



Fine-scale snow analyses improvement through coarse-scale AMSR-E SWE assimilation or fine scale MODIS SCF assimilation

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In mountainous areas, the snow amounts have a major impact on watershed water and heat budgets. Accurate snow water equivalent estimation is therefore very important. The Advanced Microwave Scanning Radiometer - EOS (AMSR-E) produces daily coarse-resolution (25 km) snow water equivalent (SWE) products. Moderate Resolution Imaging Spectroradiometer (MODIS) provides 500 m snow cover fraction information. Alternatively, model simulations allow fine-scale (e.g. 1 km) snow state estimation. Two 3D ensemble Kalman filter (EnKF) approaches are explored in the NASA Land Information System (LIS) to combine fine scale model simulations and SWE observations. Different observation operators are explored to assimilate SCF observations. Both a synthetic and real data case will be presented, showing the potential and problems in using the different observation types.