scales and minutes to decades. Capturing these processes at appropriate scales is key to determining when and where extremes in meteorological events take place. Ultimately, over large enough time and spatial scales its important to where persistent precipitation occurs affecting surface albedo as well as cloud reflectivity and height which in turn affect climate. This is the enormous challenge facing climate research attempting to foresee what weather will occur and where, so that society and agricultural production can adapt to changing climate conditions at scales that are relevant to policymakers. An overview of the important processes leading to cloud and precipitation properties and attempts to incorporate this information into relevant models will be presented.