Satellite Sounder Data Assimilation for Improving Alaska Region Weather Forecast

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A case study and monthly statistical analysis using sounder data assimilation to improve the Alaska regional weather forecast model are presented. Weather forecast in Alaska faces challenges as well as opportunities. Alaska has a large land with multiple types of topography and coastal area. Weather forecast models must be finely tuned in order to accurately predict weather in Alaska. Being in the high-latitudes provides Alaska greater coverage of polar orbiting satellites for integration into forecasting models than the lower 48. Forecasting marine low stratus clouds is critical to the Alaska aviation and oil industry and is the current focus of the case study. NASA AIRS/CrIS sounder profiles data are used to do data assimilation for the Alaska regional weather forecast model to improve Arctic marine stratus clouds forecast. Choosing physical options for the WRF model is discussed. Preprocess of AIRS/CrIS sounder data for data assimilation is described. Local observation data, satellite data, and global data assimilation data are used to verify and/or evaluate the forecast results by the MET tools Model Evaluation Tools (MET).