



Supplement of

Monitoring greenhouse gases (GHGs) in China: status and perspective

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Table S1. Geolocations of global GHGs monitoring network coordinated by NOAA and WMO

Site	Latitude (°N)	Longitude (°E)	Project
Alert, Nunavut	82.45	-62.51	Surface Flasks
Argyle, Maine	45.04	-68.68	Surface Flasks
Anmyeon-do	36.54	126.33	Surface Flasks
Ascension Island	-7.97	-14.40	Surface Flasks
Assekrem	23.26	5.63	Surface Flasks
Terceira Island, Azores	38.77	-27.38	Surface Flasks
Baring Head Station	-41.41	174.87	Surface Flasks
Bukit Kototabang	-0.20	100.32	Surface Flasks
Tudor Hill, Bermuda	32.27	-64.89	Surface Flasks
Barrow Atmospheric Baseline Observatory	71.32	-156.61	Surface Flasks
Brentwood, Maryland	38.93	-76.96	Surface Flasks
Cold Bay, Alaska	55.21	-162.72	Surface Flasks
Cape Grim, Tasmania	-40.68	144.69	Surface Flasks
Christmas Island	1.70	-157.15	Surface Flasks
Centro de Investigacion de la Baja Atmosfera	41.81	-4.93	Surface Flasks
Cape Point	-34.35	18.49	Surface Flasks
Carbon in Arctic Reservoirs Vulnerability Experiment	64.99	-147.60	Surface Flasks
Crozet Island	-46.43	51.85	Surface Flasks
Drake Passage	-59.00	-64.69	Surface Flasks
Dongsha Island	20.70	116.73	Surface Flasks
Easter Island	-27.16	-109.43	Surface Flasks
Mariana Islands	13.39	144.67	Surface Flasks
Halley Station, Antarctica	-75.61	-26.21	Surface Flasks
Hohenpeissenberg	47.80	11.02	Surface Flasks
Hegyhatsal	46.95	16.65	Surface Flasks
Storhofdi, Vestmannaeyjar	63.40	-20.29	Surface Flasks
Indianapolis Flux Experiment	39.58	-86.42	Surface Flasks
Izana, Tenerife, Canary Islands	28.31	-16.50	Surface Flasks
Key Biscayne, Florida	25.67	-80.16	Surface Flasks
Cape Kumukahi, Hawaii	19.56	-154.89	Surface Flasks
Park Falls, Wisconsin	45.95	-90.27	Surface Flasks
Lewisburg, Pennsylvania	40.95	-76.88	Surface Flasks
Lulin	23.47	120.87	Surface Flasks
Lampedusa	35.52	12.63	Surface Flasks
Mt. Bachelor Observatory	43.98	-121.69	Surface Flasks
High Altitude Global Climate Observation Center	18.98	-97.31	Surface Flasks

Mace Head, County Galway	53.33	-9.90	Surface Flasks
Sand Island, Midway	28.22	-177.37	Surface Flasks
Mauna Loa, Hawaii	19.54	-155.58	Surface Flasks
Marcellus Pennsylvania	41.47	-76.41	Surface Flasks
Mashpee, Massachusetts	41.66	-70.50	Surface Flasks
Mt. Wilson Observatory	34.23	-118.06	Surface Flasks
Farol De Mae Luiza Lighthouse	-5.80	-35.19	Surface Flasks
NE Baltimore, Maryland	39.32	-76.58	Surface Flasks
Gobabeb	-23.58	15.03	Surface Flasks
NW Baltimore	39.34	-76.69	Surface Flasks
Niwot Ridge, Colorado	40.05	-105.59	Surface Flasks
Ochsenkopf	50.03	11.81	Surface Flasks
Pallas-Sammaltunturi, GAW Station	67.97	24.12	Surface Flasks
Palmer Station, Antarctica	-64.77	-64.05	Surface Flasks
Ragged Point	13.17	-59.43	Surface Flasks
Beech Island, South Carolina	33.41	-81.83	Surface Flasks
Mahe Island	-4.68	55.53	Surface Flasks
Southern Great Plains, Oklahoma	36.61	-97.49	Surface Flasks
Shemya Island, Alaska	52.71	174.13	Surface Flasks
Tutuila	-14.247	-170.56	Surface Flasks
South Pole, Antarctica	-89.98	-24.80	Surface Flasks
Sutro Tower, San Francisco, California	37.76	-122.45	Surface Flasks
Summit	72.60	-38.42	Surface Flasks
Syowa Station, Antarctica	-69.01	39.59	Surface Flasks
Tae-ahn Peninsula	36.79	126.13	Surface Flasks
Hydrometeorological Observatory of Tiksi	71.60	128.89	Surface Flasks
Thurmont, Maryland	39.58	-77.49	Surface Flasks
Taiping Island	10.38	114.37	Surface Flasks
Ushuaia	-54.85	-68.31	Surface Flasks
Wendover, Utah	39.90	-113.72	Surface Flasks
Ulaan Uul	44.45	111.10	Surface Flasks
West Branch, Iowa	41.73	-91.35	Surface Flasks
Walnut Grove, California	38.26	-121.49	Surface Flasks
Weizmann Institute of Science	29.97	35.06	Surface Flasks
Moody, Texas	31.32	-97.33	Surface Flasks
Mt. Waliguan	36.29	100.90	Surface Flasks
Ny-Alesund, Svalbard	78.91	11.89	Surface Flasks
Alaska Coast Guard	57.74	-152.50	Airborne Flasks
Briggsdale, Colorado	40.64	-104.33	Airborne Flasks
Offshore Cape May, New Jersey	38.83	-74.32	Airborne Flasks
Estevan Point, British Columbia	49.38	-126.54	Airborne Flasks
East Trout Lake, Saskatchewan	54.35	-104.99	Airborne Flasks
Homer, Illinois	40.07	-87.91	Airborne Flasks

Indianapolis Flux Experiment	39.58	-86.42	Airborne Flasks
Park Falls, Wisconsin	45.95	-90.27	Airborne Flasks
Offshore Portsmouth, New Hampshire	42.95	-70.63	Airborne Flasks
Poker Flat, Alaska	64.90	-148.76	Airborne Flasks
Rarotonga	-21.25	-159.83	Airborne Flasks
Offshore Charleston, South Carolina	32.77	-79.55	Airborne Flasks
Southern Great Plains, Oklahoma	36.61	-97.49	Airborne Flasks
Offshore Corpus Christi, Texas	27.73	-96.86	Airborne Flasks
Trinidad Head, California	41.05	-124.15	Airborne Flasks
West Branch, Iowa	41.73	-91.35	Airborne Flasks
Argyle, Maine	45.04	-68.68	In Situ Tall Tower
Carbon in Arctic Reservoirs Vulnerability Experiment	64.99	-147.60	In Situ Tall Tower
Park Falls, Wisconsin	45.95	-90.27	In Situ Tall Tower
Beech Island, South Carolina	33.41	-81.83	In Situ Tall Tower
West Branch, Iowa	41.73	-91.35	In Situ Tall Tower
Walnut Grove, California	38.26	-121.49	In Situ Tall Tower
Moody, Texas	31.32	-97.33	In Situ Tall Tower
Barrow Atmospheric Baseline Observatory	71.32	-156.61	In Situ Observatory
Mauna Loa, Hawaii	19.54	-155.58	In Situ Observatory
Tutuila	-14.25	-170.56	In Situ Observatory
South Pole, Antarctica	-89.98	-24.80	In Situ Observatory
Tambopata	-12.82	-69.29	Surface In Situ
Shenandoah National Park	38.62	-78.35	Surface In Situ
Mt. Bachelor Observatory	43.98	-121.69	Surface In Situ

Table S2 Geolocations of global FTIR observation networks, including TCCON, NDACC-IRWG, and COCCON networks.

Site	Latitude (° N)	Longitude (° E)	Network
Anmyeondo, Korea	36.54	126.33	TCCON
Ascension Island	-7.92	-14.33	TCCON
Bremen, Germany	53.10	8.85	TCCON
Burgos, Philippines	18.53	120.65	TCCON
Caltech, USA	34.14	-118.13	TCCON
Darwin, Australia	-12.42	130.89	TCCON
Darwin, Australia	-12.46	130.93	TCCON
Dryden, USA	34.96	-117.88	TCCON
East Trout Lake, Canada	54.35	-104.99	TCCON
Eureka, Canada	80.05	-86.42	TCCON
Garmisch, Germany	47.48	11.06	TCCON
Harwell, Oxfordshire, UK	51.57	-1.31	TCCON
Hefei, China	31.91	117.17	TCCON
Izaña, Tenerife	28.30	-16.50	TCCON
Karlsruhe, Germany	49.10	8.44	TCCON
Lamont, OK (USA)	36.60	-97.49	TCCON
Lauder, New Zealand	-45.04	169.68	TCCON
Nicosia, Cyprus	35.14	33.38	TCCON
Ny-Ålesund, Spitsbergen	78.90	11.90	TCCON
Orléans, France	47.97	2.11	TCCON
Paris, France	48.85	2.36	TCCON
Park Falls, WI (USA)	45.95	-90.27	TCCON
Reunion Island	-20.90	55.49	TCCON
Rikubetsu, Japan	43.46	143.77	TCCON
Saga, Japan	33.24	130.29	TCCON
Sodankylä, Finland	67.37	26.63	TCCON
Tsukuba, Japan	36.05	140.12	TCCON
Wollongong, Australia	-34.41	150.88	TCCON
Xianghe, China	39.80	116.96	TCCON
Zugspitze, Germany	47.42	10.98	TCCON
Boulder	39.99	-105.26	COCCON
Paris, France	48.85	2.36	COCCON
Lanzhou	36.03	103.40	COCCON
Leicester	52.63	-1.14	COCCON
Heidelberg	49.41	8.72	COCCON
Xianghe, China	39.80	116.96	COCCON
München	48.14	11.58	COCCON

Oklahoma	35.50	-97.50	COCCON
Wollongong, Australia	-34.41	150.88	COCCON
Romania	44.38	26.02	COCCON
Harvard University	42.37	-71.12	COCCON
Meteorological State Agency of Spain	40.35	3.75	COCCON
University of Reims	49.25	4.05	COCCON
Universidad Nacional Autónoma de México	19.32	-99.18	COCCON
Vrije University Amsterdam	52.33	4.87	COCCON
University of Alaska Fairbanks	64.83	147.72	COCCON
Seoul	37.46	126.95	COCCON
Finland	60.10	24.83	COCCON
Universidade de São Paulo	-23.56	-46.73	COCCON
Moshiri	44.40	142.30	COCCON
Edinburgh	55.95	-3.22	COCCON
National Remote Sensing Centre	17.47	78.45	COCCON
Lauder, New Zealand	-45.04	169.68	COCCON
Kiruna	67.84	20.41	COCCON
Brussels	50.91	4.43	COCCON
Hefei, China	31.91	117.17	COCCON
Botswana	-24.60	25.90	COCCON
Environment and Climate Change Canada	45.20	-73.58	COCCON
Tokyo	35.71	139.76	COCCON
Shanghai	31.32	121.39	COCCON
Toronto	43.66	-79.40	COCCON
Beijing	39.90	116.40	COCCON
Eureka	80.05	-86.42	NDACC
Ny Alesund	78.92	11.30	NDACC
Thule	76.53	-68.74	NDACC
Kiruna	67.84	20.41	NDACC
Søndre Strømfjord	66.99	-50.95	NDACC
Harestua	60.20	10.80	NDACC
Petersburg	59.90	29.80	NDACC
Bremen	53.10	8.80	NDACC
Zugspitze	47.42	10.98	NDACC
Jungfrauoch	46.55	7.98	NDACC
Moshiri	44.40	142.30	NDACC
Toronto	43.66	-79.40	NDACC
Rikubetsu	43.46	143.77	NDACC
Boulder	39.99	-105.26	NDACC
Barcroft	37.58	-118.25	NDACC
Kitt Peak	31.90	-111.60	NDACC
Izaña	28.30	-16.48	NDACC
Mauna Loa	19.54	-155.58	NDACC

Altzomoni	19.12	-98.66	NDACC
Paramaribo	5.75	-55.20	NDACC
Reunion Island	-20.90	55.50	NDACC
Reunion Island	-21.10	55.40	NDACC
Wollongong	-34.41	150.88	NDACC
Lauder	-45.04	-169.68	NDACC
Arrival Heights	-77.83	166.67	NDACC