



The GOES-R/JPSS Approach for Identifying Hazardous Low Clouds: Overview and Operational Impacts

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Low ceiling and visibility is a weather hazard that nearly every forecaster, in nearly every National Weather Service (NWS) Weather Forecast Office (WFO), must regularly address. In addition, national forecast centers such as the Aviation Weather Center (AWC), Alaska Aviation Weather Unit (AAWU) and the Ocean Prediction Center (OPC) are responsible for issuing low ceiling and visibility related products. As such, reliable methods for detecting and characterizing hazardous low clouds are needed. Traditionally, hazardous areas of Fog/Low Stratus (FLS) are identified using a simple stand-alone satellite product that is constructed by subtracting the 3.9 and 11 μm brightness temperatures. However, the 3.9-11 μm brightness temperature difference (BTD) has several major limitations. In an effort to address the limitations of the BTD product, the GOES-R Algorithm Working Group (AWG) developed an approach that fuses satellite, Numerical Weather Prediction (NWP) model, Sea Surface Temperature (SST) analyses, and other data sets (e.g. digital surface elevation maps, surface emissivity maps, and surface type maps) to determine the probability that hazardous low clouds are present using a naïve Bayesian classifier. In addition, recent research has focused on blending geostationary (e.g. GOES-R) and low earth orbit (e.g. JPSS) satellite data to further improve the products. The FLS algorithm has adopted an enterprise approach in that it can utilize satellite data from a variety of current and future operational sensors and NWP data from a variety of models. The FLS products are available in AWIPS/N-AWIPS/AWIPS-II and have been evaluated within NWS operations over the last four years as part of the Satellite Proving Ground. Forecaster feedback has been predominantly positive and references to these products within Area Forecast Discussions (AFD's) indicate that the products are influencing operational forecasts. At the request of the NWS, the FLS products are currently being transitioned to NOAA/NESDIS operations, which will ensure that users have long-term access to these products. This paper will provide an overview of the FLS products and illustrate how they are being used to improve transportation safety and efficiency.