

Supplementary Materials

for

Global GOSAT, OCO-2 and OCO-3 Solar Induced Chlorophyll Fluorescence Datasets

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OCO-2 SIF 2015-2019

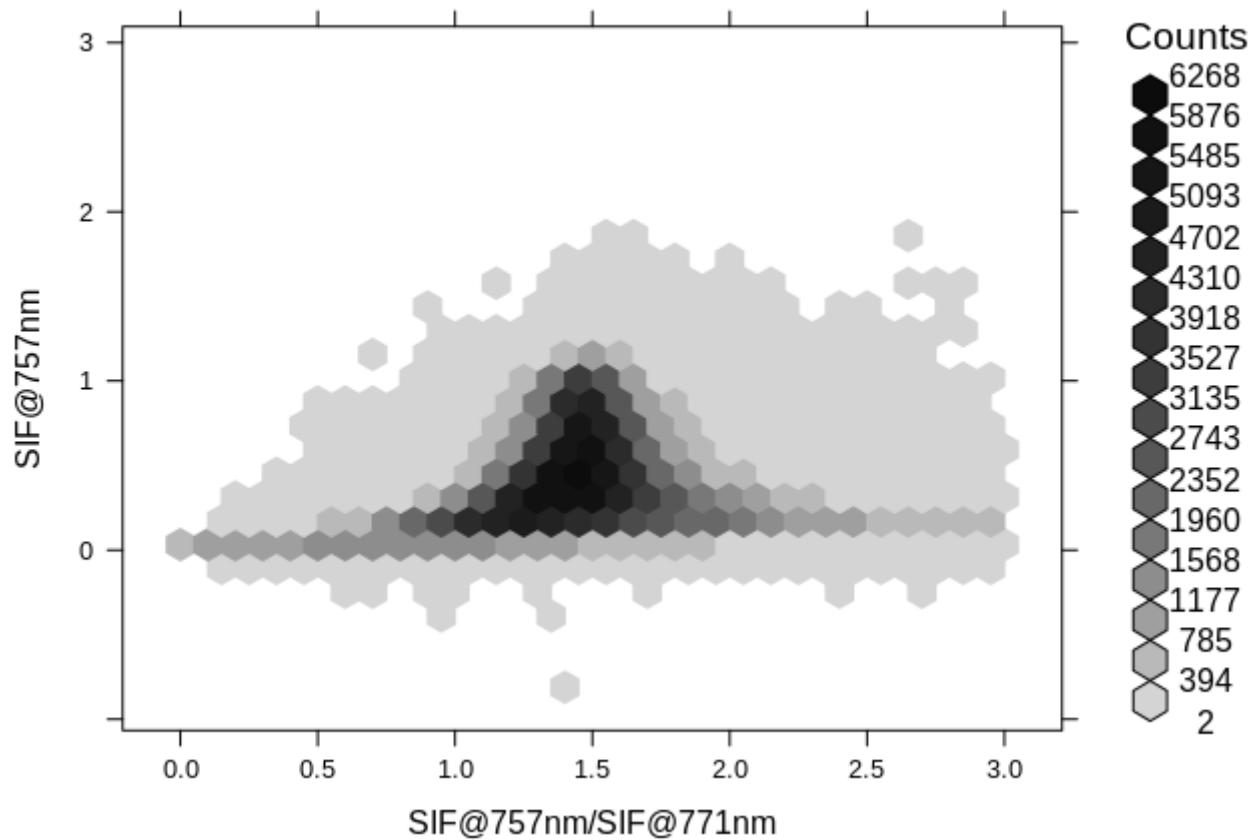


Figure S1. Ratio of SIF₇₅₇ and SIF₇₇₁ from OCO-2 for 2015-2019. Only soundings over vegetated land are included.

**Monthly Frequency of Overlapping Soundings for GOSAT and OCO-2
(QC = Best; Cloud Free)**

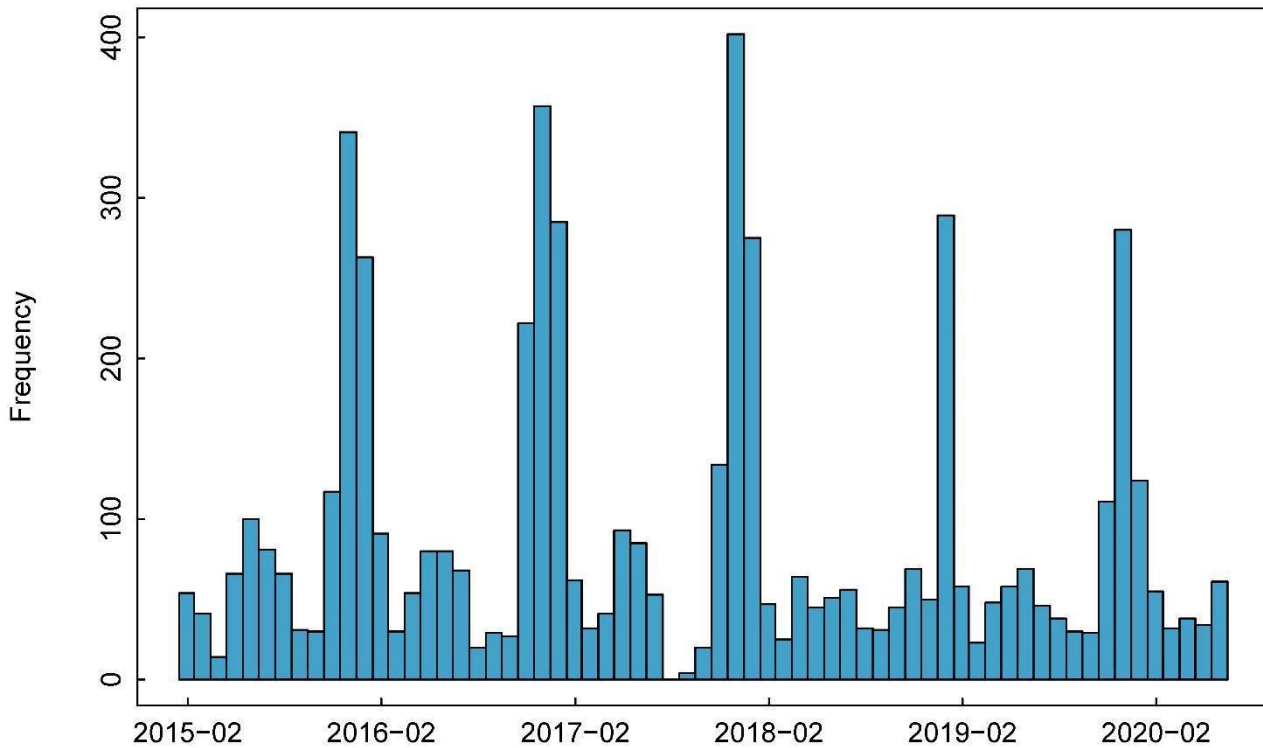


Figure S2. Frequency of overlapping GOSAT and OCO-2 sounding footprints. Soundings presented here were those flagged as best quality and cloud free.

Monthly Frequency of Overlapping Soundings for GOSAT and OCO-2 (All Filters Applied)

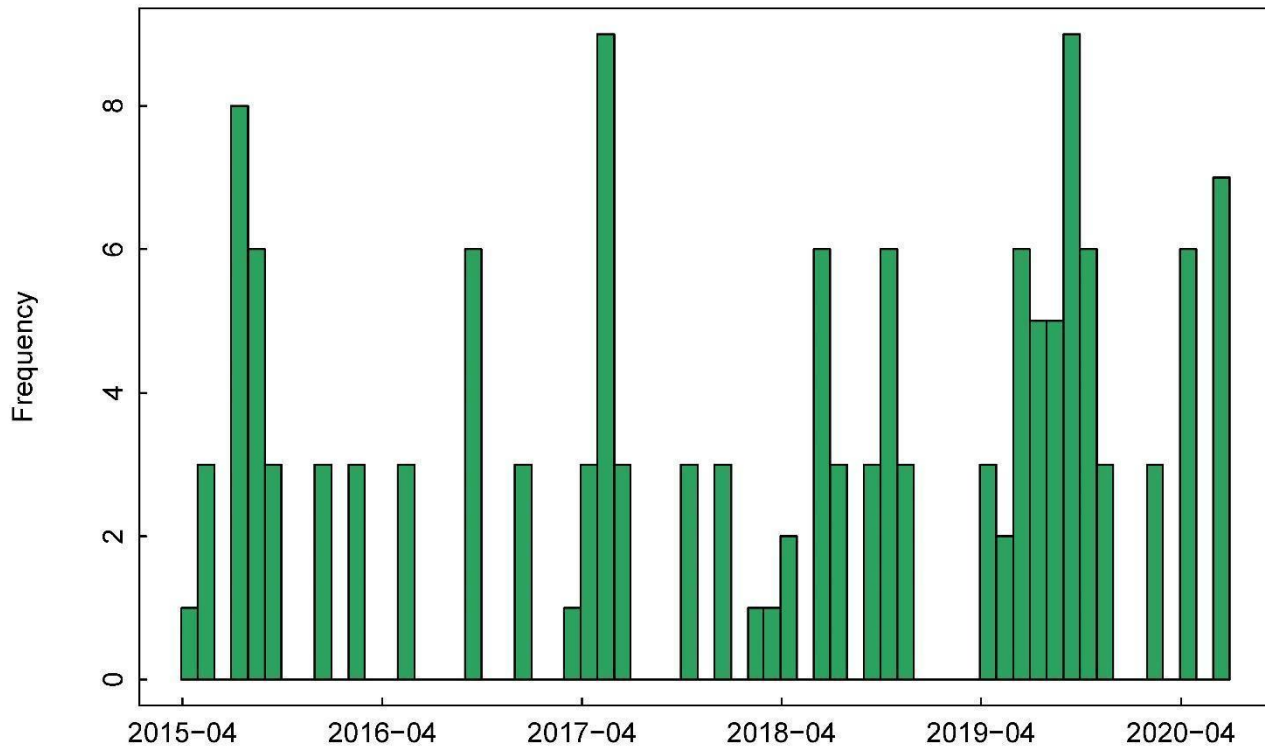


Figure S3. Frequency of overlapping GOSAT and OCO-2 sounding footprints. The soundings presented here were those presented in main text Figure 5f, which were data that had the most conservative filter: best quality and cloud free, vegetation, co-occurring within 1 hour, viewing zenith angle $< 5^\circ$, number of OCO-2 soundings within a GOSAT footprint ≥ 10 , and skin temperature $\geq 5^\circ\text{C}$.

Table S1 - List of current and retired OCO-2 target sites. Table is current as of March 30, 2021. *Denotes that the target site has been retired.

Site Name	Location	Latitude	Longitude	Number of Scans	Validation_Data
Anmyeondo*	South Korea	36.62411	126.3729	6	TCCON
Ascension Island	South Atlantic Ocean	-7.9473	-14.3873	21	TCCON
Belchatow	Poland	51.27	19.33	-	Power Plant
Bialystok*	Finland	53.23	23.025	10	AirCore, EM27
Boston	Massachusetts, USA	42.38	-179	-	EM27, SIF
Boulder	Colorado, USA	39.9122	-104.243	9	AirCore, EM27
Bremen*	Germany	53.1037	8.84951	2	TCCON
Burgos	Philippines	18.5	120.665	16	TCCON
Caltech	California, USA	34.1231	-118.073	49	TCCON
Darwin	Australia	-12.375	130.917	37	TCCON
Dryden	California, USA	34.958	-117.882	31	TCCON
East Trout Lake	Saskatchewan, Canada	54.3537	-104.987	19	TCCON
El Reno	Oklahoma, USA	35.57	-98.06	5	SIF
Eureka*	Nunavut, Canada	80.0533	-86.4165	4	TCCON
Fairbanks	Alaska, USA	64.856	-147.835	30	EM27
Gobabeb	Namibia	-23.5607	15.0404	-	EM27
Harvard Forest	Massachusetts, USA	42.527	-72.179	-	EM27, SIF

Hefei*	China	31.9	117.17	1	Provisional TCCON
Hyytiälä*	Finland	61.8462	24.2958	6	SIF
Izaña	Canary Islands, Spain	28.297	-16.518	24	TCCON
Karlsruhe	Germany	49.1	8.43801	19	TCCON
Lamont	Oklahoma, USA	36.6039	-97.486	72	TCCON
Lauder	New Zealand	-45.0022	169.685	57	TCCON
Libya*	Libya	28.55	23.39	5	Calibration
Litchfield*	Australia	-13.1791	130.7945	0	SIF
Los Angeles*	California, US	33.8142	-118.275	4	Megacity
Manaus*	Brazil	-3.21332	-60.5983	4	TCCON
Mexico City 2	Mexico	19.361	-99.1617	-	EM27
Mexico City 1*	Mexico	19.4289	-99.1375	3	Megacity
Mildred Lake	Alberta, Canada	57.03	-111.55	-	N/A
Munich	Germany	48.1852	11.512	11	EM27
Nicosia	Cyprus	35.1408	33.3813	11	TCCON
Niwot Ridge	Colorado, USA	40.0329	-105.546	25	SIF
Old Black Spruce	Saskatchewan, Canada	53.9872	-105.121	7	SIF
Orleans	France	47.965	2.1125	32	TCCON
Paris	France	48.846	2.356	13	TCCON
Park Falls	Wisconsin, USA	45.9448	-90.2725	56	TCCON
Porto Velho	Brazil	-8.774	-63.872	-	EM27

Poker Flat*	Alaska, USA	65.1186	-147.433	8	EM27
Railroad Valley	Nevada, USA	38.497	-115.69	74	Calibration
Reunion Island	South Indian Ocean	-20.9113	55.5166	38	TCCON
Rikubetsu	Japan	43.4518	143.7	10	TCCON
Rosemount*	Minnesota, USA	44.6868	-93.027	1	SIF
Saga	Japan	33.2411	130.288	19	TCCON
São Paulo*	Brazil	-23.5388	-46.6344	1	Megacity
Seoul	South Korea	37.5219	126.982	-	EM27
Shanghai*	China	31.22	121.456	3	Megacity
Sodankylä	Finland	67.368	26.633	21	TCCON
Toronto	Ontario, Canada	43.72	-79.43	14	EM27
Tsukuba	Japan	36.0513	140.122	33	TCCON
Wollongong	Australia	-34.4506	150.855	47	TCCON

Table S2 - List of OCO-3 target sites. An interactive map of OCO-3 scans for each target can be seen at <https://ocov3.jpl.nasa.gov/sams/index.php>.

Target ID	Site_Name	Longitude	Latitude
cal001	railroadValley	-115.69	38.497
coccon100	val_Thessaloniki_Greece	22.97	40.63
coccon101	val_Gobabeb_Namibia	15.04	-23.56
coccon102	val_Biust_Botswana	27.12	-22.59
coccon103	val_Jinja_Uganda	33.209	0.503

desert0000	Flat_Desert_Test_0000	2.99	30.5
desert0001	Flat_Desert_Test_0001	24.3	28.4
desert0002	Flat_Desert_Test_0002	139.85	-23.99
desert0003	Flat_Desert_Test_0003	10	30.84
desert0004	Flat_Desert_Test_0004	30.86	26.13
desert0005	Flat_Desert_Test_0005	121.45	-21.9
desert0006	Flat_Desert_Test_0006	7.52	31.89
desert0007	Flat_Desert_Test_0007	125.75	-19.31
desert0008	Flat_Desert_Test_0008	-1	31.36
desert0009	Flat_Desert_Test_0009	18.84	28.22
desert0010	Flat_Desert_Test_0010	7.3	32.76
desert0011	Flat_Desert_Test_0011	25.56	28.75
desert0012	Flat_Desert_Test_0012	11	31.36
desert0013	Flat_Desert_Test_0013	122.72	-22.11
ecostress_afln	ecostress_afln	-4.29114	53.31031
ecostress_ar_slu	ecostress_ar_slu	-66.4598	-33.4648
ecostress_ar_vir	ecostress_ar_vir	-56.1886	-28.2395
ecostress_au_asm	ecostress_au_asm	133.249	-22.283
ecostress_au_cum	ecostress_au_cum	150.7236	-33.6153
ecostress_au_das	ecostress_au_das	131.3881	-14.1592
ecostress_au_dry	ecostress_au_dry	132.3706	-15.2588
ecostress_au_how	ecostress_au_how	131.1501	-12.4952

ecostress_au_lit	ecostress_au_lit	130.7945	-13.179
ecostress_au_stp	ecostress_au_stp	133.3503	-17.1508
ecostress_au_tum	ecostress_au_tum	148.1517	-35.6566
ecostress_au_wom	ecostress_au_wom	144.0944	-37.4222
ecostress_au_ync	ecostress_au_ync	146.2907	-34.9893
ecostress_bdog	ecostress_bdog	-1.48194	51.53022
ecostress_be_lon	ecostress_be_lon	5.9981	50.305
ecostress_be_vie	ecostress_be_vie	4.746113	50.55184
ecostress_br_cmt	ecostress_br_cmt	-56.0882	-13.2875
ecostress_br_no	ecostress_br_no	-56.7667	-16.6167
ecostress_ca_pr_emss	ecostress_ca_pr_emss	-118.344	56.7438
ecostress_ca_tp	ecostress_ca_tp	-80.431	42.71308
ecostress_ch_dav	ecostress_ch_dav	9.855917	46.81533
ecostress_ch_fru	ecostress_ch_fru	8.537778	47.11583
ecostress_ch_lae	ecostress_ch_lae	8.364389	47.47833
ecostress_cr_fsc	ecostress_cr_fsc	-85.4732	10.4189
ecostress_cr_srnpe_mss	ecostress_cr_srnpe_mss	-85.6156	10.8418
ecostress_cz_bk1	ecostress_cz_bk1	18.5369	49.5021
ecostress_de_rus	ecostress_de_rus	6.4472	50.8659
ecostress_de_tha	ecostress_de_tha	13.56516	50.96235
ecostress_efgf	ecostress_efgf	-0.19299	52.47047
ecostress_fr_fon	ecostress_fr_fon	2.7801	48.4764

ecostress_il_yat	ecostress_il_yat	35.0519	31.3451
ecostress_it_cp2	ecostress_it_cp2	12.3573	41.7043
ecostress_it_tor	ecostress_it_tor	7.5781	45.8444
ecostress_ke_mak	ecostress_ke_mak	38.14067	-3.42581
ecostress_kr_gck	ecostress_kr_gck	127.1622	37.74833
ecostress_ne_waf	ecostress_ne_waf	2.633689	13.64758
ecostress_npbb	ecostress_npbb	-2.388	54.696
ecostress_nz_bfm	ecostress_nz_bfm	171.928	-43.593
ecostress_nz_kop	ecostress_nz_kop	175.554	-37.388
ecostress_nz_oxf	ecostress_nz_oxf	172.2108	-43.2619
ecostress_nz_sco	ecostress_nz_sco	175.22	-37.46
ecostress_sleg	ecostress_sleg	-2.82851	51.20728
ecostress_ssh_czo_cal	ecostress_ssh_czo_cal	-81.7225	34.60811
ecostress_ssh_czo_shale	ecostress_ssh_czo_shale	-77.9041	40.66573
ecostress_us_arm	ecostress_us_arm	-97.4888	36.6058
ecostress_us_bar	ecostress_us_bar	-71.2881	44.0646
ecostress_us_bil	ecostress_us_bil	-121.504	38.1022
ecostress_us_bsg	ecostress_us_bsg	-119.691	43.4712
ecostress_us_ced	ecostress_us_ced	-74.3791	39.8379
ecostress_us_cfl	ecostress_us_cfl	-117.082	46.7815
ecostress_us_csl	ecostress_us_csl	-89.5379	44.10305
ecostress_us_czl	ecostress_us_czl	-119.731	37.109

ecostress_us_cz2	ecostress_us_cz2	-119.256	37.031
ecostress_us_hn1	ecostress_us_hn1	-119.275	46.40889
ecostress_us_hn2	ecostress_us_hn2	-119.464	46.68886
ecostress_us_kfs	ecostress_us_kfs	-95.1907	39.0561
ecostress_us_kon	ecostress_us_kon	-96.5603	39.0824
ecostress_us_los	ecostress_us_los	-89.9792	46.0827
ecostress_us_me2	ecostress_us_me2	-121.557	44.4523
ecostress_us_men	ecostress_us_men	-89.403	43.07725
ecostress_us_mms	ecostress_us_mms	-86.4131	39.3232
ecostress_us_mrf	ecostress_us_mrf	-123.551	44.6465
ecostress_us_ro4	ecostress_us_ro4	-93.0723	44.6781
ecostress_us_rr	ecostress_us_rr	-121.863	38.55785
ecostress_us_scc	ecostress_us_scc	-116.45	33.61
ecostress_us_scs	ecostress_us_scs	-117.696	33.734
ecostress_us_ses	ecostress_us_ses	-106.744	34.3349
ecostress_us_slc	ecostress_us_slc	-74.596	39.9138
ecostress_us_sp	ecostress_us_sp	-119.925	36.2347
ecostress_us_syv	ecostress_us_syv	-89.3477	46.242
ecostress_us_tx2	ecostress_us_tx2	-96.8827	31.4802
ecostress_us_tx5	ecostress_us_tx5	-96.4252	30.5328
ecostress_us_tx6	ecostress_us_tx6	-98.2089	27.6666
ecostress_us_tx9	ecostress_us_tx9	-95.6144	28.78051

ecostress_us_var	ecostress_us_var	-120.951	38.4133
ecostress_us_vcm	ecostress_us_vcm	-106.532	35.8884
ecostress_us_wjs	ecostress_us_wjs	-105.862	34.4255
ecostress_us_wkg	ecostress_us_wkg	-109.942	31.7365
ecostress_us_wpp	ecostress_us_wpp	-123.182	44.1368
ecostress_us_wwt	ecostress_us_wwt	-122.666	45.1089
fossil0001	fossil_Seoul_South_Korea	126.9778	37.56826
fossil0002	fossil_Guangzhou_China	113.25	23.11667
fossil0003	fossil_New_York_USA	-74.0071	40.71455
fossil0004	fossil_Hong_Kong_China	114.1337	22.36472
fossil0005	fossil_Los_Angeles_USA	-118.245	34.05349
fossil0006	fossil_Shanghai_China	121.4581	31.22222
fossil0007	fossil_Singapore_Singapore	103.7571	1.46478
fossil0008	fossil_Chicago_USA	-87.6325	41.88425
fossil0009	fossil_Tokyo_Japan	139.6917	35.68946
fossil0010	fossil_Riyadh_Saudi_Arabia	46.68719	24.68218
fossil0011	fossil_Dubai_UAE	55.30884	25.26951
fossil0012	fossil_Wuxi_China	120.2886	31.56887
fossil0013	fossil_Johannesburg_South_Africa	28.04006	-26.2049
fossil0014	fossil_Tehran_Iran	51.42151	35.69439
fossil0015	fossil_London_UK	-0.12721	51.50642
fossil0016	fossil_Benha_Egypt	31.17858	30.45906

fossil0017	fossil_Beijing_China	116.3972	39.9075
fossil0018	fossil_Jakarta_Indonesia	106.8265	-6.17148
fossil0019	fossil_Al-Ahmadi_Kuwait	48.07602	29.09426
fossil0020	fossil_Miami_USA	-80.1977	25.77481
fossil0021	fossil_Samut_Prakan_Thailand	100.5969	13.59947
fossil0022	fossil_Paris_France	2.3414	48.85717
fossil0023	fossil_Dallas_USA	-96.7954	32.77815
fossil0024	fossil_Tianjin_China	117.1767	39.14222
fossil0025	fossil_Istanbul_Turkey	28.94966	41.01384
fossil0026	fossil_Detroit_USA	-83.048	42.33168
fossil0027	fossil_Philadelphia_USA	-75.1622	39.95222
fossil0028	fossil_San_Jose_USA	-121.885	37.33865
fossil0029	fossil_New_Delhi_India	77.21728	28.63095
fossil0030	fossil_Cologne_Germany	6.95516	50.94167
fossil0031	fossil_Houston_USA	-95.3697	29.76058
fossil0032	fossil_Jeddah_Saudi_Arabia	39.18279	21.48172
fossil0033	fossil_Washington_DC_USA	-77.032	38.89037
fossil0034	fossil_Osaka_Japan	135.5022	34.69373
fossil0035	fossil_Buenos_Aires_Argentina	-58.3734	-34.6085
fossil0036	fossil_Mexico_City_Mexico	-99.1332	19.43194
fossil0037	fossil_Shah_Alam_Malaysia	101.4943	3.09198
fossil0038	fossil_Taipei_Taiwan	121.5636	25.03737

fossil0039	fossil_Phoenix_USA	-112.076	33.44825
fossil0040	fossil_Wuhan_China	114.3247	30.64353
fossil0041	fossil_Hangzhou_China	120.1614	30.29365
fossil0042	fossil_Toronto_Canada	-79.3854	43.64869
fossil0043	fossil_Nanjing_China	118.7778	32.06167
fossil0044	fossil_Shenyang_China	123.4328	41.79222
fossil0045	fossil_Melbourne_Australia	144.9672	-37.8175
fossil0046	fossil_Shantou_China	116.7148	23.36814
fossil0047	fossil_Madrid_Spain	-3.70577	40.42028
fossil0048	fossil_Kolkata_India	88.37124	22.57054
fossil0049	fossil_Pusan_South_Korea	129.0403	35.31
fossil0050	fossil_Sydney_Australia	151.2069	-33.8696
fossil0051	fossil_Xian_China	108.9251	34.2705
fossil0052	fossil_Chengdu_China	104.0758	30.6719
fossil0053	fossil_Huhot_China	118.5458	25.76444
fossil0054	fossil_Boston_USA	-71.0567	42.35866
fossil0055	fossil_Baotou_China	109.8222	40.65222
fossil0056	fossil_Taiyuan_China	112.5495	37.88141
fossil0057	fossil_Denver_USA	-104.992	39.74001
fossil0058	fossil_Athens_Greece	23.7364	37.97614
fossil0059	fossil_Atlanta_USA	-84.3911	33.74831
fossil0060	fossil_Seattle_USA	-122.329	47.60357

fossil0061	fossil_Yinchuan_China	106.2652	38.46662
fossil0062	fossil_Sao_Paulo_Brazil	-46.6547	-23.5629
fossil0063	fossil_Berlin_Germany	13.37691	52.51604
fossil0064	fossil_Minneapolis_USA	-93.2649	44.97902
fossil0065	fossil_Zhengzhou_China	113.6486	34.75778
fossil0066	fossil_Chongqing_China	106.5528	29.56278
fossil0067	fossil_Doha_Qatar	51.51907	25.29502
fossil0068	fossil_Mumbai_India	72.83486	18.94017
fossil0069	fossil_Ad_Damman_Saudi_Arabia	50.06027	26.44041
fossil0070	fossil_Wenzhou_China	120.6668	27.99942
fossil0071	fossil_Quanzhou_China	118.5805	24.91197
fossil0072	fossil_Brisbane_Australia	153.0233	-27.4684
fossil0073	fossil_Dalian_China	121.6022	38.91222
fossil0074	fossil_Tel_Aviv-Yafo_Israel	34.78953	32.08556
fossil0075	fossil_Milan_Italy	9.18178	45.46796
fossil0076	fossil_Abu_Dhabi_UAE	54.37173	24.46918
fossil0077	fossil_Ankara_Turkey	32.85391	39.92109
fossil0078	fossil_Qingdao_China	120.3719	36.09861
fossil0079	fossil_Nagoya_Japan	136.9067	35.18142
fossil0080	fossil_Montreal_Canada	-73.5547	45.5124
fossil0081	fossil_St_Louis_USA	-90.1996	38.62775
fossil0082	fossil_San_Diego_USA	-117.162	32.71568

fossil0083	fossil_Jinan_China	116.9972	36.66833
fossil0084	fossil_Santiago_Chile	-70.65	-33.4372
fossil0085	fossil_Rotterdam_Netherlands	4.47848	51.92282
fossil0086	fossil_Cape_Town_South_Africa	18.42198	-33.9191
fossil0087	fossil_Hyderabad_India	78.47076	17.39487
fossil0088	fossil_Ho_Chi_Minh_City_Vietnam	106.7032	10.77822
fossil0089	fossil_Barcelona_Spain	2.17001	41.38804
fossil0090	fossil_Baltimore_USA	-76.6093	39.29058
fossil0091	fossil_Changchun_China	125.3037	43.88415
fossil0092	fossil_Almaty_Kazakhstan	76.88814	43.25066
fossil0093	fossil_Birmingham_UK	-1.90592	52.47891
fossil0094	fossil_Hefei_China	117.2808	31.86389
fossil0095	fossil_Shijiazhuang_China	114.4786	38.04139
fossil0096	fossil_Harbin_China	126.6395	45.75553
fossil0097	fossil_Cleveland_USA	-81.6907	41.50473
fossil0098	fossil_Fremantle_Australia	115.7535	-32.0473
fossil0099	fossil_Durban_South_Africa	31.0259	-29.8471
fossil0100	fossil_Las_Vegas_USA	-115.14	36.17193
fossil0101	fossil_Lima_Peru	-77.0282	-12.0432
fossil0102	fossil_Mashhad_Iran	59.56796	36.31559
fossil0103	fossil_Kansas_City_USA	-94.5831	39.10344
fossil0104	fossil_Guiyang_China	106.6947	26.57242

fossil0105	fossil_Chennai_India	80.28252	13.08362
fossil0106	fossil_Caracas_Venezuela	-66.8792	10.48801
fossil0107	fossil_Bangalore_India	77.58742	12.96685
fossil0108	fossil_Orlando_USA	-81.3774	28.53823
fossil0109	fossil_Baghdad_Iraq	44.39309	33.34213
fossil0110	fossil_Sacramento_USA	-121.491	38.57944
fossil0111	fossil_Bogota_Colombia	-74.0694	4.61496
fossil0112	fossil-Taegu_South_Korea	128.5911	35.87028
fossil0113	fossil_Urumqi_China	87.58627	43.78787
fossil0114	fossil_Vienna_Austria	16.36842	48.20263
fossil0115	fossil_Manila_Philippines	120.9845	14.58864
fossil0116	fossil_Columbus_USA	-83.0028	39.96199
fossil0117	fossil_Esfahan_Iran	51.67761	32.65722
fossil0118	fossil_Portland_USA	-122.676	45.51179
fossil0119	fossil_Indianapolis_USA	-86.15	39.76691
fossil0120	fossil_Zibo_China	118.0633	36.79056
fossil0121	fossil_San_Antonio_USA	-98.4946	29.42458
fossil0122	fossil_Taejon_South_Korea	127.1897	36.08139
fossil0123	fossil_Chifeng_China	118.9549	42.27207
fossil0124	fossil_Hamburg_Germany	9.99183	53.55375
fossil0125	fossil_Pune_India	73.85302	18.50422
fossil0126	fossil_Al_Ain_UAE	55.68635	24.20739

fossil0127	fossil_Mecca_Saudi_Arabia	39.82222	21.42111
fossil0128	fossil_Vancouver_Canada	-123.113	49.26038
fossil0129	fossil_Datong_Shanxi_China	113.2914	40.09361
fossil0130	fossil_Xiamen_China	118.1277	24.54404
fossil0131	fossil_Ningbo_China	121.5392	29.86569
fossil0132	fossil-Taichung_Taiwan	120.6482	24.16324
fossil0133	fossil_Rio_de_Janeiro_Brazil	-43.175	-22.9122
fossil0134	fossil_St_Petersburg_USA	-82.6388	27.77119
fossil0135	fossil_Monterrey_Mexico	-100.31	25.67093
fossil0136	fossil_Hanoi_Vietnam	105.8546	21.02888
fossil0137	fossil_Rome_Italy	12.49565	41.90322
fossil0138	fossil_New_Orleans_USA	-90.0778	29.9537
fossil0139	fossil_Al_Hofuf_Saudi_Arabia	49.58751	25.36824
fossil0140	fossil_Chios_Turkey	29.04675	40.19208
fossil0141	fossil_Naples_Italy	14.25226	40.84014
fossil0142	fossil_Guadalajara_Mexico	-103.351	20.68758
fossil0143	fossil_Kaoshiung_Taiwan	120.3123	22.62014
fossil0144	fossil_Dhaka_Bangladesh	90.39957	23.71323
fossil0145	fossil_Calgary_Canada	-114.063	51.04532
fossil0146	fossil_Pittsburgh_USA	-79.9973	40.43851
fossil0147	fossil_Austin_USA	-97.743	30.26759
fossil0148	fossil_Amman_Jordan	35.94042	31.9518

fossil0149	fossil_Salt_Lake_City_USA	-111.888	40.76031
fossil0150	fossil_Medina_Saudi_Arabia	39.60641	24.46728
fossil0151	fossil_Adelaide_Australia	138.5998	-34.9259
fossil0152	fossil_Warsaw_Poland	21.01037	52.2356
fossil0153	fossil_Omsk_Russia	73.36476	54.99471
fossil0154	fossil_Astana_Kazakhstan	71.4283	51.12771
fossil0155	fossil_Maebashi_Japan	139.0634	36.3895
fossil0156	fossil_Tabriz_Iran	46.2919	38.08
fossil0157	fossil_Ahmadabad_India	72.60025	23.02777
fossil0158	fossil_Sohag_Egypt	31.69545	26.55513
fossil0159	fossil_Munich_Germany	11.57754	48.13641
fossil0160	fossil_Ahvaz_Iran	48.6693	31.3203
fossil0161	fossil_Baabda_Lebanon	35.96785	34.51451
fossil0162	fossil_Rostov-on-Don_Russia	39.71676	47.22691
fossil0163	fossil_Prague_Czech_Republic	14.43302	50.07913
fossil0164	fossil_San_Cristobal_Dominican_Republic	-70.1	18.41667
fossil0165	fossil_Amsterdam_Netherlands	4.90788	52.36993
fossil0166	fossil_Bucharest_Romania	26.10298	44.43429
fossil0167	fossil_Maracaibo_Venezuela	-71.5976	10.68769
fossil0168	fossil_Lahore_Pakistan	74.34361	31.54972
fossil0169	fossil_Budapest_Hungary	19.05508	47.49972
fossil0170	fossil_Ashgabat_Turkmenistan	58.38333	37.95

fossil0171	fossil_Brussels_Belgium	4.35609	50.84439
fossil0172	fossil_Katowice_Poland	19.03105	50.25641
fossil0173	fossil_Kuybyshev_Russia	50.15	53.20006
fossil0174	fossil_Karachi_Pakistan	67.0822	24.9056
fossil0175	fossil_Lagos_Nigeria	3.38876	6.45471
fossil0176	fossil_Luanda_Angola	13.23288	-8.81566
fossil0177	fossil_Peshawar_Pakistan	71.57849	34.008
fossil0178	fossil_Khartoum_Sudan	32.5599	15.5007
fossil0179	fossil_Nairobi_Kenya	36.8219	-1.2921
fossil0180	fossil_Miller_Power_Plant_USA	-87.12	33.64
fossil0181	fossil_Tutuka_and_Majuba_Powerplant	29.56	-26.95
fossil0182	fossil_Janschwalde_Germany	14.5	51.62
fossil0183	fossil_Colstrip_powerplant	-106.611	45.8816
fossil0184	fossil_Monroe_powerplant	-83.342	41.895
fossil0185	fossil_Comanche_powerplant	-104.58	38.2
fossil0186	fossil_Sammis_Cardinal_Mansfield_powerplants	-80.56	40.415
fossil0187	fossil_Keystone_HomerCity_Conemaugh_Powerplants	-79.194	40.513
fossil0188	fossil_Bowen_powerplant	-84.922	34.124
fossil0189	fossil_Scherer_powerplant	-83.81	33.061
fossil0190	fossil_Boundary_Dam_powerplant	-103.031	49.09606
fossil0191	fossil_Sheerness_powerplant	-111.786	51.5317
fossil0192	fossil_Dofasco_powerplant	-79.8111	43.2597

fossil0193	fossil_Belchatow_powerplant	19.331	51.268
fossil0194	fossil_Dangjin_Yonghungdo_Taeon_powerplants	126.511	37.057
fossil0195	fossil_Shaiba_powerplant	39.5551	20.66267
fossil0196	fossil_AlQurayyah_powerplant	50.126	25.844
fossil0197	fossil_Arnot_Duvha_Hendrina_powerplants	29.611	-26.0331
fossil0198	fossil_Duvha_Kendal_Kriel_Matla_powerplants	29.17545	-25.8781
fossil0199	fossil_Vindhyachal_Sasan_Singrauli_Rihand_powerplants	82.67361	24.09722
fossil0200	fossil_Pingwei_Tianji_Bengbu_Fengtai_Luohe_powerplants	116.9005	32.68613
fossil0201	fossil_Hazelwood_Yallourn_Loy_Yang_powerplants	146.395	-38.2636
fossil0202	fossil_Stanwell_powerplant	150.3185	-23.5106
fossil0203	fossil_San_Francisco_USA	-122.185	37.73865
sif_atto	sif_ATTO_Tower_Manauas_Brazil	-59.0056	2.1459
sif_hrv	sif_Harvard_Forest_USA	-72.1715	42.5378
sif_jro	sif_Jurong_Korea	119.2173	31.8068
sif_laselva	sif_La_Selva_Costa_Rica	-84.0211	10.4333
sif_mead	sif_Mead_Cluster_USA	-96.455	41.1649
sif_mpj	sif_Pinyon_Juniper_USA	-106.238	35.4385
sif_mzo	sif_Ozark_USA	-92.2	38.7441
sif_niwot	sif_Niwot_Ridge_Colorado_USA	-105.546	40.0329
sif_obs	sif_obs	105.1178	53.9872
sif_oko	sif_KAEFS_USA	-97.5223	34.9846

sif_santarita	sif_Santa_Rita_Cluster_USA	-110.84	31.8214
sif_shq	sif_shq	115.5894	34.5203
sif_umb	sif_University_of_Michigan_USA	-84.7138	45.5598
sif_uva	sif_University_of_Virginia_USA	-78.2739	37.9229
tecon100	val_anmyeondoKo	126.3729	36.62411
tecon101	val_ascensionIsland	-14.3873	-7.9473
tecon102	val_drydenCA	-117.882	34.958
tecon104	val_bremenDe	8.84951	53.1037
tecon105	val_burgosPh	120.6495	18.5325
tecon106	val_caltechCA	-118.073	34.1231
tecon107	val_darwinAu	130.9167	-12.375
tecon112	val_izanaTenerifeEs	-16.518	28.29701
tecon113	val_karlsruheDe	8.43801	49.1
tecon114	val_lamontOK	-97.4855	36.6039
tecon115	val_lauderNz	169.6853	-45.0022
tecon122	val_orleansFr	2.1125	47.965
tecon123	val_parisFr	2.356	48.846
tecon124	val_parkFallsWI	-90.2725	45.9448
tecon127	val_reunionIsland	55.485	-20.901
tecon128	val_rikubetsuJp	143.6997	43.45181
tecon130	val_sagaJp	130.2882	33.2411
tecon134	val_tsukubaJp	140.1215	36.0513

tecon135	val_wollongongAu	150.8545	-34.4506
tecon136	val_cyprus	33.06	35.04
texmex001	campaign_texmex_corpus_christi	-97.4059	27.80902
texmex002	campaign_texmex_freeport	-95.4099	29.00426
texmex003	campaign_texmex_port_arthur	-93.9882	29.95389
texmex004	campaign_texmex_lake_charles	-93.316	30.1254
texmex005	campaign_texmex_harrington_station	-101.739	35.29897
texmex006	campaign_texmex_fayette_station	-96.7524	29.90869
texmex007	campaign_texmex_WA_parish_station	-95.6831	29.49279
texmex008	campaign_texmex_limestone_big_brown_stations	-96.145	31.59419
texmex009	campaign_texmex_martin_lake_pirkey_stations	-94.5322	32.34324
texmex010	campaign_texmex_baton_rouge	-91.1721	30.43348
texmex012	campaign_texmex_fort_worth	-97.4108	32.74046
texmex013	campaign_texmex_amarillo_south01	-102.91	34.50262
texmex014	campaign_texmex_amarillo_south02	-102.436	34.67376
texmex015	campaign_texmex_amarillo_north01	-102.596	36.11278
texmex016	campaign_texmex_amarillo_north02	-102.132	36.10232
texmex017	campaign_texmex_permian01b	-104.278	32.72488
texmex018	campaign_texmex_permian01c	-103.851	32.16013
texmex019	campaign_texmex_permian01d	-103.36	31.56453
texmex020	campaign_texmex_permian01e	-103.149	31.21835
texmex021	campaign_texmex_permian02b	-102.197	33.00135

texmex022	campaign_texmex_permian02c	-102.01	32.31402
texmex023	campaign_texmex_permian02d	-101.8	31.60538
volcano0001	v257040_Ambrym	168.12	-16.25
volcano0002	v341090_Popocatepetl	-98.622	19.023
volcano0003	v211060_Etna	15	37.73
volcano0004	v263250_Merapi	110.44	-7.56
volcano0005	v332010_Kilauea_Hawaii	-155.29	19.42
volcano0006	v211040_Stromboli	15.21482	38.78782
volcano0007	v257030_Aoba_Ambae	167.83	-15.4
volcano0008	v357120_Villarrica	-71.93	-39.42
volcano0009	v332020_Mauna_Loa_Hawaii	-155.61	19.48
volcano0010	v252120_Ulawun	151.33	-5.05
volcano0011	v273030_Mayon	13.26	13.26
volcano0012	v345070_Turrialba	-83.767	10.025
volcano0013	v233020_Piton_de_la_Fournaise_Reunion	55.713	-21.231
volcano0014	v282110_Aso	131.11	32.88
volcano0015	v342090_Fuego	-90.88	14.47
volcano0016	v252140_Rabaul_Tarvurvur	152.203	-4.271
volcano0017	v354006_Sabancaya	-71.8597	-15.7952
volcano0018	v282080_Sakurajima	130.657	31.585
volcano0019	v273070_Taal	120.994	14.008
volcano0020	v223030_Nyiragongo	29.25	-1.52

volcano0021	v262000_Krakatau_Anak_Krakatau	105.42	-6.1
volcano0022	v323150_Mammoth_Mountain_LVC	-119.032	37.631
volcano0023	v241040_White_Island	177.1806	-37.5202
volcano0024	v257100_Yasur	169.447	-19.532
volcano0025	v2110010_Campi_Flegrei_and_Pisciarelli	14.139	40.827
volcano0026	v354020_Ubinas	-70.9	-16.34
volcano0027	v251020_Manam	145.04	-4.08
volcano0028	v351020_Nevado_del_Ruiz	-75.322	4.895
volcano0029	v344100_Masaya	-86.16	11.98
volcano0030	v263310_Bromo	112.95	-7.94
volcano0031	v264020_Agung	115.51	-8.34
volcano0032	v211050_Vulcano	14.962	38.404
volcano0033	v222120_Oldoinyo_Lengai	35.914	-2.764
volcano0034	v345040_Poas	-84.233	10.2
volcano0035	v241100_Ruapehu	175.57	-39.28
volcano0036	v325010_Yellowstone	110.7	44.4
volcano0037	v353010_Fernandina_Galapagos	-91.55	-0.37
volcano0038	v221080_Erta_Ale	40.67	13.6
volcano0039	v268010_Dukono	127.88	1.68
volcano0040	v357090_Copahue	-71.16	-37.86
volcano0041	v342110_Pacaya	-90.601	14.382
volcano0042	v332010_East_Rift_Zone_Hawaii	-154.91	19.275

volcano0043	v283110_Asama	138.53	36.4
volcano0044	v342030_Santiaguito_Santa_Maria	-91.552	14.757
volcano0045	v305060_Changbaishan_CN_Baekdusan_Paekdusan_NK	128.08	41.98
volcano0046	v224010_Mt._Cameroon	9.175	4.211
volcano0047	v353050_Sierra_Negra	-91.17	-0.83
volcano0048	v223020_Nyamuragira	29.2	-1.408
volcano0049	v224030_Oku_Volcanic_Field_Lake_Nyos	10.298	6.437
volcano0050	v263280_Kelut	112.31	-7.93
volcano0051	v255020_Bagana	155.23	-6.09
volcano0052	v344090_Momotombo	-86.539	12.423
volcano0053	v282030_Suwanosejima_Marianas	129.716	29.635
volcano0054	v282060_Satsuma-Iwojima_Kikai	130.308	30.789
volcano0055	v221101_Nabro	41.7	13.37
volcano0056	v261080_Sinabung	98.391	3.17
volcano0057	v263300_Semeru	112.922	-8.108
volcano0058	v261170_Kerinci	101.26	-1.7
volcano0059	v266100_Lokon-Empung_Sulawesi	124.79	1.36
volcano0060	v354010_Misti	-71.409	-16.294
volcano0061	v351110_Chiles-Cerro_Negro	-77.964	0.826
volcano0062	v266030_Soputan	124.734	1.113
volcano0063	v284040_Miyake-jima_Marianas	139.526	34.094
volcano0064	v360050_Soufriere_Hills_Montserrat	-62.18	16.72

volcano0065	v267020_Karangetan	125.41	2.78
volcano0066	v351050_Nevado_del_Huila	-76.034	2.917
volcano0067	v263350_Kawah_Ijen_Ijen	114.24	-8.06
volcano0068	v311290_Okmok	-168.13	53.43
volcano0069	v252010_Langila	148.42	-5.53
volcano0070	v351080_Galeras	-77.39	1.2
volcano0071	v360101_Morne_Watt_Dominica_Island	-61.31	15.31
volcano0072	v343020_Santa_Ana	-89.63	13.853
volcano0073	v264270_Sirung_Pantar	124.1275	-8.509
volcano0074	v321050_Mount_St._Helens	-122.18	46.2
volcano0075	v283030_Fuji-san	138.73	35.36
volcano0076	v355838_Uturuncu	-67.18	-22.27
volcano0077	v344020_San_Cristobal	-87.004	12.702
volcano0078	v355100_Lascar	-67.73	-23.37
volcano0079	v355120_Lastarria	-68.5	-25.17
volcano0080	v357061_Laguna_del_Maule	-70.49	-36.06
volcano0081	v300070_Gorely	158.03	52.56
volcano0082	v300060_Mutnovsky	158.196	52.449
volcano0083	v282090_Shinmoedake_Kirishimayama	130.882	31.911
volcano0084	v283040_Ontake-san_Nagoya	137.48	35.893
volcano0085	v284010_Izu-Oshima	139.39	34.72
volcano0086	v271011_Parker	124.892	6.113

volcano0087	v352010_Reventador	-77.656	-0.077
volcano0088	v352006_Cayambe	-77.986	0.029
volcano0089	v284120_Ioto_Iwo-Jima	141.29	24.75
volcano0090	v351110_Cerro_Negro_de_Mayasquer	-77.936	0.817
volcano0091	v358020_Calbuco	-72.61	-41.33
volcano0092	v351040_Cerro_Machin	-75.389	4.487
volcano0093	v358041_Chaiten	-72.646	-42.833