C6 updates to Level-3 (& Joint Level-2)

Paul Hubanks, Steve Platnick, Bill Ridgway,
Robert Pincus, & Michael King

Added, Renamed, Deleted, or Modified SDS's in Level-3

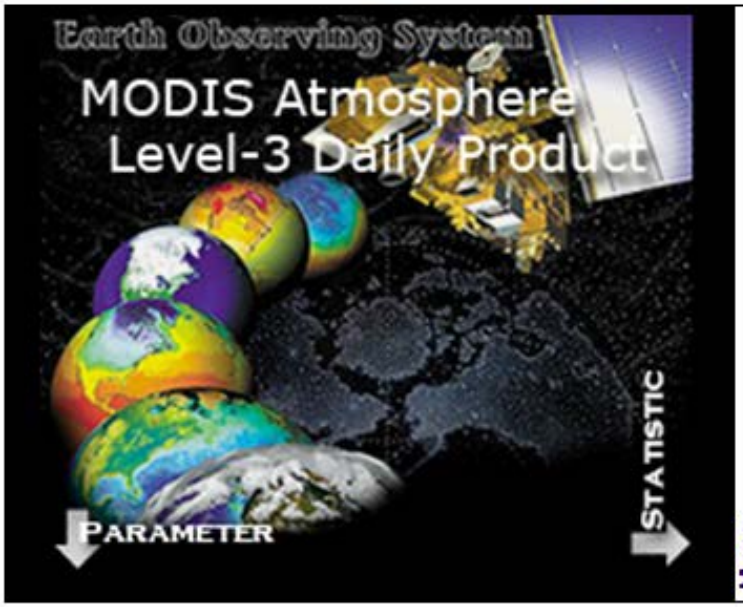
a. Viewing and Solar Geometry

L3 Daily Global (08_D3) Statistics

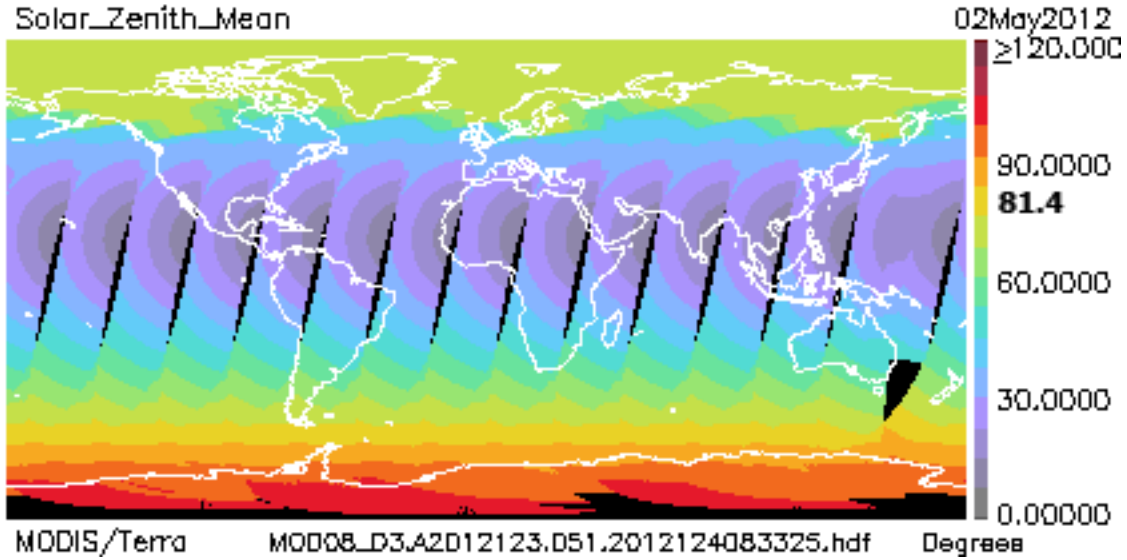
Collection 006 Updates

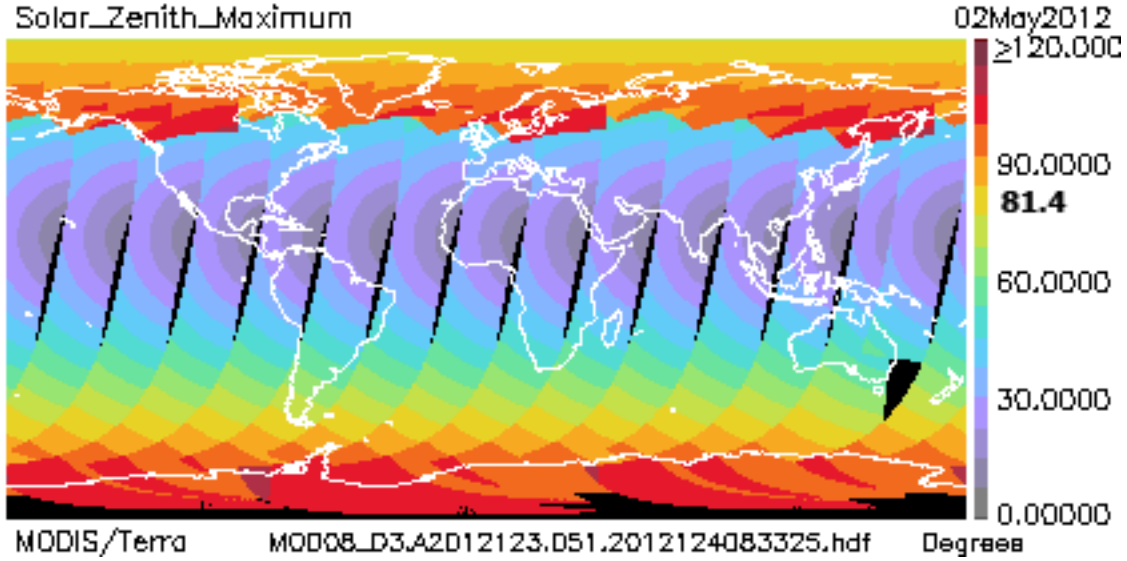
May 2012 version

= Added = Renamed = Deleted = Modified



Angles	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
01. Solar_Zenith	•	•	•	•						•																
Solar_Zenith_Day	•	•	•	•						•																
Solar_Zenith_Night	•	•	•	•						•																
02. Solar_Azimuth	•	•	•	•						•																
Solar_Azimuth_Day	•	•	•	•						•																
Solar_Azimuth_Night	•	•	•	•						•																
03. Sensor_Zenith	•	•	•	•						•																
Sensor_Zenith_Day	•	•	•	•						•																
Sensor_Zenith_Night	•	•	•	•						•																
04. Sensor_Azimuth	•	•	•	•						•																
Sensor_Azimuth_Day	•	•	•	•						•																
Sensor_Azimuth_Night	•	•	•	•						•																


Solar_Zenith_Mean
02May2012
≥120.000
90.0000
81.4
60.0000
30.0000
0.00000
MODIS/Terra
MOD08_D3.A2012123.051.2012124083325.hdf
Degrees


Solar_Zenith_Maximum
02May2012
≥120.000
90.0000
81.4
60.0000
30.0000
0.00000
MODIS/Terra
MOD08_D3.A2012123.051.2012124083325.hdf
Degrees

b. Aerosol (04_L2)

L3 Daily Global (08_D3) Statistics

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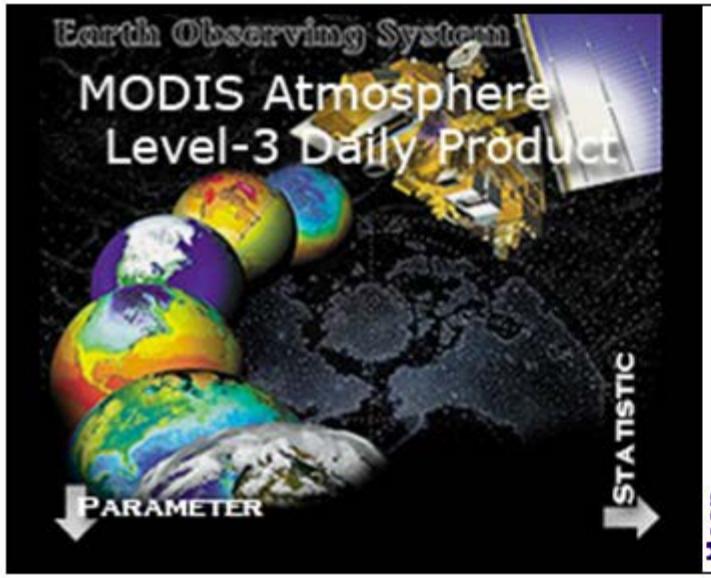

Combined Land & Ocean

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
05. Aerosol_Scattering_Angle [prev. Scatt...]	•	•	•	•			•			•																
06. Aerosol_Optical_Depth_Land_Ocean [prev. Opt...]	•	•	•	•						•																
07. Optical_Depth_Ratio_Small_Land_And_Ocean	•	•	•	•						•																
08. Reflected_Flux_Land_And_Ocean	•	•	•	•						•																
Aerosol_Avg_Cloud_Distance_Land_Ocean	•	•	•	•						•																

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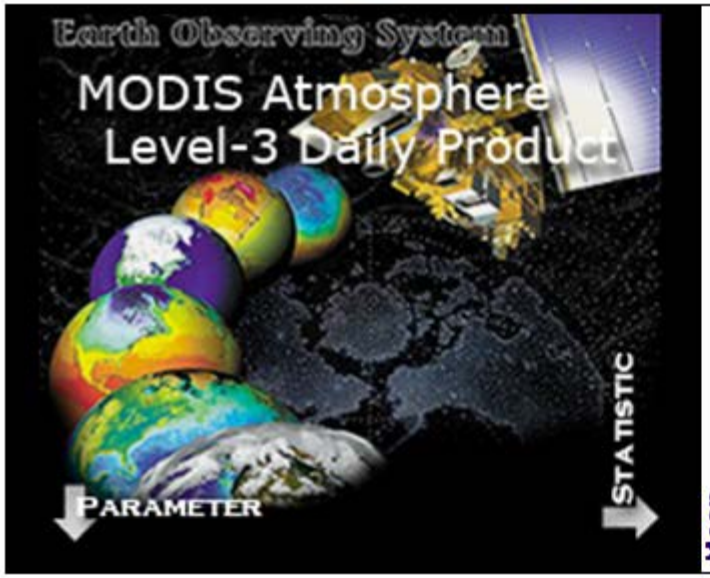

Land Only

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
09. Aerosol_Optical_Depth_Land (3) [prev. Corrected]	•	•	•	•	•	•	•	•																		
10. Optical_Depth_Ratio_Small_Land	•	•	•	•	•	•	•	•																		
11. Aerosol_Mass_Concentration_Land	•	•	•	•	•	•	•	•																		
12. Transmitted_Flux_Land (2)	•	•	•	•	•	•	•	•																		
13. Reflected_Flux_Land (3)	•	•	•	•	•	•	•	•																		
14. Angstrom_Exponent_Land [1]	•	•	•	•	•	•	•	•											•	•	•	•				
15. Mean_Reflectance_Land_All_QA47 (3)	•	•	•	•	•	•	•	•																		
16. Mean_Reflectance_Land_All_QA66 (3)	•	•	•	•	•	•	•	•																		
17. Path_Radiance_Land_QA47 (2)	•	•	•	•	•	•	•	•																		
18. Path_Radiance_Land_QA66 (2)	•	•	•	•	•	•	•	•																		
19. Critical_Reflectance_Land_QA47 (2)	•	•	•	•	•	•	•	•																		
20. Critical_Reflectance_Land_QA66 (2)	•	•	•	•	•	•	•	•																		
21. Aerosol_Cloud_Mask_Cloud_Fraction_Land	•	•	•	•						•																
22. Aerosol_Number_Pixels_Used_Land (2) to (10)	•	•	•	•						•																

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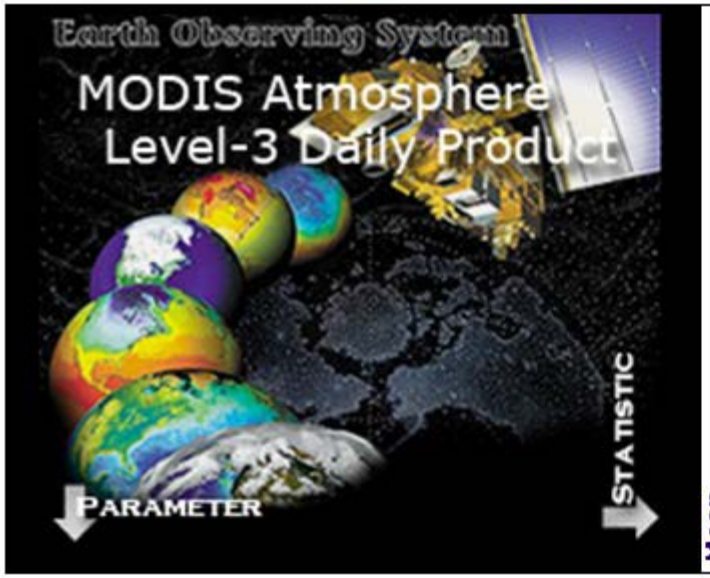

Ocean Only

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
23. Aerosol_Optical_Depth_Average_Ocean (7) [Eff]	•	•	•	•	•	•	•	•																		
24. Aerosol_Optical_Depth_Small_Ocean	•	•	•	•	•	•	•	•																		
24. Optical_Depth_Ratio_Small_Ocean	•	•	•	•	•	•	•	•																		
25. Aerosol_Effective_Radius_Ocean [prev Eff...]	•	•	•	•	•	•	•	•																		
26. Aerosol_Mass_Concentration_Ocean	•	•	•	•	•	•	•	•																		
27. Aerosol_PSML003_Ocean [prev. CCN_Ocean]	•	•	•	•	•	•	•	•																		
28. Aerosol_Angstrom_Exponent_1_Ocean [2]	•	•	•	•	•	•	•	•											•	•	•	•				
29. Aerosol_Angstrom_Exponent_2_Ocean [3]	•	•	•	•	•	•	•	•											•	•	•	•				
30. Aerosol_Asymmetry_Factor_Avg_Ocean (7)	•	•	•	•	•	•	•	•																		
31. Aerosol_Backscattering_Ratio_Avg_Ocean (7)	•	•	•	•	•	•	•	•																		
32. Transmitted_Flux_Average_Ocean (7)	•	•	•	•	•	•	•	•																		
33. Reflected_Flux_Average_Ocean (7)	•	•	•	•	•	•	•	•																		
34. Aerosol_Optical_Depth_by_models_Ocean (9) Opt	•	•	•	•	•	•		•																		
35. Aerosol_Cloud_Mask_Cloud_Fraction_Ocean	•	•	•	•						•																
36. Aerosol_Number_Pixels_Used_Ocean (1) to (10)	•	•	•	•						•																

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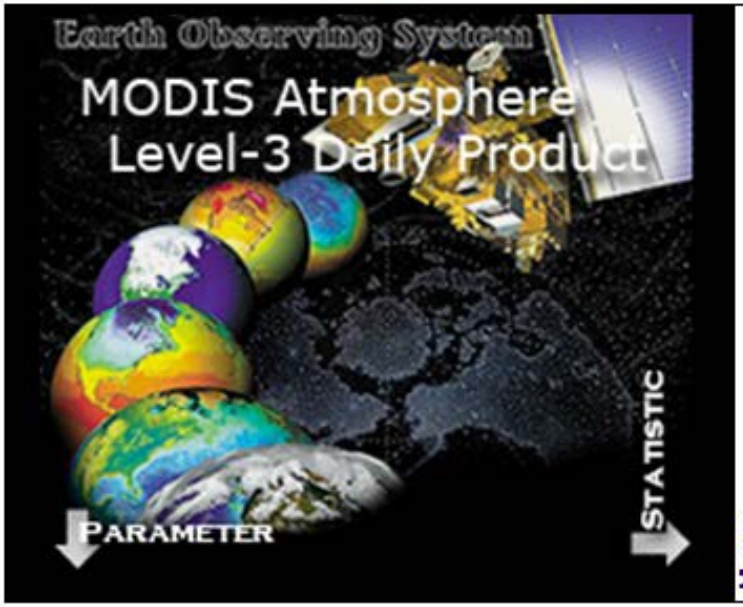

Deep Blue Aerosol

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
Deep_Blue_Aerosol_Optical_Depth_Land	•	•	•	•	•	•	•	•																		
Deep_Blue_Aerosol_Optical_Depth_550_Land	•	•	•	•	•	•	•	•																		
Deep_Blue_Angstrom_Exponent_Land	•	•	•	•	•	•	•	•																		
Deep_Blue_Single_Scattering_Albedo_Land (3)	•	•	•	•	•	•	•	•																		
AOD_Dark_Target_Deep_Blue_Combined	•	•	•	•	•	•	•	•																		

* Note that "Screen (L2 Input) by Usefulness Flag" may be requested for some Deep Blue Parameters. – Corey Bettenhausen

b. Cloud Top Properties (06_L2)

Cloud Top Properties

(New SDS's from Two New Aggregations)

1. Near-Nadir View:

   Sensor Zenith Angle LT 32 degrees

2. Cloud Height:

   High Clouds (CTP LT 440 hPa)

   Middle Clouds (680 GT CTP GE 440)

   Low Clouds (CTP GE 680 hPa)

1 hPa = 1 mb

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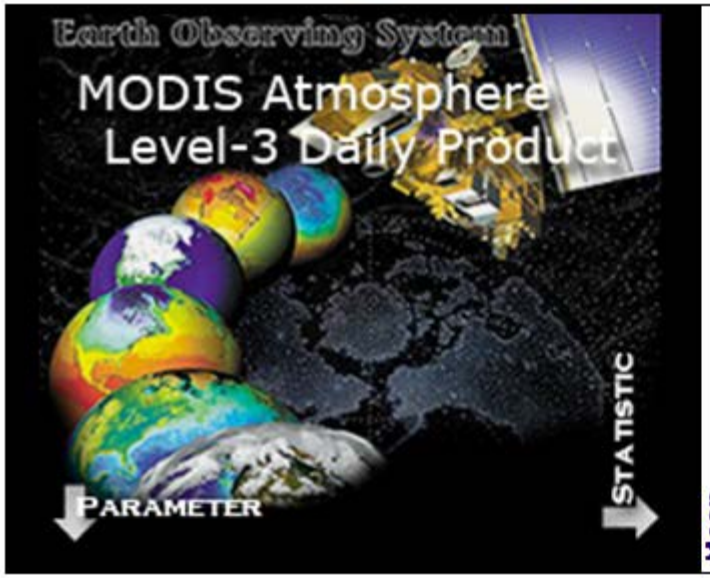

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
Cloud Top Properties																										
41. Cloud_Top_Pressure	•	•	•	•			•			•															•	
Cloud_Top_Pressure_ISCCP[8] [Day? Night?]																								•		
42. Cloud_Top_Pressure_Day	•	•	•	•			•			•															•	
43. Cloud_Top_Pressure_Night	•	•	•	•			•			•															•	
Cloud_Top_Pressure_Nadir	•	•	•	•						•																
Cloud_Top_Pressure_Nadir_Day	•	•	•	•						•																
Cloud_Top_Pressure_Nadir_Night	•	•	•	•						•																
H. Cloud_Top_Pressure_Nadir_High	•	•	•	•						•																
H. Cloud_Top_Pressure_Nadir_Day_High	•	•	•	•						•																
H. Cloud_Top_Pressure_Nadir_Night_High	•	•	•	•						•																
M. Cloud_Top_Pressure_Nadir_Middle	•	•	•	•						•																
M. Cloud_Top_Pressure_Nadir_Day_Middle	•	•	•	•						•																
M. Cloud_Top_Pressure_Nadir_Night_Middle	•	•	•	•						•																
L. Cloud_Top_Pressure_Nadir_Low	•	•	•	•						•																
L. Cloud_Top_Pressure_Nadir_Day_Low	•	•	•	•						•																
L. Cloud_Top_Pressure_Nadir_Night_Low	•	•	•	•						•																

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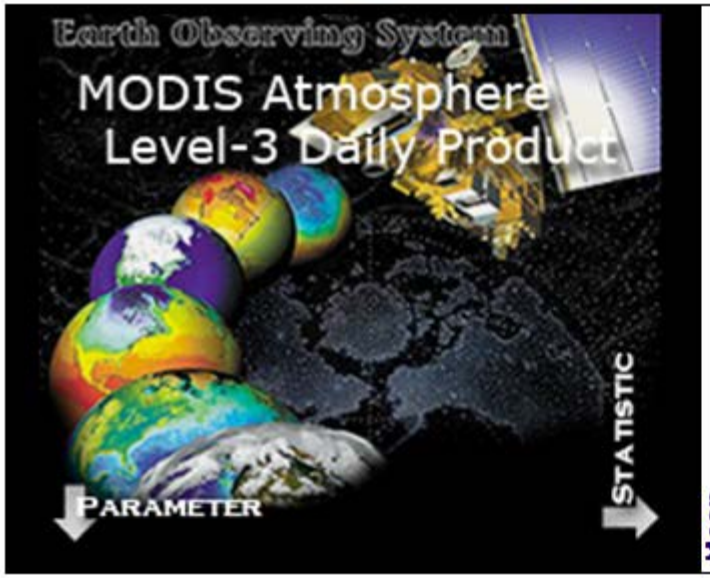

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
44. Cloud_Top_Temperature	•	•	•	•			•			•																
45. Cloud_Top_Temperature_Day	•	•	•	•			•			•																
46. Cloud_Top_Temperature_Night	•	•	•	•			•			•																
Cloud_Top_Temperature_Nadir	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Day	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Night	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_High	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Day_High	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Night_High	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Middle	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Day_Middle	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Night_Middle	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Low	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Day_Low	•	•	•	•						•																
Cloud_Top_Temperature_Nadir_Night_Low	•	•	•	•						•																

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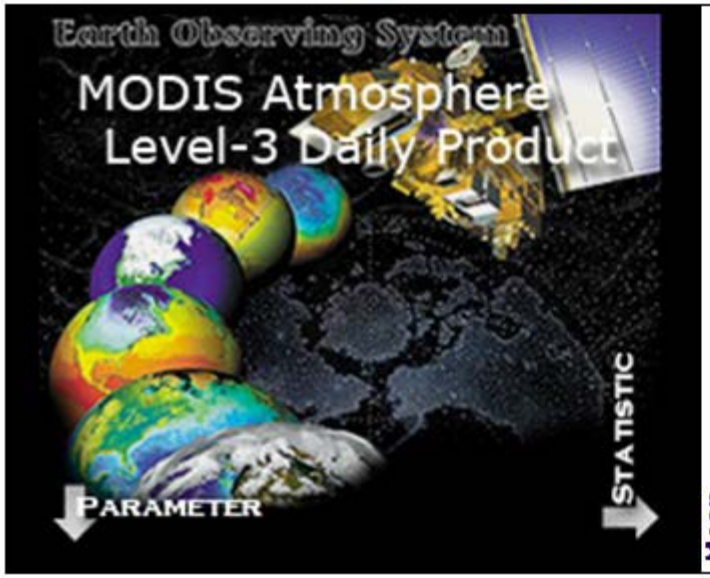

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
47. Cloud_Effective_Emissivity	•	•	•	•			•			•																
48. Cloud_Effective_Emissivity_Day	•	•	•	•			•			•																
49. Cloud_Effective_Emissivity_Night	•	•	•	•			•			•																
Cloud_Effective_Emissivity _Nadir	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Day	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Night	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_High	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Day_High	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Night_High	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Middle	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Day_Middle	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Night_Middle	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Low	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Day_Low	•	•	•	•						•																
Cloud_Effective_Emissivity _Nadir_Night_Low	•	•	•	•						•																

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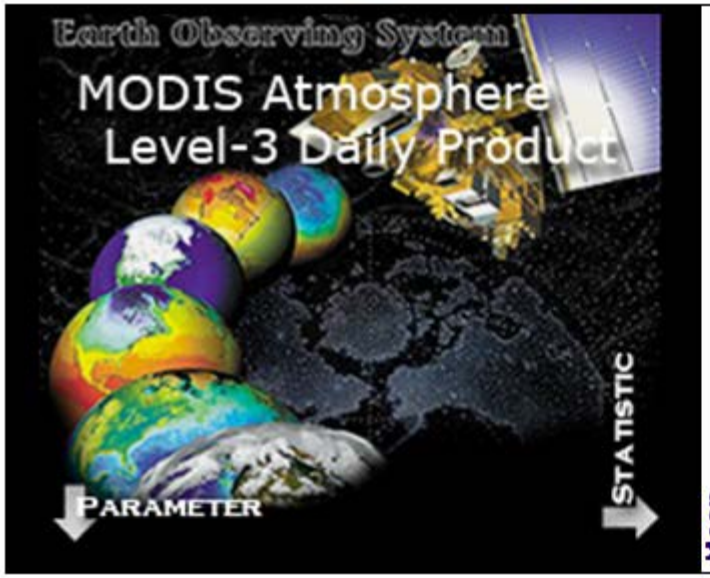

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
50. Cloud_Fraction	•	•	•	•			•			•																
51. Cloud_Fraction_Day	•	•	•	•			•			•																
52. Cloud_Fraction_Night	•	•	•	•			•			•																
Cloud_Fraction_Nadir	•	•	•	•						•																
Cloud_Fraction_Nadir_Day	•	•	•	•						•																
Cloud_Fraction_Nadir_Night	•	•	•	•						•																
Cloud_Fraction_Nadir_High	•	•	•	•						•																
Cloud_Fraction_Nadir_Day_High	•	•	•	•						•																
Cloud_Fraction_Nadir_Night_High	•	•	•	•						•																
Cloud_Fraction_Nadir_Middle	•	•	•	•						•																
Cloud_Fraction_Nadir_Day_Middle	•	•	•	•						•																
Cloud_Fraction_Nadir_Night_Middle	•	•	•	•						•																
Cloud_Fraction_Nadir_Low	•	•	•	•						•																
Cloud_Fraction_Nadir_Day_Low	•	•	•	•						•																
Cloud_Fraction_Nadir_Night_Low	•	•	•	•						•																

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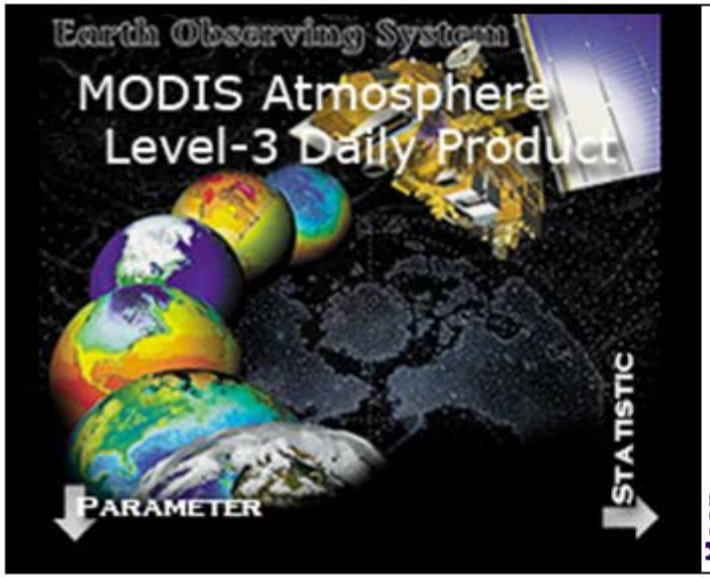

	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
Cloud_Top_Height	•	•	•	•			•			•																
Cloud_Top_Height_Day	•	•	•	•			•			•																
Cloud_Top_Height_Night	•	•	•	•			•			•																
Cloud_Top_Height _Nadir	•	•	•	•						•																
Cloud_Top_Height _Nadir_Day	•	•	•	•						•																
Cloud_Top_Height _Nadir_Night	•	•	•	•						•																
Cloud_Top_Height _Nadir_High	•	•	•	•						•																
Cloud_Top_Height _Nadir_Day_High	•	•	•	•						•																
Cloud_Top_Height _Nadir_Night_High	•	•	•	•						•																
Cloud_Top_Height _Nadir_Middle	•	•	•	•						•																
Cloud_Top_Height _Nadir_Day_Middle	•	•	•	•						•																
Cloud_Top_Height _Nadir_Night_Middle	•	•	•	•						•																
Cloud_Top_Height _Nadir_Low	•	•	•	•						•																
Cloud_Top_Height _Nadir_Day_Low	•	•	•	•						•																
Cloud_Top_Height _Nadir_Night_Low	•	•	•	•						•																

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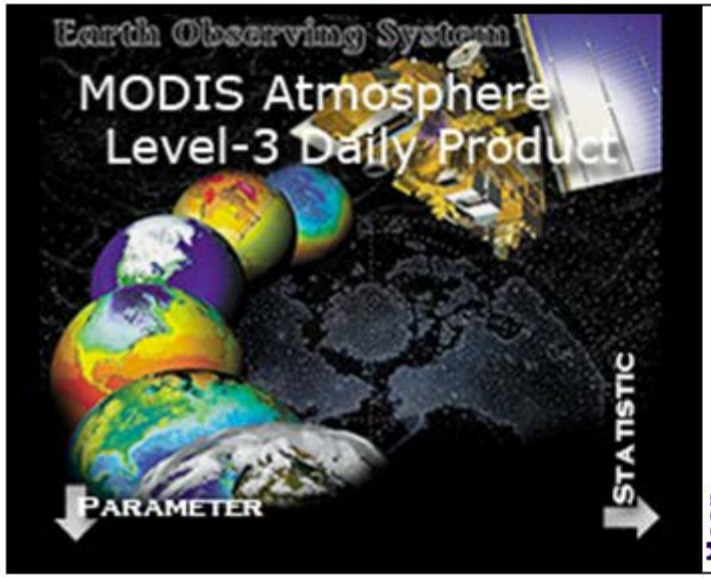
May 2012 version

= Added = Renamed = Deleted = Modified



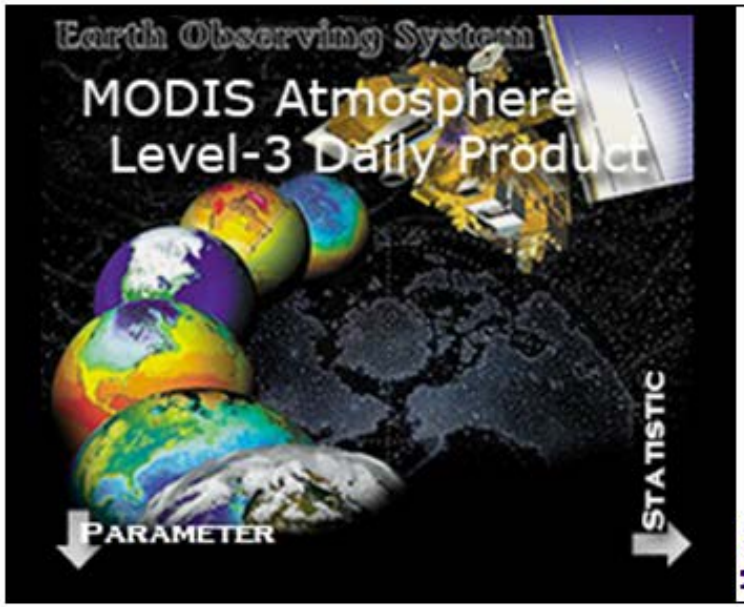
	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
53. Cirrus_Fraction_Infrared (prev. no clear sky)									•	•																
54. High_Cloud_Fraction_Infrared (")									•	•																
Overshooting_Thunderstorm_Top									•	•																
55. Cloud_Phase_Infrared							•																			
56. Cloud_Phase_Infrared_Day							•																	•		
56. Cloud_Phase_Infrared_Night							•																	•		
Cloud_Fraction_Infrared_Liquid (tbd)									•	•																
Cloud_Fraction_Infrared_Ice (tbd)									•	•																
Cloud_Fraction_Infrared_Mixed (tbd)									•	•																
Cloud_Fraction_Infrared_Undetermined (tbd)									•	•																
Cloud_Fraction_Infrared_Combined (tbd)									•	•																

L3 Daily Global (08_D3) Statistics

Collection 006 Updates

May 2012 version

= Added = Renamed = Deleted = Modified



	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
Sunglint_Fraction_Day									•	•																
Snow_Fraction_Day									•	•																
Snow_Fraction_Night									•	•																
Ocean_Fraction_Day									•	•																
Ocean_Fraction_Night									•	•																
Coast_Fraction_Day									•	•																
Coast_Fraction_Night									•	•																
Desert_Fraction_Day									•	•																
Desert_Fraction_Night									•	•																
Land_Fraction_Day									•	•																
Land_Fraction_Night									•	•																

Note: All Surface Type parameters above are computed where the Cloud Top Properties Retrieval was successful

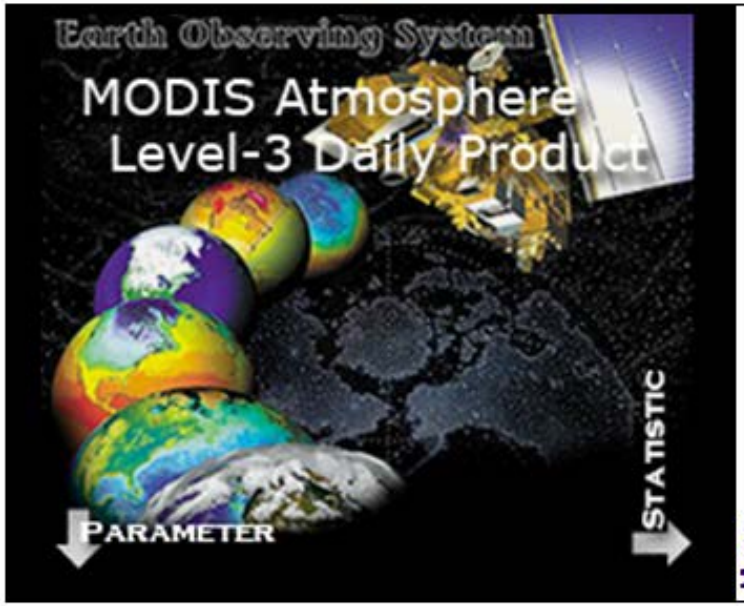
c. Cloud Optical Properties (06_L2)

L3 Daily Global (08_D3) Statistics

Collection 006 Updates

May 2012 version

= Added = Renamed = Deleted = Modified



Cloud Optical Properties (Primary Retrieval)

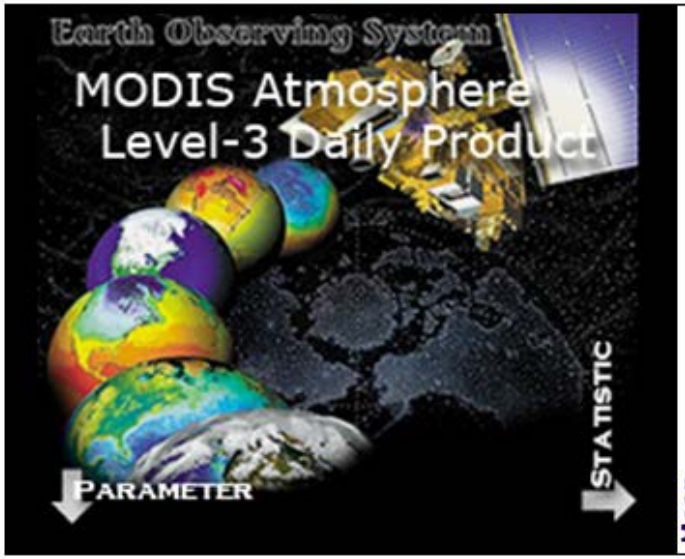
	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
58. Cloud_Optical_Thickness_Liquid	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•					•	•	•	•
59. Cloud_Optical_Thickness_Ice	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•					•	•	•	•
60. Cloud_Optical_Thickness_Undetermined	•	•	•	•	•	•									•	•	•	•								
61. Cloud_Optical_Thickness_Combined	•	•	•	•	•	•									•	•	•	•								•
62. Cloud_Optical_Thickness_ISCCP [8]							•	•																		•
63. Cloud_Effective_Radius_Liquid	•	•	•	•	•	•	•	•			•	•												•	•	•
64. Cloud_Effective_Radius_Ice	•	•	•	•	•	•	•	•			•	•												•	•	•
65. Cloud_Effective_Radius_Undetermined	•	•	•	•	•	•																				
66. Cloud_Effective_Radius_Combined	•	•	•	•	•	•																				
67. Cloud_Water_Path_Liquid	•	•	•	•	•	•	•	•			•	•														
68. Cloud_Water_Path_Ice	•	•	•	•	•	•	•	•			•	•														
69. Cloud_Water_Path_Undetermined	•	•	•	•	•	•																				
70. Cloud_Water_Path_Combined	•	•	•	•	•	•																				
71. Cloud_Phase_Optical_Properties																								•		

L3 Daily Global (08_D3) Statistics

Collection 006 Updates

May 2012 version

= Added = Renamed = Deleted = Modified



	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
(Primary Cloud Fraction)																										
72. Cloud_Retrieval_Fraction_Liquid									•	•																
73. Cloud_Retrieval_Fraction_Ice									•	•																
74. Cloud_Retrieval_Fraction_Undetermined									•	•																
75. Cloud_Retrieval_Fraction_Combined									•	•																
(Single-Layer Cloud Fraction)																										
83. Cloud_Retrieval_Fraction_1L_Liquid									•	•																
84. Cloud_Retrieval_Fraction_1L_Ice									•	•																
(Multi-Layer Cloud Fraction)																										
85. Cloud_Retrieval_Fraction_ML_Liquid									•	•																
86. Cloud_Retrieval_Fraction_ML_Ice									•	•																
87. Cloud_Retrieval_Fraction_ML_Undetermined									•	•																
88. Cloud_Retrieval_Fraction_ML_Combined									•	•																
(Ratio of Multi-Layer Clouds to All-Layer Clouds by Phase)																										
89. ML_Ratio_Liquid (prev. Fraction)									•	•																
90. ML_Ratio_Ice (prev. Fraction)									•	•																
91. ML_Ratio_Undetermined (prev. Fraction)									•	•																
92. ML_Ratio_Combind (prev. Fraction)									•	•																

Table 6. Two key L2 QA Flags used to compute the Cloud Optical Properties Cloud Fraction.

L2 QA Flag	Flag Value	Meaning
Primary Cloud Retrival Phase Flag	0	Cloud Mask Undetermined (Missing or Fill)
	1	Not Processed (Typically Clear)
	2	Liquid Water Cloud
	3	Ice Cloud
	4	Undetermined Phase Cloud
Primary Cloud Retrieval Outcome Flag	0	Retrieval Not Attempted or Unsuccessful
	1	Retrieval Successful

$$\text{Cloud Fraction Liquid} = \text{SCRW} / \text{Total}$$

$$\text{Cloud Fraction Ice} = \text{SCRI} / \text{Total}$$

$$\text{Cloud Fraction Undetermined} = \text{SCRU} / \text{Total}$$

$$\text{Cloud Fraction Combined} = (\text{SCRW}+\text{SCRI}+\text{SCRU}) / \text{Total}$$

where,

SCRW = Number of **Successful** Liquid Water Cloud Retrievals

SCRI = Number of **Successful** Ice Cloud Retrievals

SCRU = Number of **Successful** Undetermined Phase Cloud Retrievals

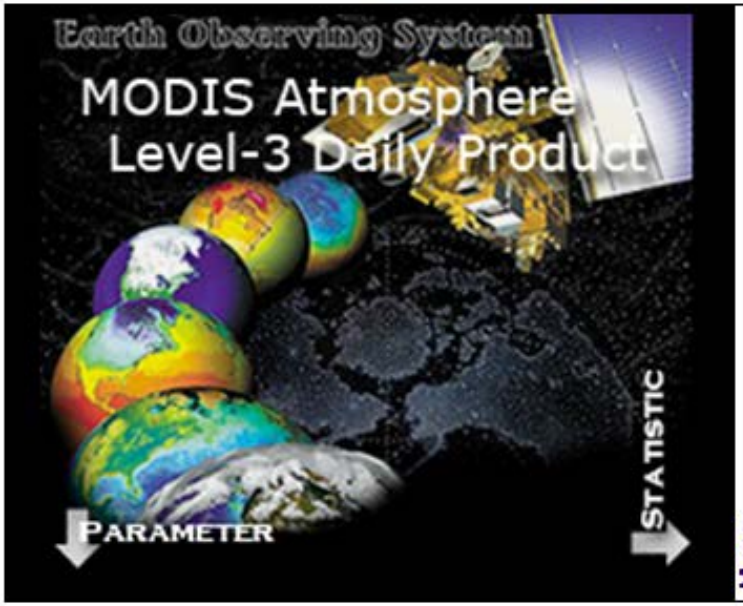
Total = Number of Clear + **Successful** Cloudy Retrievals for all Phases

L3 Daily Global (08_D3) Statistics

Collection 006 Updates

May 2012 version

= Added = Renamed = Deleted = Modified



	Mean	Standard_Deviation	Minimum	Maximum	QA_Mean	QA_Standard_Deviation	Histogram_Counts (n)	Confidence_Histogram (4)	Fraction	Pixel_Counts	Mean_Uncertainty	QA_Mean_Uncertainty	Log_Mean_Uncertainty	QA_Log_Mean_Uncertainty	Log_Mean	Log_Standard_Deviation	QA_Log_Mean	QA_Log_Standard_Deviation	Regression_Slope	Regression_Intercept	Regression_R-Squared	Regression_Mean_Square_Error	Joint_Histogram_vs_Effect_Radius (nxn)	Joint_Histogram_vs_Temperature (nxn)	Joint_Histogram_vs_Emissivity (nxn)	Joint_Histogram_vs_Pressure (nxn)
(Supplementary 1.6/2.1 Retrieval)																										
93. Cloud_Optical_Thickness_1621_Liquid [6]	•	•	•	•	•	•	•																•			
94. Cloud_Optical_Thickness_1621_Ice [7]	•	•	•	•	•	•	•																•			
95. Cloud_Effective_Radius_1621_Liquid	•	•	•	•	•	•	•																			
96. Cloud_Effective_Radius_1621_Ice	•	•	•	•	•	•	•																			
97. Cloud_Water_Path_1621_Liquid	•	•	•	•	•	•	•																			
98. Cloud_Water_Path_1621_Ice	•	•	•	•	•	•	•																			
99. Cloud_Retrieval_Fraction_1621_Liquid									•	•																
100. Cloud_Retrieval_Fraction_1621_Ice									•	•																
(Supplementary 1.6 Retrieval)																										
Cloud_Effective_Radius_16_Liquid	•	•	•	•	•	•	•	•			•	•											•	•		
Cloud_Effective_Radius_16_Ice	•	•	•	•	•	•	•	•			•	•											•	•		
(Supplementary 3.7 Retrieval)																										
Cloud_Effective_Radius_37_Liquid	•	•	•	•	•	•	•	•			•	•											•	•		
Cloud_Effective_Radius_37_Ice	•	•	•	•	•	•	•	•			•	•											•	•		

New Statistics Proposed for Level-3

Aerosol

"QA_Counts"

sum of QA Confidence Flags within each 1° box

(This new Statistic relates to "Pixel_Counts" and will be used in Post-Processing)

"Num_Days"

number of days with at least six L2 (10km) Aerosol retrievals within 1° box (For Post-Processing)

Cloud

"Median"

numerical value separating the higher half of a population from the lower half (Means only can be misleading)

“Standard Deviation” in Multiday L3

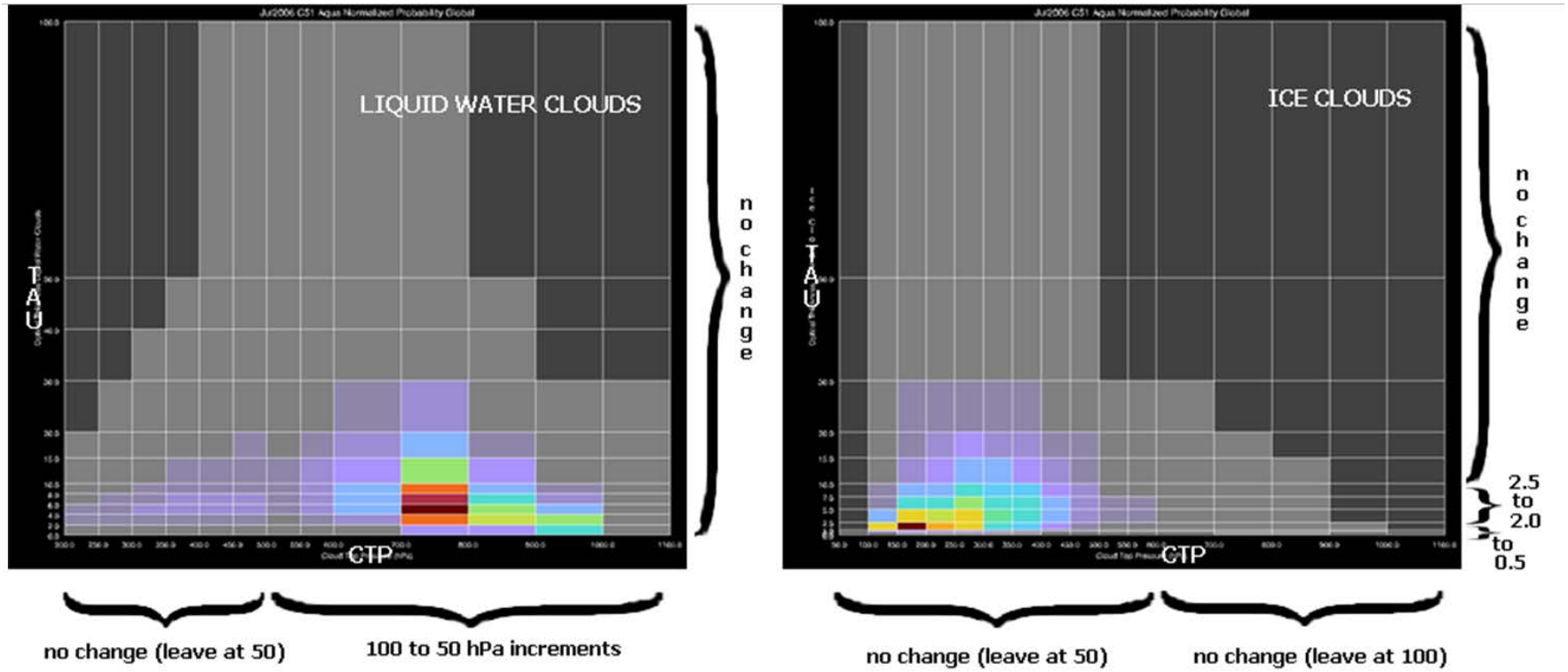
Two E3/M3 Standard Deviation Statistics:

1. Mean of the Daily Standard Deviations
2. Standard Deviation of the Daily Means
3. ??? (Standard Deviation of the L2 Input Pixels)

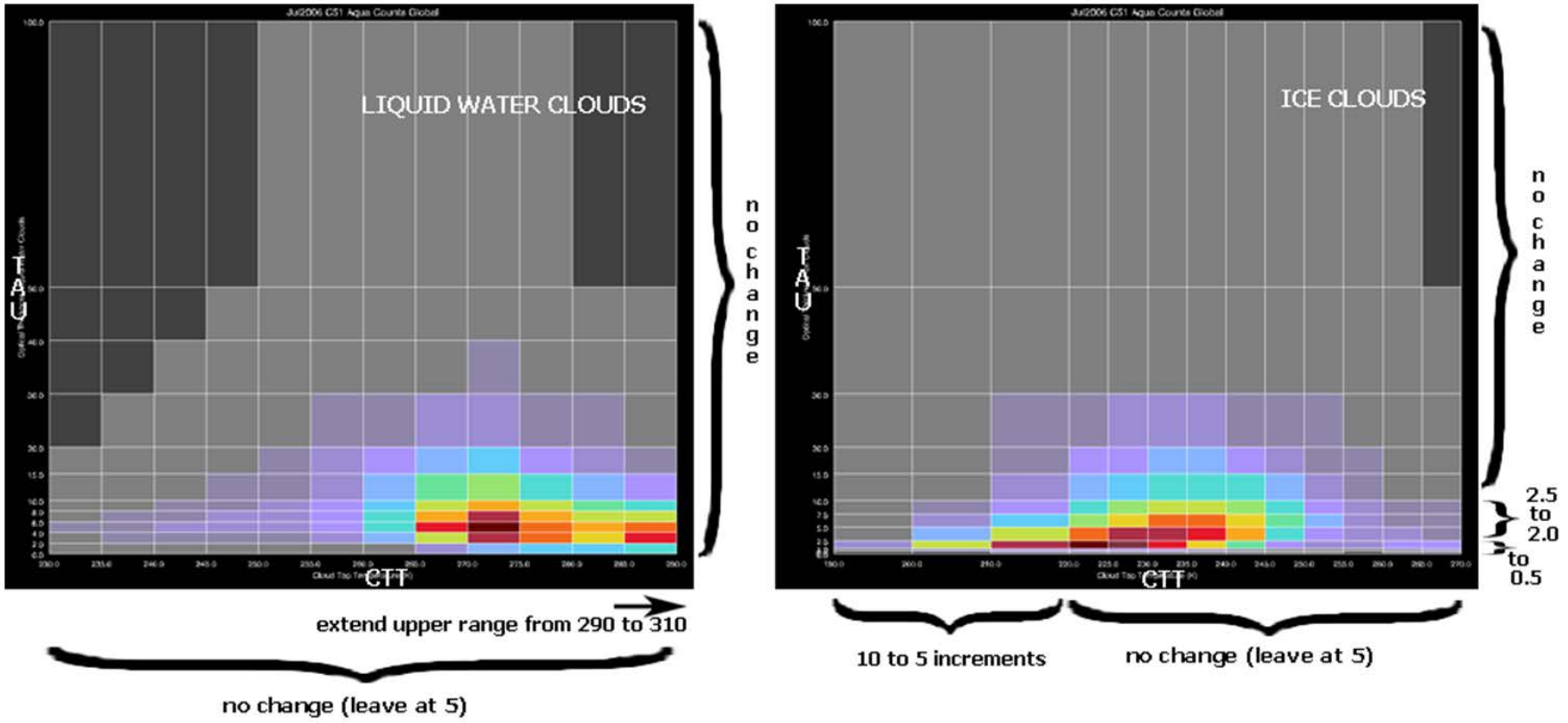
Might need some new intermediate statistics in the L3 Daily (e.g.: “SumSquares”)

Optimizing
Histogram and Joint Histogram
Bin Boundaries

Cloud Opt. Thickness vs. Cloud Top Pressure



Cloud Opt. Thickness vs. Cloud Top Temperature



Summary of Scientific Data Set (SDS) Additions and Deletions

Daily (D3) SDS Count Changes

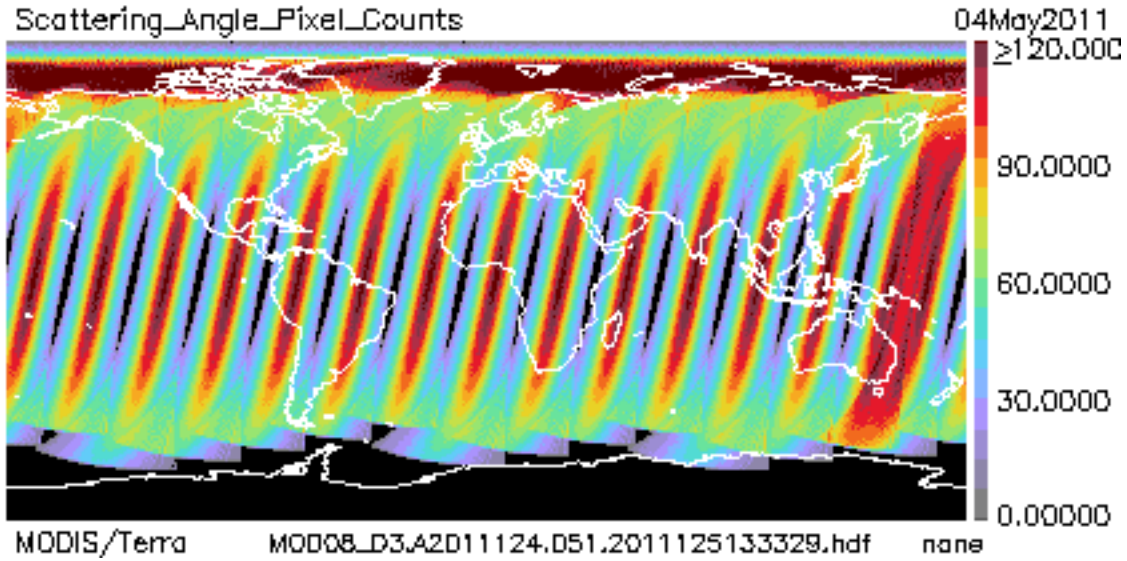
(Note that E3 and M3 Totals are larger)

Group	Added	Deleted	Net
Angles	40	-20	**20**
Aerosol L+O	5	-10	**-5**
Aerosol Land	0	-88	**-88**
Aerosol Ocean	8	-29	**-21**
Aerosol Deep Blue	8	0	**8**
Cloud Top Prop	351	0	**351**
Cloud Optical Prop	48	0	**48**

Net D3 SDS Count Increase = 313

Definition of “Day” in Level-3

“Day” Definition Problem



UTC “Day” problem is clearly visible in browse.

Note these 4 consecutive D3 browse images.

Schedule

L3 Delivery Schedule (part 1)

Task	PGE	Status
COP: New 16 & 37 Retrieval	TL, D3, E3, M3	Done!
COP: Cloud Fraction Change	TL, D3, E3, M3	Done!
Aerosol: Deleted & Renamed	TL, D3, E3, M3	Done!
CTP: Addition 400 SDS's	TL, D3	Close
CTP: Addition of >400 SDS's	E3, M3	Jun 7
Aerosol: Add New & "Aerosol_"	TL, D3, E3, M3	Jun 30
Cloud: Histogram Bin Bounds	TL, D3, E3, M3	Jul 15

L3 Delivery Schedule (part 2)

Task	PGE	Status
All: Definition of “Day”	TL	Aug 15*
Aerosol & Cloud: New Statistics +	TL, D3, E3, M3	Sep 15*

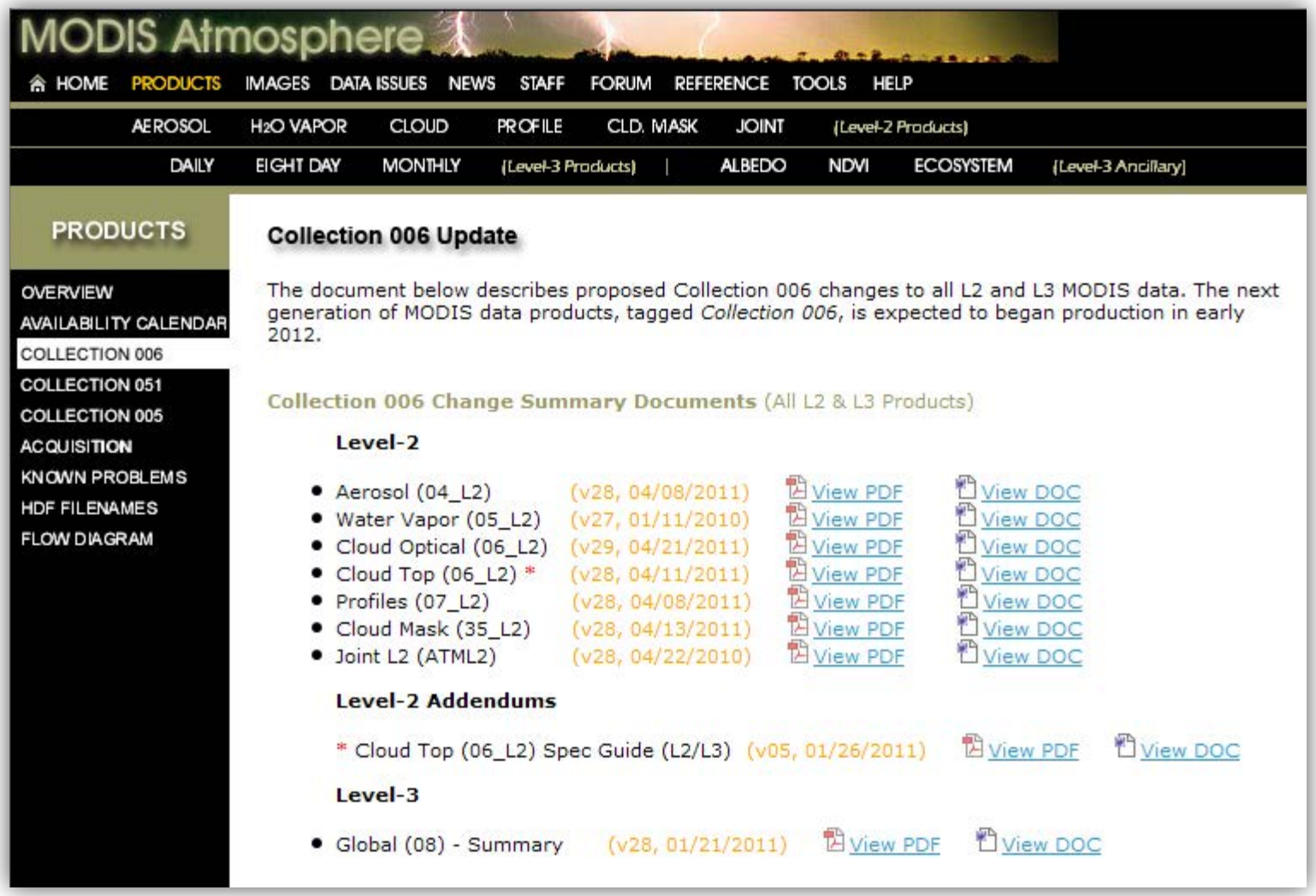
* Lower Confidence Estimate

+ QA_Count, Num_Days, Median, SumSquares(?)

C6 Updates to Joint Level-2 (MODATML2)

Collection 006 Summary Documents

http://modis-atmos.gsfc.nasa.gov/products_c6update.html



Questions/Comments on L3 or Joint L2?

Paul.A.Hubanks@nasa.gov