Using NPROVS+ to Validate Suomi-NPP Derived Atmospheric Soundings versus Reference / Dedicated RAOB

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INTRODUCTION

The consistent validation and verification of the multiple satellites, sensors and derived product suites operated by NOAA is critical for their optimal integration and impact in weather forecast and climate applications. The NOAA Products Validation System+ (NPROVS+), supported by the NOAA Joint Polar Satellite system (JPSS), deployed at NOAA NESDIS STAR in April 2008, provides ongoing data access, collocation, monitoring and inter-comparison of these multiple product suites against reference and dedicated RAOB observations.

In this study, we present the initial analysis of ensemble vertical statistics, based on 6 months of NPROVS+ collocation data, showing performance characteristics of derived atmospheric temperature and water vapor retrievals from the Suomi-NPP Cross-track Infrared Microwave Sounder Suite (CrIMSS), focusing on products from the CrIMSS Interface Data Processing Segment (IDPS), the NOAA Unique CrIS/ATMS Processing System (NUCAPS) but also including products from NOAA Microwave integrated Retrieval Systems (MIRS) and IASI products from MetOP.

Reference and dedicated RAOB are primarily from the GCOS Reference Upper Air Network (GRUAN) and JPSS funded dedicated RAOB program conducted at ARM sites. Reference observations provide traceable temperature and moisture profiles and include uncertainty estimates which are directly integrated into the product characterization analysis. Collocations include NWP observations from the NOAA GFS 6-hr forecast and Climate re-analysis (CSFR) and ECMWF Analysis. Although limited to the RAOB, plans for expanding NPROVS+ to include reference ancillary observations and Site Atmospheric State best estimates (SASBE) from integrated RAOB and ancillary data are planned (but not yet available for analysis). Longer term goals include achieving a nominal level of maturity for application in climate monitoring.

NPROVS+

NPROVS+ leverages from NPROVS and provides daily compilation of available RAOB and NWP observations from multiple satellite product/sensor suites. The collocation strategy identifies the “single, closest” satellite profile to a given RAOB but also stores all products and sensor data within satellite sounding and sensor data from multiple satellite product/sensor suites. The NPROVS+ system (JPSS), deployed at NOAA NESDIS STAR in April 2008, provides ongoing data access, collocation, monitoring and inter-comparison of these multiple product suites against reference and dedicated RAOB observations.