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Supplement of

Spring net community production and its coupling with the CO_2 dynamics in the surface water of the northern Gulf of Mexico

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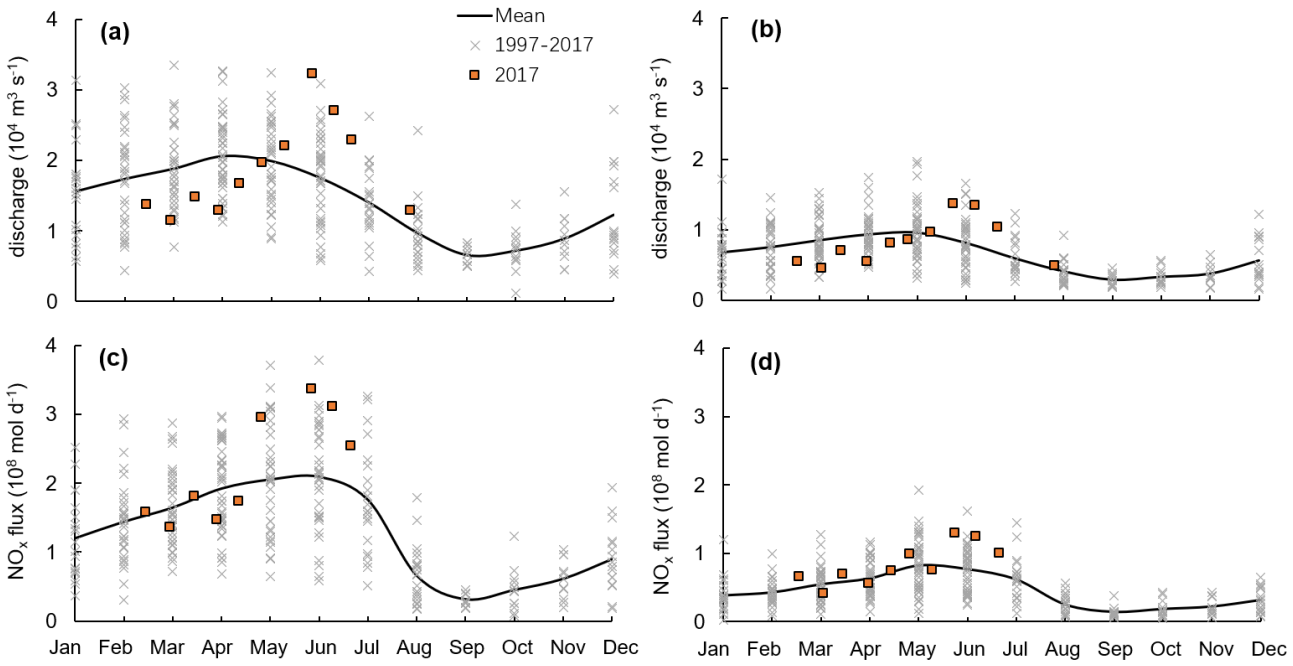

Fig. S1. Freshwater discharge and NO_x flux of (a, c) the Mississippi River and (b, d) the Atchafalaya River. The measurements for the period of 1997-2017 (grey x) and the monthly mean values (grey lines) are shown and the monthly averages in 2017 are highlighted as orange dots. All data are from the USGS webpage (http://waterdata.usgs.gov/nwis/qw): station 07373420 Mississippi River at St. Francisville (30°45'30" N, 91°23'45" W) and station 07381495 Atchafalaya River at Melville (30°41'26" N, 91°44'10" W).

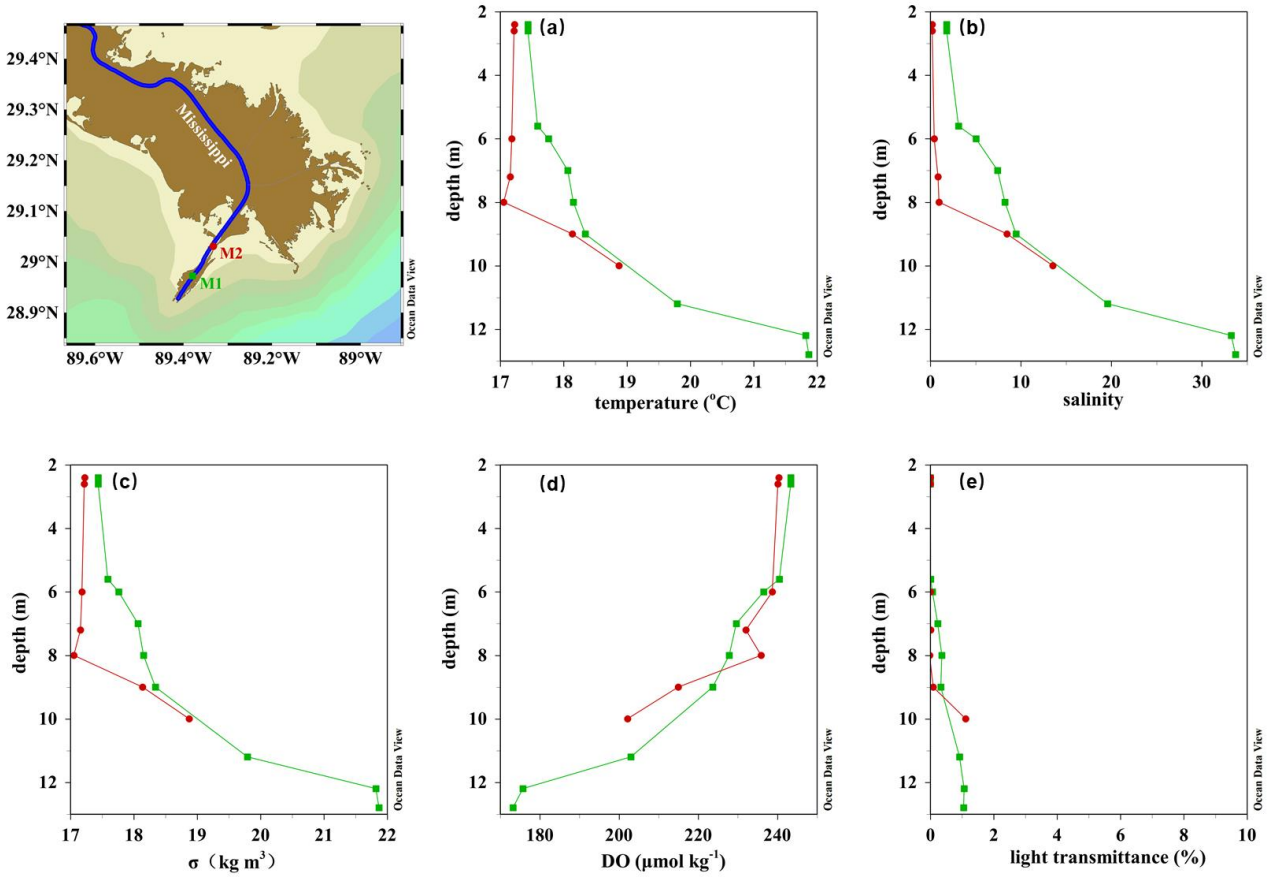

Fig. S2. Vertical profiles of (a) temperature, (b) salinity, (c) potential density, σ = density (kg m^{-3}) – 1000, (d) DO, (e) light transmittance in the lower Mississippi River channel. The different symbols correspond to the measurements from different sites shown in the map in the upper left corner.

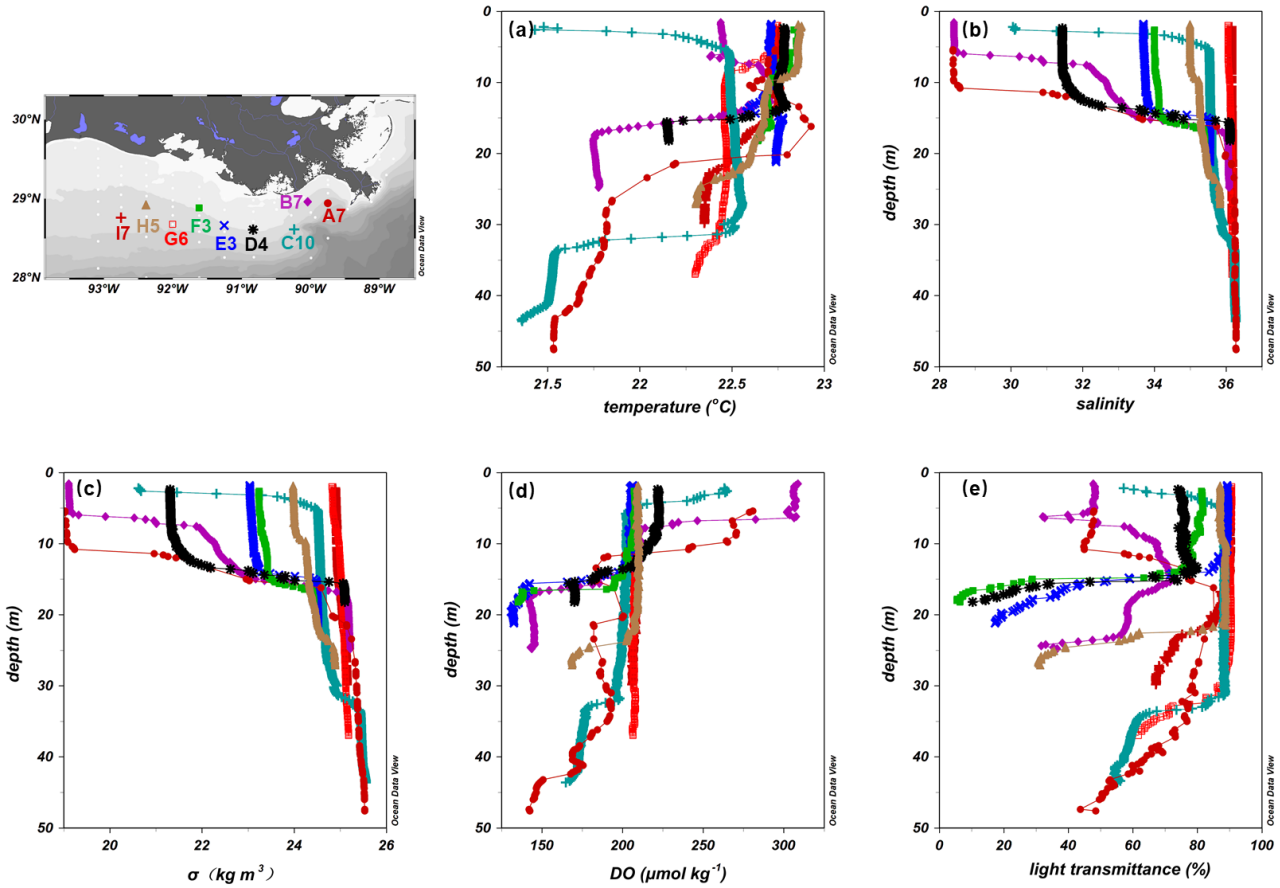

Fig. S3. Vertical profiles of (a) temperature, (b) salinity, (c) potential density, σ = density (kg m^{-3}) – 1000, (d) DO, (e) light transmittance at the stratified offshore region. The different symbols correspond to the measurements from different sites shown in the map in the upper left corner.

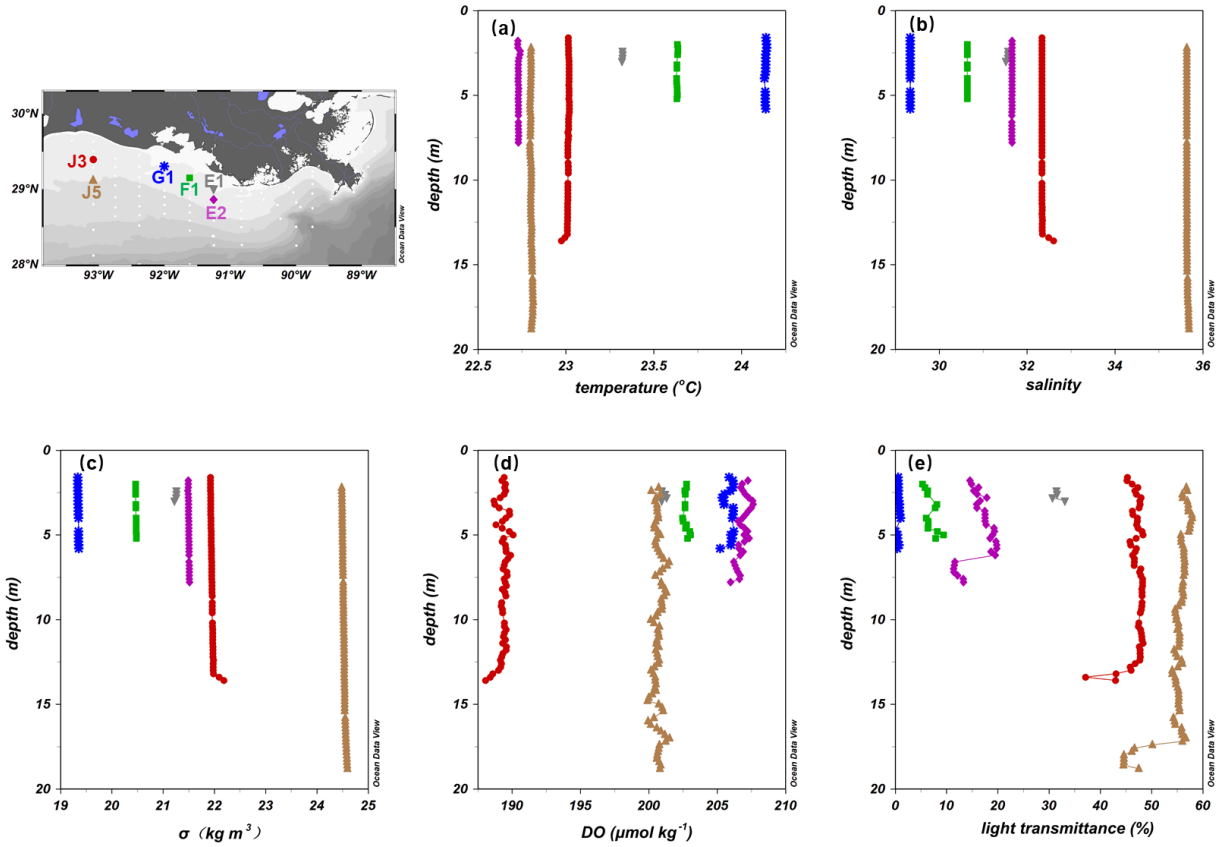

Fig. S4. Vertical profiles of (a) temperature, (b) salinity, (c) potential density, σ = density (kg m^{-3}) – 1000, (d) DO, (e) light transmittance in the well-mixed Atchafalaya coastal region. The different symbols correspond to the measurements from different sites shown in the map in the upper left corner.

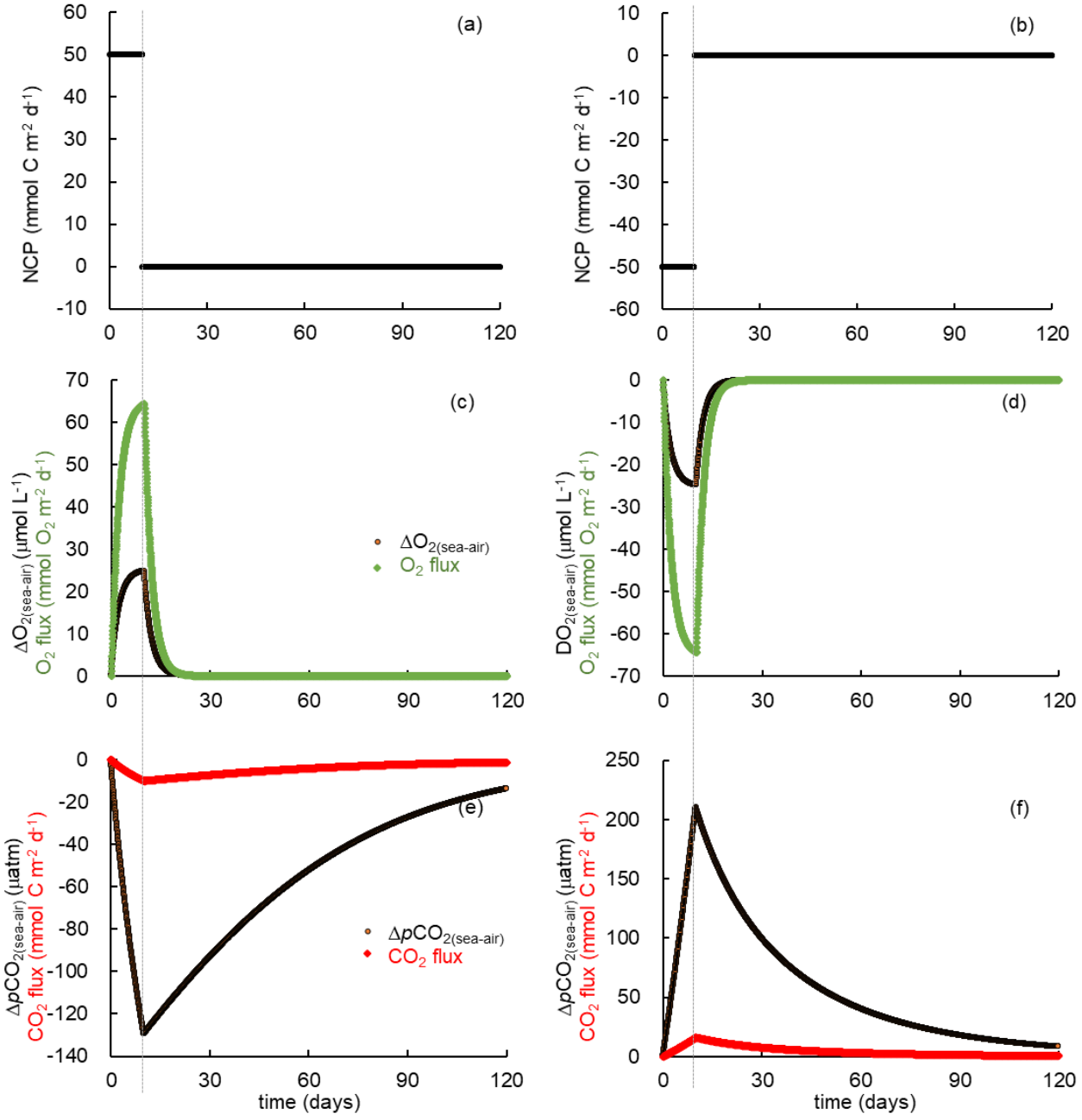

Fig. S5. Simulation of carbon and oxygen dynamics responding to NCP and gas exchange using a 1-D model. The system is assumed to be in equilibrium with the atmosphere on day 0, which is followed by a 10-day (a) autotrophic or (b) heterotrophic production. The corresponding changes in (c, d) O_2 flux and air-sea O_2 difference ($\Delta O_{2(sea\text{-}air)}$) and (e, f) CO_2 flux and air-sea pCO_2 difference ($\Delta pCO_{2(sea\text{-}air)}$).