



Expected Benefits from GOES-R for Fog Detection and Forecasting

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The Advanced Baseline Imager (ABI) on the GOES-R series, with a planned first launch in 2015, has been designed to meet user requirements covering a wide range of phenomena. As with the current GOES Imager, the ABI will be used for a wide range of weather, oceanographic, climate, and environmental applications. The ABI will improve upon the current GOES Imager with more spectral bands, faster imaging, higher spatial resolution, better navigation, and more accurate calibration. The ABI expands from five spectral bands on the current GOES imagers to a total of 16 spectral bands in the visible, near-infrared and infrared spectral regions. There will be an increase of the coverage rate leading to full disk scans at least every 15 minutes. ABI spatial resolution will be 2 km for the infrared (IR) bands and 0.5 km for the 0.64 micron visible band. The ABI will improve every product from the current GOES Imager and will introduce a host of new products.

The first step to improve fog forecasting is improved detection. The improved spatial resolution in the visible, near IR and IR channels will allow for detection of fog that cannot be seen on the present generation of GOES satellites. The improved temporal resolution will allow for quicker detection and improved monitoring of fog growth and decay. The increased number of channels will provide better information on cloud physics including cloud top phase and cloud top particle size distribution. Onboard visible calibration, along with improved image navigation and registration, will allow for quantitative use of visible images leading to improved short-term forecasting of fog dissipation, and improved fog climatology. Additional channels will also provide better information on aerosols and thin cirrus to allow a more accurate assessment of the actual fog brightness and thus the thickness, and expected time of dissipation. Improved information on aerosols and low level water vapor should help in the short term forecasting of fog formation both over land and water. Improved satellite derived winds and sea surface temperatures will provide additional tools for forecasting sea fog. This presentation will describe the expected new capabilities of GOES-R with respect to fog observation and forecasting and illustrate these with the use of proxy GOES-R images from MODIS (MODerate-resolution Imaging Spectroradiometer) and NOAA polar orbiting satellites.