



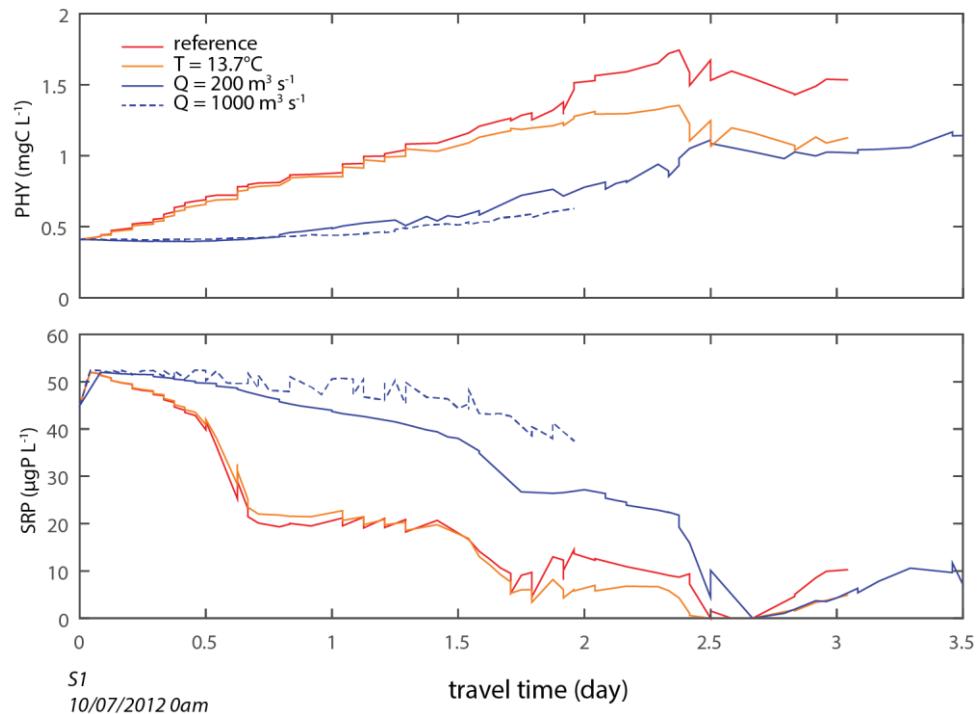
Supplement of

QUAL-NET, a high temporal-resolution eutrophication model for large hydrographic networks

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S1. Lagrangian profiles from S1 to S2 of phytoplankton and SRP concentrations for four contrasted simulations to show phytoplankton and phosphorus sensitivity to flow and water temperature conditions: i) reference simulation used throughout the manuscript; ii) constant low-flow in the Loire at S1 forced at $200 \text{ m}^3 \text{ s}^{-1}$ and forced at $0.1 \text{ m}^3 \text{ s}^{-1}$ in all other streams; iii) constant high-flow in the Loire at S1 forced at $1000 \text{ m}^3 \text{ s}^{-1}$ and forced at $0.1 \text{ m}^3 \text{ s}^{-1}$ in all other streams; iv) constant water temperature simulation, $T = 13.7^\circ\text{C}$ in all streams at all time. Phytoplankton development was much more affected by shorter travel times than by colder water temperature. P availability played a major role, and SRP exhaustion was reached 2.5 days after the starting date from S1 for all simulations except for the high-flow simulation where no P limitation was simulated because travel time from S1 to S2 was not long enough.