Current Usage and Future Prospects of Multispectral (RGB) Satellite Imagery in Support of NWS Forecast Offices and National Centers

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Current and future satellite sensors provide remotely sensed quantities from a variety of wavelengths ranging from the visible to the passive microwave, from both geostationary and low-Earth orbits. The NASA Short-term Prediction Research and Transition (SPoRT) Center has a long history of providing multispectral imagery from the Moderate Resolution Imaging Spectroradiometer (MODIS) aboard NASA's Terra and Aqua satellites in support of NWS forecast office activities. Products from MODIS have recently been extended to include a broader suite of multispectral imagery similar to those developed by EUMETSAT, based upon the spectral channel s available from theSpinning Enhanced Visible and InfraRed Imager (SEVIRI) aboard METEOSAT-9 . This broader suite includes products that discriminate between air mass types associated with synoptic-scale features, assists in the identification of dust, and improves upon paired channel difference detection of fog and low cloud events. Similarly, researchers at NOAA/NESDIS and CIRA have developed air mass discrimination capabilities using channels available from the current GOES Sounders. Other applications of multispectral composites include combinations of high and low frequency, horizontal and vertically polarized passive microwave brightness temperatures to discriminate tropical cyclone structures and other synoptic-scale features. Many of these capabilities have been transitioned for evaluation and operational use at NWS Weather Forecast Offices and National Centers through collaborations with SPoRT and CIRA.

Future instruments will continue the availability of these products and also expand upon current capabilities. The Advanced Baseline Imager (ABI) on GOES-R will improve the spectral, spatial, and temporal resolution of our current geostationary capabilities, and the recent launch of the Suomi National Polar-Orbiting Partnership (S-NPP) carries instruments such as the Visible Infrared Imager Radiometer Suite (VIIRS), the Cross-track Infrared Sounder (CrIS), and the Advanced Technology Microwave Sounder (ATMS), which have unrivaled spectral and spatial resolution, as precursors to the JPSS era (i.e., the next generation of polar orbiting satellites). At the same time, new image manipulation and display capabilities are available within AWIPS II, the next generation of the NWS forecaster decision support system. This presentation will present a review of SPoRT, CIRA, and NRL collaborations regarding multispectral satellite imagery and articulate an integrated and collaborative path forward with Raytheon AWIPS II development staff for integrating current and future capabilities that support new satellite instrumentation and the AWIPS II decision support system.