Data sets for the manuscript

Variation in CO_2 and CH_4 Fluxes Among Land Cover Types in Heterogeneous Arctic Tundra in Northeastern Siberia

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Data are in four cvs files and are described below

Study area

Chamber measurements of CO2 and CH4 fluxes were consucted at the area of micrometeorological greenhouse gas flux station in Tiksi, Russia (71.5943 N, 128.8878 E)

Overview of the measurement periods, measured fluxes (CH_4, ecosystem respiration of CO2, ER, and ecosysten net exchnage of CO2, NEE), years, and number of measurement points and observations (points, observations) in each land cover type (LCT) across the study

LCT	2012 Jul 18–21 CH_4	2013 Jul 5–Sep 3 CH_4	2014 Jul 15–Aug 16 ER, NEE, CH_4	2016 May 30, Aug 4–5, Sep 13–14 CH_4	2019 Aug 28–Sep 1 CH_4
Wet fen	4, 4	6, 22	3, 107	3, 27	5, 72
Vehicle track					2, 30
Dry fen	2, 2	4, 11	3, 107	3, 14	2, 26
Bare peat					1, 15
Bog	2, 2	3, 7	1, 36		1, 13
Meadow	1, 1	2, 6	2, 62,		
Dwarf-shrub tundra	1, 1		1, 36	1,1	
Lichen tundra		1, 3	2, 67	2, 18	2, 29
Snow and ice[1]				2, 2	

[1]Measured only on May 30, 2016.

Descriptions of the data files are below

Juutinen_etal_DCAdata.xlsx

Species data and environmental variables data used in the DCA analysis in two sheets and a read-me sheet
Species coverage on July 22, 2014, other variable means of the measurement period (July 15-Aug 16, 2014)

Column heading	Explanation
Sheet species	
Point	collar ID, C1-C12
Lichen	% cover of lichens in the collar
Sphagnum	% cover of Sphagnum mosses in the collar
Brownm	% cover of brown mosses in the collar
Featherm	% cover of feather mosses in the collar
Gramin	% cover of graminoids in the collar
Forb	% cover of forbs in the collars
Dwarf-S	% cover of dwarf-shrubs (excl Betula nana, Salix spp) in the collar
B. nana	% cover of Betula nana in the collar
Salix	% cover of Salix species in the collar
Point	collar ID, C1-C12
ThawD	thaw depth (cm) in the collar
WT	water table depth relative to the ground surface (cm), mean over the measurement period
LA	Leaf area index, m2m-2, mean over the measurement period
ER	estimate of the ecosystem respiration
CH4	mean CH4 fluxes (mmol m-2d-1)
NEE800	estimate of the net ecosystem CO2 exchange at photon flux density 800 µmol m-2s-2 (mmol m-2d-1)
Pg800	estimate of the gross photosynthesis at photon flux density 800 µmol m-2s-2 (mmol m-2d-1)
masl	plot's elevation above sea level (m)
TWIplot	topographic wetness index at plot's location
GCC	Green chromatic coordinate determined from a plot photo

Juutinen_etal_Chamber_CO2flux2014.xlsx

Chamber measurements of CO2 fluxes with dublicated transparent and opaque chambers
Measurement period July 15-Aug 16, 2014

Column heading	Explanation
Date	date of the measurement
TimeUTC	Time of the measurement
Jday	Number of day
Plot ID	Plot ID (1-12)
Plottype	Land-cover type of the plot (wet fen, dry fen, bog, meadow, dwarf-shrub tundra, lichen tundra)
ChamberType	Transparent or opaque, dublicate measurement to estimate gross photosynthesis
WT depth (cm)	Water table depth relative to the ground surface
T Chamber (°C)	temprature in chamber
CO2 (mol/m2/d1)	CO2 flux
CO2 (mmol/m2/d1)	CO2 flux
CO2 (mg C/m2/d1)	CO2 flux
CO2 (mg CO2/m2/d1)	CO2 flux
CH4 (mol/m2/d1)	CH4 flux
CH4 (mmol/m2/d1)	CH4 flux
CH4 (mg C/m2/d1)	CH4 flux
CH4 (mg CH4/m2/d1)	CH4 flux
CH4(mg CH4/m2/h1)	CH4 flux
CO2(mmol/m2/h)	CO2 flux
CH4(mmol/m2/h)	CH4 flux
ER (mmolm2h)	Ecosystem dark respiration of CO2
CH4_dark (mmolm2h)	CH4 flux measured with the opaque chamber
NEE (CO2 mmolm2h)	Net exchnage of CO2 in light (transparent chamber)
CH4_light (mmolm2h)	CH4 flux measured with the transparent chamber
PPFD (µmol/m2/s)	Photosynthetically active photon flux density
Globalradiation (W/m2)	Global radiation
Pg (CO2 mmol/m2/h)	Estimate of gross photosynthesis based on measured NEE and ER
Biomass_vascular (g/m2)	Estimated above ground biomass of vascular plants
Biomass_moss (g/m2)	Estimated above ground biomass of living moss
LAI_vascular	estimated LAI of vascular plants, one sided (m2/m2)
LAImoss	estimates LAI of mosses, based on %cover in the plot
ThawDepth (cm)	Thaw depth, cm below ground surface

Juutinen_etal_ECdata_windsectors(2014).xlsx

30-min means of CO2 fluxes measured using eddy covariance method, distinguished based on wind sectors (source area)
Proportional land-cover type distribution in the wind sector-based source areas and wind-sector averages of the CH4 fluxes
Period July 15-Aug 16, 2014

Sheet CO2 flux

Column heading	Explanation
Date	Date and time (UTC)
PPFD (umol/m2/s)	Photosynthetically active photon flux density (µmol/m2/s)
125-185	CO2 flux from the wind sector 125-185°, unit mg CO2/m2/s
185-239	CO2 flux from the wind sector 185-239°
240-300	CO2 flux from the wind sector 240-300°
300-15	CO2 flux from the wind sector 300-15°
30-125	CO2 flux from the wind sector 30-125°

Juutinen_etal_ChamberSummary2012_2019.xlsx

All CH4 and CO2 flux data measured using closed chambers in years 2012-2019 in the EC-strudy site
Data consist also the measurements of dark respiration of CO2 and net exchnage of CO2 in years 2016-2019 that are not included in the publication
CO2 flux data measured in 2014 provided also as a seprate file (see description above)

Column heading	Explanation
Year	Year of the measurement
Date	Date of the measurement
TimeUTC	UTC time of the measurement
Jday	number of the day (1-365)
Plot ID	Plot ID in the original data
TWI	Topographic wetness index
GCC	Green chromatic coordinate
Plottype	Land-cover type in the plot (wet fen, wet fen-vehicle track,dry fen, dry fen-bare peat, bog, meadow, dwarf-shrub tundra, lichen tundra)
ChamberType	Transparent or opaque chamber
Analyzer	Gas chromatrograph (GC) or Los Gatos Research, DLT-100 (LGR)
WT depth (cm)	Water table depth relative to the ground, negative sign denotes below ground
Permafrost depth (cm)	permafrost depth relative to the ground, negative sign denotes below ground
Tair (°C)	air temperature
CO2 (mmol/m2/h)	CO2 flux
CH4 (mmol/m2/h)	CH4 flux
Notes_A	Notes flux
CO2 ER (mmol/m2/h)	ecosystem dark respiration of CO2
CO2 NEE (mmol/m2/h)	Ecosystem net exchnage of CO2 (negative if uptake by ecosystem)
CO2_Pg (mmol/m2/h)	Estimate of gross photosynthesis based on measured NEE and ER
PPFD (µmol/m2/s)	Photosynthetically active photon flux density
Globalradiation (W/m2)	Global radiation
rejected NEE	rejected flux
rejected Pg	rejected flux