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Supporting Information for

Sustained-flux global warming potential driven by nitrogen inflow and hydroperiod in a model of Great Lakes coastal wetlands

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Introduction

We provided two figures and one table in the supporting information section. Figure S1 is a map of the Great Lakes coastal wetlands, created by ArcGIS, showing the geological position of the coastal wetlands, from 41°N to 50°N, 75°W to 93°W, within 10 km of coastlines of the Great Lakes.

We selected six water level scenarios to represent possible water levels found in coastal wetlands in Michigan, showing in Figure S2. The patterns of fluctuated water level were standardized from the observed daily water levels in coastal wetlands in Michigan over the past 10 years with the highest in July and the lowest in January in one year. The 5-day fluctuations in water level scenario E and F were generalized from the observed daily water levels in 2019 that water level fluctuated 5 to 8 times in one-month, higher magnitude of fluctuations occurred from October to April while the fluctuations with lower magnitude occurred from May to September. Above observed water levels were from the National Oceanic and Atmospheric Administration.

Table S1 shows the levels of parameters we used in this study. We have 5 levels of N inflow (1, 5, 10, 15, 20 $g\ N\ m^{2}\ y^{-1}$), four levels of water residence time

(1, 10, 30, 100 days), four levels of temperature (10.2, 11.5, 13.5 14.5℃). Plant growing season changes with temperature and also has 4 levels.

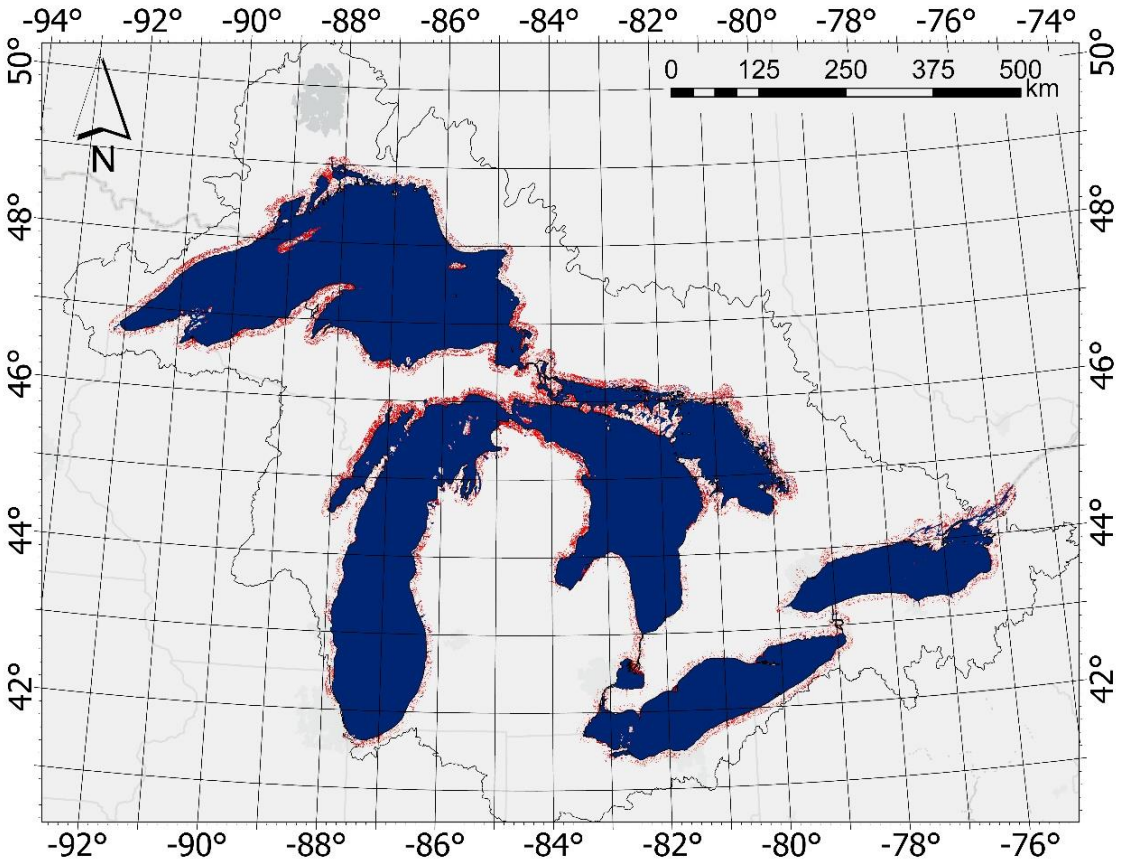

Figure S1. Coastal wetlands surrounding the Great Lakes, USA. Latitude and longitude are shown. Lake surfaces are in blue. Coastal wetlands, those connected hydrologically to the Great Lakes and within 10 km of the coastline, are shown in red. Figure courtesy Laura Bourgeau-Chavez and Jeremy Graham in Michigan Technological University.

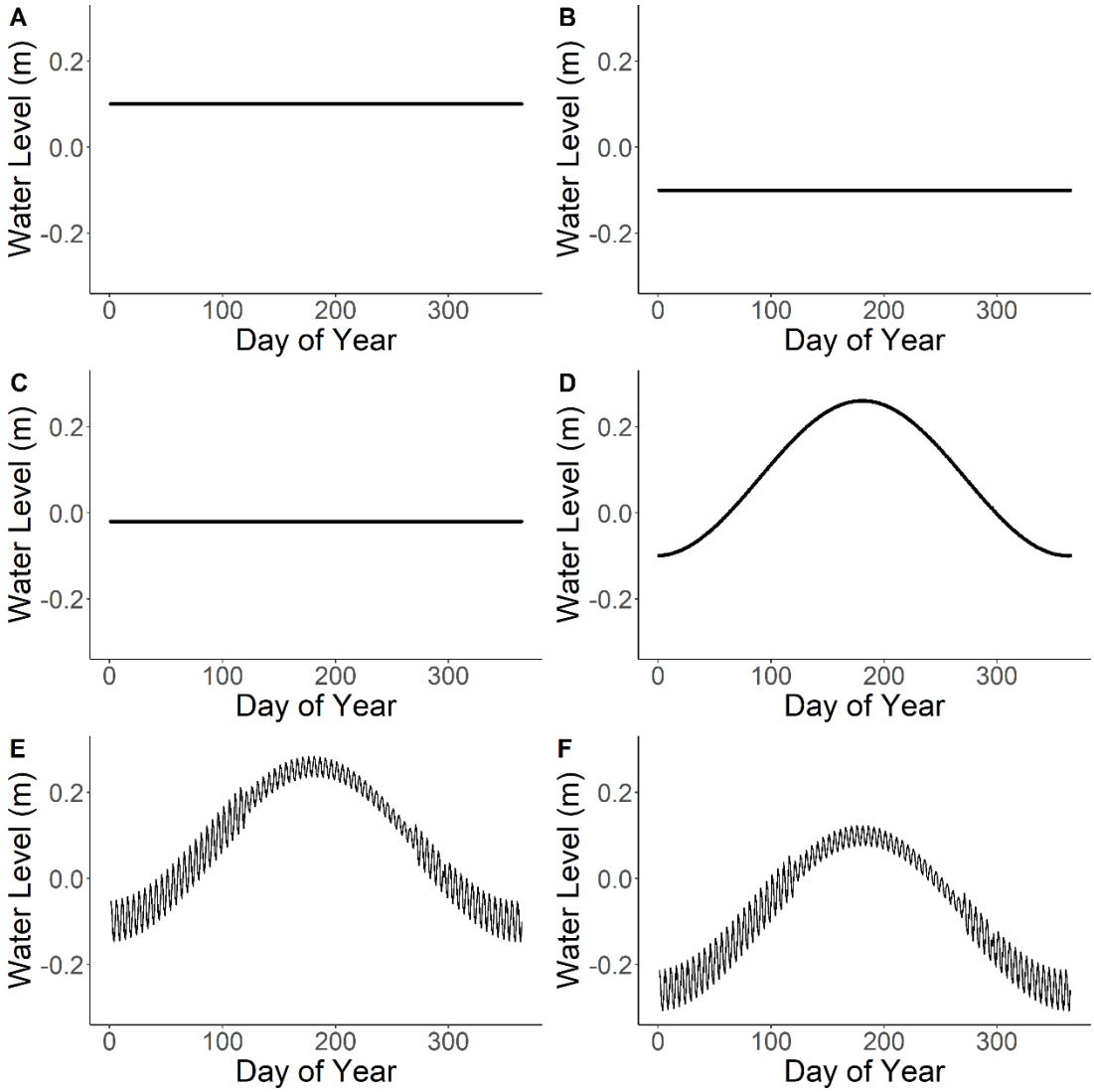

Figure S2. Annual patterns in daily water level (meters) of six water level scenarios used in the present study. Scenarios A, B, C had constant water level, whereas D, E, and F had seasonally fluctuating water levels. Scenarios E and F superimposed an additional 5-day fluctuation on seasonal fluctuations.

N inflow from land (NH_4-N +NO_3-N) (g N $m^2 y^{-1}$)	1	5	10	15	20
Water residence time (days)	1	10	30	100	
Annual average temperature (°C)	10.2	11.5	13.5	14.5	
Plant growing season (day of year)	114-239	105-244	91-252	84-256	

Table S1. Levels of parameters we used in present study, including N inflow, water residence time, temperature and the corresponding plant growing season. Water levels of 6 scenarios are shown in Figure S2 and excluded from this table.