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Supplement of

On the statistical optimality of CO₂ atmospheric inversions assimilating CO₂ column retrievals

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Locality (identifier)	Period	Source
Alert, Nunavut, CA (ALT)	1988-2012	WDCGG/ EC
Amsterdam Island, FR (AMS)	1981-2011	LSCE
Argyle, Maine, US (AMT)	2003-2011	NOAA/ ESRL
Anmyeon-do, KR (AMY)	1999-2012	WDCGG/ KMA
Barrow, Alaska, US (BRW)	1979-2013	NOAA/ ESRL
Candle Lake, CA (CDL)	2002-2012	WDCGG/ EC
Monte Cimone, IT (CMN)	1996-2010	WDCGG/ IAFMS
Cape Ochi-ishi, JP (COI)	1995-2002	WDCGG/ NIES
Cape Point, SA (CPT)	1993-2013	WDCGG/ SAWS
Egbert, CA (EGB)	2005-2012	WDCGG/ EC
East Trout Lake, CA (ETL)	2005-2012	WDCGG/ EC
Frasedale, CA (FSD)	1990-2012	WDCGG/ EC
Hateruma, JP (HAT)	1993-2002	WDCGG/ NIES
Hegyhatsal tower, 115m level, HU (HUN0115)	1994-2013	WDCGG/ HMS
Tenerife, Canary Islands, ES (IZO)	1984-2013	WDCGG/ AEMET
Jubany, Antarctica, AR (JBN)	1994-2009	WDCGG/ ISAC IAA
Jungfraujoch, CH (JFJ)	2004-2013	WDCGG/ Univ. Of Bern
K-puszta, HU (KPS)	1981-1999	WDCGG/ HMS
Park Falls, Wisconsin, US (LEF)	2003-2011	NOAA/ ESRL
Mace Head, County Galway, IE (MHD)	1992-2012	LSCE
Mauna Loa, Hawaii, US (MLO)	1979-2013	NOAA/ ESRL
Minamitorishima, JP (MNM)	1993-2013	WDCGG/ JMA
Pallas-Sammaltunturi, GAW Station, FI (PAL)	1999-2013	WDCGG/ FMI
Plateau Rosa, IT (PRS)	2000-2013	WDCGG/ CESI RICERCA
Puy de Dome, FR (PUY)	2000-2010	LSCE
Ryori, JP (RYO)	1987-2013	WDCGG/ JMA
Tutuila, American Samoa (SMO)	1979-2013	NOAA/ ESRL
Sonnblick, AU (SNB)	1999-2013	WDCGG/ EEA
South Pole, Antarctica, US (SPO)	1979-2013	NOAA/ ESRL
Tsukuba tower, 200m level, JP (TKB)	1986-2000	WDCGG/ MRI
Westerland, DE (WES)	1979-2013	WDCGG/ UBA
Moody, Texas, US (WKT)	2003-2011	NOAAA/ ESRL
Yonagunijima, JP (YON)	1997-2013	WDCGG/ JMA

Table S1: List of the continuous sites used in the MACC CO₂ inversion v13r1 together with the period of coverage (defined as the period between the first sample and the last one), and the data source. Each station is identified by the name of the place, the corresponding country (abbreviated) and the code used in the corresponding database.

Locality (identifier)	Period	Source
Alert, Nunavut, CA (ALT)	1985-2013	NOAA/ ESRL
Amsterdam Island, FR (AMS)	1979-1990	NOAA/ ESRL
Amsterdam Island, FR (AMS)	2003-2013	LSCE
Ascension Island, GB (ASC)	1979-2013	NOAA/ ESRL
Assekrem, DZ (ASK)	1995-2013	NOAA/ ESRL
St. Croix, Virgin Islands, USA (AVI)	1979-1990	NOAA/ ESRL
Terceira Island, Azores, PT (AZR)	1979-2013	NOAA/ ESRL
Baltic Sea, PL (BAL)	1992-2011	NOAA/ ESRL
Bering Island, RU (BER)	1986-1994	WDCGG/ MGO
Begur, ES (BGU)	2000-2013	LSCE /IC3
Baring Head, NZ (BHD)	1999-2013	NOAA/ESRL
Baring Head, NZ (BHD)	1979-2011	WDCGG/ NIWA
Bukit Kototabang, ID (BKT)	2004-2013	NOAA/ESRL
St. Davids Head, Bermuda, GB (BME)	1989-2009	NOAA/ ESRL
Tudor Hill, Bermuda, GB (BMW)	1989-2013	NOAA/ ESRL
Barrow, Alaska, US (BRW)	1979-2013	NOAA/ ESRL
Portsall, FR (BZH)	1998-2001	CarboEurope/LSCE
Cold Bay, Alaska, US (CBA)	1979-2013	NOAA/ ESRL
Cape Ferguson, AU (CFA)	1991-2013	WDCGG/ CSIRO
Cape Grim, Tasmania, AU (CGO)	1984-2013	NOAA/ ESRL
Christmas Island, Republic of Kiribati (CHR)	1984-2013	NOAA/ ESRL
Cape Meares, Oregon, US (CMO)	1982-1998	NOAA/ ESRL
Crozet Island, FR (CRZ)	1991-2013	NOAA/ ESRL
Cape St. James, CA (CSJ)	1979-1992	WDCGG/ EC
Casey Station, AU (CYA)	1996-2013	WDCGG/ CSIRO
Drake Passage (DRP)	2003-2013	NOAA/ ESRL
Easter Island, CL (EIC)	1994-2013	NOAA/ ESRL
Estevan Point, British Columbia, CA (ESP)	1992-2012	WDCGG/ EC
Estevan Point, British Columbia, CA (ESP)	1993-2001	WDCGG/ CSIRO
Finokalia, Crete, GR (FIK)	1999-2013	LSCE
Mariana Islands, Guam (GMI)	1979-2013	NOAA/ ESRL
Dwejra Point, Gozo, MT (GOZ)	1993-1999	NOAA/ ESRL
Halley Station, Antarctica, GB (HBA)	1983-2013	NOAA/ ESRL
Hohenpeissenberg, DE (HPB)	2006-2013	NOAA/ ESRL
Hegyhatsal, HU (HUN)	1993-2013	NOAA/ ESRL
Storhofdi, Vestmannaeyjar, IS (ICE)	1992-2013	NOAA/ ESRL
Grifton, North Carolina, US (ITN)	1992-1999	WDCGG/ ESRL
Tenerife, Canary Islands, ES (IZO)	1991-2013	NOAA/ ESRL
Key Biscayne, Florida, US (KEY)	1979-2013	NOAA/ ESRL
Kotelny Island, RU (KOT)	1986-1993	WDCGG/ MGO
Cape Kumukahi, Hawaii, US (KUM)	1979-2013	NOAA/ ESRL
Sary Taukum, KZ (KZD)	1997-2009	NOAA/ ESRL
Plateau Assy, KZ (KZM)	1997-2009	NOAA/ ESRL

Lulin, TW (LLN)	2006-2013	NOAA/ ESRL
Lampedusa, IT (LMP)	2006-2013	NOAA/ ESRL
Ile grande, FR (LPO)	2004-2013	LSCE
Mawson, AU (MAA)	1990-2013	WDCGG/ CSIRO
Mould Bay, Nunavut, CA (MBC)	1980-1997	NOAA/ ESRL
Mace Head, County Galway, IE (MHD)	1991-2013	NOAA/ ESRL
Mace Head, County Galway, IE (MHD)	1996-2013	LSCE
Sand Island, Midway, US (MID)	1985-2013	NOAA/ ESRL
Mt. Kenya, KE (MKN)	2003-2011	NOAA/ ESRL
Mauna Loa, Hawaii, US (MLO)	1979-2013	NOAA/ ESRL
Macquarie Island, AU (MQA)	1990-2013	WDCGG/ CSIRO
Gobabeb, NA (NMB)	1997-2013	NOAA/ ESRL
Niwot Ridge, Colorado, US (NWR)	1979-2013	NOAA/ ESRL
Olympic Peninsula, WA, USA (OPW)	1984-1990	NOAA/ ESRL
Ochsenkopf, DE (OXK)	2003-2013	NOAA/ ESRL
Pallas-Sammaltunturi, GAW Station, FI (PAL)	2001-2013	NOAA/ ESRL
Pic du Midi, FR (PDM)	2001-2013	LSCE
Pacific Ocean, 0N (POC000)	1987-2011	NOAA/ ESRL
Pacific Ocean, 5N (POCN05)	1987-2011	NOAA/ ESRL
Pacific Ocean, 10N (POCN10)	1987-2011	NOAA/ ESRL
Pacific Ocean, 15N (POCN15)	1987-2011	NOAA/ ESRL
Pacific Ocean, 20N (POCN20)	1987-2011	NOAA/ ESRL
Pacific Ocean, 25N (POCN25)	1987-2011	NOAA/ ESRL
Pacific Ocean, 30N (POCN30)	1987-2011	NOAA/ ESRL
Pacific Ocean, 5S (POCS05)	1987-2011	NOAA/ ESRL
Pacific Ocean, 10S (POCS10)	1987-2011	NOAA/ ESRL
Pacific Ocean, 15S (POCS15)	1987-2011	NOAA/ ESRL
Pacific Ocean, 20S (POCS20)	1987-2011	NOAA/ ESRL
Pacific Ocean, 25S (POCS25)	1987-2011	NOAA/ ESRL
Pacific Ocean, 30S (POCS30)	1987-2011	NOAA/ ESRL
Pacific Ocean, 35S (POCS35)	1987-2011	NOAA/ ESRL
Palmer Station, Antarctica, US (PSA)	1979-2013	NOAA/ ESRL
Point Arena, California, US (PTA)	1999-2011	NOAA/ ESRL
Puy de Dome, FR (PUY)	2001-2013	LSCE
Ragged Point, BB (RPB)	1987-2013	NOAA/ ESRL
South China Sea, 3N (SCSN03)	1991-1998	NOAA/ ESRL
South China Sea, 6N (SCSN06)	1991-1998	NOAA/ ESRL
South China Sea, 9N (SCSN09)	1991-1998	NOAA/ ESRL
South China Sea, 12N (SCSN12)	1991-1998	NOAA/ ESRL
South China Sea, 15N (SCSN15)	1991-1998	NOAA/ ESRL
South China Sea, 18N (SCSN18)	1991-1998	NOAA/ ESRL
South China Sea, 21N (SCSN21)	1991-1998	NOAA/ ESRL
Mahe Island, SC (SEY)	1980-2013	NOAA/ ESRL
Southern Great Plains, Oklahoma, US (SGP)	2002-2013	NOAA/ ESRL
Shemya Island, Alaska, US (SHM)	1985-2013	NOAA/ ESRL

Ship between Ishigaki Island and Hateruma Island, JP (SIH)	1993-2005	WDCGG/ Tohoku University
Shetland, Scotland, GB (SIS)	1992-2003	WDCGG/ CSIRO
Tutuila, American Samoa (SMO)	1979-2013	NOAA/ ESRL
South Pole, Antarctica, US (SPO)	1979-2013	NOAA/ ESRL
Ocean Station M, NO (STM)	1980-2009	NOAA/ ESRL
Summit, GL (SUM)	1997-2013	NOAA/ ESRL
Syowa Station, Antarctica, JP (SYO)	1986-2013	NOAA/ ESRL
Tae-ahn Peninsula, KR (TAP)	1991-2013	NOAA/ ESRL
Tierra Del Fuego, Ushuaia, AR (TDF)	1994-2013	NOAA/ ESRL
Trinidad Head, California, US (THD)	2002-2013	NOAA/ ESRL
Tromelin Island, F (TRM)	1998-2007	LSCE
Wendover, Utah, US (UTA)	1993-2013	NOAA/ ESRL
Ulaan Uul, MN (UUM)	1992-2013	NOAA/ ESRL
Sede Boker, Negev Desert, IL (WIS)	1995-2013	NOAA/ ESRL
Sable Island, CA (WSA)	1979-2012	WDCGG/ EC
Mt. Waliguan, CN (WLG)	1990-2013	NOAA/ ESRL
Western Pacific Cruise (WPC)	2004-2013	NOAA/ ESRL
Ny-Alesund, Svalbard, Norway and Sweden (ZEP)	1994-2013	NOAA/ ESRL

Table S2: Same as Table S1 but for the flask-sampling sites.

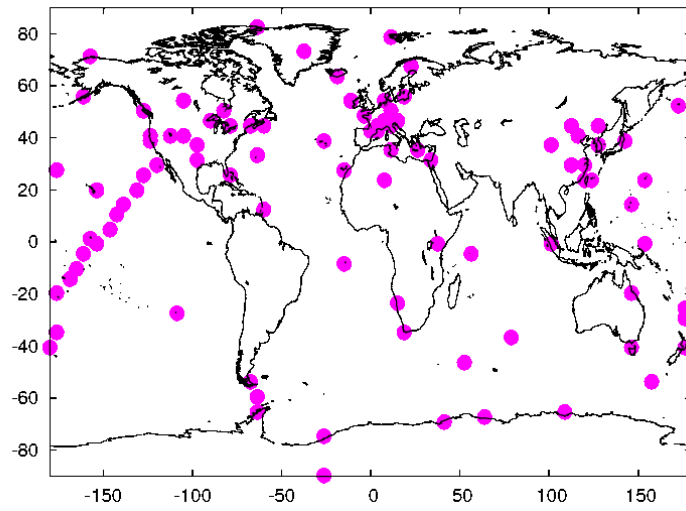


Fig. S1. Map of the sites used in the MACC CO₂ inversion v13r1 for years 2010-2013 as listed in Tables S1 and S2.