



Impact of human activities on phosphorus flows on an early eutrophic plateau: A case study in Southwest China

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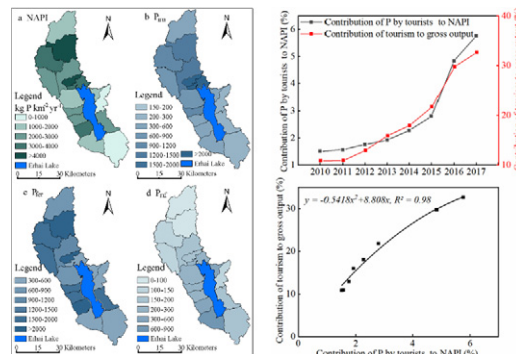
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HIGHLIGHTS

- NAPI was implemented to evaluate impacts from temporary population (tourism).
- P cycling and critical sources were identified and quantified using the NAPI model.
- P was mostly retained in the studied basin and only 9.54% was output in products.
- P from fertilizer application is a primary pollution source in the studied basin.
- Controlled application of P fertilizers is recommended as a conservation measure.

GRAPHICAL ABSTRACT



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ABSTRACT

The net anthropogenic phosphorus inputs (NAPI) model has been used extensively to assess changes in phosphorus (P) inputs and cycling in the environment. However, temporary populations have generally been unconsidered in these assessments. In this study, the NAPI model was used to estimate P loads from the 16 towns and villages in the Erhai Lake Basin (ELB), Southwest China and to evaluate the potential impact from temporary residents (tourism). The results showed that the average value P inputs in the basin (estimated at $2384 \text{ kg P km}^{-2} \text{ year}^{-1}$) were 5 times the national average level, and that temporary residents contributed 1%. Agriculture accounted for most of the net P, with chemical fertilizers (55% of the inputs) as the main source, followed by food and animal feed. Only 9.54% of the P inputs to the basin were exported. River water quality and NAPI were significantly correlated ($P < 0.01$). Tourism industry contributes significantly to regional economic growth and prosperity, but its beneficial effects on the economy does not equate with the adverse impact on environment. This study illustrates what is happening in Southwest China and provides scientific evidence that shows we need to find novel ways to reduce nutrients.

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