Comparison of GOES-9 Imager and Sounder Precipitable Water (PW) against the RAOB PW

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Introduction

This TA lite will describe the trends that were observed when comparing the GOES-9 imager and sounder PW (See DPI TA by Kevin Schrab) against the RAOB. The trends described were observed from data collected during the months of August, September and part of October.

Since the sounder has better vertical resolution than the imager, its accuracy in measuring precipitable water should be much better than the imager when compared to the values returned by the RAOB. The data gathered supported this assumption, but not to the extent anticipated.

Data Collection

Data was collected every day from August until mid October. Using RAMSDIS, digital values were retrieved by placing the cursor over a RAOB site and averaging the values returned. (The cursor size selected was 3X3.) At least five of the nine values had to be good in order to use the average. The RAOB sites were all in the Western Region, with the exception of RIW, GJT, ABQ, and EPZ.

When the observation period was done, the data for each site were evaluated. If the sight contained very little or no data, it was removed. The remaining data were plotted to find any trends.

Results

The sounder, on the average, was closer to the RAOB PW values than was the imager, as was thought would be the case. However, it appeared that the sounder did much better than imager along the coast, see graph (all). To verify this observation, the sights were divided into two geographical region, those along the coast, and those inland. The results were rather significant.

It was observed that along the coastal regions, the sounder overestimated the PW by 10% whereas the imager overestimated by 23%, see graph (coastal). Inland, however, neither of the instruments returned very good values. The sounder overestimated by 21% and the imager by 22%, see graph (inland). (To find these averages, the absolute value of the percentage difference between the RAOB and the instruments for each site was taken, and then an average for all sites was found.)

Summary

The data collected from the imager and sounder on GOES9 for precipitable water yielded some interesting trends. Although both instruments overestimated the PW, the time trends can be very useful in determining the relative changes and total precipitable water in the atmosphere.

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graph (all)
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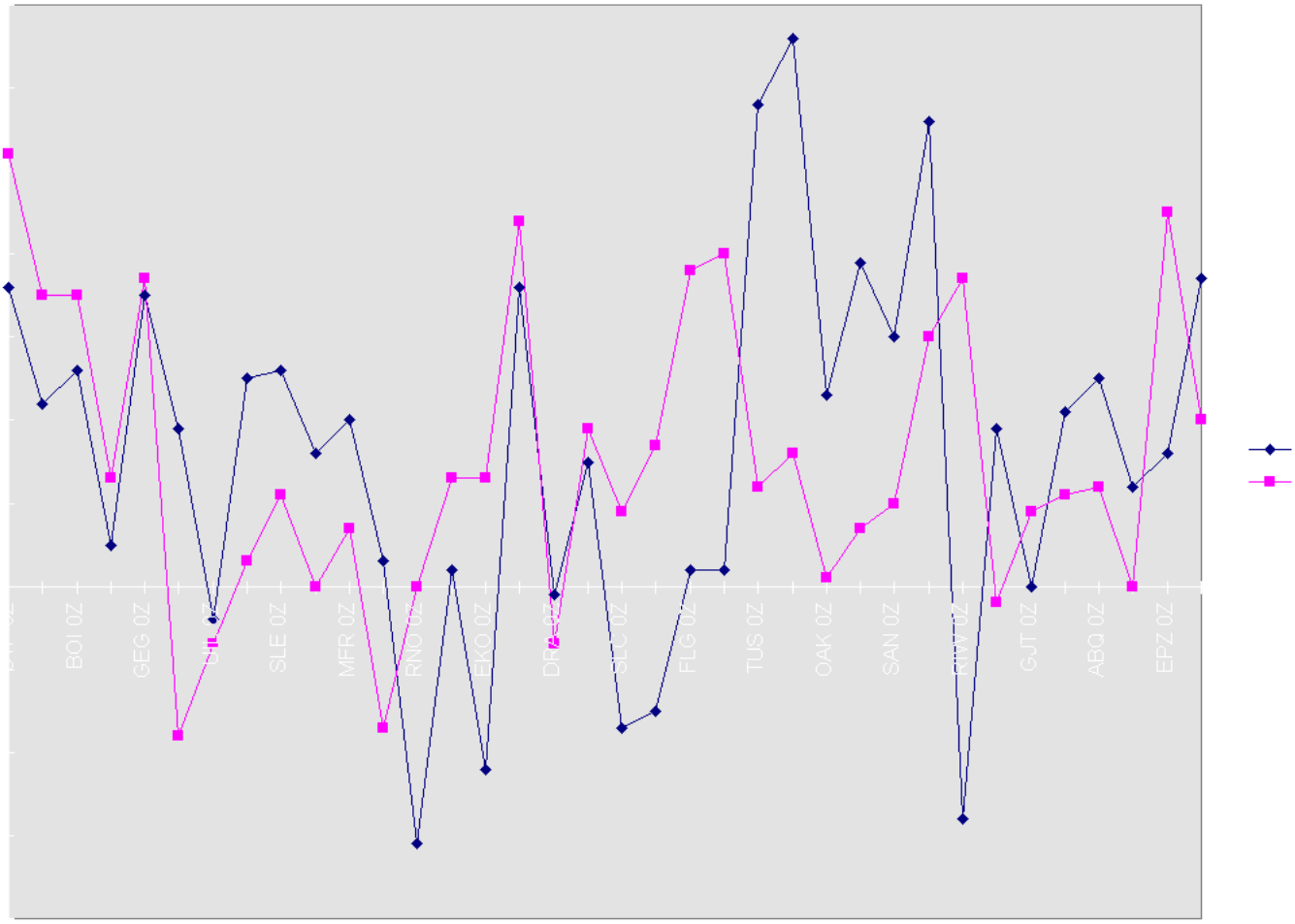
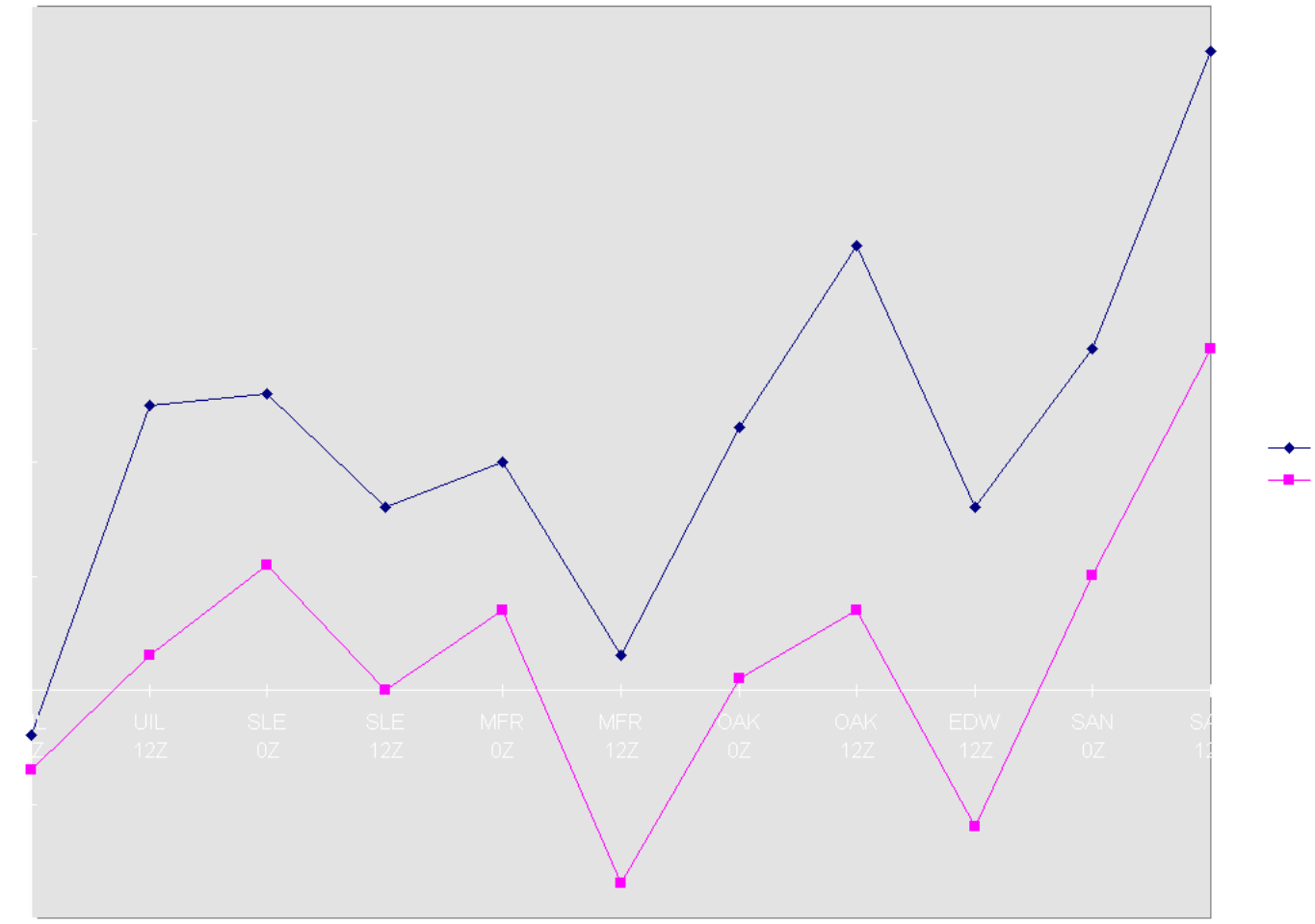
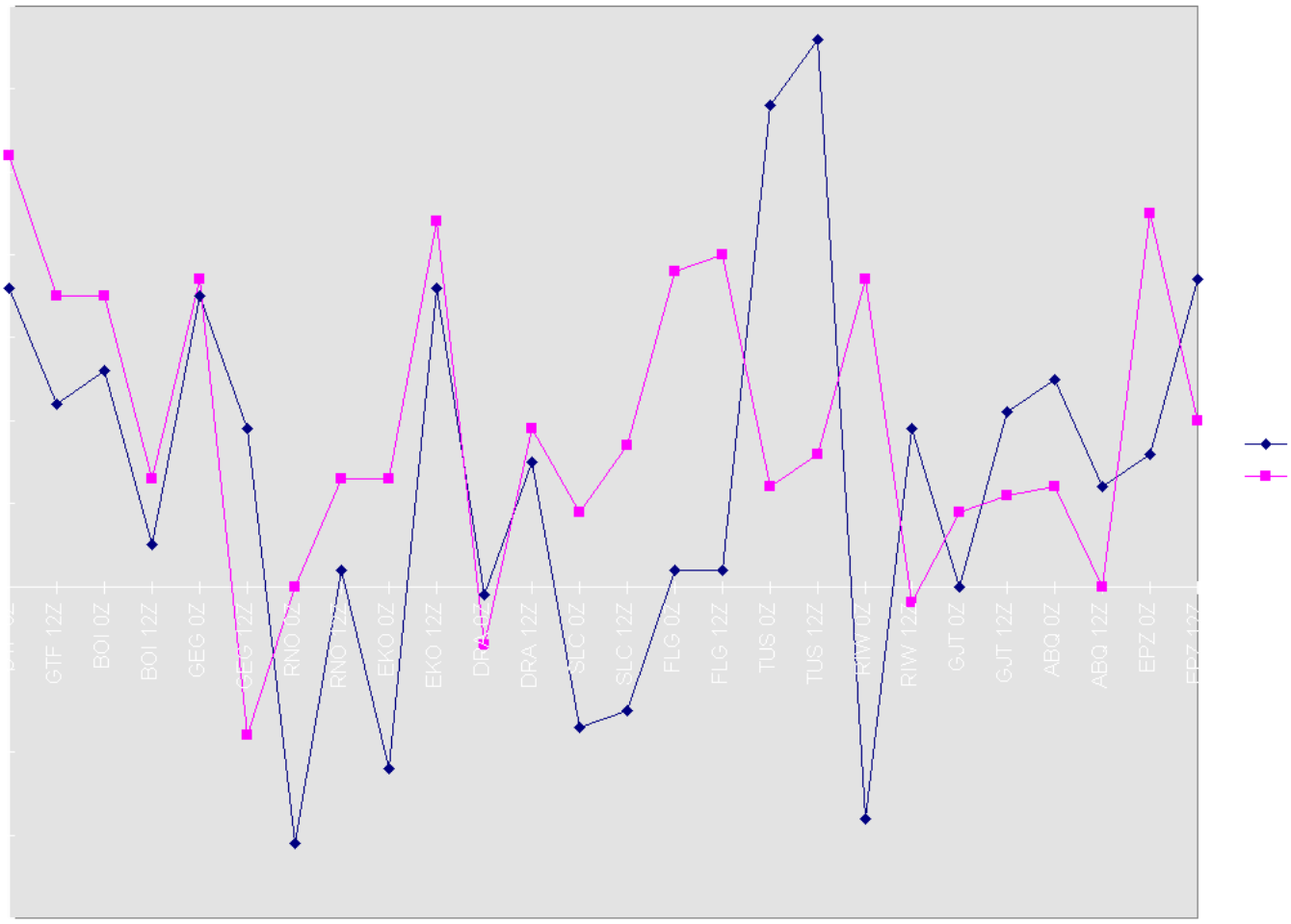


graph (coastal)



graph (inland)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