NASA/GMAO GEOS-5 Observation Impact Monitoring

http://gmao.gsfc.nasa.gov/products/forecasts/systems/fp/obs_impact/

The following results are from the routine observation impact monitoring of NASA/GMAO's GEOS-5 atmospheric data assimilation system, but focused here on the period 10 Jan-10 Mar 2012

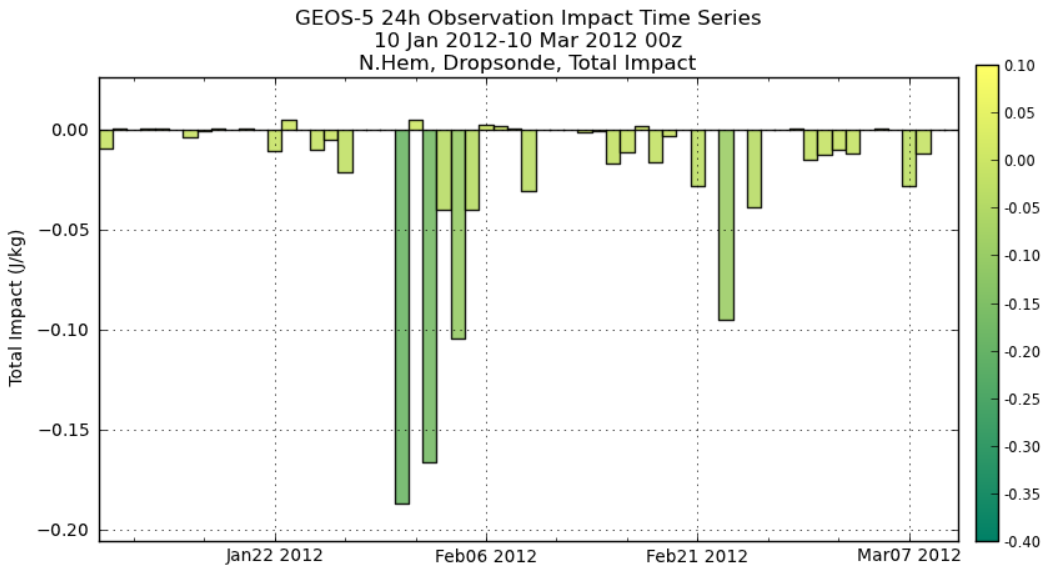
Observation impacts are computed daily using the adjoint of the GEOS-5 atmospheric data assimilation system, including the GEOS-5 global forecast model and Gridpoint Statistical Interpolation (GSI) analysis scheme

The metric is a 24h global forecast error norm - dry total energy;

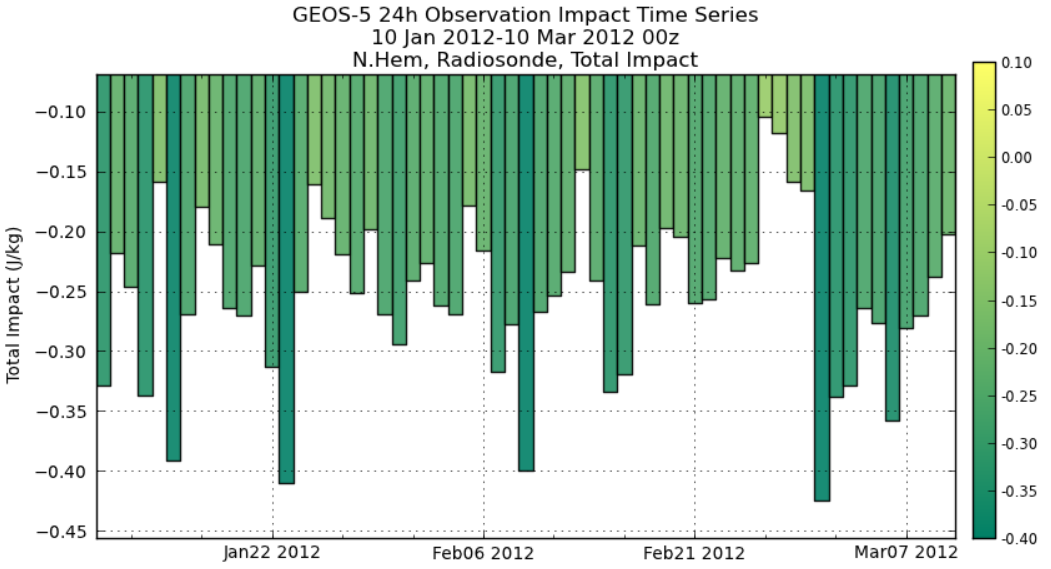
- Negative (positive) values indicate that assimilation of a given set of observation has improved (degraded) the 24hr forecast in terms of this metric

NASA/GMAO GEOS-5 24h Observation Impact Time Series
10 January – 10 March 2012 00z

- Dark greens indicate largest improvements
- Dropsondes have significant beneficial impact in several cases, but also degrade the forecast slightly in some cases
- For reference, NH radiosondes have consistently large beneficial impact, but are much more numerous



N.H. Dropsonde Total Impact

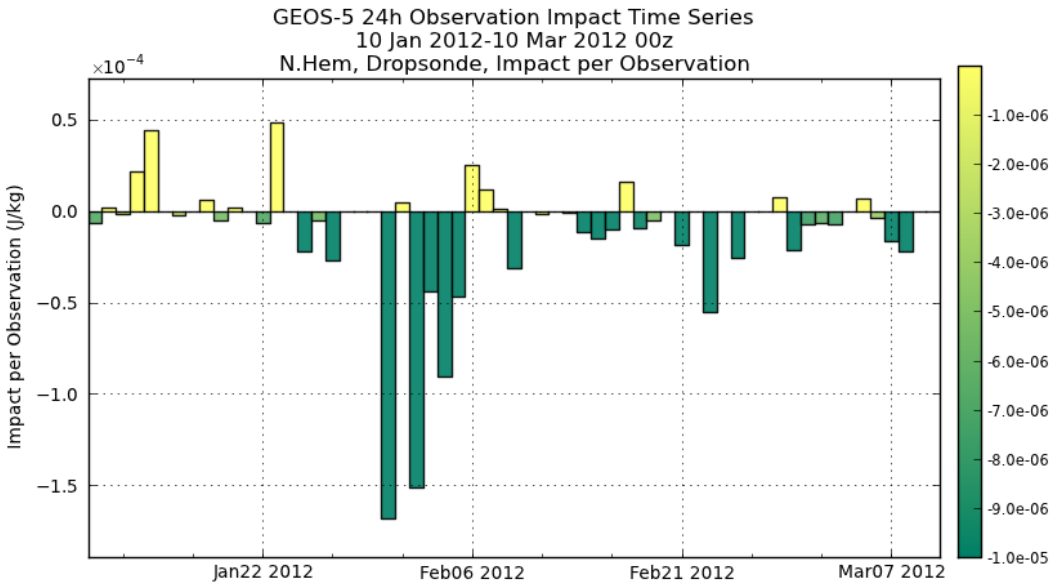


N.H. Radiosonde Total Impact

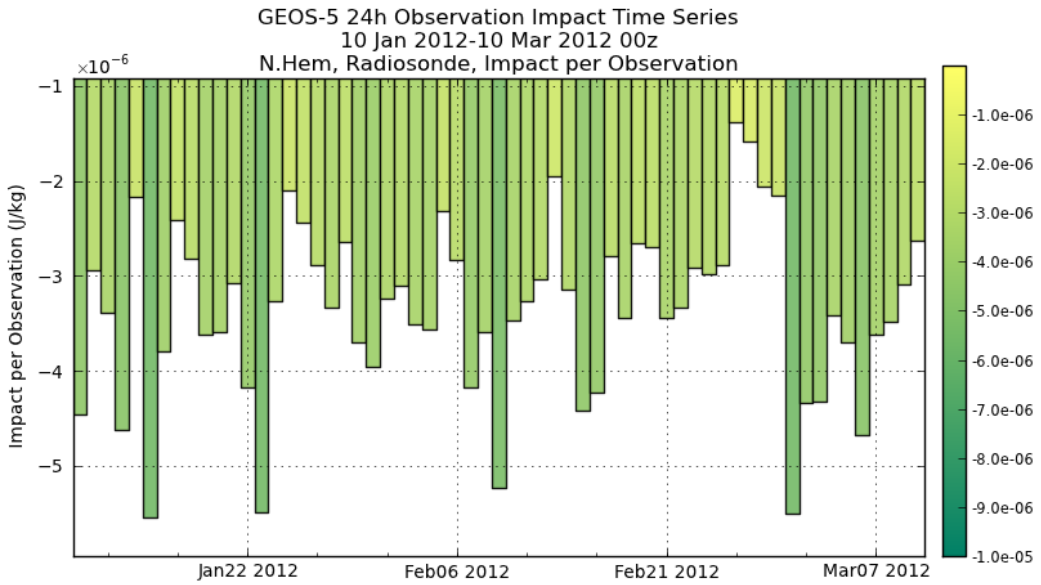
NASA/GMAO GEOS-5 24h Observation Impact Time Series
10 January – 10 March 2012 00z

- On a per-ob basis, dropsondes often have a very large impact because they are few in number and tend to be deployed in 'sensitive' areas

- For these same reasons, however, they can degrade the forecast in some cases



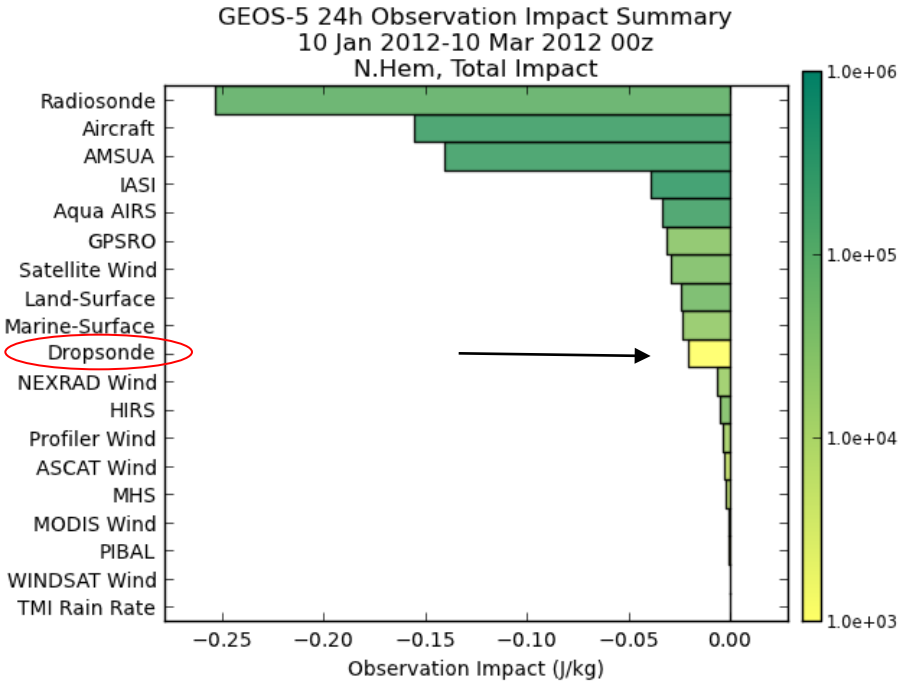
N.H. Dropsonde Impact Per Ob



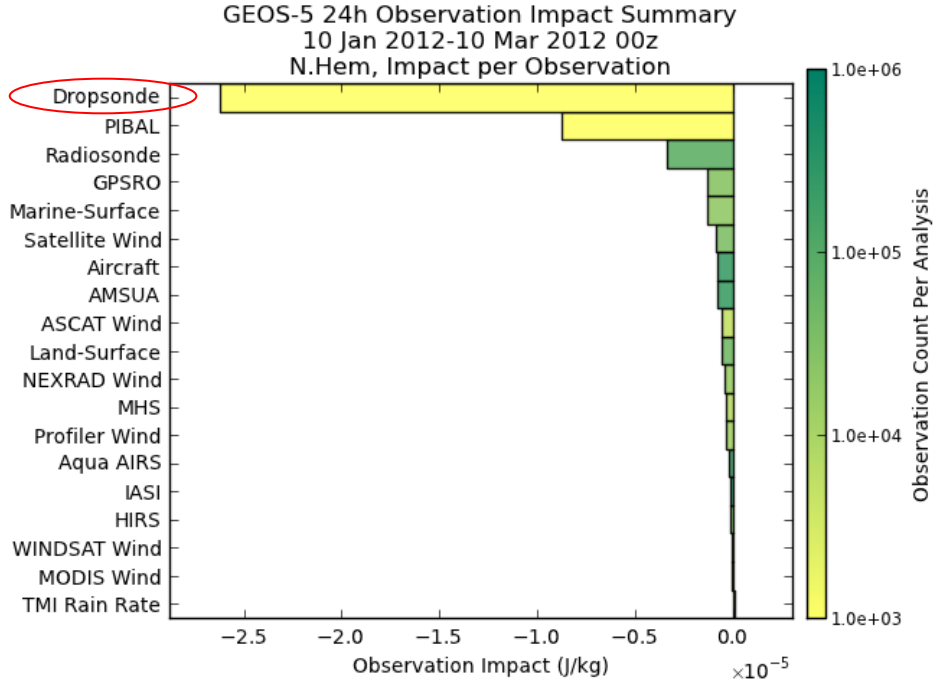
N.H. Radiosonde Impact Per Ob

NASA/GMAO GEOS-5 24h Observation Impact Summary
10 January – 10 March 2012 00z

Total Impact



Impact Per Observation

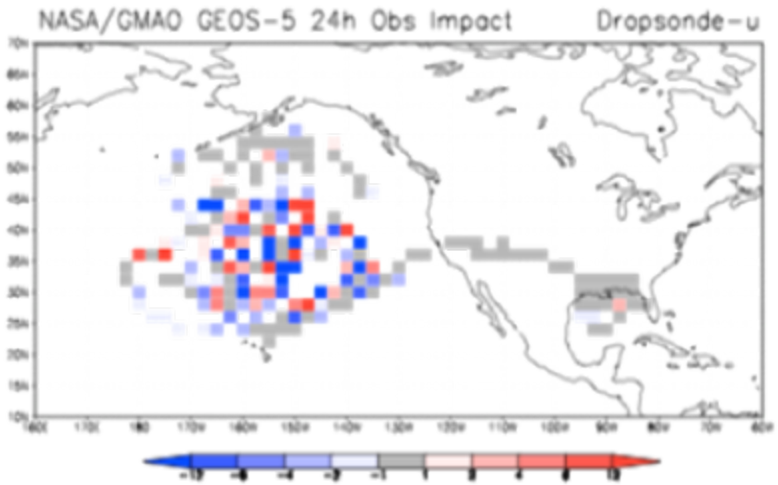


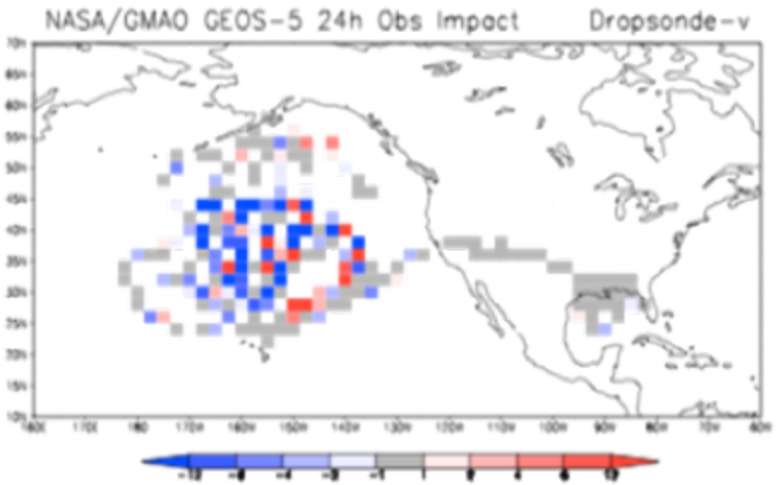
- Here, the color shading indicates observation count: green (yellow) = more (fewer) observations

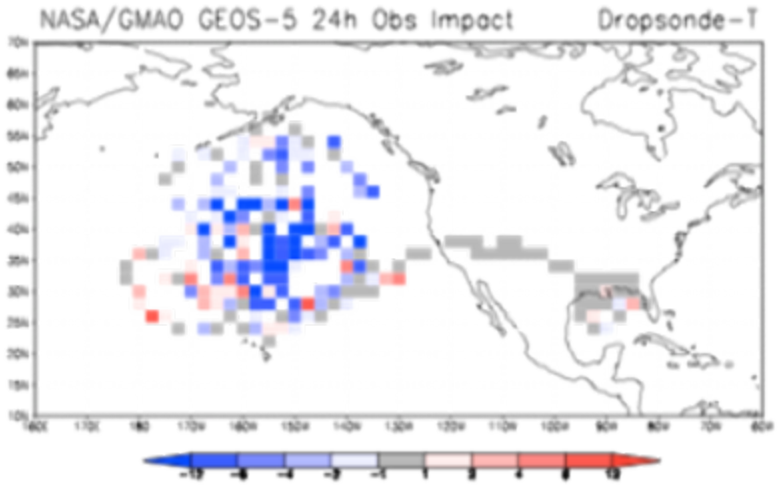
- On a per-ob basis, dropsondes have the largest beneficial impact of all observation types in the NH during the WSRP period, in terms of the 24h global error metric

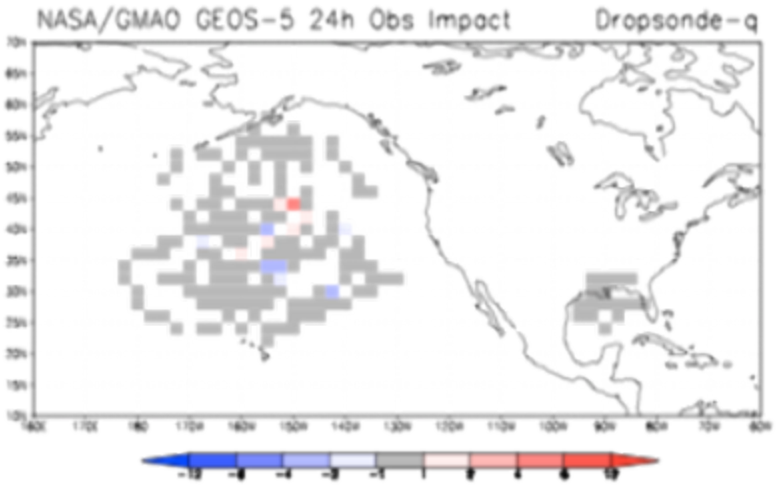
NASA/GMAO GEOS-5 24h Observation Impact Map

10 January – 10 March 2012 00z





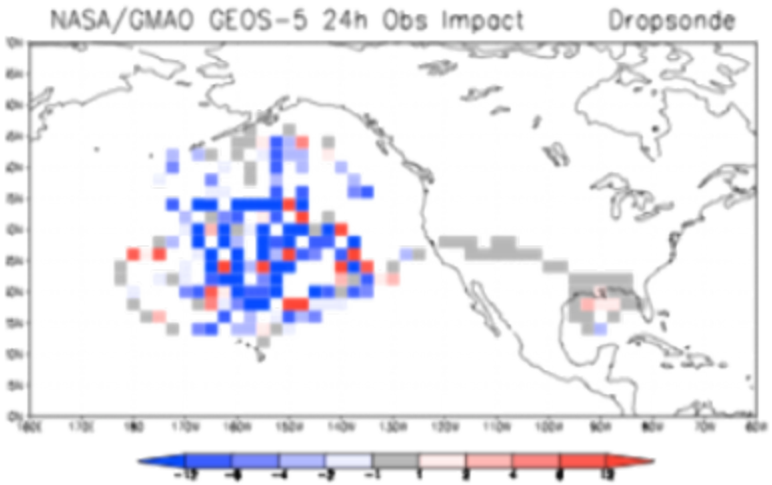


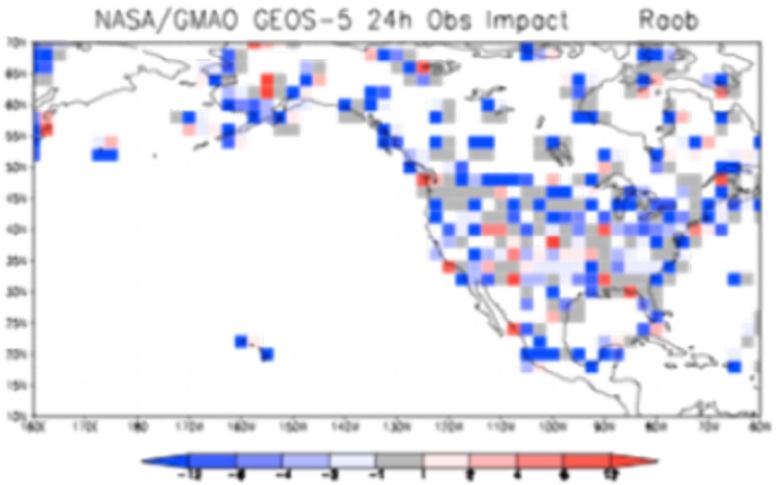


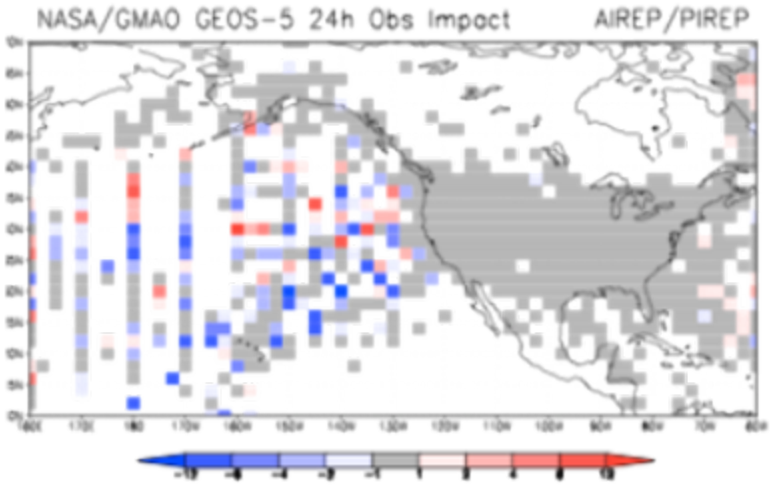
Time-averaged vertically-integrated 24h global forecast error norm (dry total energy);
Blue (red) = forecast improvement (degradation) due to assimilation

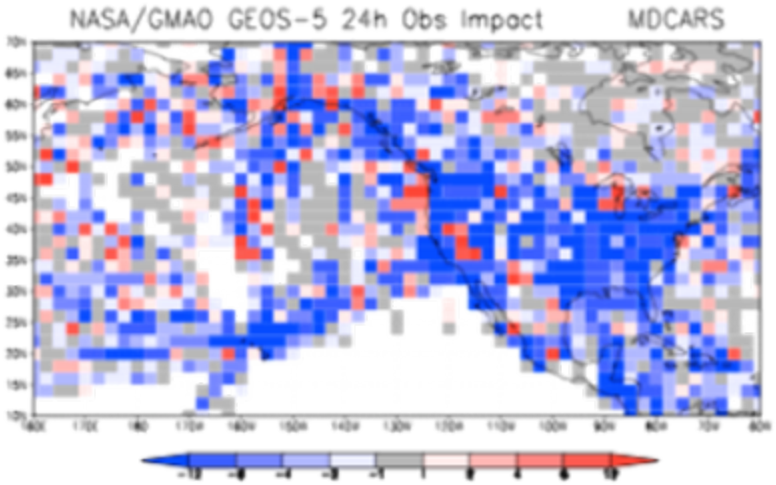
NASA/GMAO GEOS-5 24h Observation Impact Map

10 January – 10 March 2012 00z









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