

An example of the use of GOES-9 digital data and surface observations on WFO-Advanced (AWIPS) to determine cloud cover on Nov. 10, 1997

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WFO-Advanced (now being incorporated in AWIPS) is very useful in comparing satellite data with conventional surface observations. This example will show how the satellite data and surface data can complement one another.

First, look at Figure 1 which shows the IR image at 1700Z on 10 November 1997. Note that the enhancement only covers temperature below -30 C and that no areas are color enhanced. The METARs (in yellow) and ceiling/visibility information (in white) indicate where clouds and fog are present. However, using just the unenhanced IR image it is difficult to determine the extent of the clouds and/or fog. The IR image can be enhanced to accent the temperatures between 0 C and -20 C, as seen in Figure 2. This helps very little, since some of the METARs that are reporting clear skies actually have colder IR temperatures than areas that are reporting clouds. The Great Falls SKEWT is shown in Figure 3. Note that there is about a 15 C inversion present. Figure 2 shows that the cloud temperature near Great Falls (the METAR with 1/4 mile visibility and FZFG) is about -14 C (which according to the Great Falls sounding would be very near the surface).

The 1700 Z VIS image from GOES-9 is shown in Figure 4. This helps somewhat in determining cloud extent, however with snow cover present (to the northwest of Great Falls) it is still difficult to assess the extent of the cloud cover. The window IR (11um) minus 3.9um IR image at 1700 Z. The enhancement is created so that white indicates that 3.9um pixels values are greater than the 11um values. This indicates that reflection is taking place (i.e., water droplets). This image clearly shows where the cloud edge is located since the snow cover is poorly reflective in 3.9um (shows up as dark). It should also be noted that since the cloud top temperature in this region are in the -10 C to -20 C region, one could expect that supercooled water drops are present (i.e. aviation icing danger).

This is just a simple example of how powerful the use of combined satellite and surface based observations can be using the new technologies soon to be available at NWS forecast offices.

Figure 1.

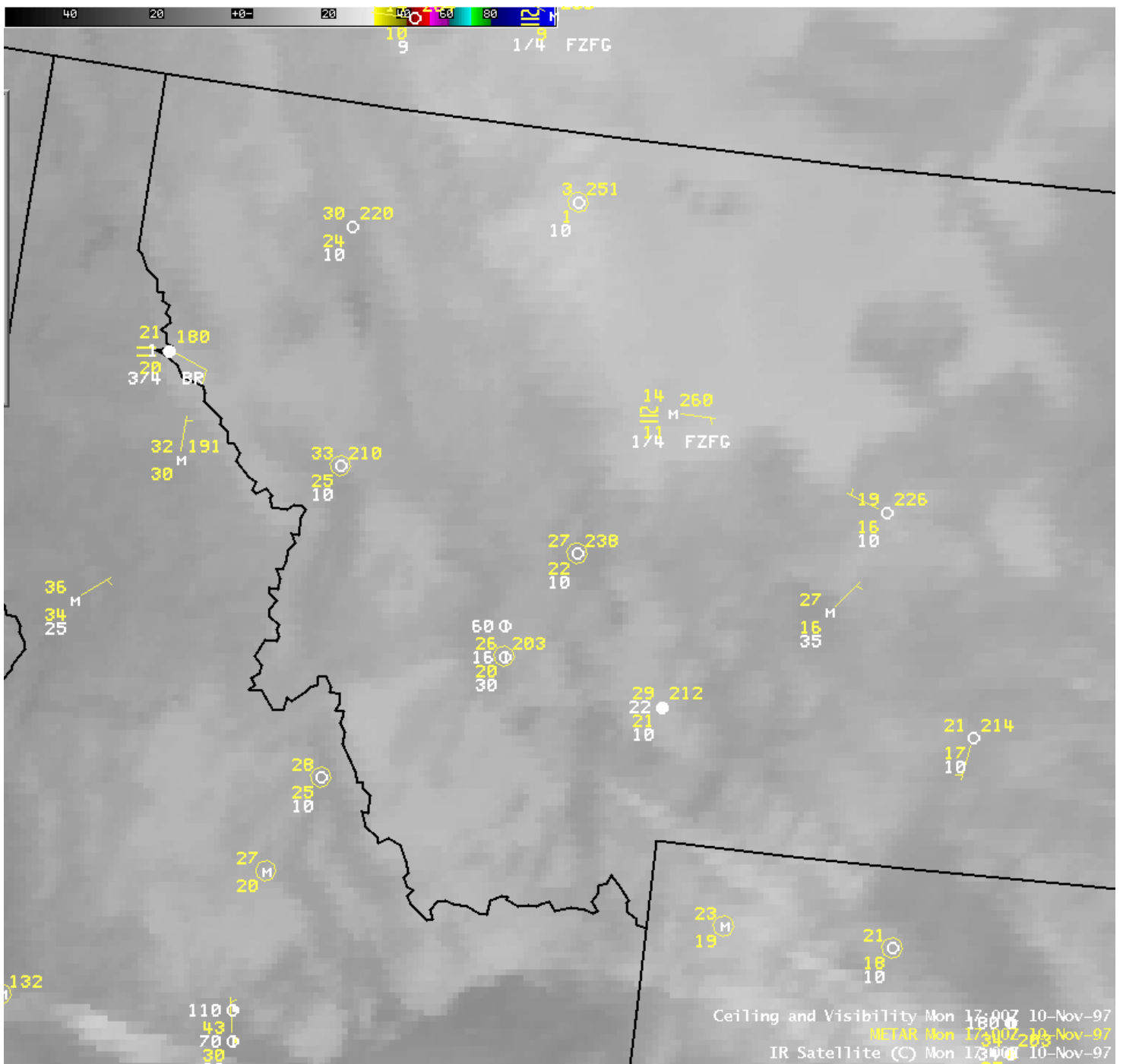


Figure 2.

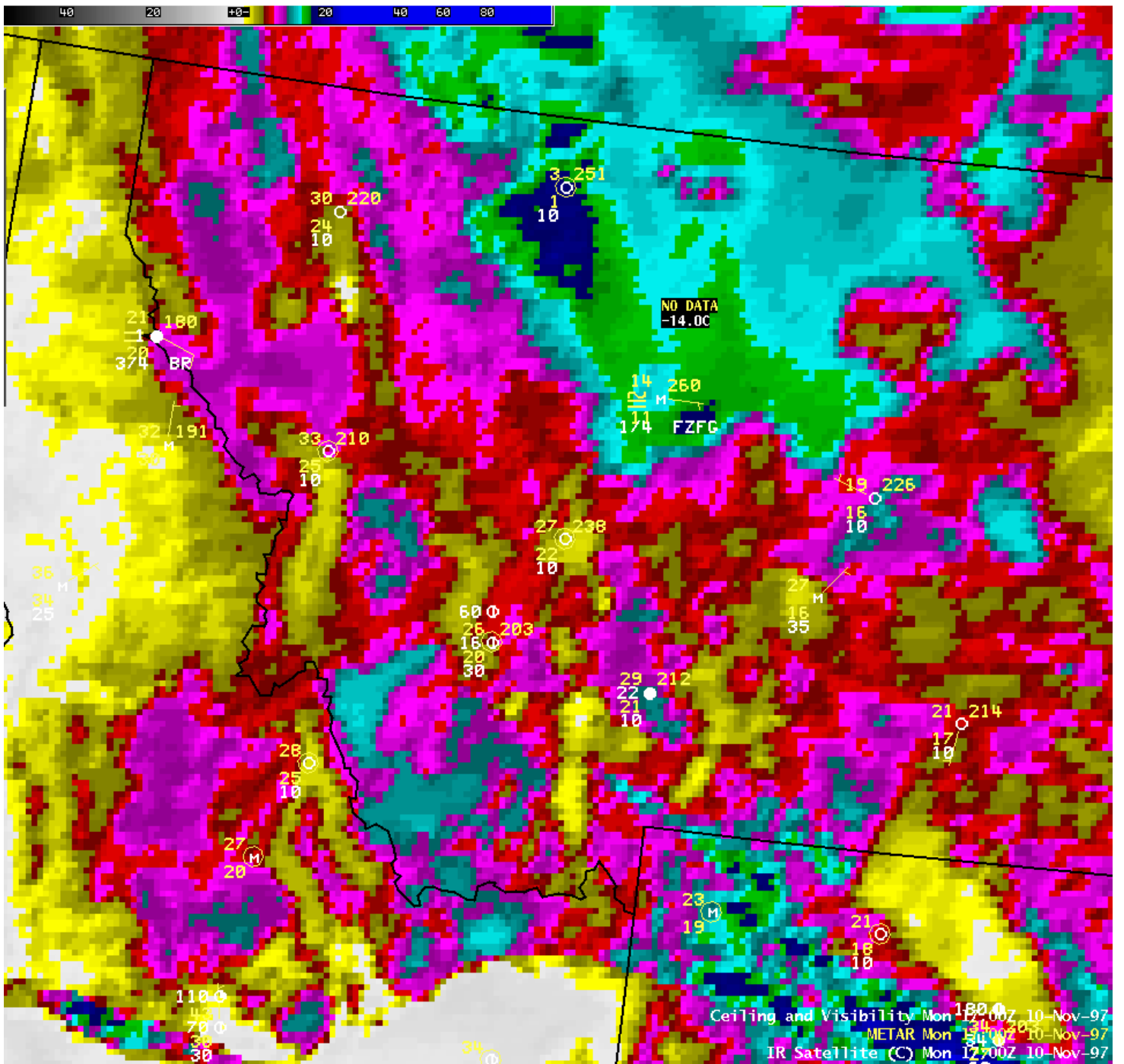


Figure 3.

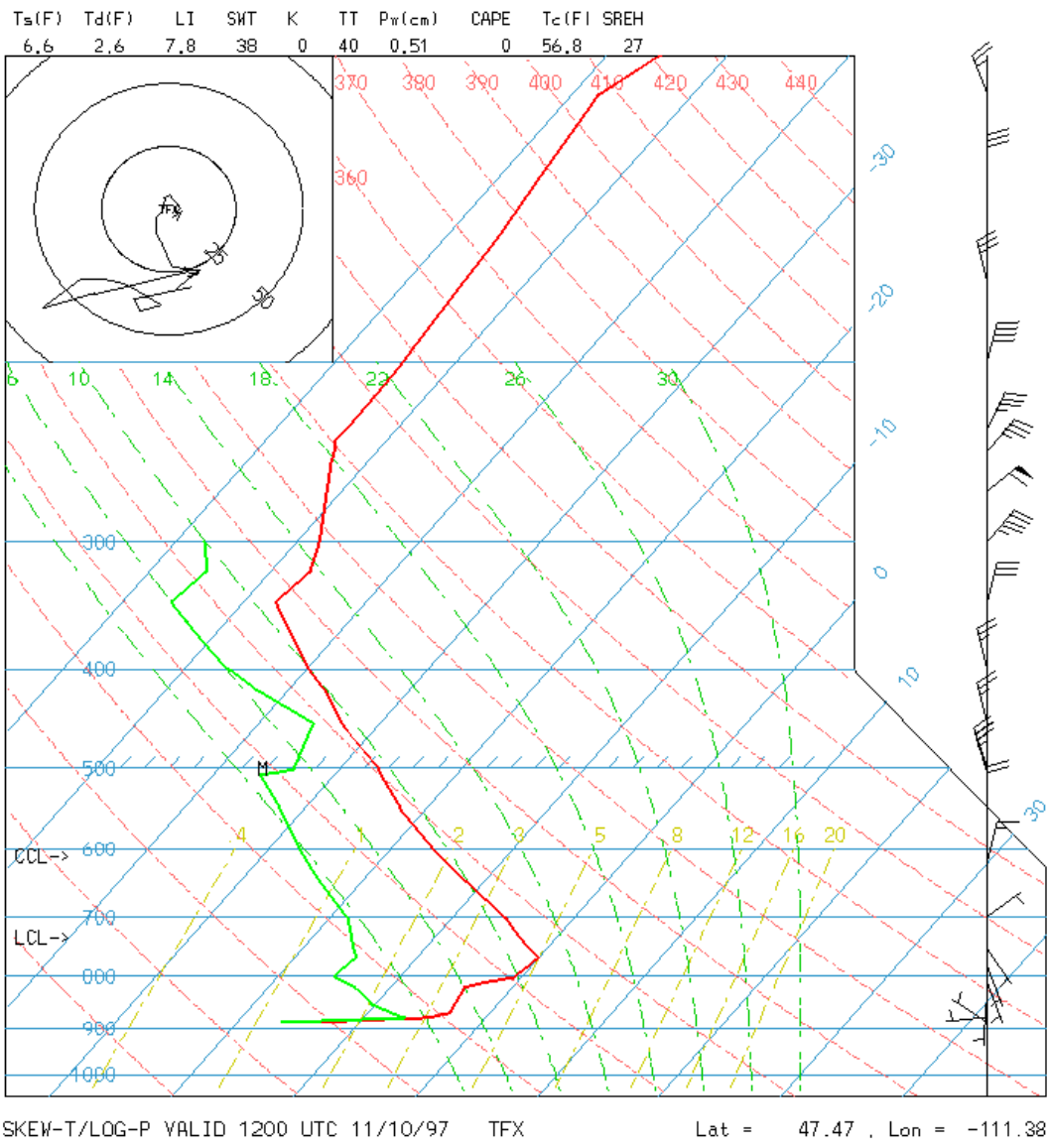


Figure 4.

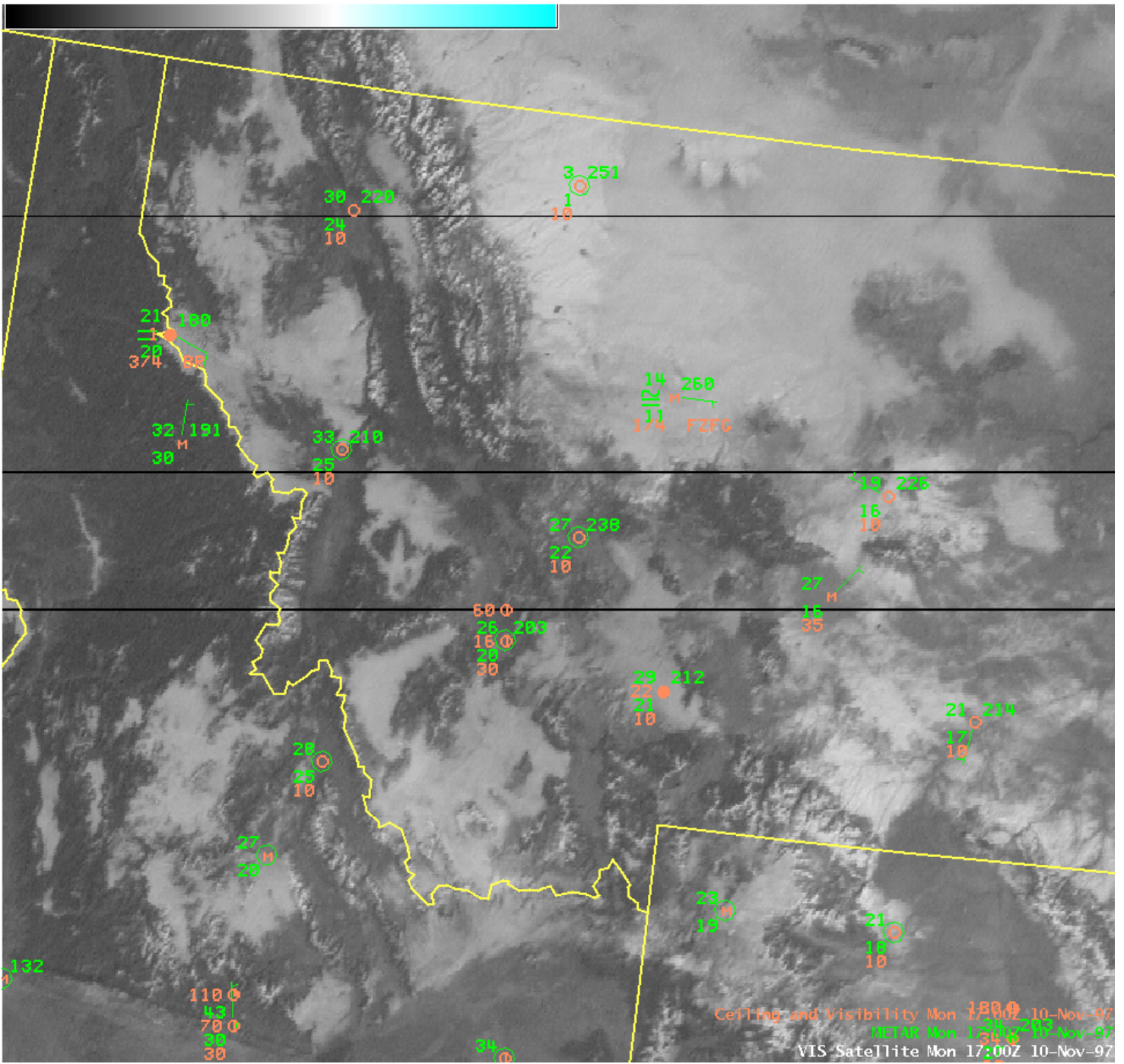


Figure 5.

