



**WESTERN REGION TECHNICAL ATTACHMENT  
NO. 98-40  
DECEMBER 1, 1998**

---

**GOES SOUNDER DATA IN ETA MODEL**

**Kevin J. Schrab - WRH, SSD, Salt Lake City, UT**

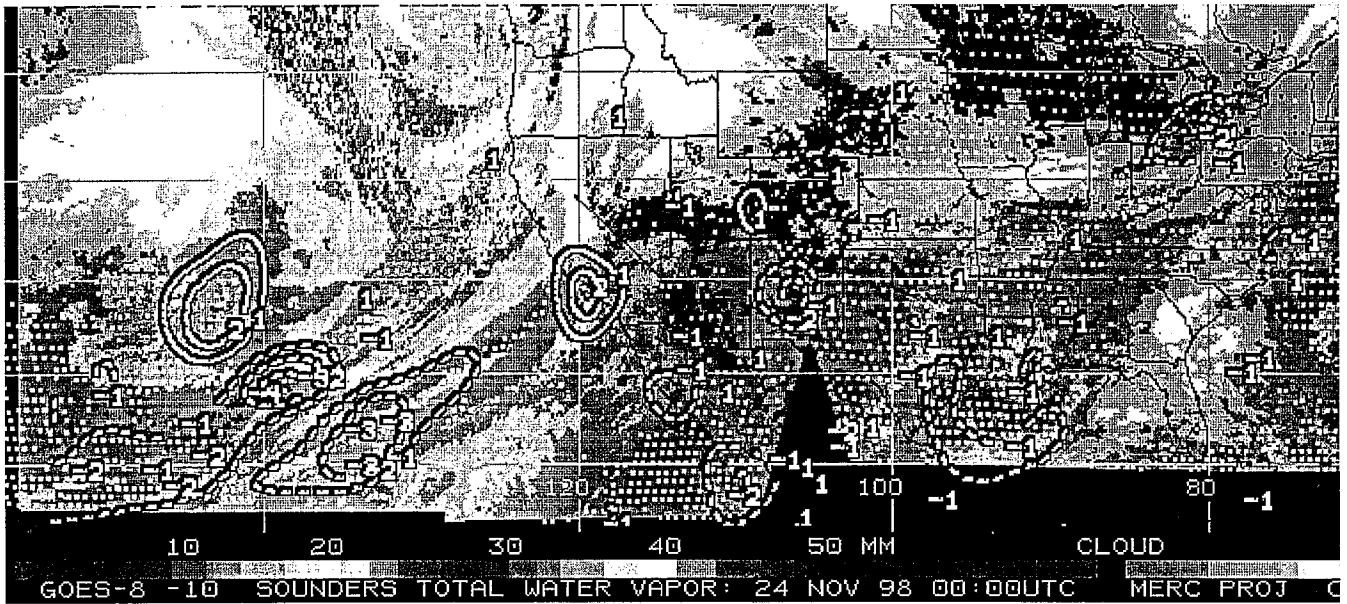
Editor's Note: The following Technical Attachment was summarized from information by T. Schmidt of NESDIS, J. Jung and J. Nelson of CIMMS.

GOES-8 and GOES-9 sounder derived precipitable water (PW) data was going into the ETA assimilation scheme up until GOES-9 failed in July. The GOES PW are put into the ETA as total column precipitable water and information on PW in 3 layers (low-, mid-, and high-level). Since GOES-10 replaced GOES-9 GOES PW data was only being assimilated by the ETA from GOES-8. This was due to having to wait for the GOES-10 algorithms to be verified and quality controlled. This negatively impacted the ETA analysis of TPW, especially over the Pacific Ocean. Figure 1 shows how dramatic this difference can be. The figure shows a GOES-8/10 combined PW image with the difference between the ETA analysis and the GOES PW values contoured. The top portion is for 00Z on 24 Nov 98 when the GOES-10 PW was not included in the ETA assimilation. Notice the large differences between GOES PW and ETA PW, especially in the region that would be covered by GOES-10. The bottom portion of the figure is for 12Z on 24 Nov 98 when GOES-10 PW was introduced into the ETA assimilation. Notice the rather small differences between the GOES PW and the ETA analysis. This indicates that the ETA is now assimilating the GOES PW values quite well.

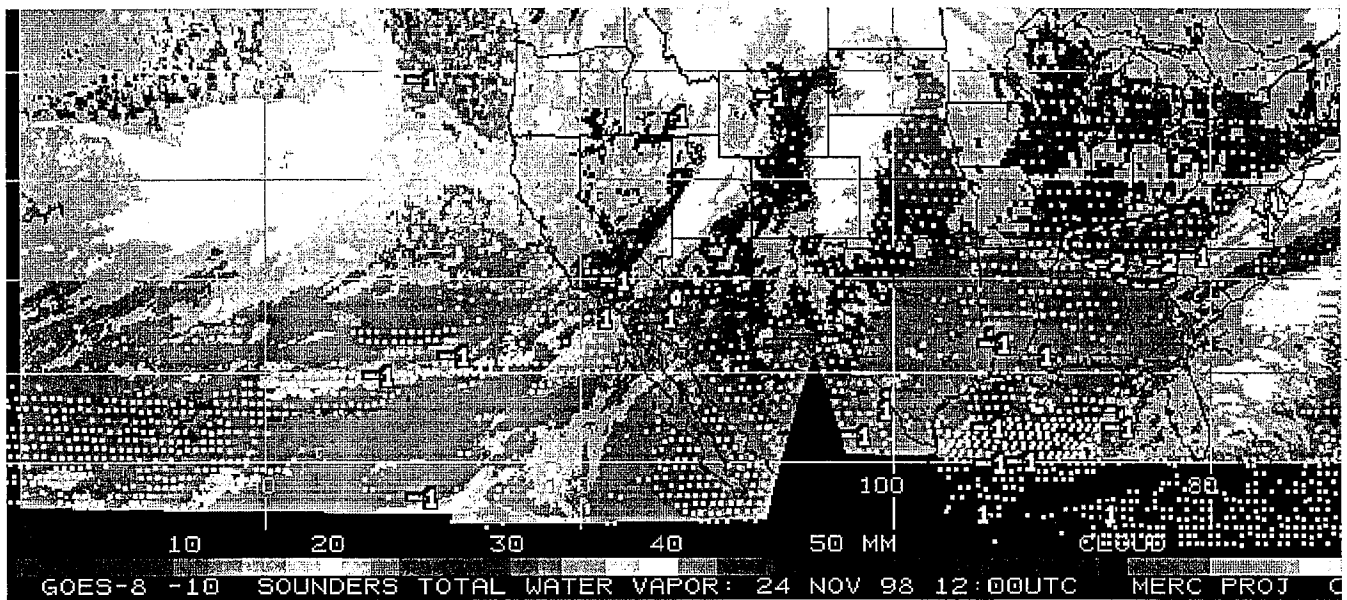
The assimilation of GOES PW data has an impact on ETA precipitation accuracy. Figure 2 shows the effect of GOES PW on ETA precipitation equitable threat scores. These test runs were done with a workstation version of the ETA run at the University of Wisconsin. The positive differences indicate that in most cases the inclusion of GOES PW data in the ETA improves ETA precipitations forecasts. Also note that the addition of GOES-10 (white bars) usually improves threat scores more than if just GOES-8 data were assimilated into the ETA. CIMMS puts GOES PW statistics with regard to the ETA on their web page daily. The URL is: <http://cimss.ssec.wisc.edu/model/daily/goes8.html>

The bottom line is that GOES-8 and GOES-10 PW data are now being assimilated into the ETA. This should help improve the ETA's precipitation forecasts in the Western U.S.

**GOES minus Initial Eta TPW      Only GOES-8 moisture data are assimilated.**



**GOES minus Initial Eta TPW      Both GOES-10 and -8 data are assimilated.**



**As of 12 UTC on 24-NOV-98, moisture information from the GOES-10 sounder, in addition to that from GOES-8, is being used in the operational Eta model system. Small Total Precipitable Water (TPW) differences imply the data are assimilated.**

Figure 1

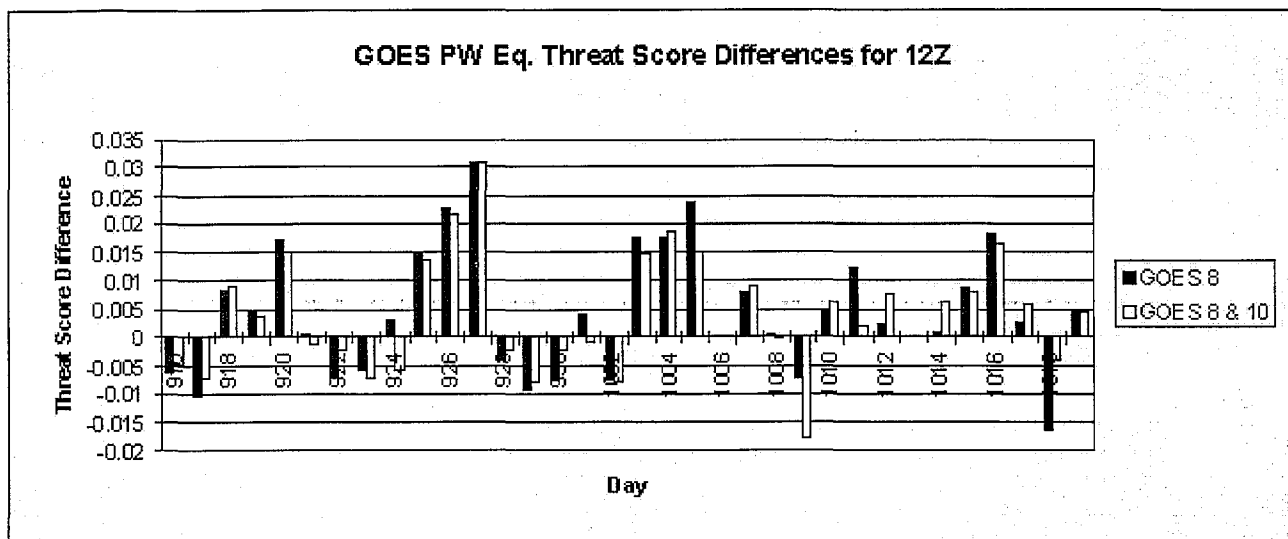


Figure 2