The data is presented in the paper "Enhanced carbon uptake and reduced methane emissions in a newly restored wetland".

1. In the sheet "seasonal change": the data presented the seasonal change of CO2, CH4, N2O, as well as GWP in the restored and natural wetlands.

   Treatments: "Restored" is "the restored wetland"; "Natural" is "the natural wetland".

   Month: The data was collected monthly in 2018.

   CO2: CO2 emission flux (μmol m^{-2} s^{-1}).

   CH4: CH4 emission flux (μmol m^{-2} s^{-1}).

   N2O: N2O emission flux (μmol m^{-2} s^{-1}).

   GWP: the partial global warming potential over a 100-year time horizon (GWP_{100}, umol CO_2 equivalent $m^{-2}s^{-1}$) by multiplying the seasonal GHG fluxes by their respective radiative forcing potential considering 100 years of effects and then combined the resulting values of the three gases. The GWP_{100} calculation formula is as follows：

$$GWP_{100} = FCO_2 + (FCH_4 \times 25) + (FN_2O \times 298)$$

2. In the sheet "influence in summer"： the data was collected in the June-August, 2018, in the restored and natural wetlands.

   Treatments: "Restored" is "the restored wetland"; "Natural" is "the natural wetland".

   CO2: CO2 emission flux (μmol m^{-2} s^{-1}).

   CH4: CH4 emission flux (μmol m^{-2} s^{-1}).

   N2O: N2O emission flux (μmol m^{-2} s^{-1}).

   GWP: global warming potential (μmol m^{-2} s^{-1}).

   pH: soil pH value.

   ORP: Soil oxidation-reduction potential (mV).

   Soil moisture: Soil moisture (%).

   Water salinity: Water salinity (‰).

   Plant biomass: Plant biomass (kg/m^2).

   Total nitrogen concentration: Total nitrogen concentration of the pore water (mg/L)

3. In the sheet "ch4 and orp": the data was presented the relationship between CH4 emission and ORP.

CH4: CH4 emission flux (μmol m^{-2} s^{-1}).

ORP: Soil oxidation-reduction potential (mV).

4. In the sheet "CH4 AND PLANT HIGHT": the data was presented the relationship between CH4 emission and plant growth.

   Month: The data was collected monthly in 2018.

   CH4: CH4 emission flux (μmol m^{-2} s^{-1}).

   Plant height: Plant height (cm).

   Chlorophyll: leaf chlorophyll concentration (SPAD VALUE).

5. In the sheet "diurnal variations": the data was presented the diurnal variations of GHG emission of the restored wetland.

   Time: the time on July 15th, 2018.

   CO2: CO2 emission flux (μmol m^{-2} s^{-1}).

   CH4: CH4 emission flux (μmol m^{-2} s^{-1}).

   N2O: N2O emission flux (μmol m^{-2} s^{-1}).

   CO2-SE: the standard value of CO2 emission flux (μmol m^{-2} s^{-1}).

   CH4-SE: the standard value of CH4 emission flux (μmol m^{-2} s^{-1}).

   N2O -SE: the standard value of N2O emission flux (μmol m^{-2} s^{-1}).

   PAR: photosynthetically active radiation (μmol m^{-2} s^{-1}).

6. In the sheet "CO2 and chl or PAR": the data was presented the relationships between CH4 emission and leaf chlorophyll concentration, and between CH4 emission and light intensity.

   CO2: CO2 emission flux (μmol m^{-2} s^{-1}).

   Chlorophyll: leaf chlorophyll concentration (SPAD VALUE).

   PAR: photosynthetically active radiation (μmol m^{-2} s^{-1}).

7. In the sheet "CH4 and water treatment": the data was presented the effect of water flow (tide) on CH4 emission.

   Restored :the restored wetland. In the restored wetland, measurements were taken on Aug. 10th (flow rate of 0.03 m/s, F), Aug. 28th (without flow, WF), Sep. 5th (flow rate of 0.03 m/s, F).

   Natural:the natural wetland. In the natural wetland, measurements were taken on Jul.

3th (low tide, LT), Jul.13th (high tide, HT), Jul. 20th (LT)

CH4: CH4 emission flux (μmol m^{-2} s^{-1}).

ORP: Soil oxidation-reduction potential (mV).

CH4-SE: the standard value of CH4 emission flux (μmol m^{-2} s^{-1}).

ORP-SE: the standard value of ORP (μmol m^{-2} s^{-1}).