

## Metadata Template

<b>Title of dataset</b>	<i>A Carbon Source in a Carbon Sink: Carbon Dioxide and Methane Dynamics in Open-Water Peatland Pools</i>
<b>Keywords</b>	
<b>Lead author for the dataset</b>	<i>Pierre Taillardat</i>
<b>Title and position of lead author</b>	<i>Senior Research Fellow</i>
<b>Organization and address of lead author</b>	<i>Université du Québec à Montréal, Canada Current addresses: National University of Singapore</i>
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<b>Organization associated with the data</b>	<i>Same as for lead author</i>
<b>Funding</b>	<i>This research was funded by the Natural Sciences and Engineering Research Council of Canada and Hydro-Quebec to Michelle Garneau (RDCPJ 514218-17).</i>
<b>License</b>	<i>CCBY</i>
<b>Geographic location – verbal description</b>	<i>The data was collected in a boreal peatland in Minganie, Québec, Canada (50°31'N; 63°12'W, elevation: 108 ± 5 m asl).</i>
<b>Time frame - Begin date</b>	<i>01/06/2019 (MM/DD/YYYY)</i>
<b>Time frame - End date</b>	<i>10/10/2020 (MM/DD/YYYY)</i>
<b>General study design</b>	<i>This study was led by Michelle Garneau's lab in collaboration with researchers from other institutions in Quebec and France. In total, the study site was visited monthly and automated continuous equipment were left on the site between visits.</i>
<b>Methods description</b>	<i>Please refer to the manuscript for full description of the methods used.</i>
<b>Quality control</b>	<i>All data were carefully checked by at least two coauthors.</i>

## Figure2\_Figure6.csv

	Description	Unit or code explanation or date format	Empty value code
<b>SiteID</b>	Sampling location (5 open water pools)	M## (goes from pool M11 to M15)	NA
<b>Year</b>	Sampling year	-	
<b>Month</b>	Sampling month	In letters	NA
<b>Sampling_date</b>	Sampling date	dd/mm/YYYY	NA

<b>Sampling_time</b>	Sampling time	HH:MM	NA
<b>Pool_size_m2</b>	Surface area of the pool	Square meter	NA
<b>CO2atm_ppm</b>	Atmospheric CO <sub>2</sub> partial pressure (from eddy covariance tower)	Part per million (ppm)	NA
<b>CH4atm_ppm</b>	Atmospheric CO <sub>2</sub> partial pressure (from eddy covariance tower)	Part per million (ppm)	NA
<b>AtmP_Pa</b>	Atmospheric pressure	Pascal	NA
<b>air_pressure_atm</b>	Atmospheric pressure	Atmosphere	NA
<b>Windspeed_msec</b>	Wind Speed	Meter per second	NA
<b>pCH4_ppm</b>	Stream dissolved CH <sub>4</sub> partial pressure (median value from triplicates)	Part per million (ppm)	NA
<b>pCO2_ppm</b>	Stream dissolved CO <sub>2</sub> partial pressure (median value from triplicates)	Part per million (ppm)	NA
<b>d13CCH4_permil</b>	Stream dissolved $\delta^{13}\text{C}$ -CH <sub>4</sub> value (median value from triplicates)	permil	NA
<b>d13CCO2_permil</b>	Stream dissolved $\delta^{13}\text{C}$ -CO <sub>2</sub> value (median value from triplicates)	permil	NA
<b>FluxCO2_mgCm2d</b>	CO <sub>2</sub> flux at the interface water-atmosphere using a floating chamber	Milligram of carbon per square meter per day	NA
<b>FluxCH4_mgCm2d</b>	CH <sub>4</sub> flux at the interface water-atmosphere using a floating chamber	Milligram of carbon per square meter per day	NA
<b>Water.body</b>	Water body type (M=Pool; PW= porewater; W=well)	-	
<b>T_degC</b>	Water temperature	Degrees Celsius	NA
<b>pH</b>	pH	-	NA
<b>water_temp_K</b>	Water temperature	Kelvin	NA
<b>pH</b>	Water pH	NA	NA
<b>DOC_mgL</b>	Dissolved organic carbon concentration	Milligram of carbon per liter	NA
<b>Sol_CO2</b>	Coefficient solubility of carbon dioxide (CO <sub>2</sub> )	NA	NA
<b>Sol_CH4</b>	Coefficient solubility of methane	NA	NA
<b>water_pCO2_uatm</b>	Partial pressure of CO <sub>2</sub> in water	Micro atmosphere	NA
<b>water_pCH4_uatm</b>	Partial pressure of CH <sub>4</sub> in water	Micro atmosphere	NA

<b>water_CO2_umolL1</b>	Concentration of dissolved CO <sub>2</sub> in water	Micromole per liter	NA
<b>water_CH4_umolL1</b>	Concentration of dissolved CH <sub>4</sub> in water	Micromole per liter	NA
<b>air_CO2_uatm</b>	Partial pressure of CO <sub>2</sub> in the air	Micro atmosphere	NA
<b>air_CH4_uatm</b>	Partial pressure of CH <sub>4</sub> in the air	Micro atmosphere	NA
<b>deltaCO2_umolL1</b>	Concentration difference between air and water	Micromole per liter	NA
<b>deltaCH4_umolL1</b>	Concentration difference between air and water	Micromole per liter	NA
<b>deltaCO2_mgCL1</b>	Concentration difference between air and water	Milligram of carbon per liter	NA
<b>deltaCH4_mgCL1</b>	Concentration difference between air and water	Milligram of carbon per liter	NA
<b>CO2_mgCL</b>	Carbon dioxide concentration in water	Milligram of carbon per liter	NA
<b>CH4_mgCL</b>	Methane concentration in water	Milligram of carbon per liter	NA
<b>CO2CH4_mgCL</b>	Carbon dioxide to methane ratio	-	
<b>k_CO2_measured_md</b>	Gas transfer velocities of CO <sub>2</sub>	Meter per day	NA
<b>k_CH4_measured_md</b>	Gas transfer velocities of CH <sub>4</sub>	Meter per day	NA
<b>Sc_CO2</b>	Schmidt number of a CO <sub>2</sub> based on field temperature	NA	NA
<b>Sc_CH4</b>	Schmidt number of a CH <sub>4</sub> based on field temperature	NA	NA
<b>k600_CO2_measured_md</b>	Normalized gas transfer velocities of CO <sub>2</sub> (k at 20°C in freshwater at a Schmidt number of 600)	Meter per day	NA
<b>k600_CH4_measured_md</b>	Normalized gas transfer velocities of CH <sub>4</sub> (k at 20°C in freshwater at a Schmidt number of 600)	Meter per day	NA

Figure3\_Figure4ab.csv

	Description	Unit or code explanation or date format	Empty value code
<b>Date_Time</b>	Measurement date and time	dd-mm-yy HH:MM	-

<b>CO2_ppm</b>	Partial pressure of CO <sub>2</sub> at the outlet station (#8)	Part per million	Blank
<b>CH4_ppm</b>	Partial pressure of CH <sub>4</sub> at the outlet station (#8)	Part per million	Blank
<b>Temp_degC</b>	Water temperature	Degrees Celsius	Blank
<b>CO2atm_ppm</b>	Atmospheric CO <sub>2</sub> partial pressure (from eddy covariance tower)	Part per million (ppm)	NA
<b>CH4atm_ppm</b>	Atmospheric CO <sub>2</sub> partial pressure (from eddy covariance tower)	Part per million (ppm)	NA
<b>windspeed_msec1</b>	Wind Speed	Meter per second	NA
<b>Rain_mm_Tot</b>	Cumulative rain	mm	NA
<b>AirTemp_degC</b>	Air temperature	Degrees Celsius	Blank
<b>WTD_m</b>	Water table depth	m	NA
<b>Temp5cm_degC</b>	Soil Temperature at -5cm	degC	NA
<b>Temp10cm_degC</b>	Soil Temperature at -10cm	degC	NA
<b>Temp20cm_degC</b>	Soil Temperature at -20cm	degC	NA
<b>Temp40cm_degC</b>	Soil Temperature at -40cm	degC	NA
<b>PoolT_degC</b>	Pool Temperature	degC	NA
<b>Sol_CO2</b>	Coefficient solubility of carbon dioxide (CO <sub>2</sub> )	NA	NA
<b>Sol_CH4</b>	Coefficient solubility of methane	NA	NA
<b>air_pressure_atm</b>	Air pressure	Atmosphere	NA
<b>water_pCO2_uatm</b>	Partial pressure of CO <sub>2</sub> in water	Micro atmosphere	NA
<b>water_pCH4_uatm</b>	Partial pressure of CH <sub>4</sub> in water	Micro atmosphere	NA
<b>water_pCO2_umolL1</b>	Concentration of dissolved CO <sub>2</sub> in water	Micromole per liter	NA
<b>water_pCH4_umolL1</b>	Concentration of dissolved CH <sub>4</sub> in water	Micromole per liter	NA
<b>air_CO2_uatm</b>	Partial pressure of CO <sub>2</sub> in the air	Micro atmosphere	NA
<b>air_CH4_uatm</b>	Partial pressure of CH <sub>4</sub> in the air	Micro atmosphere	NA
<b>deltaCO2_umolL1</b>	Concentration difference between air and water	Micromole per liter	NA
<b>deltaCH4_umolL1</b>	Concentration difference between air and water	Micromole per liter	NA
<b>CO2_mgCL</b>	Carbon dioxide concentration in water	Milligram of carbon per liter	NA
<b>CH4_ugCL</b>	Methane concentration in water	Microgram of carbon per liter	NA

Figure4cd.csv

	Description	Unit or code explanation or date format	Empty value code
<b>Fulldate</b>	Sampling date and time	dd/mm/YYYY HH:MM	
<b>water_pCO2_uatm</b>	Partial pressure of CO <sub>2</sub> in water	Micro atmosphere	NA
<b>water_pCH4_uatm</b>	Partial pressure of CH <sub>4</sub> in water	Micro atmosphere	NA
<b>water_temp_K</b>	Water temperature	Kelvin	NA
<b>Sol_CO2</b>	Coefficient solubility of carbon dioxide (CO <sub>2</sub> )	NA	NA
<b>Sol_CH4</b>	Coefficient solubility of methane	NA	NA
<b>air_pressure_atm</b>	Atmospheric pressure	Atmosphere	NA
<b>water_CO2_umolL1</b>	Concentration of dissolved CO <sub>2</sub> in water	Micromole per liter	NA
<b>water_CH4_umolL1</b>	Concentration of dissolved CH <sub>4</sub> in water	Micromole per liter	NA
<b>pool_CO2_daily_median_umolL1</b>	Daily median concentration of dissolved CO <sub>2</sub> in water	Micromole per liter	NA
<b>pool_CH4_daily_median_umolL1</b>	Daily median concentration of dissolved CH <sub>4</sub> in water	Micromole per liter	NA
<b>pool_CO2_var_umolL1</b>	Variation between sample and daily median concentration of dissolved CO <sub>2</sub> in water	Micromole per liter	NA
<b>pool_CH4_var_umolL1</b>	Variation between sample and daily median concentration of dissolved CH <sub>4</sub> in water	Micromole per liter	NA
<b>pool_CO2_var_mgCL</b>	Variation between sample and daily median concentration of dissolved CO <sub>2</sub> in water	Milligram of carbon per liter	NA
<b>pool_CH4_var_ugCL</b>	Variation between sample and daily median concentration of dissolved CH <sub>4</sub> in water	Milligram of carbon per liter	NA

Figure4ef.csv

	Description	Unit or	Empty value code
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		code explanation or date format	
<b>SiteID</b>	Sampling location (5 open water pools)	M## (goes from pool M11 to M15)	NA
<b>Year</b>	Sampling year	-	
<b>Month</b>	Sampling month	In letters	NA
<b>Sampling_date</b>	Sampling date	dd/mm/YYYY	NA
<b>Sampling_time</b>	Sampling time	HH:MM	NA
<b>TimeDate</b>	Sampling date and time	dd/mm/YYYY HH:MM	
<b>CO2atm_ppm</b>	Atmospheric CO <sub>2</sub> partial pressure (from eddy covariance tower)	Part per million (ppm)	NA
<b>CH4atm_ppm</b>	Atmospheric CO <sub>2</sub> partial pressure (from eddy covariance tower)	Part per million (ppm)	NA
<b>AtmP_Pa</b>	Atmospheric pressure	Pascal	NA
<b>air_pressure_atm</b>	Atmospheric pressure	Atmosphere	NA
<b>Windspeed_msec</b>	Wind Speed	Meter per second	NA
<b>pCH4_ppm</b>	Stream dissolved CH <sub>4</sub> partial pressure (median value from triplicates)	Part per million (ppm)	NA
<b>pCO2_ppm</b>	Stream dissolved CO <sub>2</sub> partial pressure (median value from triplicates)	Part per million (ppm)	NA
<b>d13CCH4_permil</b>	Stream dissolved $\delta^{13}\text{C}$ -CH <sub>4</sub> value (median value from triplicates)	permil	NA
<b>d13CCO2_permil</b>	Stream dissolved $\delta^{13}\text{C}$ -CO <sub>2</sub> value (median value from triplicates)	permil	NA
<b>Water.body</b>	Water body type (M=Pool; PW= porewater; W=well)	-	
<b>T_degC</b>	Water temperature	Degrees Celsius	NA
<b>pH</b>	pH	-	NA
<b>DOC_mgL</b>	Dissolved organic carbon concentration	Milligram of carbon per liter	NA
<b>Sol_CO2</b>	Coefficient solubility of carbon dioxide (CO <sub>2</sub> )	NA	NA
<b>Sol_CH4</b>	Coefficient solubility of methane	NA	NA
<b>water_pCO2_uatm</b>	Partial pressure of CO <sub>2</sub> in water	Micro atmosphere	NA
<b>water_pCH4_uatm</b>	Partial pressure of CH <sub>4</sub> in water	Micro atmosphere	NA

<b>water_CO2_umolL1</b>	Concentration of dissolved CO <sub>2</sub> in water	Micromole per liter	NA
<b>water_CH4_umolL1</b>	Concentration of dissolved CH <sub>4</sub> in water	Micromole per liter	NA
<b>air_CO2_uatm</b>	Partial pressure of CO <sub>2</sub> in the air	Micro atmosphere	NA
<b>air_CH4_uatm</b>	Partial pressure of CH <sub>4</sub> in the air	Micro atmosphere	NA
<b>CO2_mgCL</b>	Carbon dioxide concentration in water	Milligram of carbon per liter	NA
<b>CH4_mgCL</b>	Methane concentration in water	Milligram of carbon per liter	NA

**Figure5\_daily.csv**

	Description	Unit or code explanation or date format	Empty value code
<b>Date</b>	Measurement date	dd-mm-yy	-
<b>Flux_mgCm2d</b>	Carbon dioxide emission to the atmosphere	Milligram of carbon per square meter per day	NA
<b>Flux_type</b>	CO <sub>2</sub> evasion, CH <sub>4</sub> evasion or CH <sub>4</sub> ebullition	NA	NA

**LiteratureReview\_OpenWaterPeatlandPools.csv**

	Description	Unit or code explanation or date format	Empty value code
<b>Reference</b>	Publication reference	-	NA
<b>Year of publication</b>	Publication year of publication	-	NA
<b>Site.ID</b>	Study site ID	-	NA
<b>Country</b>	Study site Country	-	NA
<b>Latitude</b>	Study site latitude	-	NA
<b>Longitude</b>	Study site longitude	-	NA
<b>Sampling.date.and.frequency</b>	Sampling date and frequency	-	NA
<b>Pool_Depth_m</b>	Pool depth	-	NA
<b>Pool_surface_m2</b>	Pool surface area	-	NA
<b>Pool_occupation_catchment_%</b>	Total occupation of the pool(s) within the catchment	-	NA
<b>Peat_occupation_catchment_%</b>	Total occupation of the peatland(s) within the catchment	-	NA

<b>Pool_type</b>	Pool type (beaver pond, peatland pool bog, peatland pool fen, thaw pool, wetland pond)	-	NA
<b>Catchment_land_cover</b>	Catchment land cover	-	NA
<b>Permafrost</b>	Indication of permafrost in the study site (continuous, discontinuous, sporadic, no)	-	NA
<b>DOC_range</b>	Dissolved Organic Carbon concentration range	-	NA
<b>DOC_mean</b>	Dissolved Organic Carbon mean concentration	-	NA
<b>DOC_median</b>	Dissolved Organic Carbon median concentration	-	NA
<b>DOC_unit</b>	Dissolved Organic Carbon concentration unit	-	NA
<b>CH4_range</b>	Dissolved methane concentration range	-	NA
<b>CH4_mean</b>	Dissolved methane mean concentration	-	NA
<b>CH4_median</b>	Dissolved methane median concentration	-	NA
<b>CH4_unit</b>	Dissolved methane concentration unit	-	NA
<b>CO2_range</b>	Dissolved carbon dioxide concentration range	-	NA
<b>CO2_mean</b>	Dissolved carbon dioxide mean concentration	-	NA
<b>CO2_median</b>	Dissolved carbon dioxide median concentration	-	NA
<b>CO2_unit</b>	Dissolved carbon dioxide concentration unit	-	NA
<b>FCO2_range</b>	Carbon dioxide diffusion range	-	NA
<b>FCO2_mean</b>	Carbon dioxide mean diffusion	-	NA
<b>FCO2_median</b>	Carbon dioxide median diffusion	-	NA
<b>FCO2_unit</b>	Carbon dioxide diffusion unit	-	NA
<b>diffusive_FCH4_range</b>	Methane diffusion range	-	NA
<b>diffusive_FCH4_mean</b>	Methane mean diffusion	-	NA
<b>diffusive_FCH4_median</b>	Methane median diffusion	-	NA
<b>FCH4_unit</b>	Methane diffusion unit	-	NA
<b>CH4_ebullition</b>	Methane ebullition	-	NA
<b>CH4_ebullition_unit</b>	Methane mean ebullition	-	NA
<b>k600_CO2</b>	Normalized gas transfer velocities of CO <sub>2</sub> (k at 20°C in	-	NA



	freshwater at a Schmidt number of 600)		
<b>k600_CO2_unit</b>	Unit of normalized gas transfer velocities of CO <sub>2</sub>	-	NA
<b>k600_CH4</b>	Normalized gas transfer velocities of CH <sub>4</sub> (k at 20°C in freshwater at a Schmidt number of 600)	-	NA
<b>k600_CH4_unit</b>	Unit of normalized gas transfer velocities of CH <sub>4</sub>	-	NA
<b>doi</b>	Publication DOI	-	NA
<b>Comments</b>	Any comment	-	NA
<b>CH4_mean_mgCL</b>	Homogeneized dissolved methane mean concentration	Milligran carbon per liter	NA
<b>CH4_median_mgCL</b>	Homogeneized dissolved methane median concentration	Milligran carbon per liter	NA
<b>CO2_mean_mgCL</b>	Homogeneized dissolved carbon dioxide mean concentration	Milligran carbon per liter	NA
<b>CO2_median_mgCL</b>	Homogeneized dissolved carbon dioxide median concentration	Milligran carbon per liter	NA
<b>FCO2_mean_gCm2d</b>	Homogeneized dissolved carbon dioxide mean diffusion	Gram of carbon per square meter per day	NA
<b>FCO2_median_gCm2d</b>	Homogeneized dissolved carbon dioxide median diffusion	Gram of carbon per square meter per day	NA
<b>FCH4_diffusion_mean_gCm2d</b>	Homogeneized dissolved methane mean diffusion	Gram of carbon per square meter per day	NA
<b>FCH4_diffusion_median_gCm2d</b>	Homogeneized dissolved methane median diffusion	Gram of carbon per square meter per day	NA
<b>FCH4_ebultion_mean_gCm2d</b>	Homogeneized dissolved methane ebullition	Gram of carbon per square meter per day	NA
<b>DOC_mean_mgCL</b>	Homogeneized dissolved organic carbon mean concentration	Milligran carbon per liter	NA
<b>DOC_median_mgCL</b>	Homogeneized dissolved organic carbon median concentration	Milligran carbon per liter	NA
<b>FCO2_mean_mgCm2d</b>	Homogeneized dissolved carbon dioxide mean diffusion	Milligram of carbon per	NA

		square meter per day	
<b>FCO2_median_mgCm2d</b>	Homogeneized dissolved carbon dioxide median diffusion	Milligram of carbon per square meter per day	NA
<b>FCH4_diffusion_mean_mgCm2d</b>	Homogeneized dissolved methane mean diffusion	Milligram of carbon per square meter per day	NA
<b>FCH4_diffusion_median_mgCm2d</b>	Homogeneized dissolved methane median diffusion	Milligram of carbon per square meter per day	NA

Figure9ab\_.csv

	Description	Unit or code explanation or date format	Empty value code
<b>Reference</b>	Publication reference	-	NA
<b>Category</b>			
<b>Site ID</b>	Study site ID	-	NA
<b>Location</b>	Study site Country	-	NA
<b>Latitude</b>	Study site latitude	-	NA
<b>Longitude</b>	Study site longitude	-	NA
<b>Sampling_date</b>	Sampling date	-	NA
<b>area_ha</b>	Water body surface area	Hectare	NA
<b>area_km2</b>	Water body surface area	Square kilometer	
<b>CO2_umolL1</b>	Carbon dioxide concentration in water	Milligram of carbon per liter	NA
<b>CH4_umolL1</b>	Methane concentration in water	Milligram of carbon per liter	NA
<b>CO2_mgCL</b>	Carbon dioxide concentration in water	Milligram of carbon per liter	NA
<b>CH4_mgCL</b>	Methane concentration in water	Milligram of carbon per liter	NA

Figure9c\_.csv

	Description	Unit or code explanation or date format	Empty value code
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<b>total_CH4_flux_mgCH4m-2d-1</b>	Total methane emission	Milligram of methane per square meter per day	NA
<b>total_CH4_flux_mgCm-2d-1</b>	Total methane emission	Milligram of carbon per square meter per day	
<b>WaterBody</b>	Water body type	-	NA
<b>Ref</b>	Study site reference	-	NA
<b>Source</b>	Metadata source (Rosentreter et al. 2021 or This Study)	-	NA