

# Early validation of level 1b using the NESDIS real-time system

*November 2001 AIRS science team meeting*

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# Topics

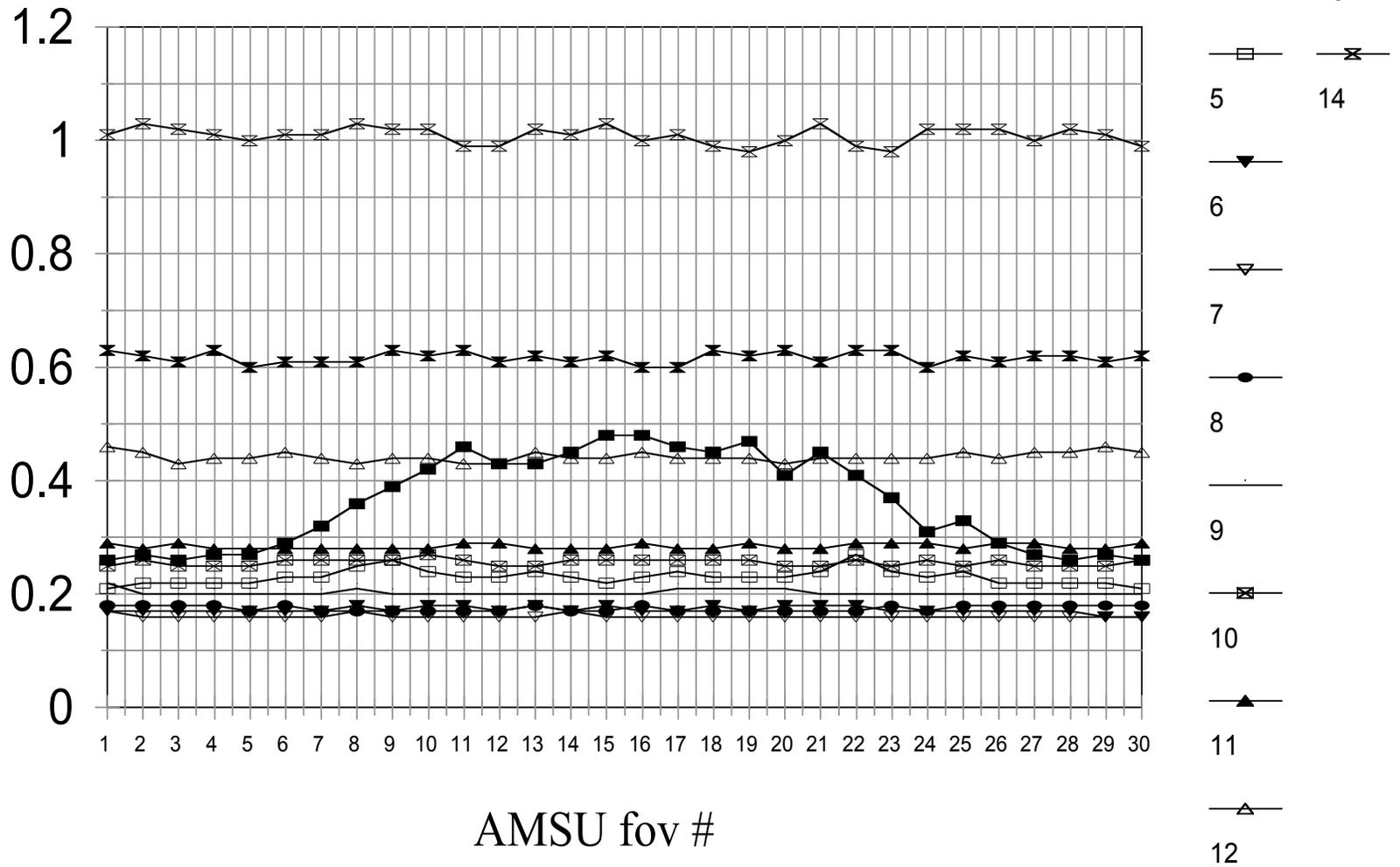
- Early validation of level 1b
  - - couple of granules
  - - global coverage
- Copy granules from JPL and process it through NOAA system to produce validation gridded files

# Couple of granules

- Ocean Night
- Display radiances -- 2D and 3D (Grads display tools, may use VIS 5D)
- Compute mean radiances as function of fov
- Examine asymmetry.
- Compute standard deviation of adjacent fovs.
- Compute measured – calculated brightness temperatures as function of fov

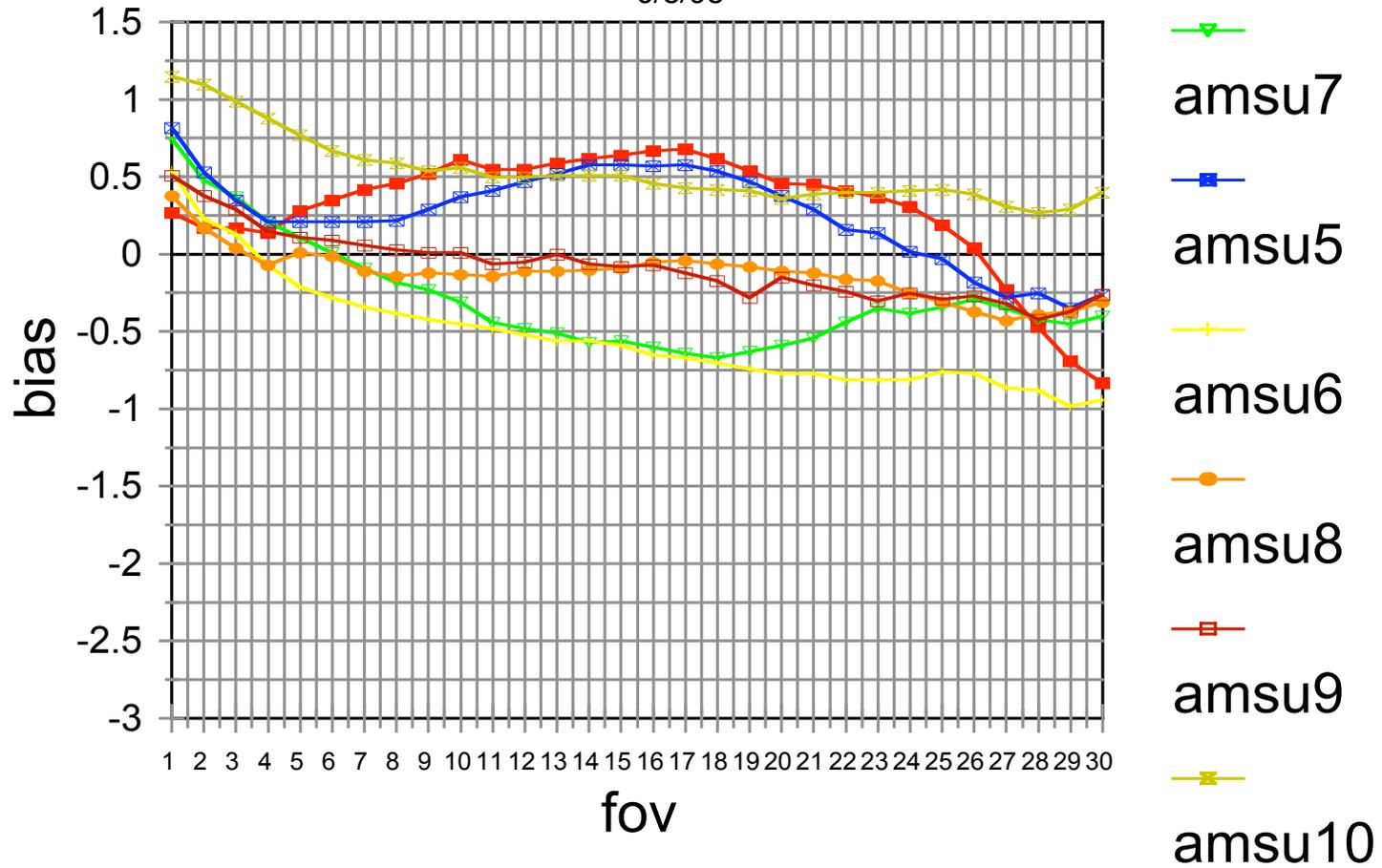


# AMSU N16 RMS- Same FOV Neighbor



# bright. temp - NCEP analysis computed

6/8/98



# Also

- Compute difference between 2616 and SST
- Superimpose differences with GOES imagery and AVHRR.
- Use AVHRR cloud amount at 15 km resolution to compute cumulative distribution function (cdf).
- Compute SST – 2616 cdf
- Select threshold and recompute measured – computed statistics and asymmetry ,etc.

## Also ...

- For “clear” cases - generate SST retrieval coefficients (based on 4 channels) and compare coefficients with synthetic coefficients.
- Compare “clear” and simulated spectra (ecmwf).

# Global Coverage

- Produce gridded files (GG (all channels) EC files)
- Generate radiance eigenvectors
- Generate principal component score gridded file
- Check information content
- Check reconstruction scores.

# Global coverage using gridded files

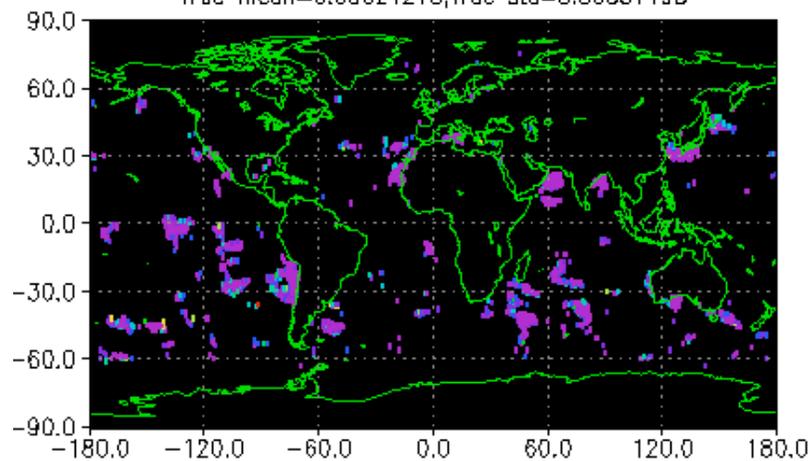
- Use 2616 and SST difference to generate new cdf and select new conservative threshold (night)
- Generate SST regression retrieval from 8 and 11 um channels (4 channels) from the night data.
- Predict SST for day and night – compute difference between predicted and observed SST and generate cdf – select threshold.
- Repeat measured – computed comparisons and adjacent fov standard deviation, etc

# Global coverage

- Gridded observed radiances (GG file)
- Gridded observed pc scores (PC file)
- Gridded ECMWF forecast (EC file)
- Use SST threshold and  $965 \text{ bt} > 273 \text{ K}$  to select clear cases.
- Generate eigenvector retrieval regression coefficients (internally we merge GG, EC and PC for clear cases)
- Apply regression coefficients to PC files to produce retrieval gridded file.
- Compare differences between retrieval and ECMWF.
- Test on independent day

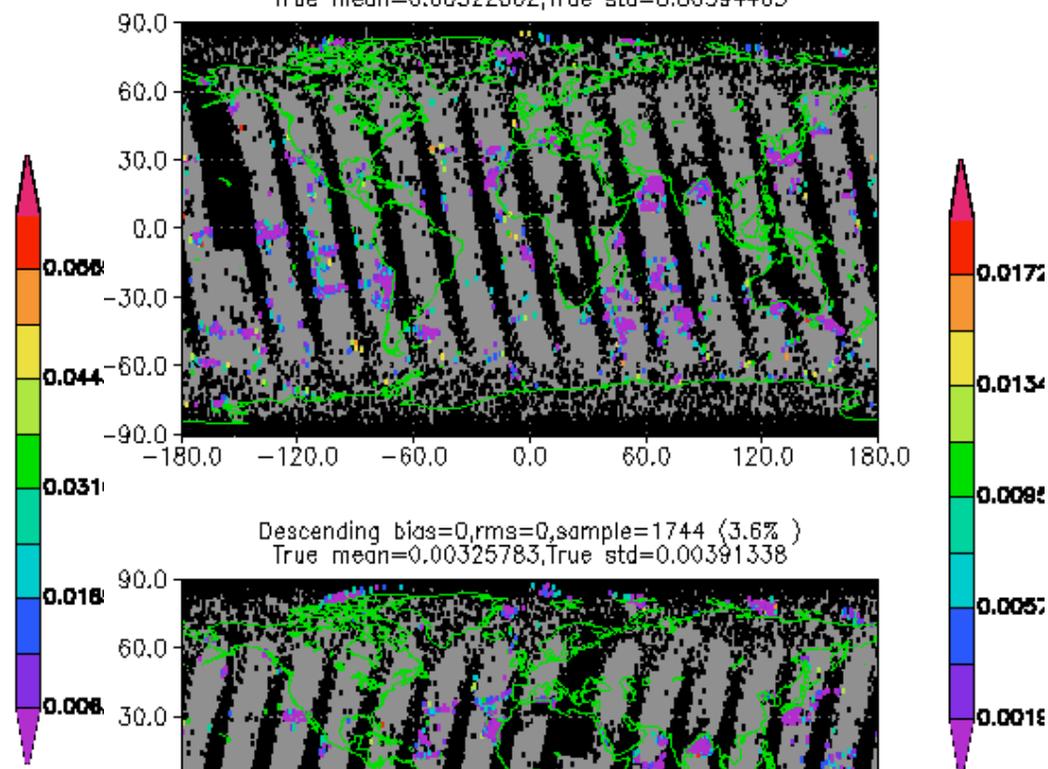
Dec. 14 2000, totcld

Ascending bias=0,rms=0,sample=1429 (100.%)  
True mean=0.00624218,True std=0.00881198

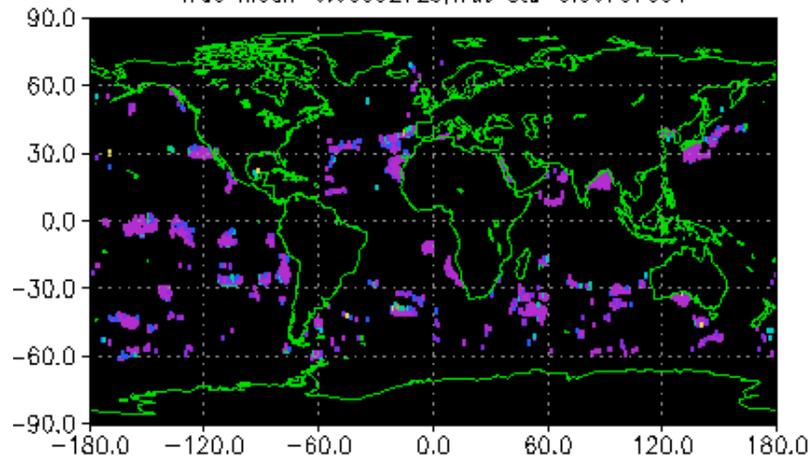


Dec. 16 2000, totcld

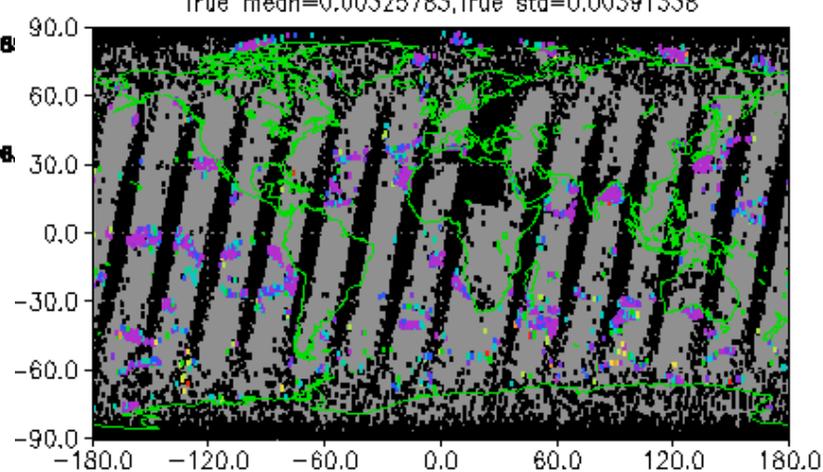
Ascending bias=0,rms=0,sample=1618 (3.4%)  
True mean=0.00322002,True std=0.00394465



Descending bias=0,rms=0,sample=1215 (100.%)  
True mean=0.00552723,True std=0.00797694

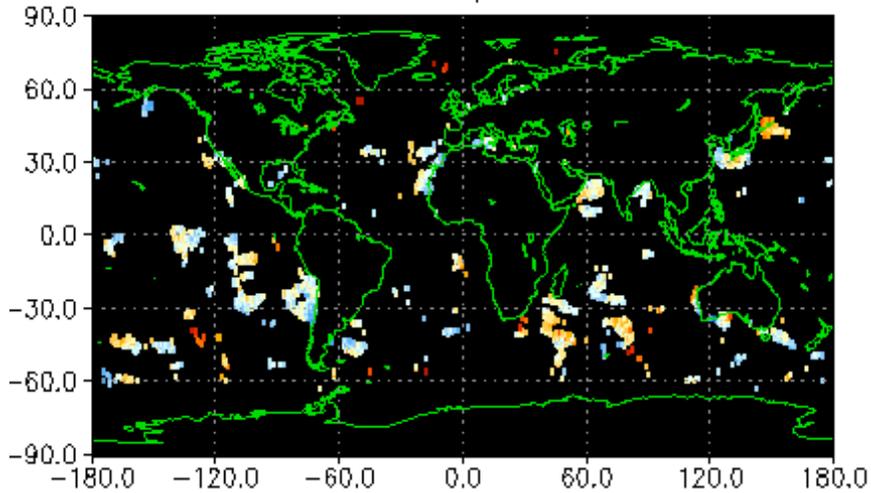


Descending bias=0,rms=0,sample=1744 (3.6%)  
True mean=0.00325783,True std=0.00391338



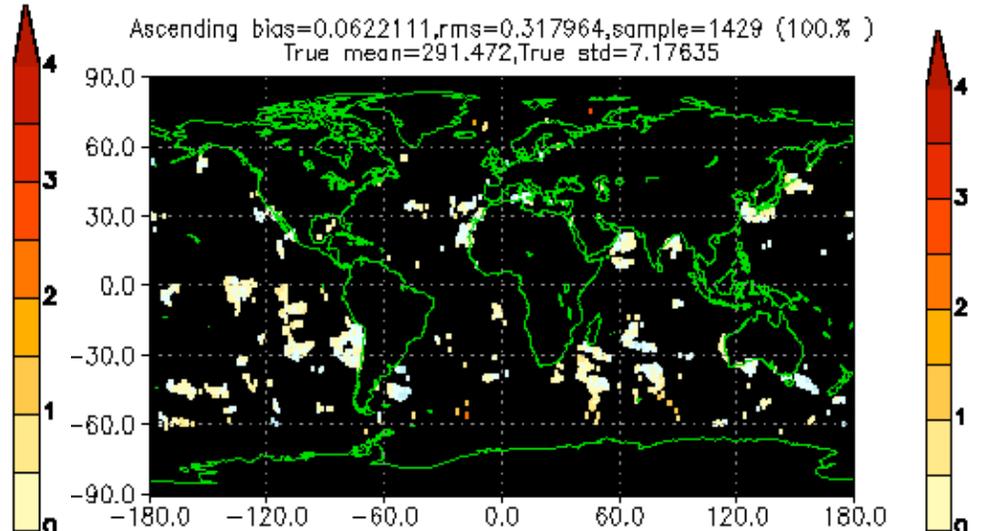
Dec. 14 2000, Temperature Error (904.8660 to 1013.948mb)

Ascending bias=-0.0702562,rms=1.09894, sample=1429( 100.% )  
True mean=286.568,True std=7.57618

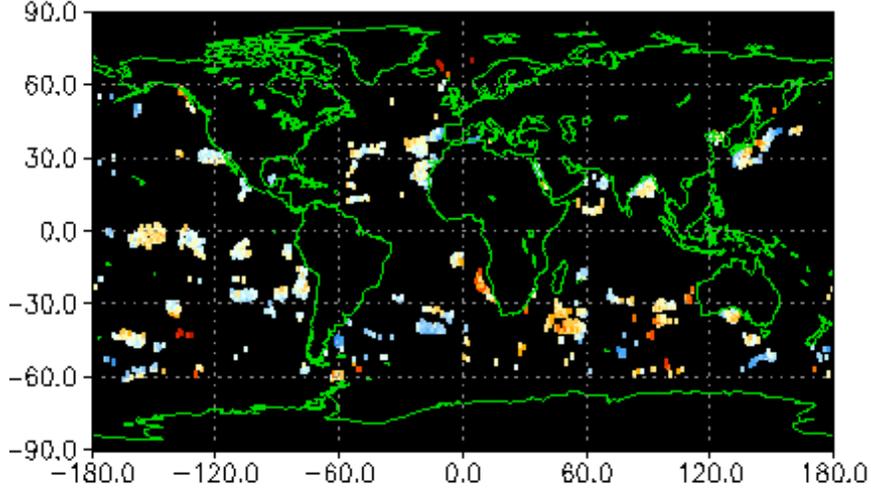


Dec. 14 2000, surft

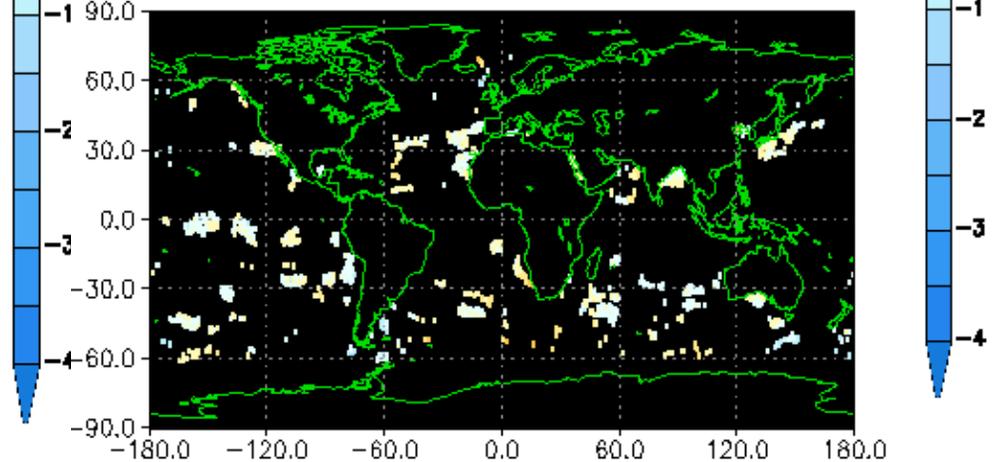
Ascending bias=0.0622111,rms=0.317964,sample=1429 (100.% )  
True mean=291.472,True std=7.17635



Descending bias=0.0306198,rms=1.13988,sample=1215 (100.% )  
True mean=286.08,True std=7.20351

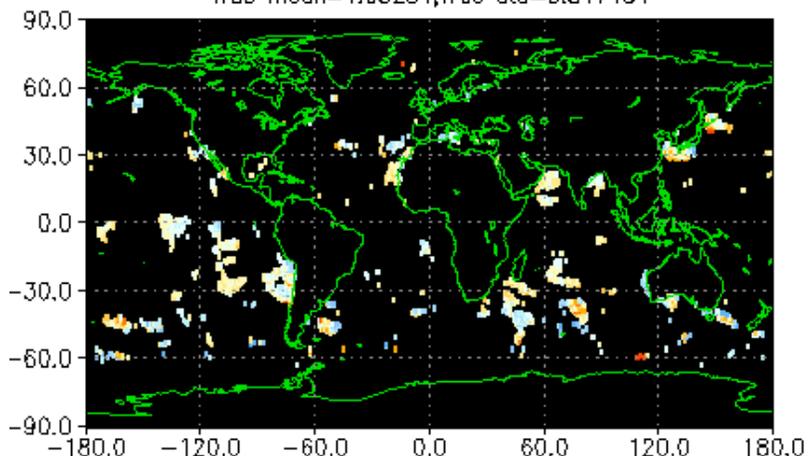


Descending bias=-0.00786545,rms=0.308057,sample=1215 (100.% )  
True mean=291.725,True std=6.94622



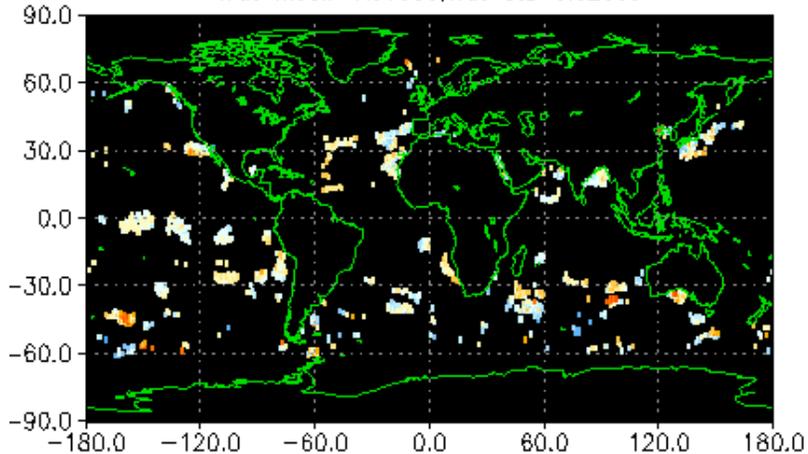
Dec. 14 2000, totw

Ascending bias=0.00896833,rms=0.114008,sample=1429 (100.%)  
True mean=1.63204,True std=0.847484



bias % error is: 0.935107, % error is: 6.9639837258891

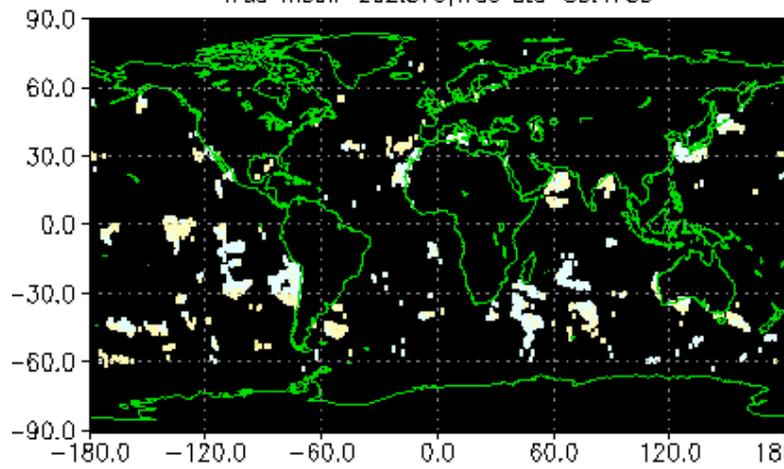
Descending bias=0.00943719,rms=0.111409,sample=1215 (100.%)  
True mean=1.59883,True std=0.82303



bias % error is: 0.954786, % error is: 6.9431396708843

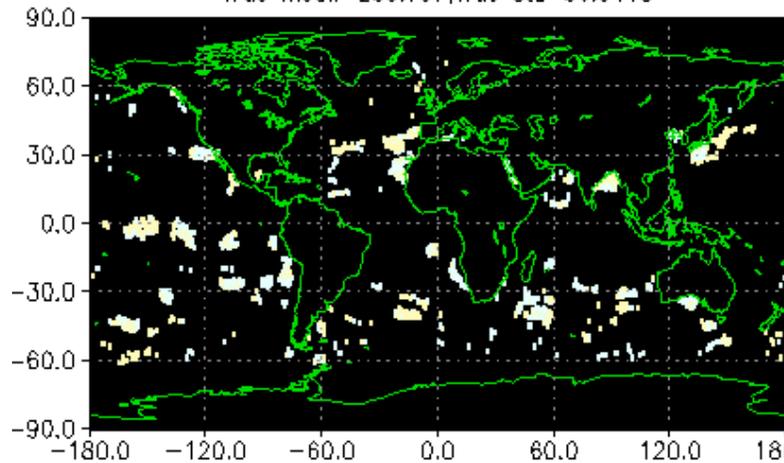
Dec. 14 2000, toto

Ascending bias=-0.575729,rms=4.3576,sample=1429 (100.%)  
True mean=262.379,True std=39.4739



bias % error is: -0.213422, % error is: 1.6462445546328

Descending bias=-0.182797,rms=3.96875,sample=1215 (100.%)  
True mean=259.797,True std=36.5418



bias % error is: -0.0712114, % error is: 1.5260145421233

# Summary

- Use Grads Web-based display tools.
- Compare measured vs calculated.
- Generate eigenvectors and look at information content.
- Find clear cases.
- Generate regression retrievals.
- Check accuracy on dependent and independent data. Compare with radiosondes
- Monitor errors over time.