Supplementary Materials

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Contents

A Background

Name	Description
GEWEX/ICCP	Compiled from 12 satellite products for comparison study
HIRS	Cloud frequency from NOAA/HIRS/2
AVHRR PATMOS-x	Cloud product derived from NOAA's Advanced Very High Resolution Radiometer (A

B Methods

B.1 Removal of Orbital Artifacts

The MODIS orbit results in incomplete daily coverage in the mid-latitudes, resulting in unequal observation frequency in nearly longitudinal banding between approximately -30^o and 30^o latitude. We used the Variational Stationary Noise Remover (VSNR,available at `http://www.math.univ-toulouse.fr/~weiss/Codes/VSNR/VNSR_VariationalStationaryNoiseRemover.html`) to remove these artifacts. The VSNR was well suited to this situation because it allows specification of the shape and scale of the 'noise'. We explored various filter dimensions and visually evaluated the output to minimize artifacts (See Figure **??**). We used a gabor filter with y=200, x=5, and θ=15 for Terra and θ=-15 for Aqua.

B.2 Calculation of Seasonal Metrics

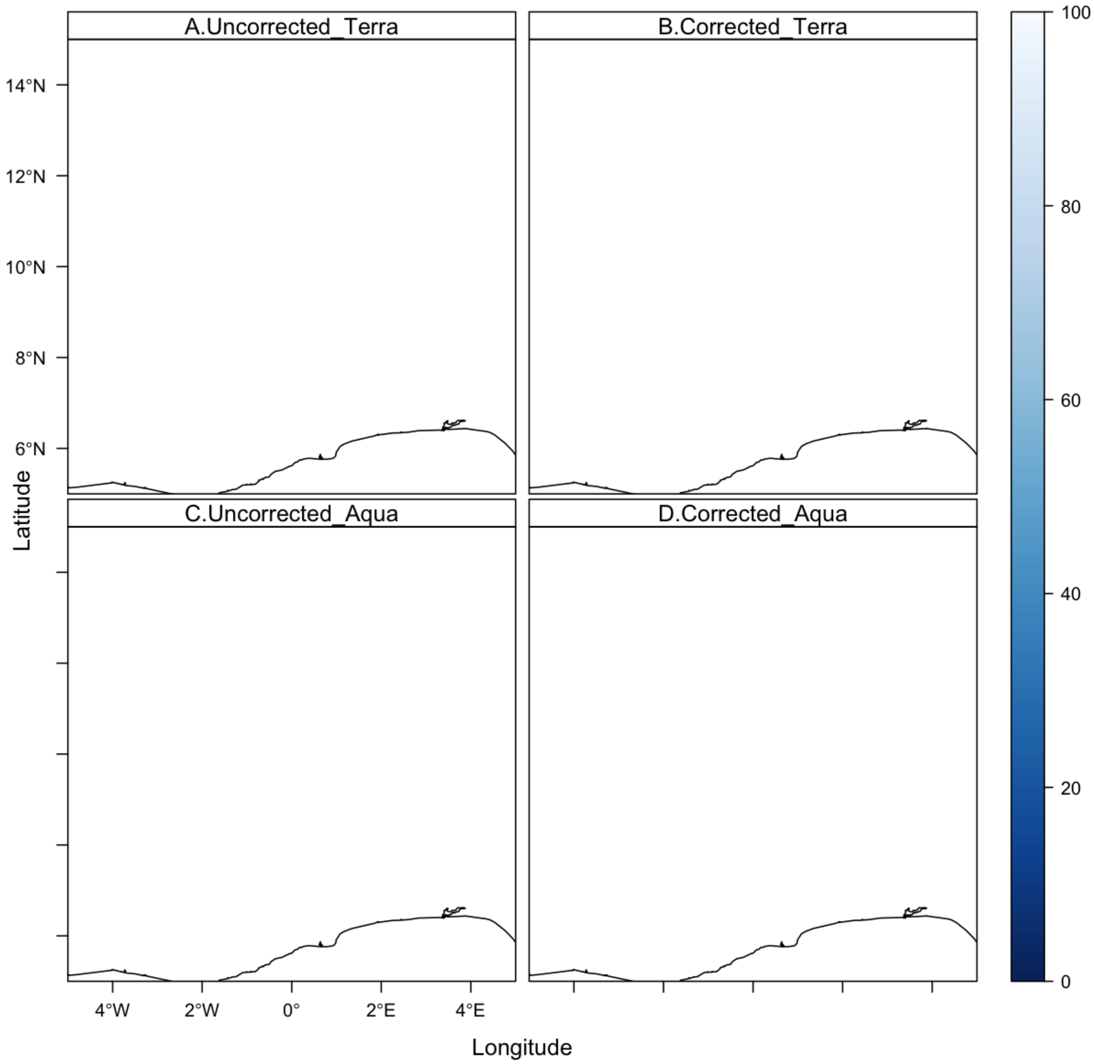


Figure SM1: Comparison of January cloud frequency over the Southwestern Sahara from A) corrected Terra and B) uncorrected Terra, C) Uncorrected Aqua, and D) Corrected Aqua. Note the banding in the uncorrected data resulting from variable observation frequency due to orbital artefacts of the MODIS Satellite.

Let m index months ($m \in 1:12$) and y index years ($y \in 2000:2014$). The timeseries of monthly cloud frequencies $CF_{m,y}$ (proportion of days with cloud flag equal to 1) was calculated separately from the daily MOD09GA and MYD09GA. These were then summarized to the 'climatological' cloud frequency mean and standard deviation: μ_m =mean($CF_{m,y}$) and σ_m =SD($CF_{m,y}$). The inter-annual variability was then calculated as mean(σ_m) and intra-annual variability (seasonality) as SD(μ_m).

C Validation

C.1 Station Observations

The monthly CF were validated using a global observational dataset of synoptic weather reports collected at 5388 stations over 1971-2009 (Eastman and Warren 2012). We extracted the mean "total cloud" amount for each month, which represents the mean proportion of the sky that was covered by all types of cloud during the observations in that month. Comparison of these observations to satellite data must take into account that the sampling radius of these observations (the visible sky) depends on cloud height, cloud thickness, the curvature of the earth, and other factors, but is typically much larger than a single 1km MODIS pixel. We followed Dybbroe, Karlsson, and Thoss (2005) and took the mean monthly MODCF for a circle with 16km radius around each station location. Additionally, this converts the temporal MODCF to mean cloud amount within the sample radius to make it comparable to the station observations.

C.1.1 Monthly Validation

The monthly MODCF (including data from 2000-2013) were compared to station observations using linear models over the full station record (1970-2009) and the MODIS era (2000-2009) to assess accuracy and relevance of the 14-year satellite-derived data for estimating long-term monthly climatologies. For the full record comparison, the station dataset was filtered to include only stations with at least 20 observations per month for at least 20 years, which retained 4679 stations. Several countries (notably the USA, Canada, and New Zealand) converted from human cloud observations to automated laser ceilometers over the past decade leading to a decline in the number of observations over 1997-2009 (Eastman and Warren 2012). For the MODIS era comparison, we included only stations with at least 20 observations per month for the full 10-year period (2000-2009), so the number of stations available was reduced to 1558.

C.1.2 Seasonal Validation

In addition to monthly validation we also performed the same validation on the seasonal (DFJ,MAM,JJA,SON) mean values for MODCF and the station observations.

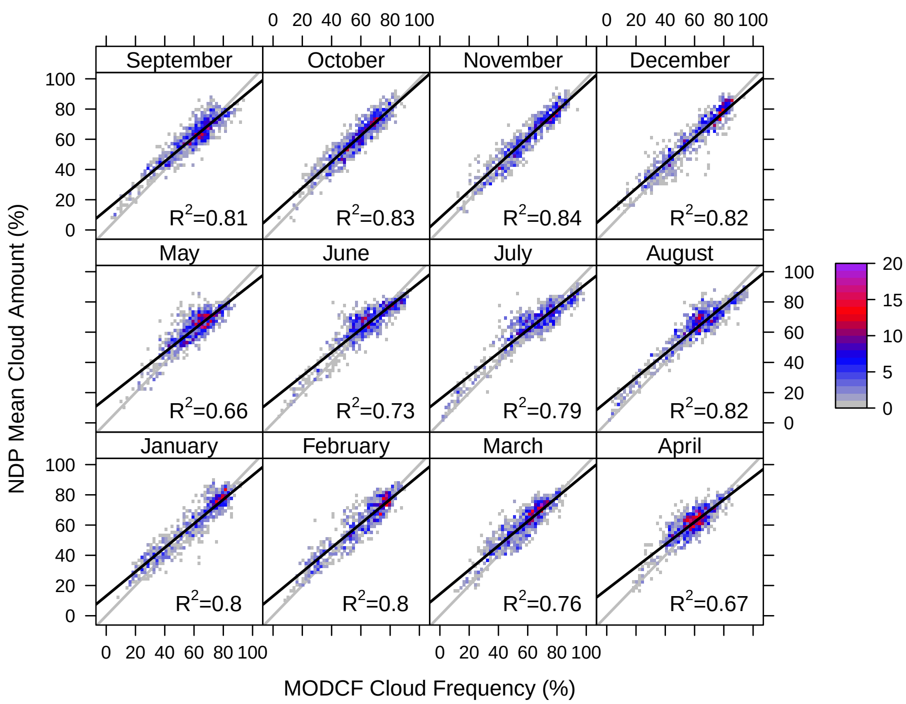


Figure SM2: Mean monthly cloud amount over 1970-2009 from 5388 global stations versus mean 2000-2009 MOD09 cloud frequency by month. Coefficient of determination is shown in each panel. Colors represent the number of monthly station observations within each grid cell of the scatterplot.

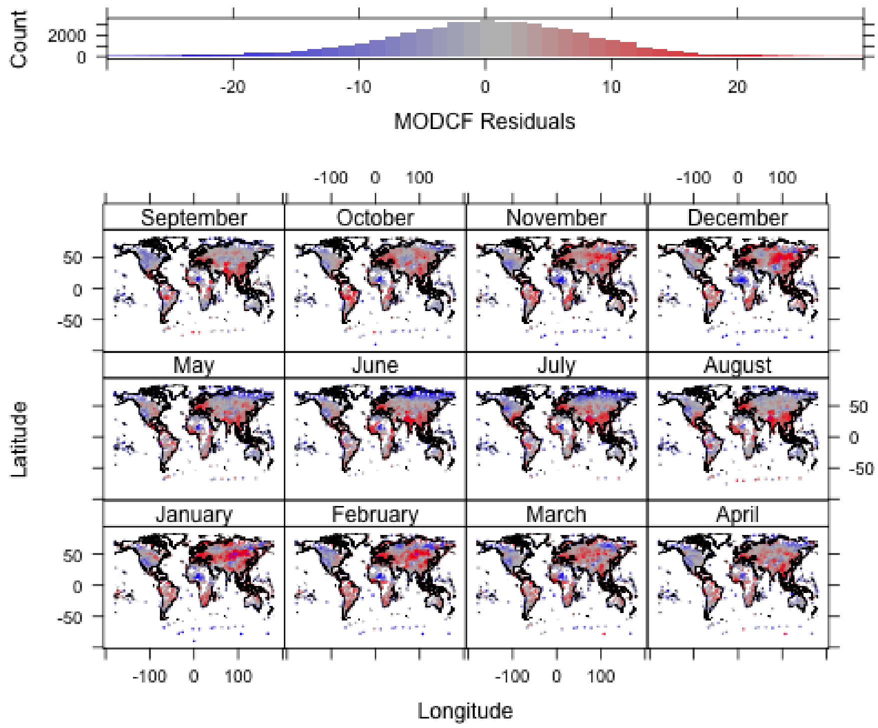
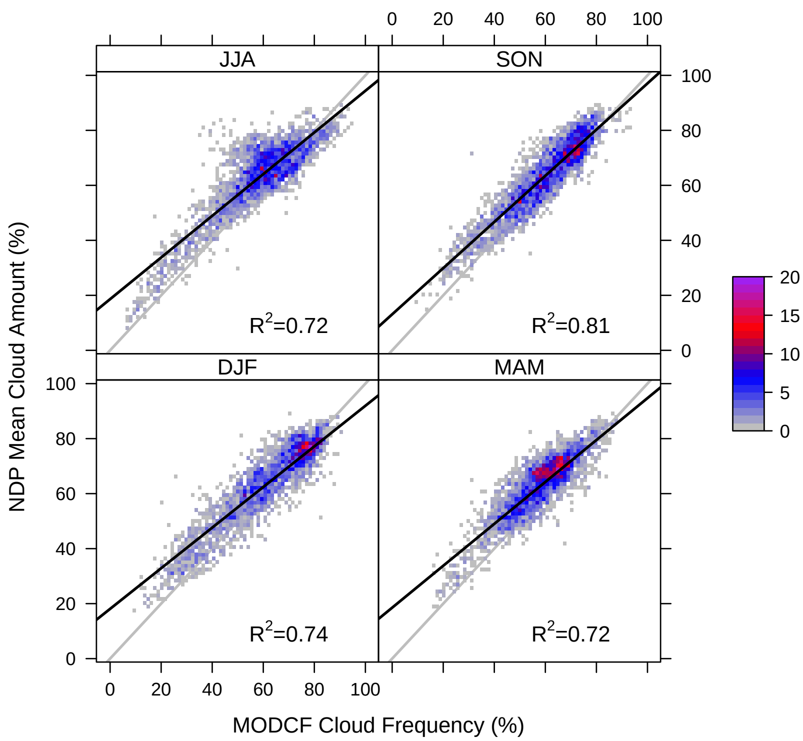
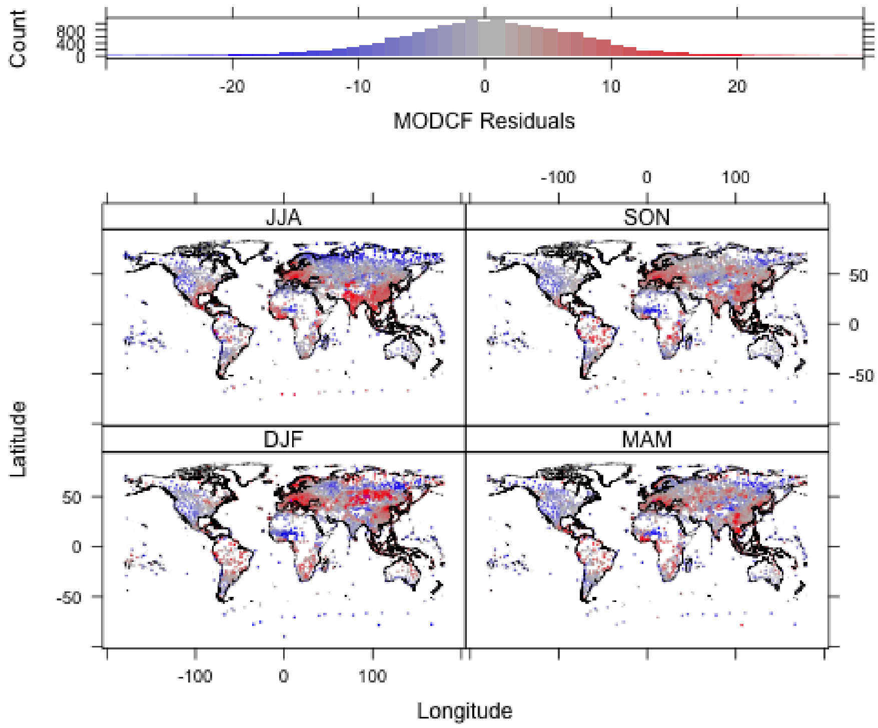


Figure SM3: Histogram and spatial distribution of residuals from linear model between station and satellite cloud amount at station locations. Negative (positive) values indicate locations where MODCF was less than (greater than) expected given the global relationship between MODCF and station observations.


JJA
SON
DJF
MAM
R^2=0.72
R^2=0.81
R^2=0.74
R^2=0.72
NDP Mean Cloud Amount (%)
MODCF Cloud Frequency (%)
0
20
40
60
80
100
0
5
10
15
20



C.2 Temporal Stability

To assess the accuracy of the MODCF product in estimating multi-decadal cloud frequencies, we used linear models between the 2000-2014 satellite climatologies and station observations divided into two periods including the full station record (1970-2009) and the MODIS-era subset (2000-2009).

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C.3 Latitudinal Effects

The MODCF tends to overestimate CF at higher latitudes in winter months, and underestimate it in summer months.

C.4 Land-Use Land-Cover Effects

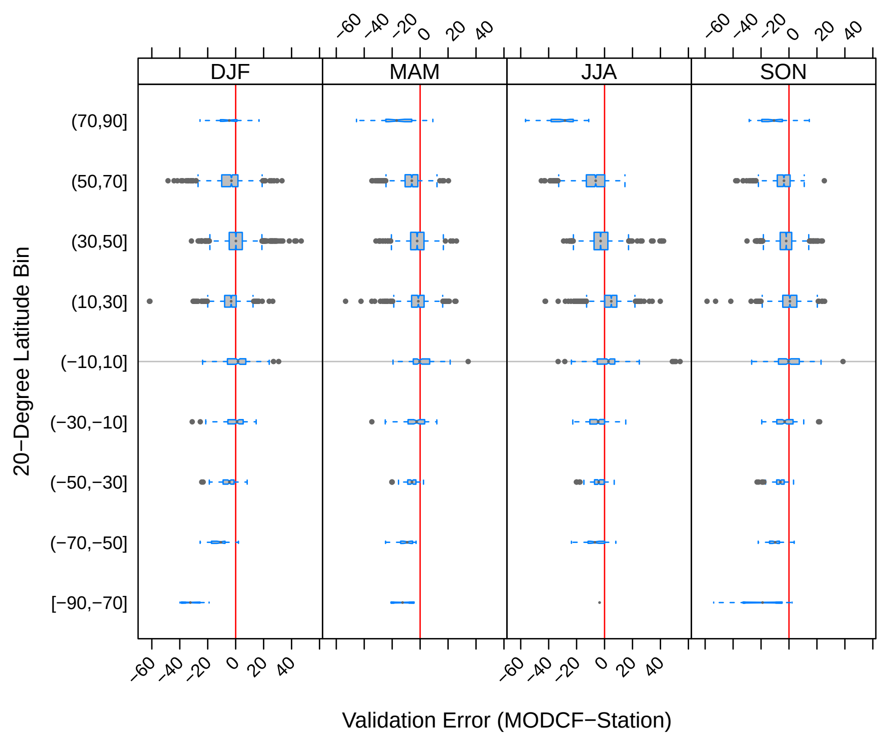

Figure SM4: Boxplots of MODCF-Station anomolies by season and 20-degree latitudinal bin. Boxplot width is proportional to the number of available validation data. Boxplot notches indicate approximate confidence intervals around the mean value in each group.

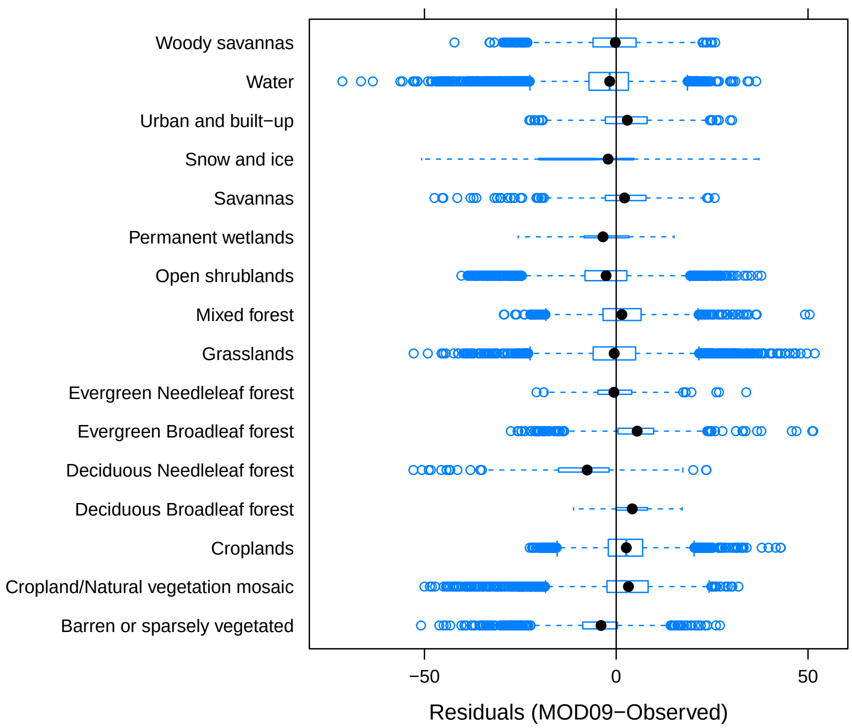

Figure SM5: Boxplot showing residuals (MOD09-Station) by land cover type.

Land Use - Land Cover	DJF	MAM	JJA	SON
Barren or sparsely vegetated	9.9 (440)	10.7 (294)	10.2 (576)	9.9 (441)
Cropland/Natural vegetation mosaic	11.2 (1264)	8.8 (847)	9.1 (1701)	9.2 (1298)
Croplands	7.6 (2633)	5.4 (1817)	8.3 (3582)	6.8 (2659)
Deciduous Broadleaf forest	8.5 (60)	6.8 (43)	6.3 (81)	6.3 (61)
Deciduous Needleleaf forest	20 (166)	14.4 (108)	9.8 (221)	10.4 (169)
Evergreen Broadleaf forest	10.2 (306)	9.5 (208)	9.9 (412)	10.1 (306)
Evergreen Needleleaf forest	9.8 (158)	5.6 (111)	7 (216)	4 (167)
Grasslands	12.1 (1582)	8.7 (1074)	9.8 (2113)	8.9 (1633)
Mixed forest	10.3 (1312)	6.6 (873)	7.4 (1769)	6.4 (1362)
Open shrublands	10.6 (898)	9.5 (624)	13.2 (1262)	8.1 (950)
Permanent wetlands	7.8 (32)	6.1 (22)	12.4 (44)	4.3 (31)
Savannas	11.1 (255)	8.3 (172)	7.6 (348)	10.1 (259)
Snow and ice	20.6 (18)	13.3 (17)	27 (21)	14.3 (24)
Urban and built-up	8.2 (420)	7.5 (282)	9.6 (570)	7.9 (428)
Water	8.4 (2896)	8.2 (2006)	11.5 (4032)	8.1 (3042)
Woody savannas	9.2 (724)	7.7 (496)	11.1 (992)	7.1 (750)

D Biome Summaries

Table SM1: Biome and realm codes used in Table ??.

code	realm	biome
AT_1	Afrotropics	Tropical & Subtropical Moist Broadleaf Forests
AT_2	Afrotropics	Tropical & Subtropical Dry Broadleaf Forests
AT_7	Afrotropics	Tropical & Subtropical Grasslands, Savannas & Shrublands
AT_8	Afrotropics	Temperate Grasslands, Savannas & Shrublands
AT_9	Afrotropics	Flooded Grasslands & Savannas
AT_10	Afrotropics	Montane Grasslands & Shrublands
AT_12	Afrotropics	Mediterranean Forests, Woodlands & Scrub
AT_13	Afrotropics	Deserts & Xeric Shrublands
AT_14	Afrotropics	Mangroves
AT_98	Afrotropics	Lake
AN_11	Antarctic	Tundra
AA_1	Australasia	Tropical & Subtropical Moist Broadleaf Forests
AA_2	Australasia	Tropical & Subtropical Dry Broadleaf Forests
AA_4	Australasia	Temperate Broadleaf & Mixed Forests
AA_7	Australasia	Tropical & Subtropical Grasslands, Savannas & Shrublands
AA_8	Australasia	Temperate Grasslands, Savannas & Shrublands
AA_10	Australasia	Montane Grasslands & Shrublands
AA_11	Australasia	Tundra
AA_12	Australasia	Mediterranean Forests, Woodlands & Scrub
AA_13	Australasia	Deserts & Xeric Shrublands
AA_14	Australasia	Mangroves
IM_1	IndoMalay	Tropical & Subtropical Moist Broadleaf Forests
IM_2	IndoMalay	Tropical & Subtropical Dry Broadleaf Forests
IM_3	IndoMalay	Tropical & Subtropical Coniferous Forests
IM_4	IndoMalay	Temperate Broadleaf & Mixed Forests
IM_5	IndoMalay	Temperate Conifer Forests
IM_7	IndoMalay	Tropical & Subtropical Grasslands, Savannas & Shrublands
IM_9	IndoMalay	Flooded Grasslands & Savannas
IM_10	IndoMalay	Montane Grasslands & Shrublands
IM_13	IndoMalay	Deserts & Xeric Shrublands
IM_14	IndoMalay	Mangroves
NA_2	Nearctic	Tropical & Subtropical Dry Broadleaf Forests
NA_3	Nearctic	Tropical & Subtropical Coniferous Forests
NA_4	Nearctic	Temperate Broadleaf & Mixed Forests
NA_5	Nearctic	Temperate Conifer Forests
NA_6	Nearctic	Boreal Forests/Taiga
NA_7	Nearctic	Tropical & Subtropical Grasslands, Savannas & Shrublands
NA_8	Nearctic	Temperate Grasslands, Savannas & Shrublands
NA_11	Nearctic	Tundra
NA_12	Nearctic	Mediterranean Forests, Woodlands & Scrub
NA_13	Nearctic	Deserts & Xeric Shrublands

NA_98	Nearctic	Lake
NA_99	Nearctic	Rock & Ice
NT_1	Neotropics	Tropical & Subtropical Moist Broadleaf Forests
NT_2	Neotropics	Tropical & Subtropical Dry Broadleaf Forests
NT_3	Neotropics	Tropical & Subtropical Coniferous Forests
NT_4	Neotropics	Temperate Broadleaf & Mixed Forests
NT_7	Neotropics	Tropical & Subtropical Grasslands, Savannas & Shrublands
NT_8	Neotropics	Temperate Grasslands, Savannas & Shrublands
NT_9	Neotropics	Flooded Grasslands & Savannas
NT_10	Neotropics	Montane Grasslands & Shrublands
NT_12	Neotropics	Mediterranean Forests, Woodlands & Scrub
NT_13	Neotropics	Deserts & Xeric Shrublands
NT_14	Neotropics	Mangroves
NT_98	Neotropics	Lake
NT_99	Neotropics	Rock & Ice
OC_1	Oceania	Tropical & Subtropical Moist Broadleaf Forests
OC_2	Oceania	Tropical & Subtropical Dry Broadleaf Forests
OC_7	Oceania	Tropical & Subtropical Grasslands, Savannas & Shrublands
PA_1	Palearctic	Tropical & Subtropical Moist Broadleaf Forests
PA_4	Palearctic	Temperate Broadleaf & Mixed Forests
PA_5	Palearctic	Temperate Conifer Forests
PA_6	Palearctic	Boreal Forests/Taiga
PA_8	Palearctic	Temperate Grasslands, Savannas & Shrublands
PA_9	Palearctic	Flooded Grasslands & Savannas
PA_10	Palearctic	Montane Grasslands & Shrublands
PA_11	Palearctic	Tundra
PA_12	Palearctic	Mediterranean Forests, Woodlands & Scrub
PA_13	Palearctic	Deserts & Xeric Shrublands

Table SM2: Mean (SD) monthly cloud frequency summarized by biome and geographic realm. See Table **??** for Code descriptions.

Code	January	February	March	April	May	June	July	August	September	October	November	December
AA_1	86.1 (7.3)	84.7 (7.6)	83.7 (8)	79.9 (9.8)	78 (10.4)	77.4 (11.3)	80.2 (11.5)	77.8 (13.5)	77.1 (14.6)	74.6 (13.3)	79.7 (10.6)	82.5 (9.3)
AA_10	66.3 (17.9)	66.3 (17.1)	65.4 (17.2)	65.3 (16.4)	69.9 (13.2)	71.8 (14.2)	73.4 (14.7)	73.5 (13.2)	74.6 (13.3)	72.9 (13.5)	71.5 (14.6)	72.8 (13.9)
AA_11	83.1 (6.2)	83.4 (5.9)	84.4 (5.8)	84.1 (6.4)	81.5 (5.3)	82.5 (6)	81.8 (5.8)	82.4 (4.9)	84.6 (6.3)	81.9 (6.5)	85.3 (7.1)	83.4 (6.5)
AA_12	27.2 (5.7)	35.4 (6.2)	34.3 (7.6)	41.9 (9)	49.1 (10.4)	53.2 (7.5)	53.8 (9)	49.7 (11.3)	45.4 (12.3)	39.1 (11.3)	39 (7.8)	33.2 (7)
AA_13	35.2 (10.4)	39.2 (7.3)	34.9 (7.8)	28.8 (7.4)	27.7 (7)	27.8 (9.8)	22.1 (10.9)	15.2 (9.4)	16.7 (6.3)	23.5 (4.8)	32.9 (6.1)	37.4 (8.6)
AA_14	80 (6.2)	79.5 (5.4)	78.3 (5.8)	73.6 (5.9)	73.9 (7.7)	76.8 (7.8)	79.6 (8.8)	77.5 (10.8)	75.6 (9.7)	69 (8.8)	73 (7)	76.9 (6.7)
AA_2	87.7 (7.4)	84.4 (8.5)	78.8 (8.8)	66.3 (13.2)	63.3 (14)	56.9 (15.9)	54.5 (17.4)	45.7 (18.9)	43.8 (18.3)	53 (16.8)	67.3 (14.2)	86 (8.9)
AA_4	51.5 (12.2)	57.5 (10.2)	55.8 (11)	56.3 (11.2)	55.4 (12.7)	60.1 (8.2)	58.2 (11.8)	56.2 (14.3)	54.7 (15.6)	56.6 (12.7)	59.4 (9.4)	58.7 (11.9)
AA_7	69.8 (11.3)	65.4 (10.4)	58.6 (11.6)	40.6 (12.1)	34.3 (12.5)	25.7 (15.1)	19.5 (15.4)	16.6 (13.4)	21.6 (10.7)	32.2 (10.4)	48.8 (11.4)	61.1 (11.2)
AA_8	40.2 (10.3)	46 (7.4)	38.4 (8.6)	33.9 (9)	36.3 (10.2)	45.1 (9.2)	38.7 (13.8)	33.6 (14.8)	31.3 (13.7)	34.6 (11.2)	45.9 (6.8)	44.2 (9.4)
AN_11	34.4 (17.4)	41.6 (19.4)	53.1 (18.7)	70.4 (20.2)	72.5 (17.5)	89 (9.4)	77 (11.4)	75.3 (13.5)	68.2 (16.4)	55.2 (18.3)	41.8 (17.9)	32.8 (17.8)
AT_1	60.9 (18.7)	68.2 (16.9)	71.9 (15.1)	73.8 (14.5)	69.9 (15.1)	70.1 (16.9)	71.9 (17.7)	75.1 (18.7)	72.6 (18.5)	70.6 (16.8)	66.7 (16.3)	60.6 (18.6)
AT_10	53.7 (20.6)	51.6 (18.6)	53.8 (14.7)	53.1 (14.4)	43.3 (19)	40.8 (25.3)	41 (29.5)	43.7 (27.8)	44.8 (23.4)	53 (15.8)	52.6 (18)	52.1 (20.9)
AT_12	28.3 (13.4)	28.4 (13)	30.3 (10.1)	38.9 (7.6)	44.3 (5.5)	42.6 (5.3)	39 (6)	42.8 (6.9)	40.3 (8.3)	41.3 (10.3)	34.7 (10.8)	33.9 (12.9)
AT_13	35.1 (17.8)	34.3 (17.8)	31.8 (15.4)	29.7 (12.5)	22.1 (13.4)	20 (14.9)	20.6 (17.9)	21.4 (17.6)	18.9 (12.4)	23.6 (12.4)	27.4 (15)	29.1 (16.1)
AT_14	52.4 (17.9)	55.7 (21.6)	59.1 (22.5)	60 (23.8)	61.8 (23.6)	68.7 (25.2)	71.3 (26.5)	71.5 (29)	67.6 (28.6)	63.1 (24.5)	56.5 (20.1)	51.6 (15.5)
AT_2	76.7 (8.7)	69.9 (10.5)	56.5 (12.3)	36.8 (10.6)	23.8 (8.7)	17.5 (10.6)	18.2 (11.7)	20.9 (13.8)	26.1 (11.7)	40.9 (14.6)	58.1 (13.9)	70.9 (11.2)
AT_7	44.2 (27.7)	45.7 (25.7)	50.7 (22.3)	52.5 (20)	46.4 (21.2)	44.4 (24.7)	47.5 (27.2)	51.5 (27.9)	48.4 (23)	49.5 (20.2)	45.8 (25.4)	43.4 (28.8)
AT_8	20.1 (9.1)	13.9 (8.5)	16.7 (8.6)	24.9 (9)	15.3 (10.8)	19.6 (10.1)	31.1 (9)	29.7 (10.1)	17.5 (11.8)	10.2 (10.9)	15.6 (11.2)	18.7 (11.3)
AT_9	48.2 (23.8)	48.8 (18.2)	50.7 (13.2)	50.9 (16.4)	46.3 (23.3)	44.4 (25.4)	44.5 (27.6)	44.9 (29.1)	40.8 (21.9)	46.5 (13.5)	48.6 (19.7)	47.1 (26.4)
AT_98	53.5 (19.1)	56.7 (14.5)	57.5 (10.5)	52.4 (13.7)	42.9 (15.2)	32.5 (13.6)	29 (15.4)	35.9 (18.6)	43 (17.3)	52 (17.4)	55.5 (18.4)	53.7 (18.3)
IM_1	56.1 (28.2)	54.2 (29.5)	56.8 (26.4)	62.3 (21.7)	70.2 (16.8)	80.8 (10.3)	84 (10.5)	82 (11)	77.6 (10.6)	65.3 (19.2)	56.9 (25.2)	55.1 (27.9)
IM_10	92.1 (3.9)	88.8 (5.7)	86.2 (7.6)	84.3 (9.5)	86.3 (7.7)	83.4 (7.4)	86.8 (5.7)	85.4 (6.5)	88.8 (5.8)	90.6 (4.9)	91.1 (5.4)	92.5 (4.3)
IM_13	23.4 (12.1)	22.6 (12.4)	21 (9.4)	25.5 (10.9)	26.6 (14.7)	55.5 (21.1)	78.2 (15.7)	77.7 (15.2)	52.8 (22.5)	25 (25.4)	23 (17.8)	20.2 (13.4)
IM_14	48.9 (30.4)	43.4 (29.3)	47.2 (25.2)	55.3 (20.1)	70.8 (16)	79.4 (11.6)	83.7 (10.4)	82.2 (12.5)	80.1 (11.7)	67.8 (17.9)	58.2 (26.4)	55.6 (30)
IM_2	26.4 (16.2)	24.8 (16.3)	30.8 (20.2)	40.3 (23)	50.9 (23.5)	78.1 (9.8)	90.3 (5.8)	90.2 (5.1)	76.6 (9.8)	49.8 (22.6)	37.7 (21.9)	30 (22)
IM_3	38.9 (16.4)	45.8 (16.5)	43.1 (18.2)	45.1 (20.6)	46.6 (24.6)	60.9 (22.6)	78.4 (18.5)	79.9 (15.3)	61.9 (22.9)	35.3 (27)	29 (22.5)	33.1 (19.9)
IM_4	46.3 (14.6)	57.4 (15.9)	61.2 (19)	67.8 (20.9)	68.2 (22.5)	76.6 (21.8)	83.2 (17.5)	81.3 (15.4)	69 (20.6)	49.3 (23.6)	37.7 (17.5)	39.8 (15.2)
IM_5	45.2 (15.2)	56 (16.6)	58.8 (21.3)	62.6 (23.2)	61.9 (28.4)	68.9 (28.4)	77.7 (24.3)	78.8 (21.6)	66.5 (27.6)	46.7 (28.5)	36.7 (20.3)	38 (16.9)
IM_7	36.2 (9.6)	24.6 (4)	20.8 (5.4)	24.6 (10.1)	35.3 (12.9)	65.6 (11.3)	84 (4.6)	77.3 (5.4)	60.6 (7.8)	28.6 (10.8)	13.1 (4.3)	19.1 (5.1)
IM_9	18.2 (9)	12.2 (6.1)	10.7 (4.7)	15.3 (6.3)	19.2 (11.9)	58.1 (7.2)	86.6 (4.7)	84.4 (6)	50.5 (9.1)	10.2 (5.6)	17.3 (8.9)	17.4 (10.8)
NA_11	65.2 (19.6)	59.9 (19.1)	62.2 (15.7)	56.7 (14.1)	48.7 (11.4)	42.9 (13)	44 (11.9)	59.3 (10.1)	68 (6.4)	70.9 (10.9)	70.8 (15.7)	66.4 (20.2)

NA_12	54.6 (13.6)	55.1 (12.9)	52.1 (11)	51.1 (11.9)	43.6 (12)	28.8 (12.7)	18.2 (11.3)	21.3 (11.4)	34.8 (12.4)	45.7 (10.7)	51.1 (11.7)	54.1 (12.4)
NA_13	33 (18.1)	31.8 (16.2)	31.6 (14.9)	32.8 (12.8)	26.9 (13.2)	21.4 (15.7)	20.1 (17)	18.1 (14.2)	16 (12.2)	18.8 (11.7)	25.9 (15.7)	31.2 (17.7)
NA_2	63.8 (21.6)	61 (23.7)	65.2 (15.9)	71.1 (10.5)	76.2 (6.8)	84.2 (4.9)	84 (6)	78.5 (7.1)	76.7 (6.1)	76.7 (8.2)	63.5 (14.4)	64.6 (18.7)
NA_3	65 (17.7)	64.8 (15.2)	62.6 (10.9)	62.7 (7.9)	62.2 (9.9)	60.7 (14)	59.8 (16.6)	58.3 (16)	59.2 (14.8)	62.6 (15)	67.6 (16.7)	66.2 (17)
NA_4	55.4 (20.9)	57.1 (18.6)	59.3 (16.3)	66.6 (12.3)	68.1 (12.2)	64.9 (15.9)	64.2 (17.7)	60.9 (17.7)	58.7 (16.6)	59.8 (14.5)	59.2 (16.8)	56.9 (19.6)
NA_5	57.5 (18.1)	48.9 (17)	53 (15.2)	55.8 (12.8)	58.2 (10.2)	53.5 (9.7)	52.2 (8.7)	62.9 (6.1)	68.9 (6)	71.7 (10.8)	65.5 (15.1)	63.6 (17.9)
NA_6	56.4 (19)	52 (16.2)	52.4 (12.5)	54.6 (8.2)	50.8 (8.5)	49.4 (12.3)	48.8 (14.5)	43.9 (14.3)	43.3 (14.2)	50.2 (14)	59.9 (16.5)	59.2 (16.6)
NA_7	30.9 (9)	32.2 (9.6)	34.9 (9.2)	47.5 (15.5)	46.3 (19.1)	40 (24.1)	43 (28.3)	39.2 (25.7)	34.2 (19.9)	36.3 (14.3)	38.7 (11.2)	35 (8.4)
NA_8	45.6 (14.8)	54.9 (14.7)	56.9 (14.5)	60.7 (14.2)	61.2 (15.5)	60.8 (19)	62.3 (19.9)	59.4 (19.4)	52.7 (19.4)	44.2 (18.4)	39.1 (17.4)	39.8 (17.3)
NA_98	29.3 (2.7)	30.1 (2.2)	22.4 (2.5)	20.5 (2.7)	11.2 (2.5)	14.9 (3.8)	45.3 (8.4)	42.3 (12.5)	35.5 (9.4)	21.1 (2.5)	21.1 (2.4)	28.7 (2.1)
NA_99	38.5 (6.3)	33.2 (5.4)	30.7 (7)	29.2 (8.9)	31.6 (12.9)	48.1 (14.3)	69.6 (10.7)	63 (11.9)	60.3 (13.3)	37.3 (10.8)	28.5 (7.5)	33.2 (5.7)
NT_1	66.9 (10.6)	66.7 (8)	62.8 (6.1)	60 (6)	64.3 (5)	62.1 (6.3)	60.3 (7.2)	57.9 (6.4)	55.6 (5)	62.1 (9.5)	65.3 (12.1)	70.7 (10.4)
NT_10	39.8 (12.4)	41.6 (11.7)	38.2 (14.2)	36.1 (15.4)	34 (15.8)	29.3 (13.9)	37.9 (16)	35.2 (14.3)	33.5 (15.3)	30.6 (10.9)	34.8 (12.7)	42.1 (12.7)
NT_12	70.3 (12.5)	66.9 (9.8)	62.2 (7.7)	59.4 (6.4)	52 (11.5)	41.5 (13.8)	37.3 (11.2)	36 (13.2)	42.2 (13.8)	56.8 (12)	66.5 (10.7)	69.6 (13.9)
NT_13	7.3 (15.8)	15.1 (21.1)	40.2 (16.7)	62 (33.1)	28.5 (23.8)	21.8 (18.1)	24.4 (16.6)	54.1 (21.8)	49.7 (17.3)	33.1 (16.1)	13.8 (17.9)	6 (12.6)
NT_14	77.4 (10.2)	78.8 (11.3)	77.7 (11)	74.4 (11.3)	70.4 (11.9)	62.1 (15.7)	57.8 (18.2)	55.9 (18.4)	62.9 (13.7)	73.1 (9.9)	75.4 (10)	76.7 (9.8)
NT_2	62.7 (12.3)	63.7 (9.6)	67.5 (13.6)	65.5 (14.2)	65.6 (13.6)	61.8 (15.7)	53.2 (18.9)	52.8 (16.8)	53.2 (14.9)	58 (14.4)	63.5 (14.9)	64.5 (10.9)
NT_3	59.3 (12.3)	52.8 (13.1)	50.3 (13.4)	54.2 (11.4)	58 (11.2)	57.4 (12.7)	60 (10.1)	63.4 (8.2)	65.4 (6.8)	70.7 (7.6)	70.2 (11.5)	65.9 (11.1)
NT_4	57.9 (2.9)	61.9 (4.3)	55.2 (4.8)	54.4 (6.3)	53.5 (7.5)	54.6 (9.8)	64.2 (8.7)	58.7 (9.1)	57 (6.7)	45.8 (5.8)	48.3 (5.2)	59.6 (3.6)
NT_7	54.2 (10.5)	53.3 (6.5)	55.3 (8.4)	53.7 (8.7)	55.9 (9.8)	50.3 (11.7)	40.8 (10.1)	41.9 (9.5)	41.9 (8.4)	49.6 (10.1)	53.2 (11.6)	57.3 (9.8)
NT_8	64.7 (14.7)	57.8 (16)	53.7 (17.7)	51.6 (18.3)	44.5 (17.7)	40.3 (16.1)	45 (15.7)	55.6 (14)	62.5 (14.3)	65.9 (12.5)	68.7 (14.6)	69.1 (13.9)
NT_9	42.6 (6.9)	48.8 (5.9)	40.7 (8)	35.5 (8)	23.4 (7.1)	15 (7.3)	12.8 (10.1)	10.8 (8.8)	12.7 (5.8)	23 (4.7)	35.3 (6)	45.5 (6.3)
NT_98	58.2 (21.4)	56.3 (23.8)	55.4 (23)	53.9 (22.5)	54.4 (21.6)	55 (20.4)	54 (20)	52.1 (20.4)	56.3 (17)	60.6 (16.9)	57.2 (21)	56.3 (21.4)
NT_99	48.5 (16.1)	41.7 (16.6)	43.1 (16.1)	48.6 (19.4)	62.5 (18.8)	75.9 (12.2)	77.6 (11)	76.3 (11.5)	78 (11)	68.9 (13.9)	53.5 (18.2)	45.6 (18)
OC_1	62.4 (25.8)	59.4 (23.1)	64.6 (21.9)	67.7 (18.6)	72.7 (11.6)	78.5 (9.3)	75.2 (10.9)	76.4 (10.8)	75.4 (13.3)	75.9 (14.4)	71.7 (18.5)	68.1 (22.1)
OC_2	67.8 (14.4)	68.7 (11.8)	65.7 (12.8)	61.1 (13.1)	55 (12.8)	47.4 (16.5)	39.9 (17.1)	36.7 (16.5)	46.6 (12.5)	62.9 (13.2)	65.8 (15.4)	68.1 (13.7)
OC_7	38.9 (12.4)	42.5 (11.7)	42 (10)	43.4 (9.8)	54 (6.6)	57.8 (8.5)	54.3 (9.9)	54.7 (10.5)	52.1 (10.6)	50 (10.1)	46.5 (11.3)	43.7 (13)
PA_1	64.4 (15)	63.4 (10.8)	55.7 (10)	49.4 (7.7)	49.8 (7.5)	46 (13.4)	40.5 (13.6)	37.9 (14.7)	46.2 (9.6)	60.7 (10.7)	60.5 (13.1)	63.4 (13.4)
PA_10	96.3 (6.2)	93.8 (8)	94.5 (6.2)	93.9 (6.6)	93.5 (7)	93.7 (6.5)	92.6 (8.4)	93.3 (7.5)	93.8 (6.4)	95.6 (5.5)	96 (5.7)	96.9 (5.2)
PA_11	73.5 (13.9)	73.8 (12.8)	73.8 (12.3)	72 (13.5)	69.4 (14)	68.4 (15)	66.7 (16)	67.7 (17.1)	68.8 (17.2)	72.2 (14.9)	76.1 (14.5)	73.8 (13.8)
PA_12	65.1 (17.3)	68.4 (15)	71.5 (12.3)	68.5 (13.1)	63.8 (13.9)	61.5 (15.9)	59.5 (16)	62.4 (17.5)	66.2 (16.8)	68.9 (12.9)	70.5 (14.5)	66.3 (15.5)
PA_13	33.3 (9.1)	42.2 (10.9)	51 (10.4)	48.6 (13.5)	42.6 (13.2)	39.3 (17.4)	39.9 (16.4)	39.5 (17.1)	45.3 (18.7)	49.5 (14)	47.7 (11.5)	40 (9)
PA_4	56 (24.5)	54 (25.3)	45.4 (28.3)	38.7 (25.5)	36.2 (23.3)	34.9 (26.8)	34.3 (25.6)	33.2 (26)	36.3 (26.3)	40.2 (27.3)	41.8 (26.5)	49.4 (27.6)
PA_5	9.5 (7.8)	10.9 (7.7)	12.6 (11)	20.3 (12.5)	34 (16.8)	40 (20)	35.3 (19.6)	34.4 (19.2)	27.2 (17.6)	24.5 (18.1)	17.4 (14.4)	12.6 (11.9)
PA_6	61 (20.6)	64.1 (22.1)	61.2 (22.5)	58.4 (23.5)	54 (24.5)	49 (23.8)	44.4 (23)	39.7 (22.8)	37 (20.9)	44.7 (20)	51.4 (20.9)	57.4 (20.7)
PA_8	53.9 (19.2)	52 (21.1)	51.8 (20.3)	54.5 (19.3)	59.1 (18.4)	62.4 (16.3)	60.2 (14.7)	57.2 (15.8)	57.2 (16.9)	57.2 (17.7)	54.6 (17.8)	53.4 (17.4)

PA_9	58.8 (10.2)	51.5 (10.3)	42.4 (10.4)	25.5 (6.1)	19.6 (3.6)	12.7 (2.2)	15.2 (2.3)	16.1 (2.1)	17.7 (4.3)	35.9 (6.3)	42.7 (9)	57.7 (11.5)