Appendix S1

Title: Granular measures of agricultural land-use influence lake nitrogen and phosphorus differently at macroscales.

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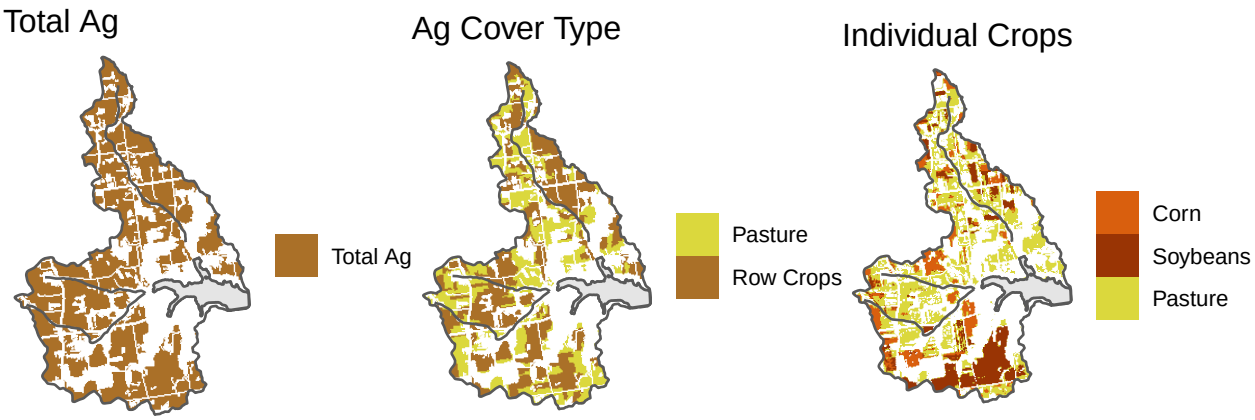

Figure S1: Example of increasing granularity for total Ag to Ag versus pasture, to pasture versus specific crops. For illustration, only corn, soybeans, and pasture are shown rather than all CDL land-use categories.

Table S1: Category definitions from the 2010 CDL. See code supplement for listing of variables classified as 'ag'.

Category	Description
Corn	Corn
Corn	Sweet corn
Corn	Pop or orn corn
Corn	Non irrigated corn
Forest	Forest
Forest	Deciduous forest
Forest	Evergreen forest
Forest	Mixed forest
Pasture	Grass pasture
Soybeans	Soybeans
Soybeans	Non irrigated soybeans
Wetlands	Wetlands
Wetlands	Woody wetlands
Wetlands	Herbaceous wetlands

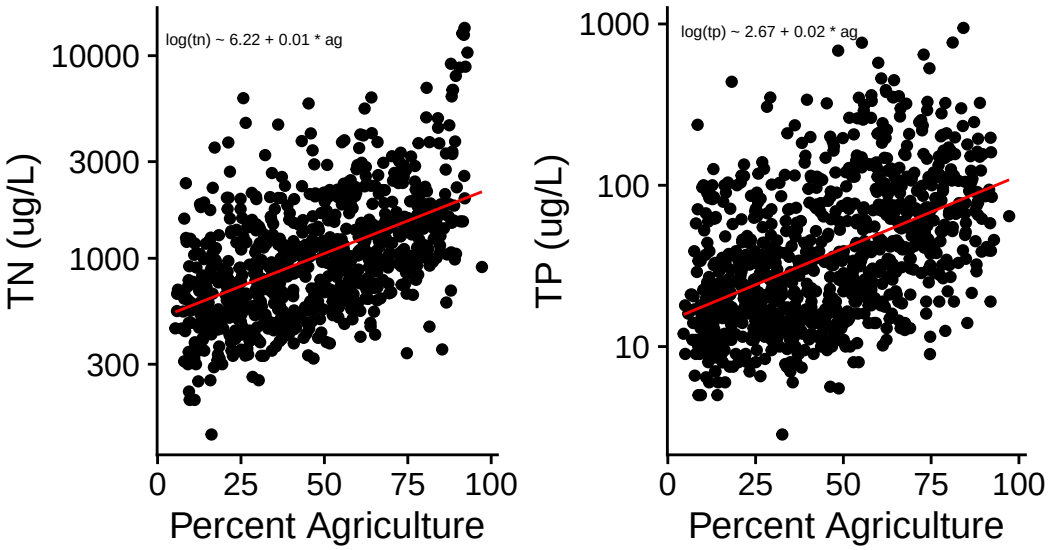

Figure S2: Lake nutrient concentrations plotted against percent watershed agriculture.

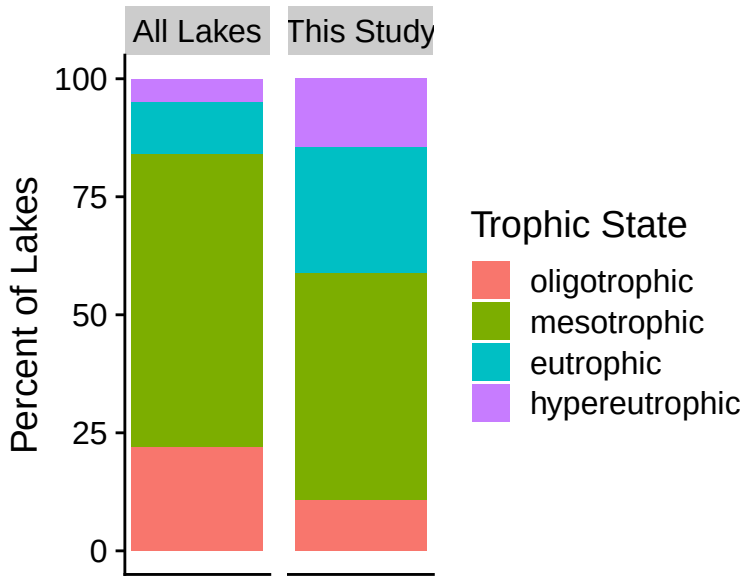

Figure S3: Lake trophic state in our study lakes versus all lakes from Soranno et al. (2017) located within our study extent. Trophic state based on the chlorophyll critera from Carlson (1996).

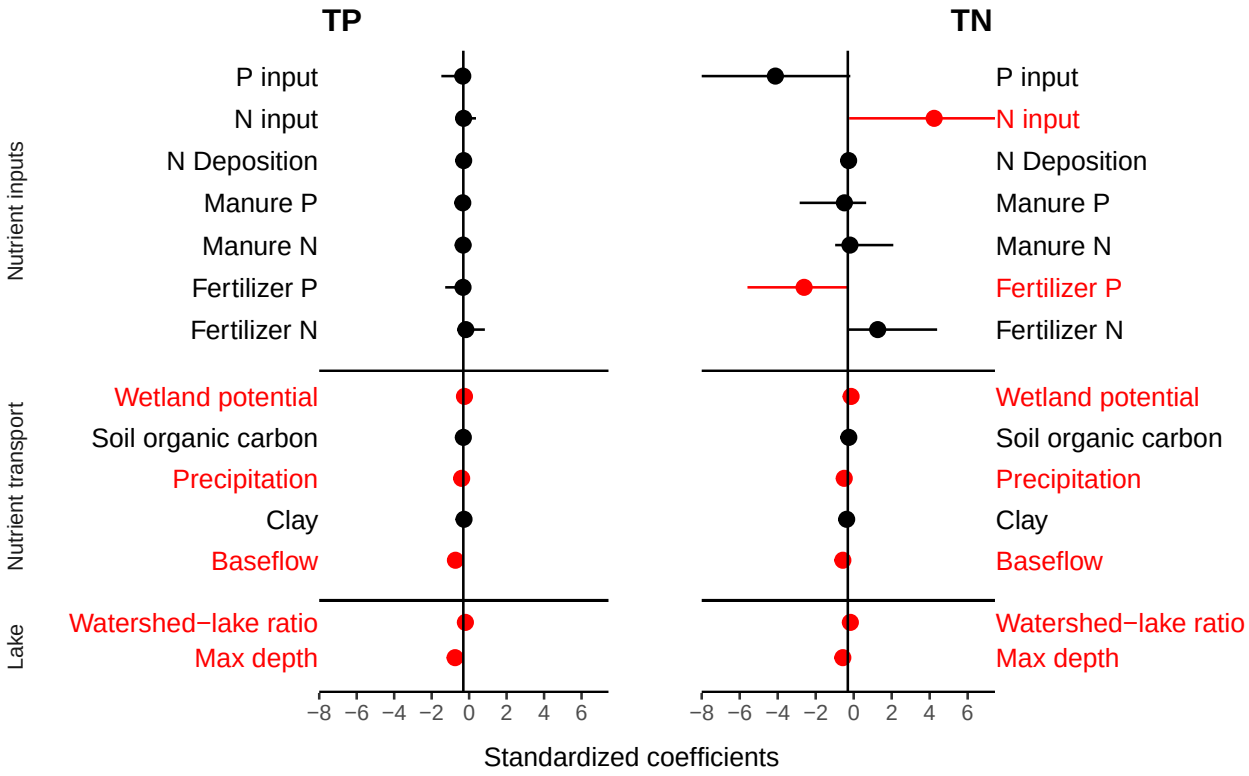

Figure S4: Global (fixed effect) coefficient values and credible intervals for top-ranked lake TP and TN models when land-use predictors are excluded. Values shown are posterior medians (filled circles) and 95% credible intervals (solid lines). Also shown is a comparison to a zero effect (solid vertical line). Values that do not overlap zero are shaded in red. Horizontal bars separate coefficients in distinct predictor categories. Coefficient estimates are reported relative to standardized predictor variables centered at zero with unit variance and correspond with β from Equation 1.

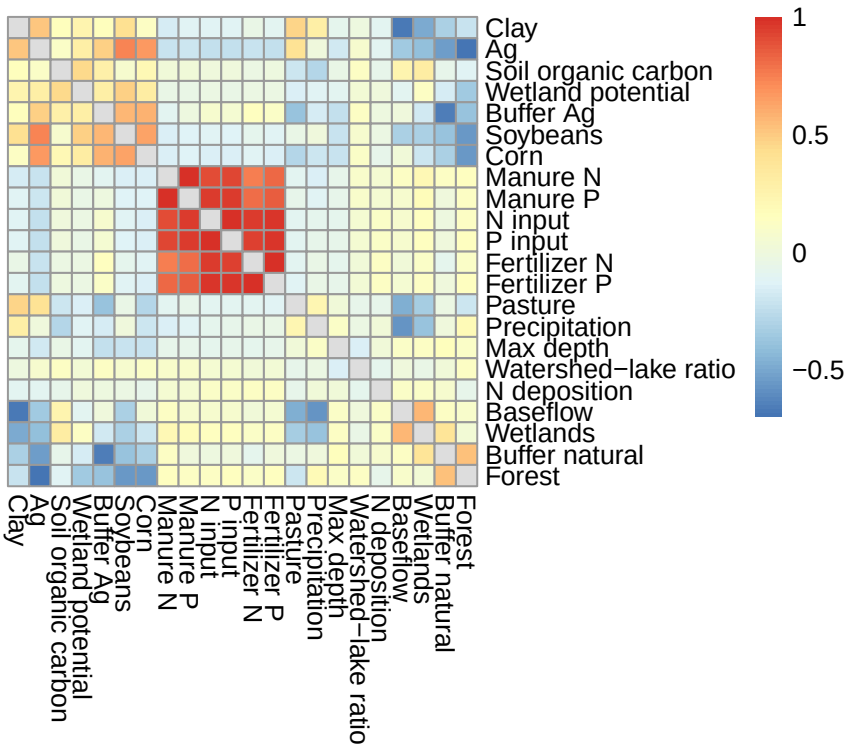

Figure S5: Heatmap showing Pearson correlation coefficients among predictor variables. Grey cells denote correlation matrix diagonals.

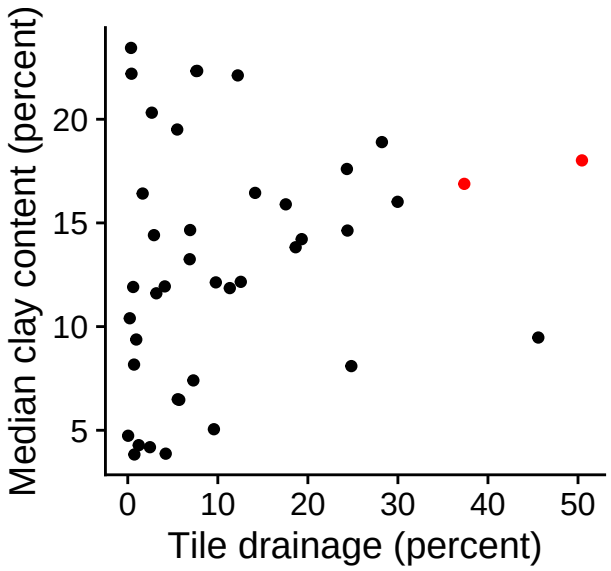

Figure S6: Scatterplot showing the median clay content of watersheds in our hydrologic regions plotted against percent tile drainage from Nakagaki and Wieczorek (2016). The regions that are highly sensitive to agricultural land-use from Figure 4 are highlighted in red.

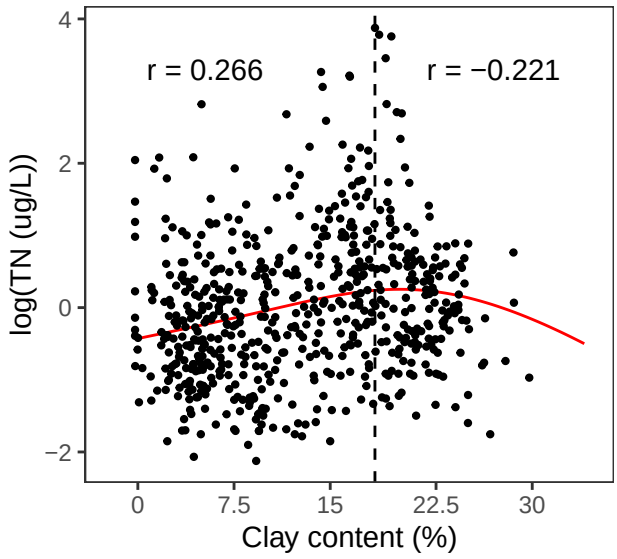

Figure S7: Scatterplot showing the non-linear relationship between watershed clay content and lake TN concentration. Vertical dashed line shows transition between a positive and a negative correlation (r) between the two variables. Solid red line shows the fit of a generalized additive model from the mgcv R package.