

AIRS Cloud Fraction Trends from a PDF-based Approach Compared to PATMOS

AIRS Virtual Science Team Meeting

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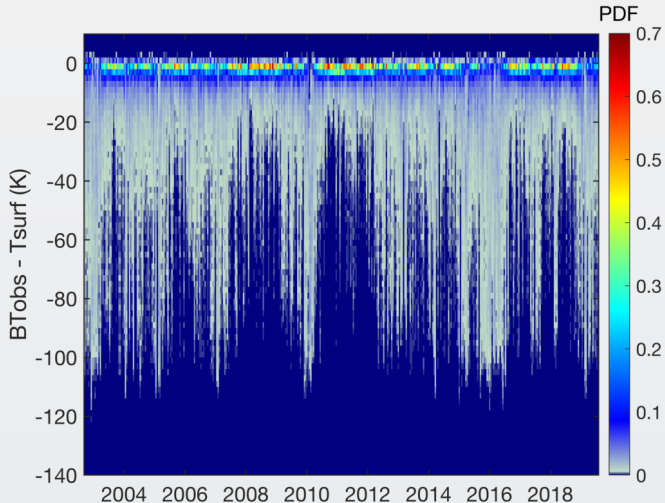
Patmosx

- Heidinger A. et. al., The Pathfinder Atmospheres-Extended AVHRR Climate Dataset, V 95 BAMS, 2014
- Starts in 1983
- AVHRR based, very high spatial resolution
- Many cloud products, not just cloud fraction
- Fairly heavily used, long-term NOAA support

Patmosx has been used for climate model studies, more below.
Validation versus AIRS L3 and/or MODIS could follow. . .

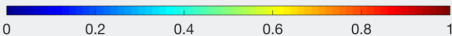
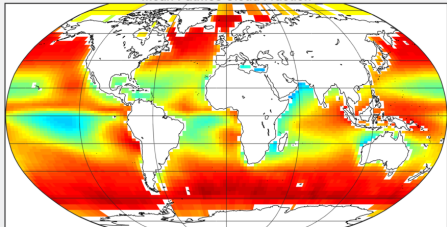
One graph

Grid point in Atlantic Ocean south of northern Africa: at $(-5,0)^{\circ}$ lat/lon, $(1.8,3.0)^{\circ}$

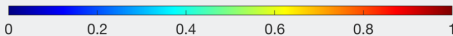
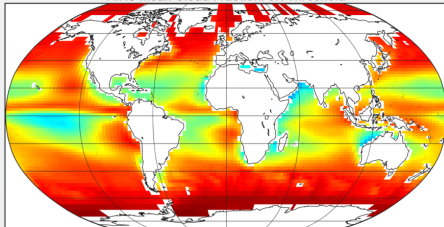


4 graphs, bottom two have block titles

Mean Patmos Cloud Fraction

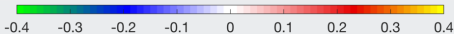
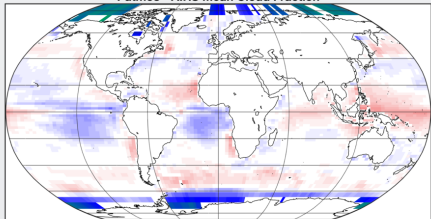


AIRS Mean Cloud Fraction: 5K Threshold



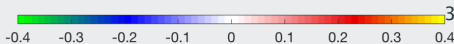
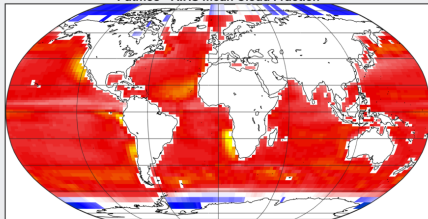
Threshold = 5K

Patmos - AIRS Mean Cloud Fraction

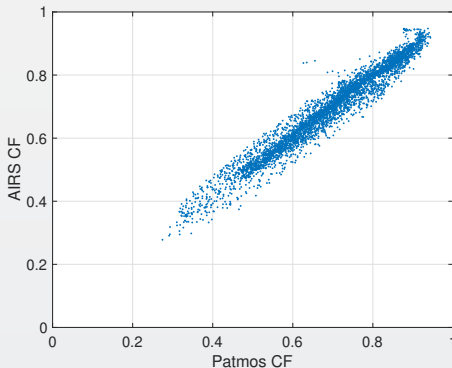


Threshold = 10K

Patmos - AIRS Mean Cloud Fraction



One graph, two column blocks below



Cloud Fraction

- Correlation Coefficient: 0.98
- Mean (Patmos - AIRS): $0.37\% \pm 2.5\%$ (std)
- Mean (Patmos - AIRS): $\pm 60^\circ$ lat = $0.03\% \pm 3\%$ (std)

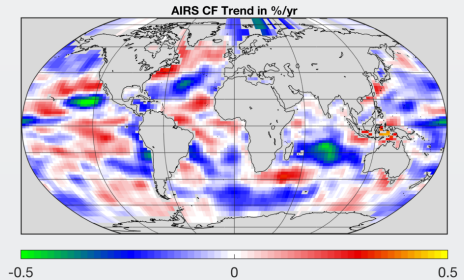
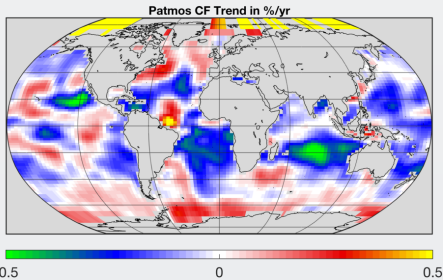
Cloud Trends

- Mean (Patmos - AIRS): -0.05 ± 0.12 %/yr (std)
- Mean (Patmos - AIRS): $\pm 60^\circ$ lat = -0.066 ± 0.015 %/yr (std)

Estimated AIRS trend uncertainty due to SST trend errors: $\sim 0.06\%/yr$ 2σ

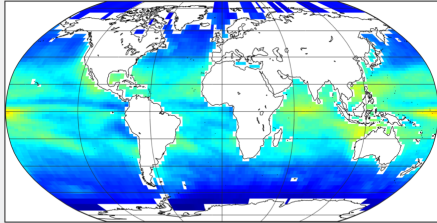
Two graphs side-by-side

- Many similarities, but note Equatorial Atlantic
- Note SAO issue for Patmosx
- Note scale is cloud fraction in %



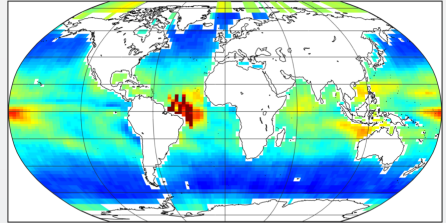
2x2 (4 graphs), no headers, use this a lot

AIRS CF Trend Unc: %/yr



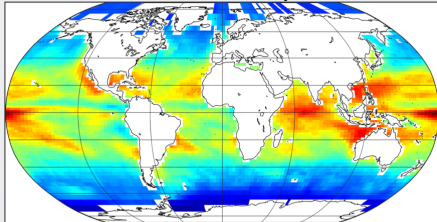
0 0.05 0.1 0.15 0.2 0.25 0.3

Patmos CF Trend Unc: %/yr



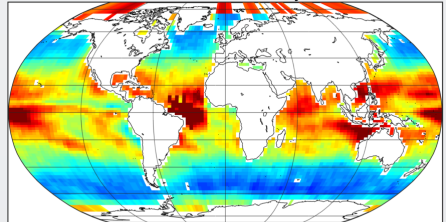
0 0.05 0.1 0.15 0.2 0.25 0.3

AIRS CF Trend Unc: %/yr



0 0.05 0.1 0.15 0.2

Patmos CF Trend Unc: %/yr



0 0.05 0.1 0.15 0.2