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Impacts of anthropogenic water regulation on global riverine dissolved organic carbon transport

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S1. Details for reservoir operation scheme

We coupled a widely used global reservoir regulation scheme (Hanasaki et al., 2006; Liu et al., 2019) into the River Transport Model (RTM) to control runoff and riverine dissolved organic carbon (DOC). Figure S1 shows the schematic of the reservoir in the river network system grid cell. Assuming that the reservoir is between the neighboring grids. The inflow of the reservoir was the outflow of the current grid, whereas the outflow from the reservoir was adjusted for the reservoir operation scheme. Based on the reservoir information (e.g., start year, main purpose, and storage capacity, Fig. S2), the operation scheme set the operating rules for individual reservoirs. If a reservoir was used as a primary irrigation water supply, the released water from the reservoir was proportional to the water demand. If a reservoir's primary purpose was not as an irrigation water supply, the reservoir operating rule was set to minimize interannual and sub‐annual streamflow variation.

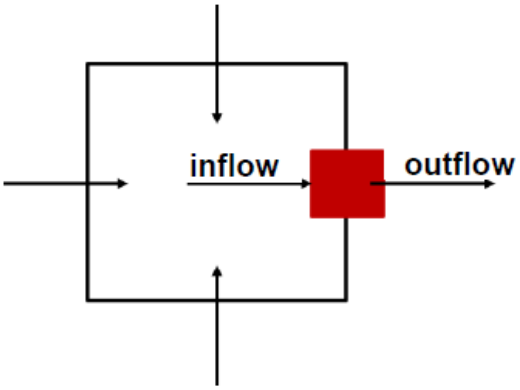

Figure S1: Schematic of the reservoir (red rectangle) in RTM grid cell (black box). The black arrow indicates the river water flow from neighboring grids.

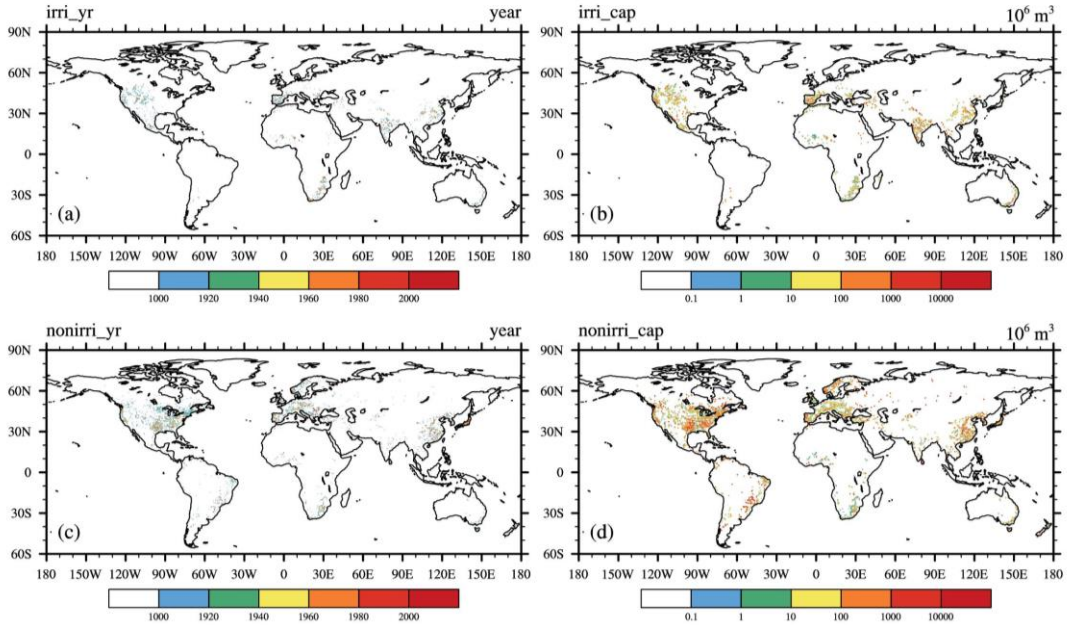

Figure S2: Spatial distributions of global reservoir information: (a) start year of reservoir for irrigation; (b) capacity of reservoir for irrigation; (c)start year of reservoir not for irrigation; (d) capacity of reservoir not for irrigation.

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