

Figures

Table 1: Mean and interquartile range of selected study lake characteristics.

| | Mean | IQR |
|---------------------|-------|-----------------|
| Max Depth (m) | 12.95 | (9.2 - 21.34) |
| Ag Landuse (%) | 53.27 | (17.68 - 74.05) |
| TP (ug/L) | 40.00 | (20 - 110) |
| P Retention (%) | 0.46 | (0.24 - 0.59) |
| Secchi (m) | 1.50 | (0.9 - 2.4) |
| Chl (ug/L) | 11.85 | (6.05 - 21.3) |
| Residence Time (yr) | 0.63 | (0.2 - 1.8) |

Table 2: Ranking of connectivity metrics according to median effect size.

| Metric | Scale | Connectivity Type | Delta k |
|-----------------------|-------|-------------------|---------|
| Average Link Length | nws | Longitudinal | 0.23 |
| Closest lake distance | nws | Longitudinal | 0.22 |
| Stream density | nws | Lateral | 0.20 |
| Lake Connection | focal | Longitudinal | 0.17 |
| Upstream lake area | nws | Longitudinal | 0.16 |
| Max Depth | focal | | 0.15 |
| Average Link Length | iws | Longitudinal | 0.14 |
| Baseflow | iws | Lateral | 0.12 |
| Stream order ratio | iws | Longitudinal | 0.10 |
| Baseflow | nws | Lateral | 0.08 |
| Closest lake distance | iws | Longitudinal | 0.05 |
| Stream order ratio | nws | Longitudinal | 0.04 |
| Stream density | iws | Lateral | 0.03 |

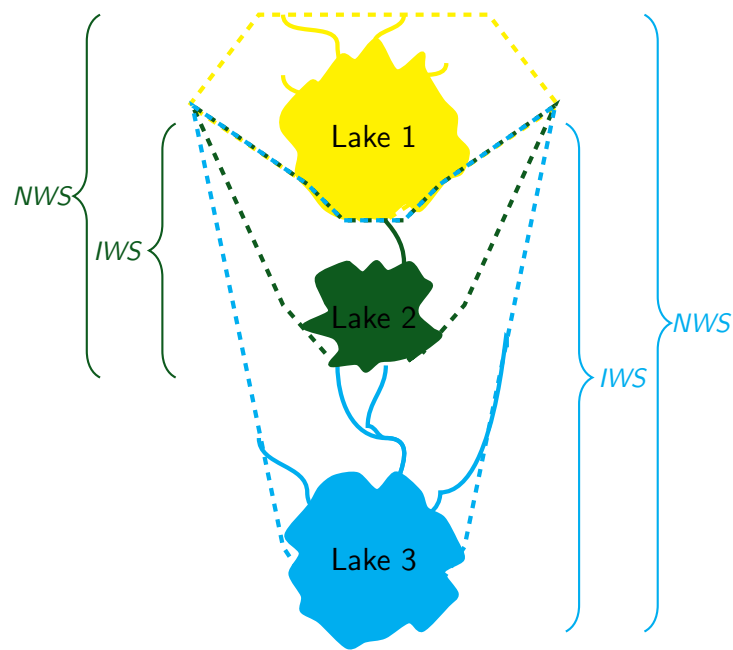


Figure 1: Diagram showing the inter-lake watershed (IWS) and network watershed (NWS) of three lakes. Here the IWS of lake 3 encompasses the IWS of lake 2 because of its small size but not the IWS of lake 1 because it is large. In contrast, the NWS of lake 3 extends to the headwaters of the lake chain.



Figure 2: Connectivity metric definitions and examples of high and low connectivity lakes.

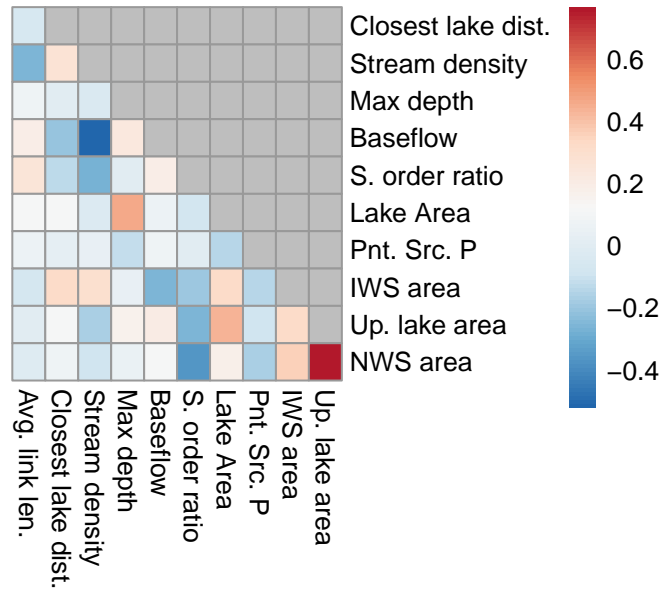


Figure 3: Correlation between connectivity metrics and selected lake characteristics.

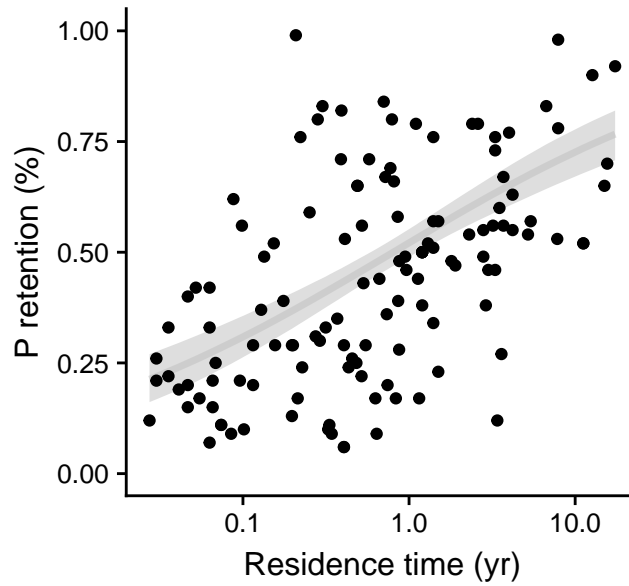


Figure 4: Median and central 95% interval estimates from global model posterior relative to NES data.

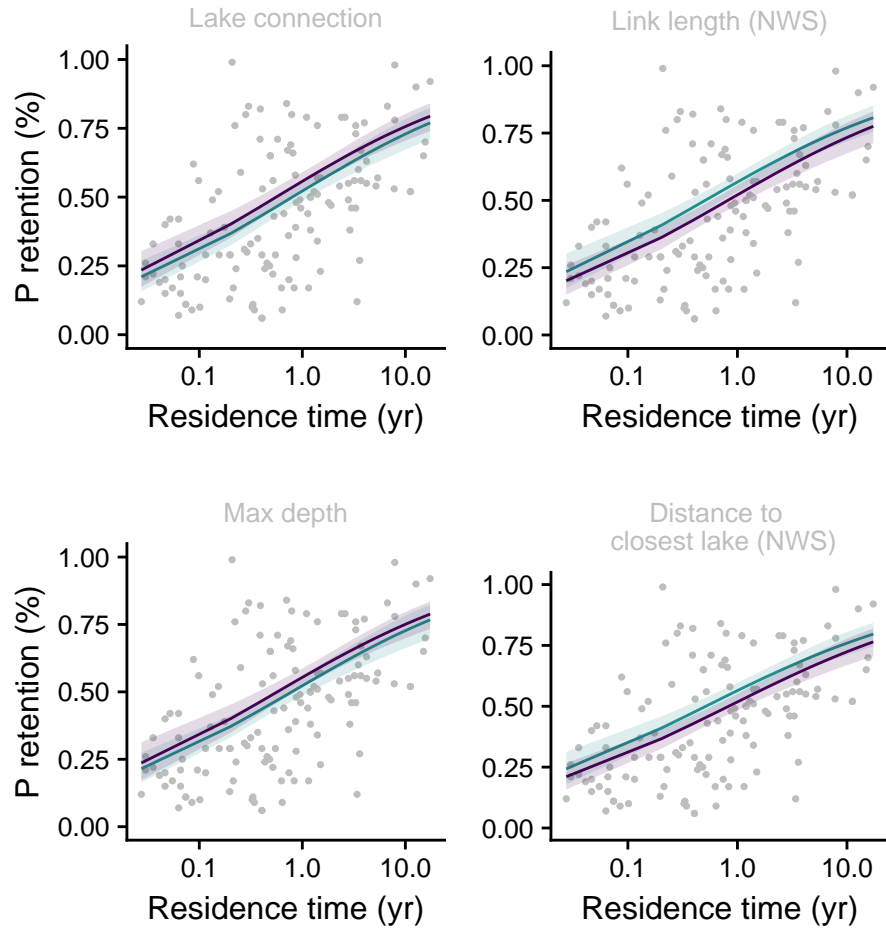


Figure 5: Median and central 95% interval estimates from hierarchical model posteriors relative to NES data. Lighter colored lines and lighter colored polygons represent the estimates from the lower of the two partition groups (see Table 2).

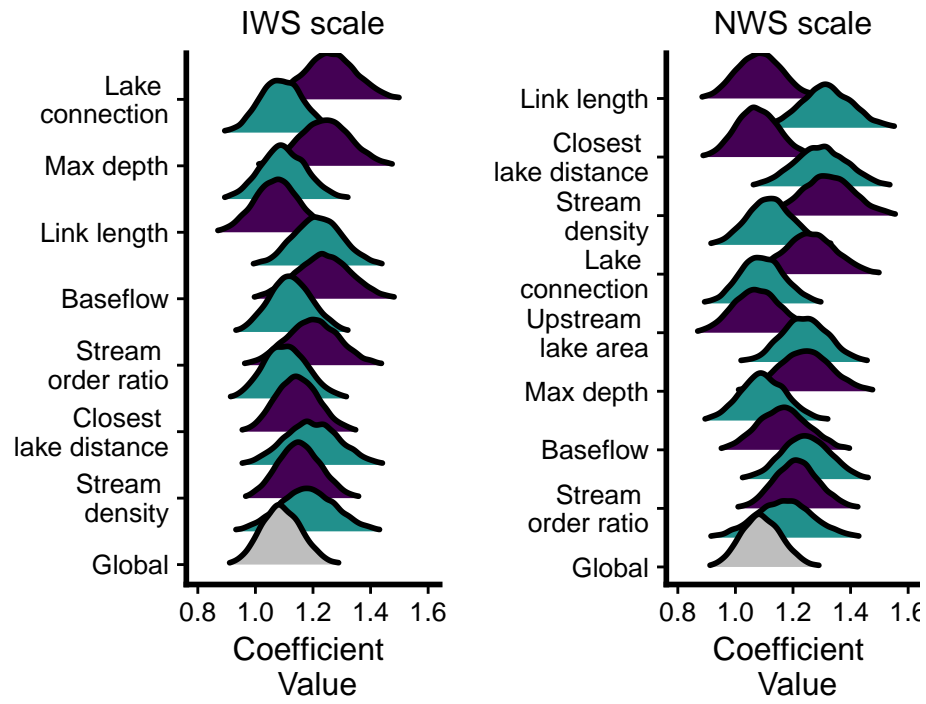
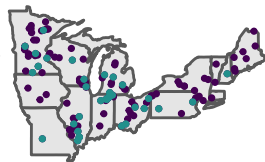
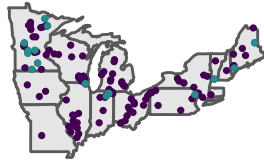


Figure 6: Distribution of Vollenweider's k in low and high connectivity partitions at the IWS and NWS scales. Lighter colors indicate the lower of the two partition groups (see Table 2).

IWS:

Closest lake dist.

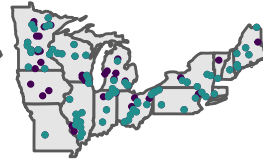
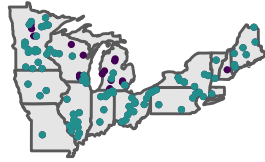
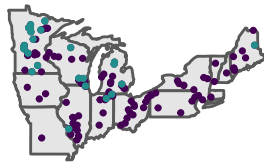
Avg. link len.



Stream density

Baseflow

S. order ratio

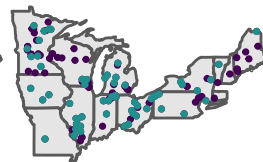
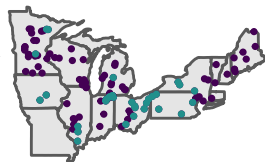
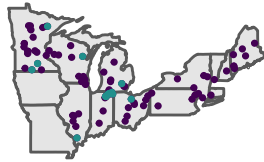


NWS:

Closest lake dist.

Avg. link len.

Up. lake area



Stream density

Baseflow

S. order ratio

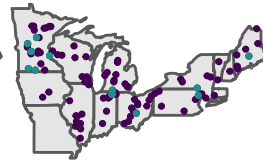
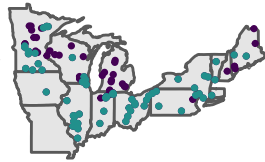
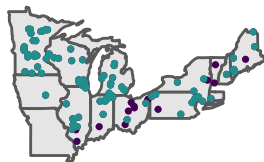


Figure 7: Map of lake connectivity partitions where lighter colored lakes have metric values on the lower side of their respective partitions (see Table 2).

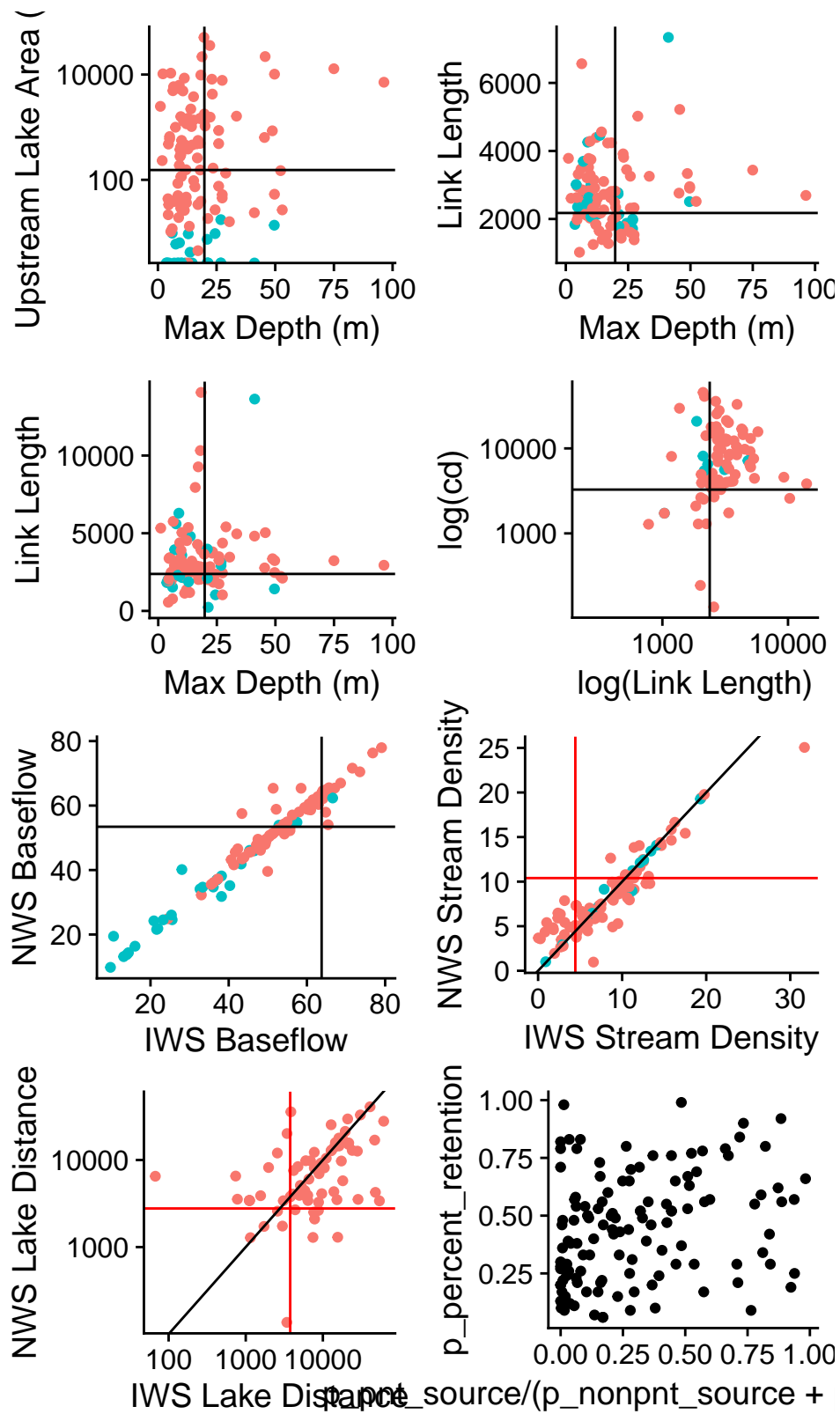


Figure 8: Exploratory plots

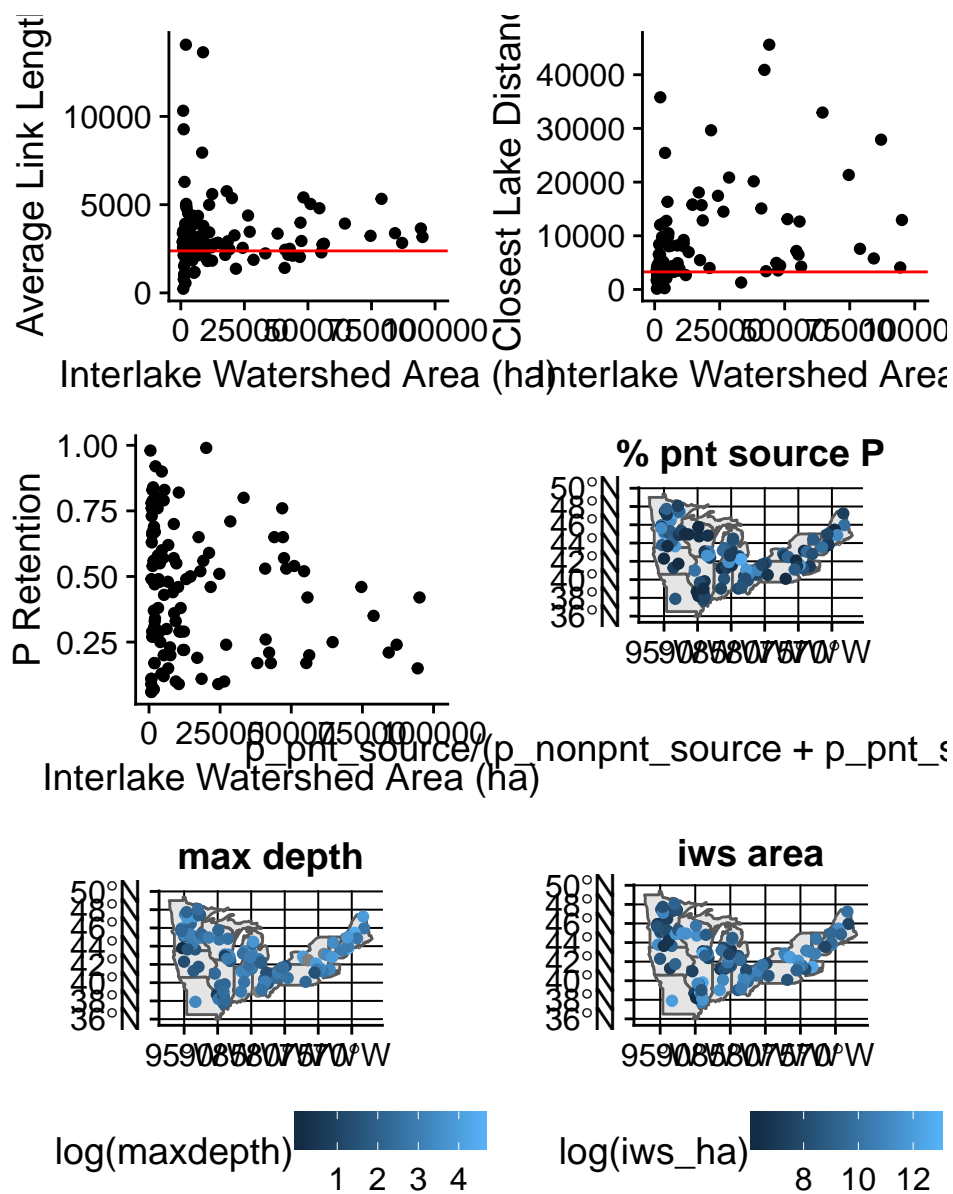


Figure 9: Exploratory plots cont