

Figures

Abb	Scale	Metric	Split Value	Delta k
cd	nws	Closest lake distance	2776.81	0.27
ll	nws	Average Link Length	2237.34	0.19
lc	misc	Lake Connection	NA	0.17
la	nws	Upstream lake area	153.50	0.16
md	misc	Max Depth	19.81	0.15
ll	iws	Average Link Length	2177.08	0.14
sd	nws	Stream density	10.40	0.13
bf	iws	Baseflow	63.76	0.12
sr	iws	Stream order ratio	0.67	0.10
cd	iws	Closest lake distance	3773.61	0.05
sr	nws	Stream order ratio	0.47	0.05
sd	iws	Stream density	4.43	0.03
bf	nws	Baseflow	52.94	0.00

```
##          state          name          geometry
## 1  ILLINOIS CRAB ORCHARD LAKE POINT (-89.14167 37.73056)
## 10 OHIO      HOLIDAY LAKE POINT (-82.72667 41.10278)
## 5  INDIANA    OLIN LAKE POINT (-85.39611 41.56361)
## 9  MINNESOTA  MADISON LAKE POINT (-93.8 44.19667)
## 6  INDIANA    WAWASEE LAKE POINT (-85.67917 41.39278)
## 7  INDIANA    JAMES LAKE POINT (-85.02444 41.69278)
## 3  INDIANA    WEBSTER LAKE POINT (-85.67444 41.32861)
## 4  INDIANA    HAMILTON LAKE POINT (-84.91833 41.54028)
## 2  INDIANA    LAKE TIPPECANOE POINT (-85.77972 41.32944)
## 8  MICHIGAN   STRAWBERRY LAKE POINT (-83.85 42.45)
```

```
## although coordinates are longitude/latitude, st_intersects assumes that they are planar
```

metric	direction	k	connectivity	in_lake_processing	axis
lakeconnection	DR_Stream	higher	lower	higher	lake
upstream lake area	lower	higher	lower	higher	lake
link_length	lower	higher	lower	higher	stream
baseflow	higher	higher	lower	higher	stream
stream order ratio	higher	higher	lower	higher	stream
upstream lake distance	lower	higher	lower	higher	lake-stream
stream density	higher	higher	lower	higher	stream

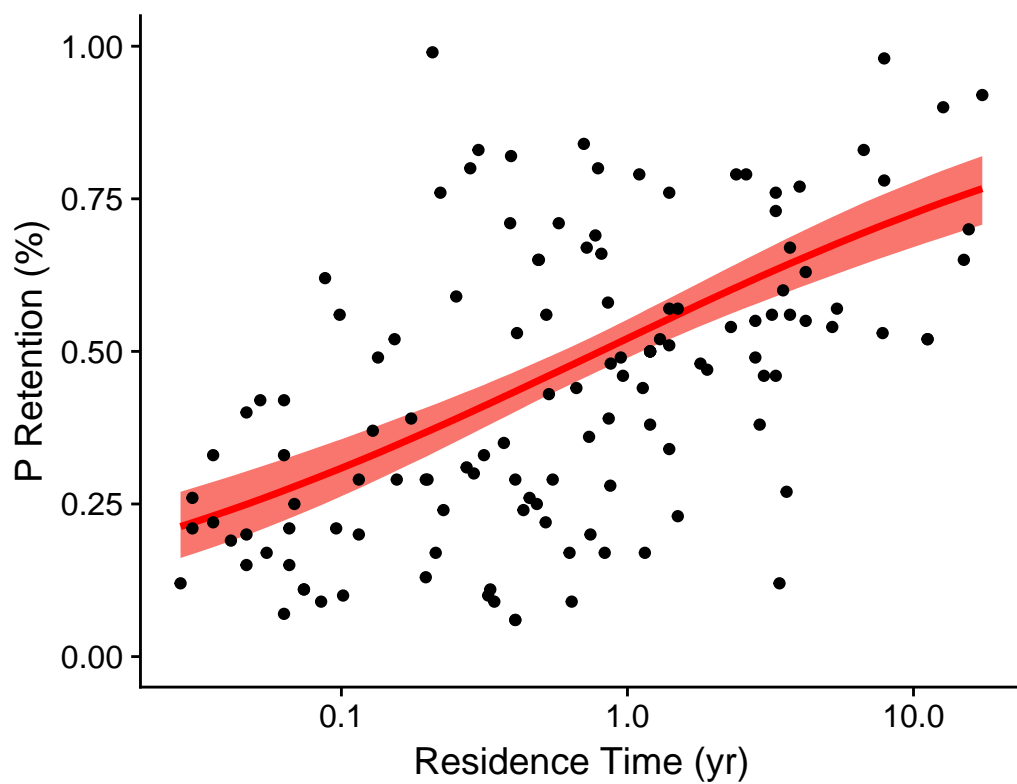


Figure 1: Median and central 95% interval estimates from the non-hierarchical model posterior relative to raw data.

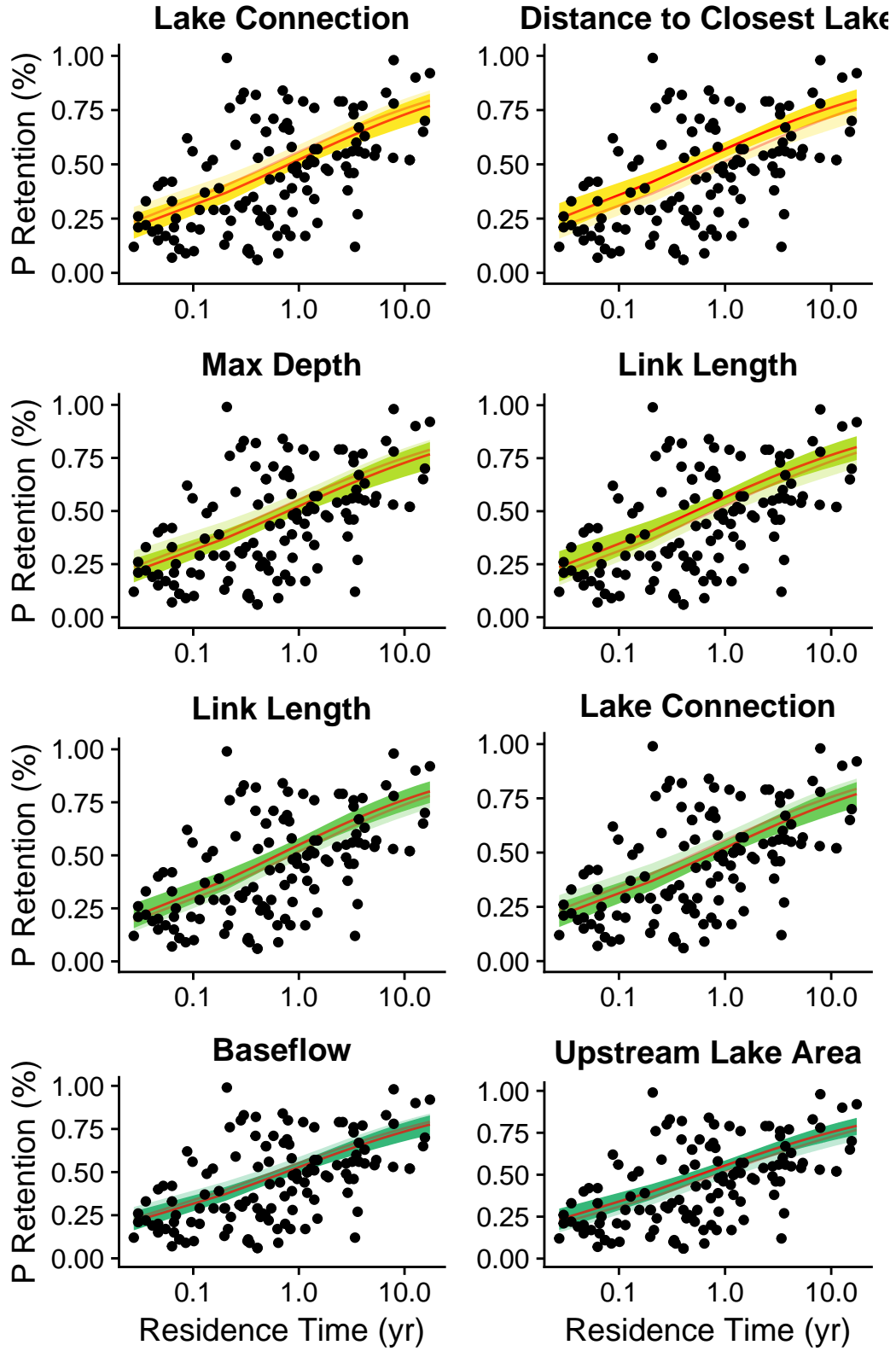


Figure 2: Median and central 95% interval estimates from the hierarchical model posteriors relative to raw data. Dark lines and shaded polygons represent the estimates from the lower of the two partition groups (see Table 1)

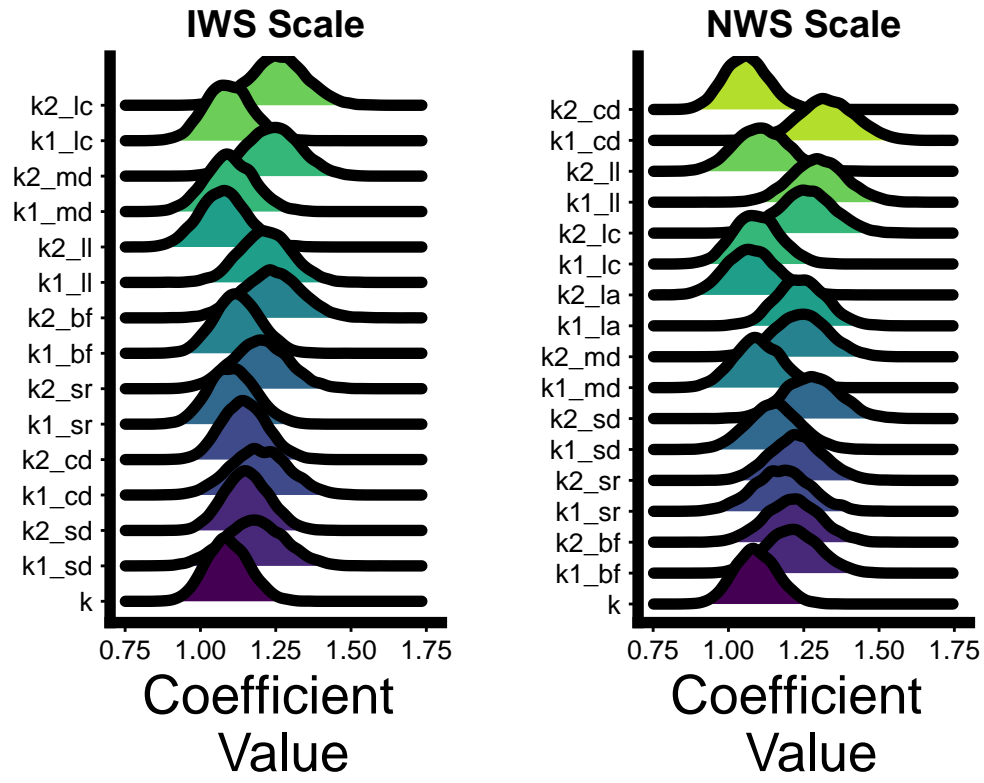


Figure 3: Distribution of Vollenweider's k in low and high connectivity partitions at the IWS and NWS scales.

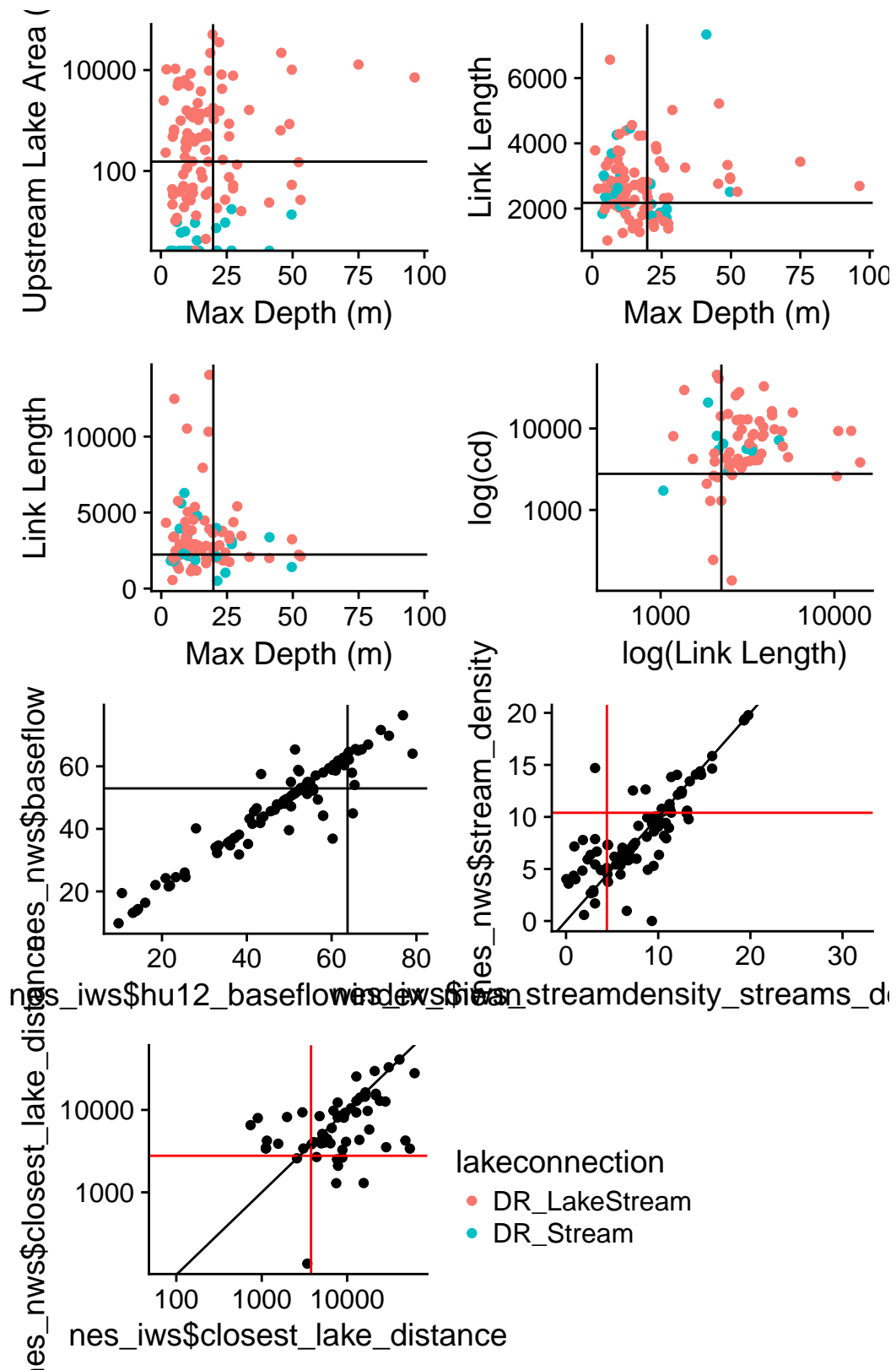


Figure 4: Exploratory plots

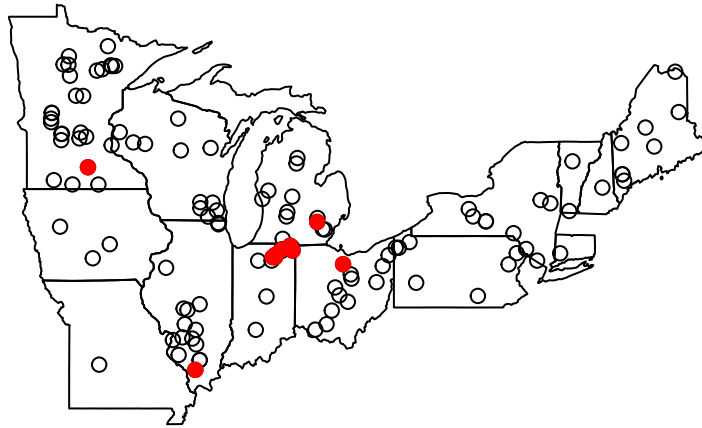


Figure 5: Map of lakes with low distance to nearest upstream lake at the NWS scale.