Results from an Operational Demonstration of a Gridded CrIS/ATMS Product for Cold Air Aloft

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At high latitudes during the winter months, the air at altitudes used by passenger and cargo aircraft can reach temperatures cold enough (-65°C) such that the jet fuel used by the aircraft can begin to freeze. Currently, aviation forecasters in Alaska rely on a combination of isolated aircraft reports (AIREPs), pilot reports (PIREPs), Aircraft Meteorological Data Relay (AMDAR) data, a sparse network of radiosondes, and global model fields for identifying and characterizing Cold Air Aloft (CAA) hazards. Satellite information can help fill in the spatial and temporal gaps in data-sparse areas across the Alaskan airspace. In particular, the NOAA-Unique Combined Atmospheric Processing System (NUCAPS), which combines infrared soundings from the Cross-track Infrared Sounder (CrIS) with the Advanced Technology Microwave Sounder (ATMS), can be used to retrieve temperature and moisture profiles. NUCAPS retrievals are available in a wide swath of observations with approximately 45-km spatial resolution at nadir and a local Equator crossing time of 1:30 A.M./P.M. enabling three-dimensional observations at asynoptic times.

For aviation forecasters to optimize NUCAPS observations, the soundings must be displayed in the National Weather Service's decision support system, the Advanced Weather Interactive Processing System (AWIPS). The experimental gridded NUCAPS data visualization within AWIPS was developed by a multi-organizational research-to-operations team linked together through the Joint Polar Satellite System (JPSS) Proving Ground. The Gridded NUCAPS visualization is composed of plan-view horizontal maps and vertical cross sections, which gives aviation forecasters easily accessible tools for diagnosing the three-dimensional extent of CAA events. NUCAPS profiles are also available operationally on AWIPS as point observations that can be displayed as Skew-T diagrams.

From December 2016 to March 2017, aviation forecasters at the National Weather Service (NWS) Anchorage Center Weather Service Unit (CWSU) collaborated with the Gridded NUCAPS development team on a targeted CAA assessment to determine the operational viability of these products. This presentation will discuss the research-to-operations transition process and results of this assessment, including case study examples where the Gridded NUCAPS products influenced forecast decisions.

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