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Technical Implementation Notice 12-32
National Weather Service Headquarters Washington DC
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From: Timothy McClung
Chief, Science Plans Branch
Office of Science and Technology

Subject: Changes to the Calculation of Snow Cover Fraction and GOES Simulated Brightness Temperature in the NAM Analysis and Forecast System: Effective August 7, 2012

Effective on or about Tuesday, August 7, 2012, beginning with the 1200 Coordinated Universal Time (UTC) run, the National Centers for Environmental Prediction (NCEP) will make fixes to the calculation of snow cover fraction and the Geostationary Orbiting Environmental Satellite (GOES) Simulated Brightness Temperatures in the North American Mesoscale (NAM) Analysis and Forecast System.

When computing the simulated GOES brightness temperature, the radiative transfer model in the NAM post-processor fails at land points defined as "permanent snow/ice" (i.e., glaciers) which had no snow cover in the NAM snow analysis. When this occurs, the point in question has undefined brightness temperature and will be bitmapped out in the output gridded binary (GRIB) GOES brightness temperature field. For example, on the 12 km contiguous U.S. (CONUS) grid #218, the number of points with this problem would start at near zero at 00-hours to about 100-150 by 84-hours (about 0.05% of the grid). The presence of this bit map for brightness temperatures in this grid caused failures in the GRIB2 unpacking utility degrib. The code has been modified to force grid points defined as permanent snow/ice to always have snow cover present so the radiative transfer model will not fail and return a valid brightness temperature.

To compute snow cover fraction, the NAM post-processor uses a snow depth threshold for snow cover of 100% at a grid point. This threshold is different for each vegetation type. The current NAM routine is using the old U.S. Geological Survey (USGS) vegetation type definitions, not the new Moderate Resolution Imaging Spectroradiometer (MODIS) International Geosphere Biosphere Programme (IGBP) vegetation types implemented in the NAM in October 2011. The code has been modified to use the IGBP vegetation types so it is consistent with the forecast model.

This change will affect all NAM products which contain snow cover fraction.

NCEP urges all users to ensure their decoders can handle changes in content order, changes in the scaling factor component within the product definition section (PDS) of the GRIB files, and volume changes. These elements may change with future NCEP model implementations. NCEP will make every attempt to alert users to these changes before implementation.

For questions regarding this change, please contact:

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