Quality assessment of the Ozone_CCI Climate Research Data Package (release 2017): 1. Ground-based validation of total ozone column data products

Katerina Garane[1], Christophe Lerot[2,] Melanie Coldewey-Egbers[3], Tijl Verhoelst[2], Irene Zyrichidou[1], Dimitris S. Balis[1], Thomas Danckaert[2], Florence Goutail[4], Jose Granville[2], Daan Hubert[2], Maria Elissavet Koukouli[1], Arno Keppens[2], Jean-Christopher Lambert[2], Diego Loyola[3], Jean-Pierre Pommereau[4], Michel Van Roozendael[2] and Claus Zehner[5]

[1] Laboratory of Atmospheric Physics, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece.
[2] Royal Belgian Institute for Space Aeronomy (BIRA-IASB), 3, Avenue Circulaire, B-1180 Brussels, Belgium.
[3] Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Methodik der Fernerkundung (IMF), 82234 Oberpfaffenhofen, Germany.
[4] *LATMOS, CNRS, University Versailles St Quentin, Guyancourt, France*
[5] European Space Agency, ESRIN, Frascati, Italy

Correspondence to: Katerina Garane (agarane@auth.gr)

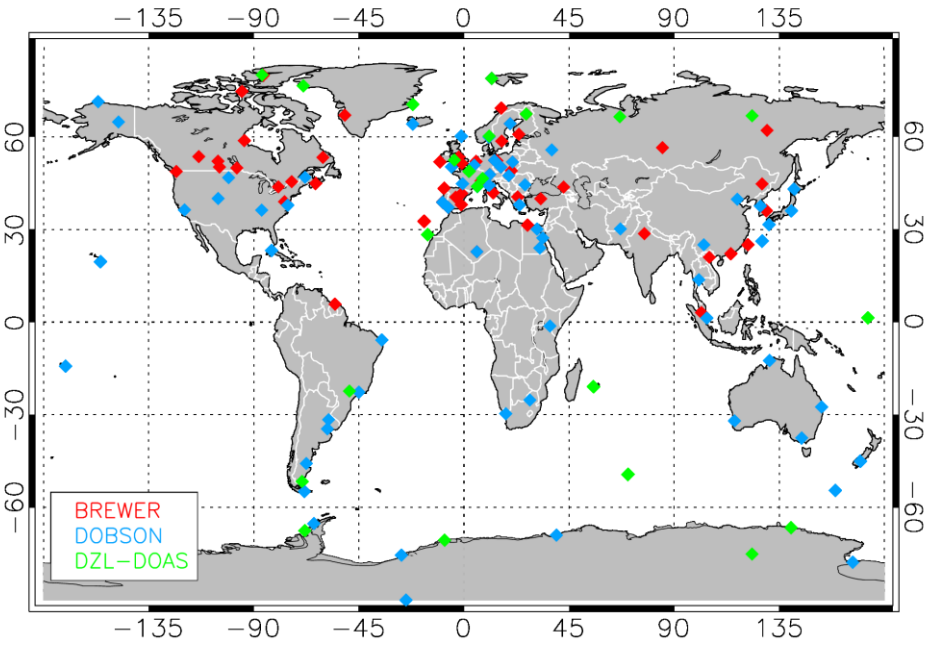

Figure S 1. The locations of the WOUDC/NDACC ground-based instruments reporting total ozone columns used in this study. For further information on these station, refer to Table S 1, Table S 2 and Table S 3.

Table S 1. The NDACC DOAS UV-Visible instruments selected for this study.

ID	Station	Location	Latitude	Longitude	Instrument
315	Eureka	Canada	80.05°N	86.41°W	SAOZ
089	Ny Alesund	Spitsbergen	78.91°N	11.88°E	DOAS
460	Thule	Western Greenland	76.53°N	68.74°W	SAOZ
459	Scoresbysund	Eastern Greenland	70.48°N	21.95°W	SAOZ
262	Sodankylä	Finland	67.37°N	26.63°E	SAOZ
752	Zhigansk	Eastern Siberia	66.79°N	123.35°E	SAOZ
821	Salekhard	Western Siberia	66.50°N	66.70°E	SAOZ
658	Harestua	Norway	60.20°N	10.80°E	DOAS
601	Aberystwyth	Great Britain	52.45°N	4.07°W	SAOZ
049	Paris	France	48.85°N	2.35°E	SAOZ
	Guyancourt	France	48.78°N	2.05°E	SAOZ
041	Jungfraujoch	Switzerland	46.55°N	7.98°E	SAOZ
040	Observatoire Haute Province	France	43.94°N	5.71°E	SAOZ
300	Izana	Canaries Island	28.30° N	15.50° W	DOAS
728	Tarawa	Kiribati	1.35°N	172.92°E	SAOZ
614	Bauru	Brazil	22.34°S	49.03°W	SAOZ
436	Reunion	Reunion Island	20.90°S	55.48°E	SAOZ
674	Kerguelen	Kerguelen Island	49.35°S	70.26°E	SAOZ
817	Rio Gallegos	Argentina	51.60°S	69.31°W	SAOZ
028	Dumont d'Urville	Antarctica	66.67°S	140.02°E	SAOZ
709	Rothera	Antarctic Peninsula	67.57°S	68.12°W	SAOZ
323	Neumayer	Antarctica	70.68°S	123.31 °E	DOAS
641	Dome Concordia	Antarctica	75.10°S	123.31 °E	SAOZ

Table S 2. The WOUDC Dobson instruments selected for this study.

Station ID	Station Name	Station location	Latitude	Longitude
111	Amundsen Scott	Antarctica	-89.98	-24.8
268	Arrival_Heights	Antarctica	-77.83	166.4
57	Halley_Bay	Antarctica	-75.52	-26.73
101	Syowa	Antarctica	-69	39.58
232	VernadskyFaraday	Antarctica	-65.25	-64.27
339	Ushuaia	Argentina	-54.85	-68.31
29	Macquarie_Island	Australia	-54.48	158.97
342	Comodoro_Rivadavia	Argentina	-45.78	-67.5
256	Lauder	New Zealand	-45.03	169.68
253	Melbourne	Australia	-37.48	144.58
91	Buenos-Aires	Argentina	-34.58	-58.48
159	Perth	Australia	-31.95	115.85
343	Salto	Uruguay	-31.58	-57.95
340	Springbok	South_Africa	-29.67	17.9
27	Brisbane	Australia	-27.47	153.03
265	Irene	South_Africa	-25.25	28.22
200	Cachoeira-Paulista	Brazil	-22.68	-45
191	Samoa	USA	-14.25	-170.57
84	Darwin	Australia	-12.47	130.83
219	Natal	Brazil	-5.83	-35.2
175	Nairobi	Kenya	-1.27	36.8
214	Singapore	Singapore	1.33	103.88
216	Bangkok	Thailand	13.73	100.57
31	Mauna_Loa	USA	19.53	-155.58
2	Tamanrasset	Algeria	22.8	5.52

311	Havana	Cuba	23.17	-82.33
245	Aswan	Egypt	23.97	32.45
209	Kunming	China	25.02	102.68
190	Naha	Japan	26.2	127.67
409	Hurghada	Egypt	27.25	33.72
152	Cairo	Egypt	30.08	31.28
11	Quetta	Pakistan	30.18	66.95
7	Kagoshima	Japan	31.63	130.6
14	Tateno	Japan	36.05	140.13
106	Nashville	USA	36.25	-86.57
341	Hanford	USA	36.32	-119.63
213	El_Arenosillo	Spain	37.1	-6.73
252	Seoul	Korea	37.57	126.95
107	Wallops_Island	USA	37.87	-75.52
293	Athens	Greece	38	23.7
82	Lisbon	Portugal	38.77	-9.13
208	Shiangher	China	39.77	117
67	Boulder	USA	40.02	-105.25
12	Sapporo	Japan	43.05	141.33
40	Haute_Province	France	43.92	5.75
201	Sestola	Italy	44.22	10.77
226	Bucharest	Romania	44.48	26.13
419	Bordeaux	France	44.81	-0.56
19	Bismarck	USA	46.77	-100.75
35	Arosa	Switzerland	46.77	9.67
20	Caribou	USA	46.87	-68.02
100	Budapest	Hungary	47.43	19.18
99	Hohenpeissenberg	Germany	47.8	11.02
96	Hradec_Kralove	Czech_Republic	50.18	15.83
36	Camborne	UK	50.22	-5.32
53	Uccle	Belgium	50.8	4.35
68	Belsk	Poland	51.83	20.78
50	Potsdam	Germany	52.38	13.05
116	Moscow	Russia	55.75	37.57
165	Oslo	Norway	59.92	10.72
43	Lerwick	UK	60.15	-1.15
51	Reykjavik	Iceland	64.13	-21.9
284	Vindeln	Sweden	64.25	19.77
105	Fairbanks	USA	64.8	-147.89
199	Barrow	USA	71.32	-156.6
89	Ny_Alesund	Norway	78.93	11.88

Table S 3. The WOUDC Brewer instruments selected for this study.

Station ID	Station Name	Station location	Latitude	Longitude
322	Petaling_Jaya	Malaysia	3.1	101.65
435	Paramaribo	Surinam	5.78	-55.2
330	Hanoi	Vietnam	21	105
468	Cape_D'aguilar	Hong Kong	22.18	114.23
2	Tamanrasset	Algeria	22.8	5.52
95	Taipei	Taiwan	25.03	121.52
10	New_Delhi	India	28.63	77.22
376	Mrsa_Mtrouh	Egypt	31.33	27.22
287	Funchal	Portugal	32.65	-17.05
332	Pohang	Korea	36.03	129.38
213	El_Arenosillo	Spain	37.1	-6.73

346	Murcia	Spain	38	-1.17
82	Lisbon	Portugal	38.77	-9.13
447	Goddard	USA	38.99	-76.83
348	Ankara	Turkey	39.95	32.88
308	Madrid	Spain	40.45	-3.55
261	Thessaloniki	Greece	40.52	22.97
411	Zaragoza	Spain	41.658	-0.944
305	Rome_University	Italy	41.9	12.52
405	La_Coruna	Spain	43.33	-8.5
282	Kislovodsk	Russia	43.73	42.66
65	Toronto	Canada	43.78	-79.47
326	Longfenshan	China	44.75	127.6
321	Halifax	Canada	44.9	-63.5
319	Montreal	Canada	45.47	-73.75
479	Aosta	Italy	45.71	7.33
301	Ispra	Italy	45.8	8.63
35	Arosa	Switzerland	46.77	9.67
100	Budapest	Hungary	47.43	19.18
99	Hohenpeissenberg	Germany	47.8	11.02
290	Saturna	Canada	48.78	-123.13
331	Poprad-Ganovce	Slovakia	49.03	20.32
320	Winnipeg	Canada	49.91	-97.24
96	Hradec_Kralove	Czech_Republic	50.18	15.83
338	Regina	Canada	50.21	-104.67
53	Uccle	Belgium	50.8	4.35
353	Reading	Great Britain	51.42	-0.96
68	Belsk	Poland	51.83	20.78
318	Valentia	Irland	51.93	-10.25
316	Debilt	Netherlands	52	5.18
241	Saskatoon	Canada	52.1	-105.28
174	Lindenberg	Germany	52.22	14.12
50	Potsdam	Germany	52.38	13.05
76	Goose	Canada	53.32	-60.38
352	Manchester	Great Britain	53.45	-2.26
21	Edmonton	Canada	53.57	-113.52
481	Tomsk	Russia	56.48	84.97
279	Norkoping	Sweden	58.58	16.12
77	Churchill	Canada	58.75	-94.07
404	Jokioinen	Finland	60.8	23.5
123	Yakutsk	Russia	62.08	129.75
284	Vindeln	Sweden	64.25	19.77
267	Sondrestrom	Greenland	67	-50.98
262	Sodankyla	Finland	67.37	26.65
476	Andoya	Norway	69.247	15.97
24	Resolute	Canada	74.72	-94.98
89	Ny_Alesund	Norway	78.93	11.88
315	Eureka	Canada	79.89	-85.93