

# Big Blake Lake Planning Meeting

Meeting 3  
April 5<sup>th</sup>, 2016



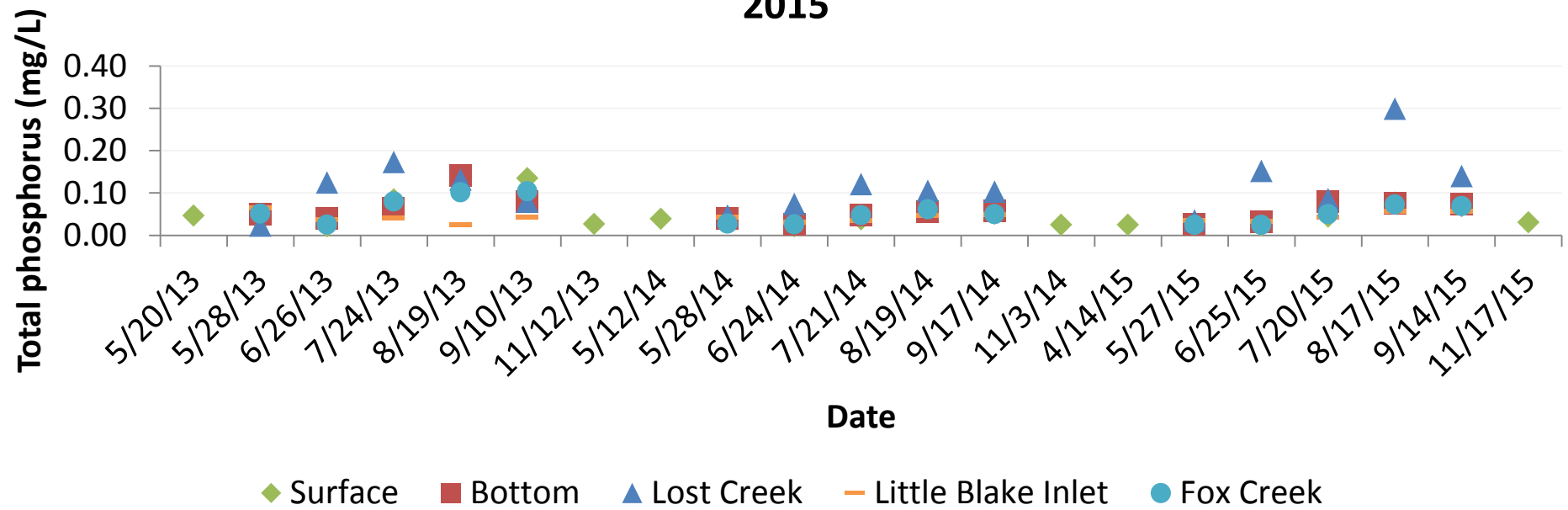




# Average total phosphorus (mg/L)

	2013	2014	2015
Surface of Big Blake Lake	0.08	0.04	0.05
Bottom of Big Blake Lake	0.07	0.04	0.06
Lost Creek	0.11	0.09	0.14
Little Blake Lake Inlet	0.04	0.04	0.04
Fox Creek	0.07	0.04	0.05

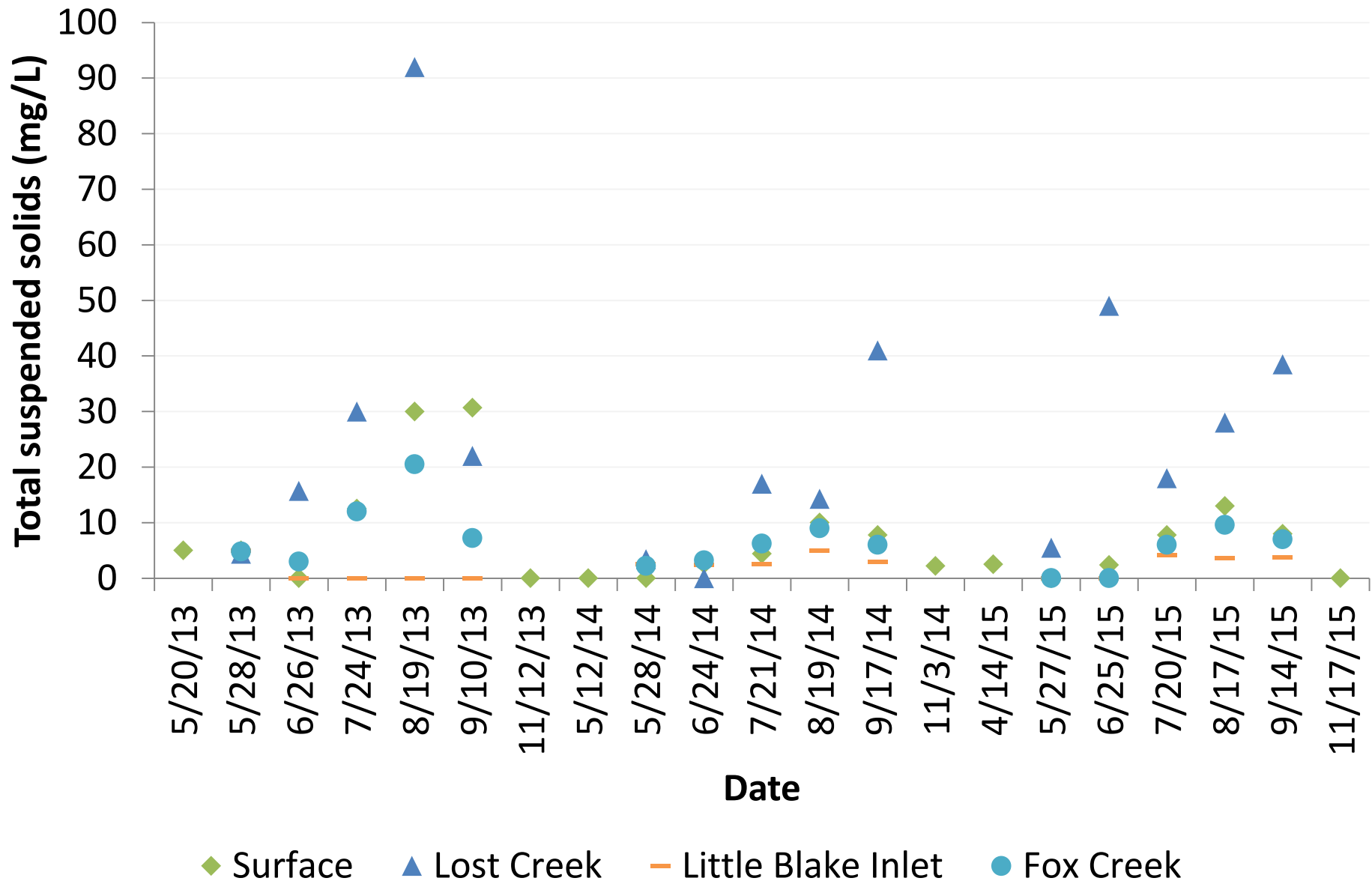
**Big Blake Lake, tributary, and outlet total phosphorus (mg/L), 2013-2015**



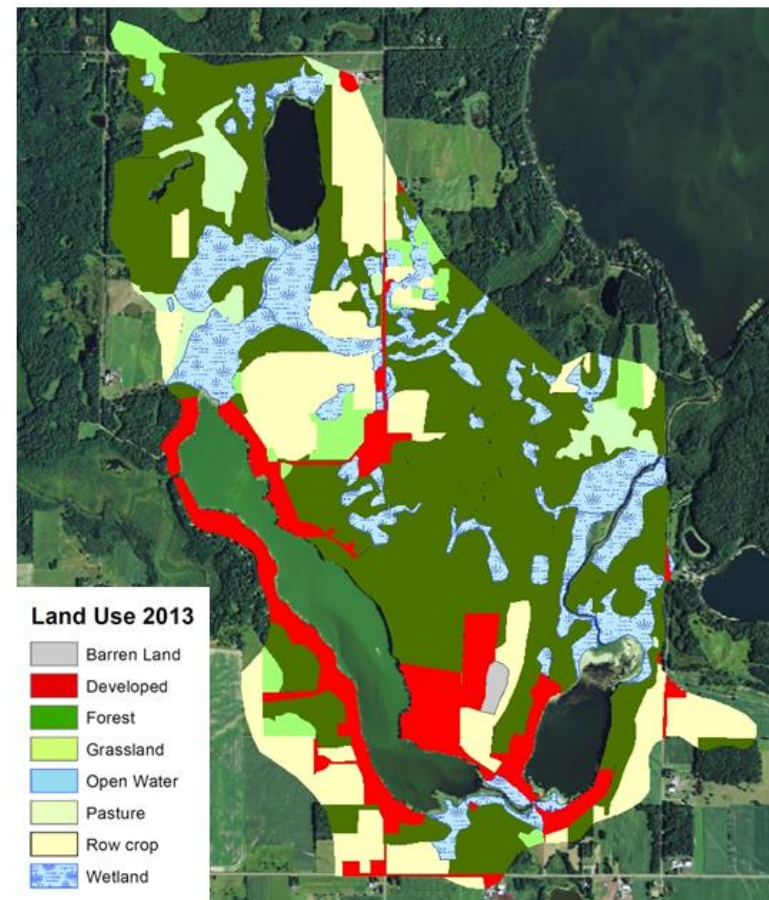
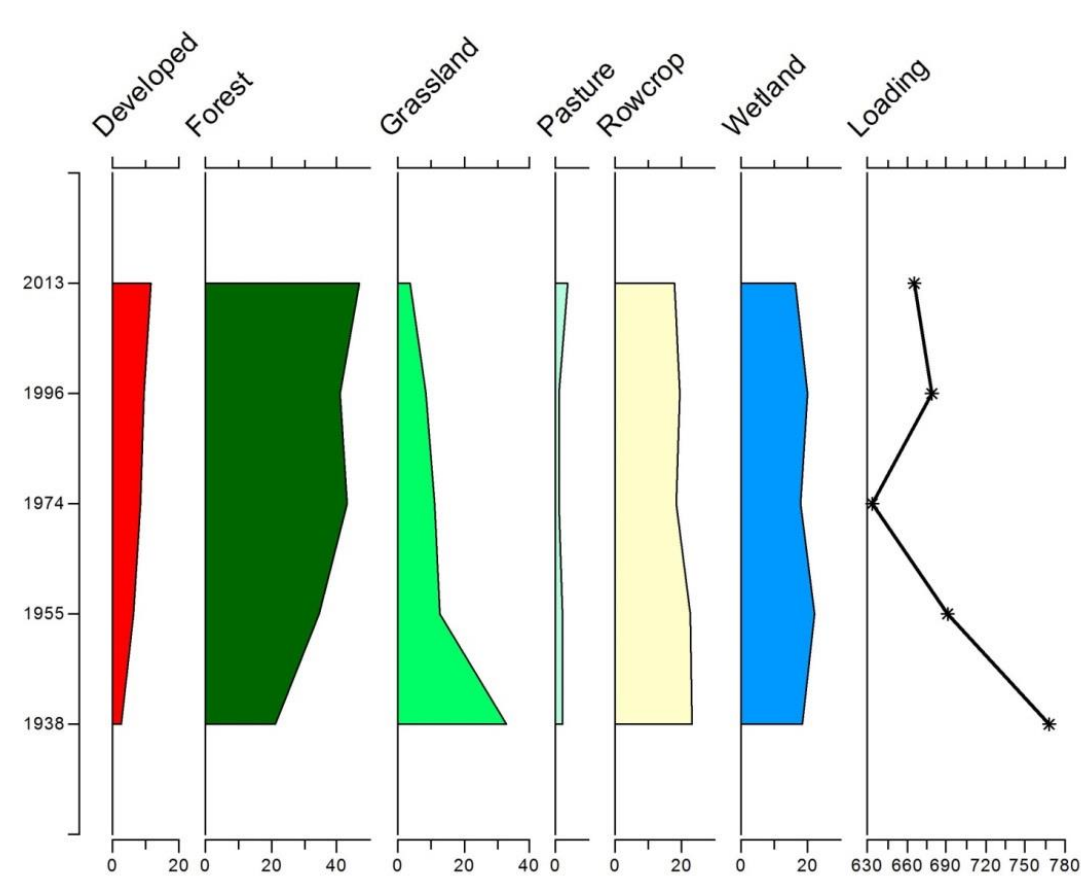
Site	TP (mg/L)	Area (m <sup>2</sup> )	Discharge (l/s)	Phosphorus (lb/yr)
2013 Fox Creek	0.0720	4.11	4,942	24,755
2014 Fox Creek	0.0422	5.72	10,696	31,402
2015 Fox Creek	0.0477	4.08	7,075	23,479
2013 Lost Creek	0.1065	5.90	360	2,667
2014 Lost Creek	0.0899	7.22	1,227	7,674
2015 Lost Creek	0.1423	8.26	760	7,524
2013 Little Blake Inlet	0.0424	10.37	4,571	13,484
2014 Little Blake Inlet	0.0415	8.17	7,487	21,616
2015 Little Blake Inlet	0.0445	8.21	5,460	16,904



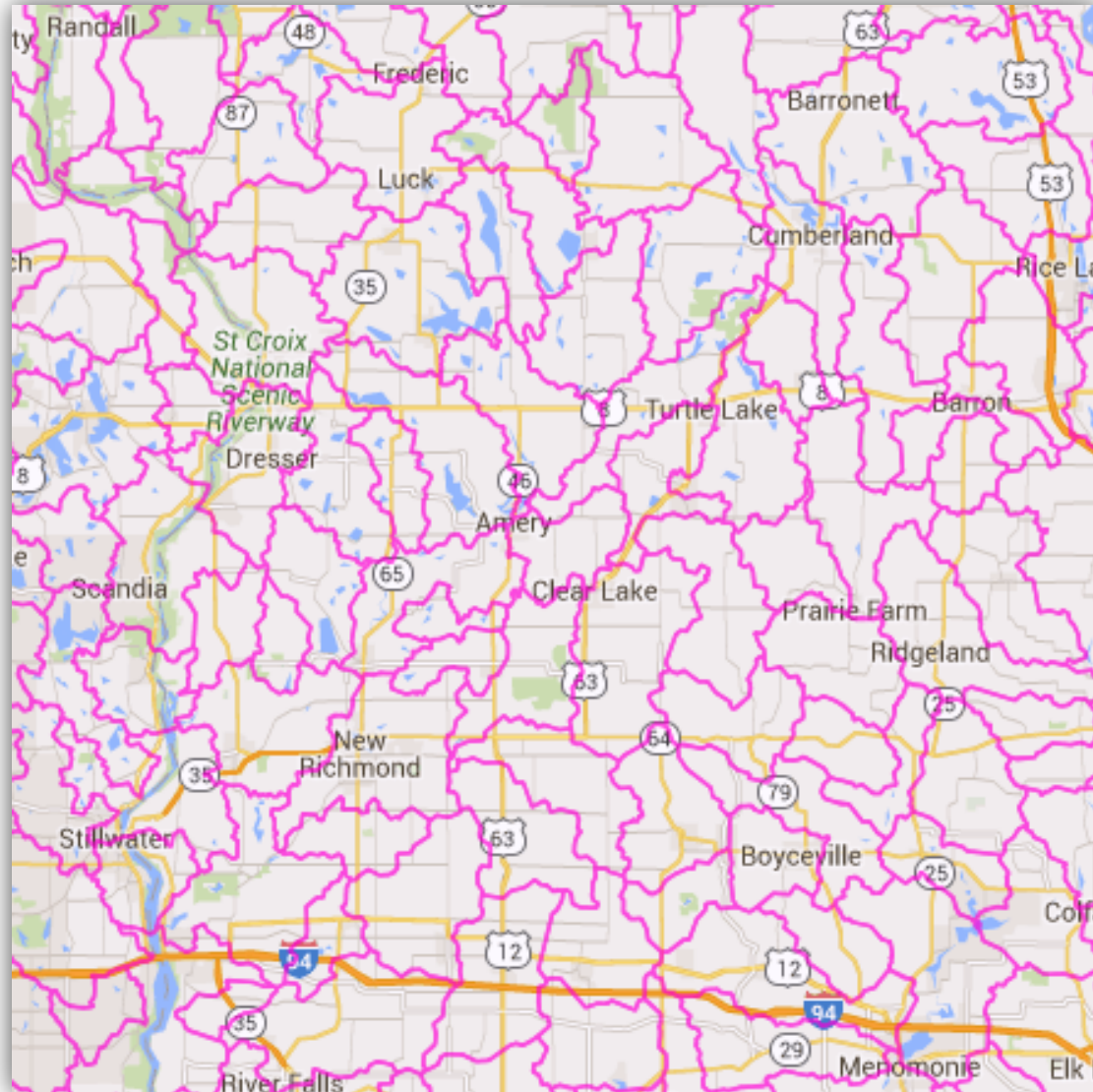
# Big Blake Lake, tributary, and outlet total suspended solids (mg/L), 2013-2015

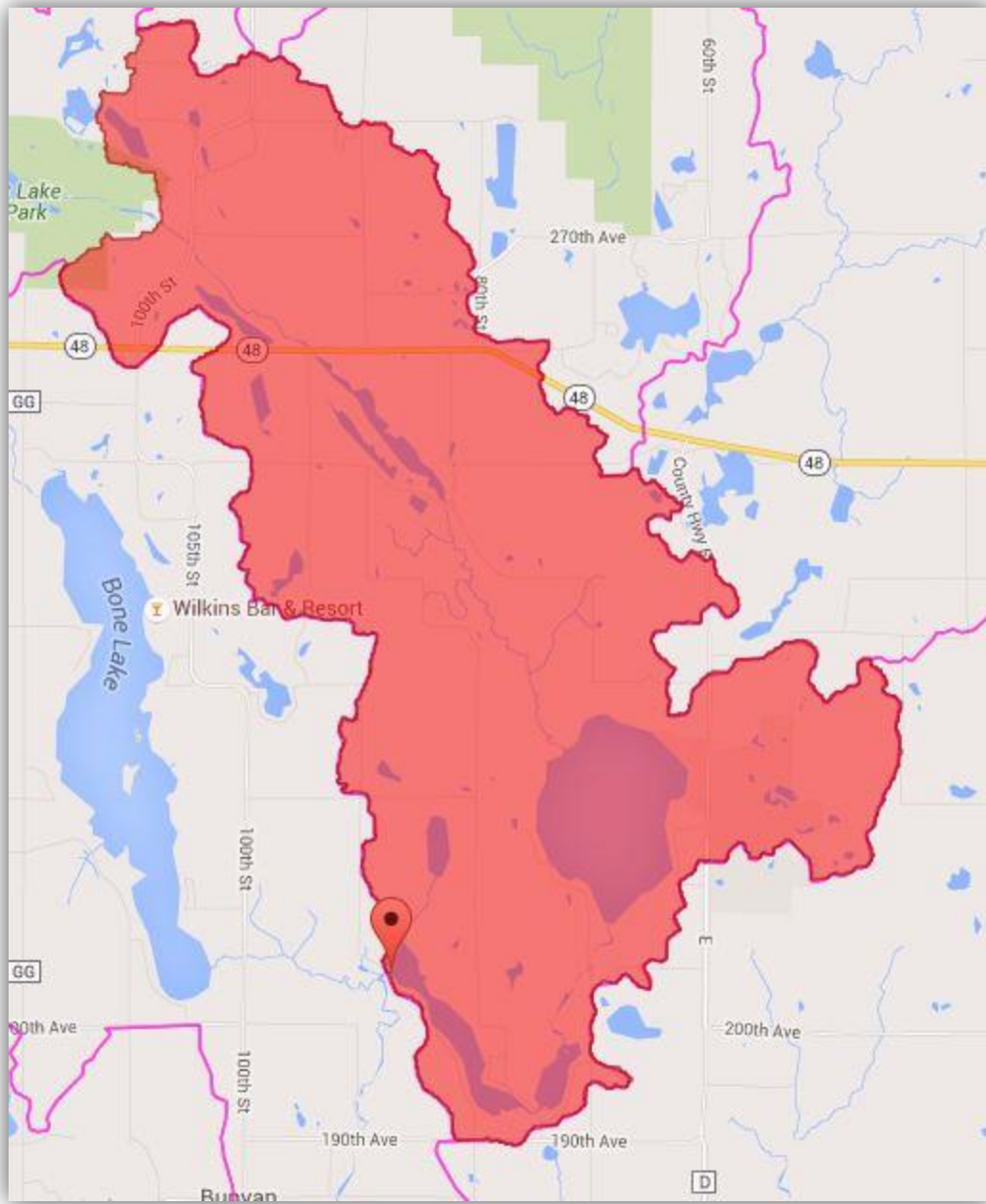


Date	Developed (acres)	Forest (acres)	Grassland (acres)	Pasture (acres)	Row crop (acres)	Wetland (acres)	Phosphorus loading (lbs/yr)
1938	57, (3%)	451, (21%)	705, (33%)	40, (2%)	490, (23%)	391, (18%)	769
1955	132, (6%)	753, (35%)	279, (13%)	40, (2%)	489, (23%)	474, (22%)	691
1974	179, (8%)	922, (43%)	244, (11%)	26, (1%)	392, (18%)	379, (18%)	634
1996	204, (10%)	873, (41%)	177, (8%)	28, (1%)	417, (20%)	421, (20%)	679
2013	250, (12%)	1004, (47%)	80, (4%)	80, (4%)	390, (18%)	348, (16%)	666

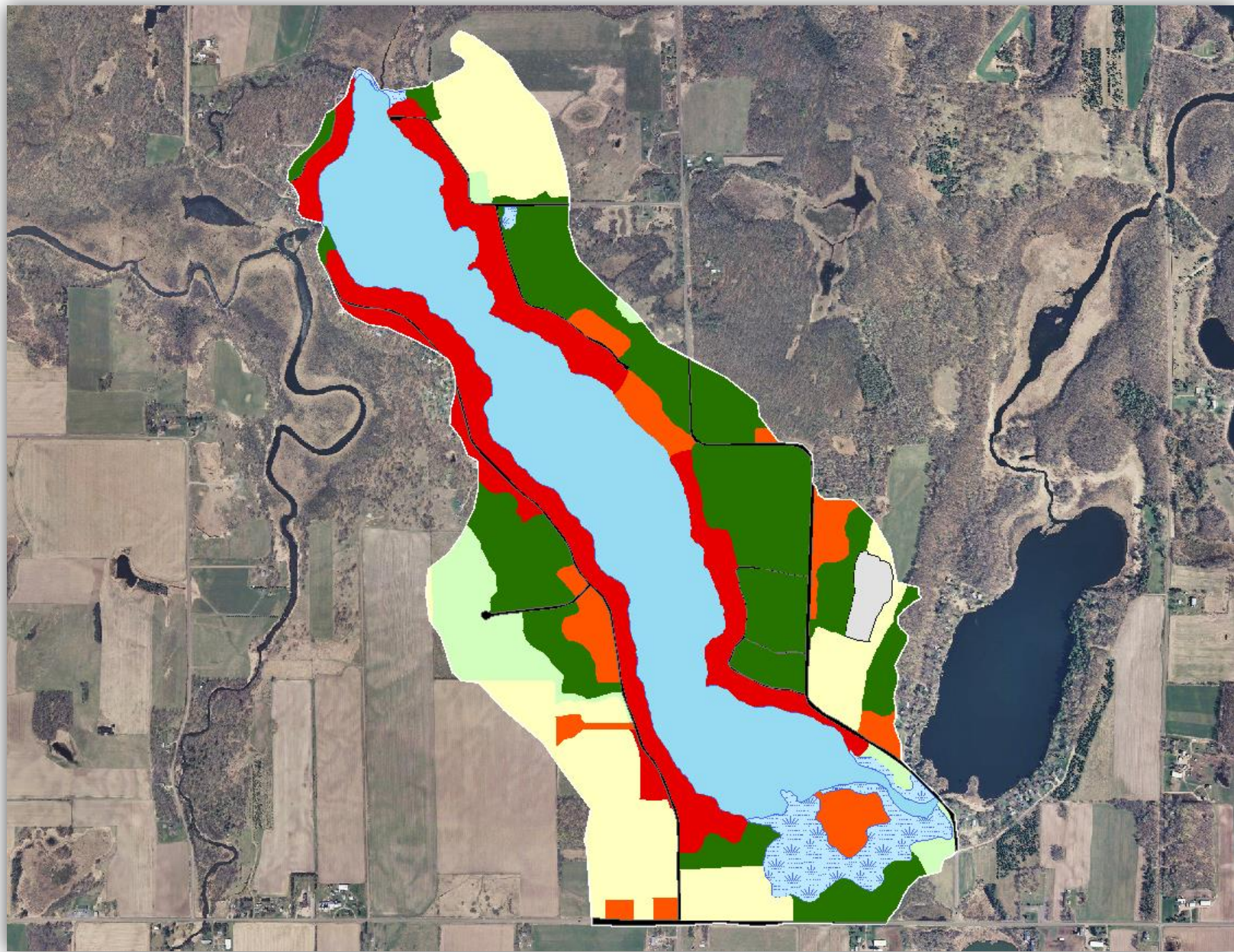


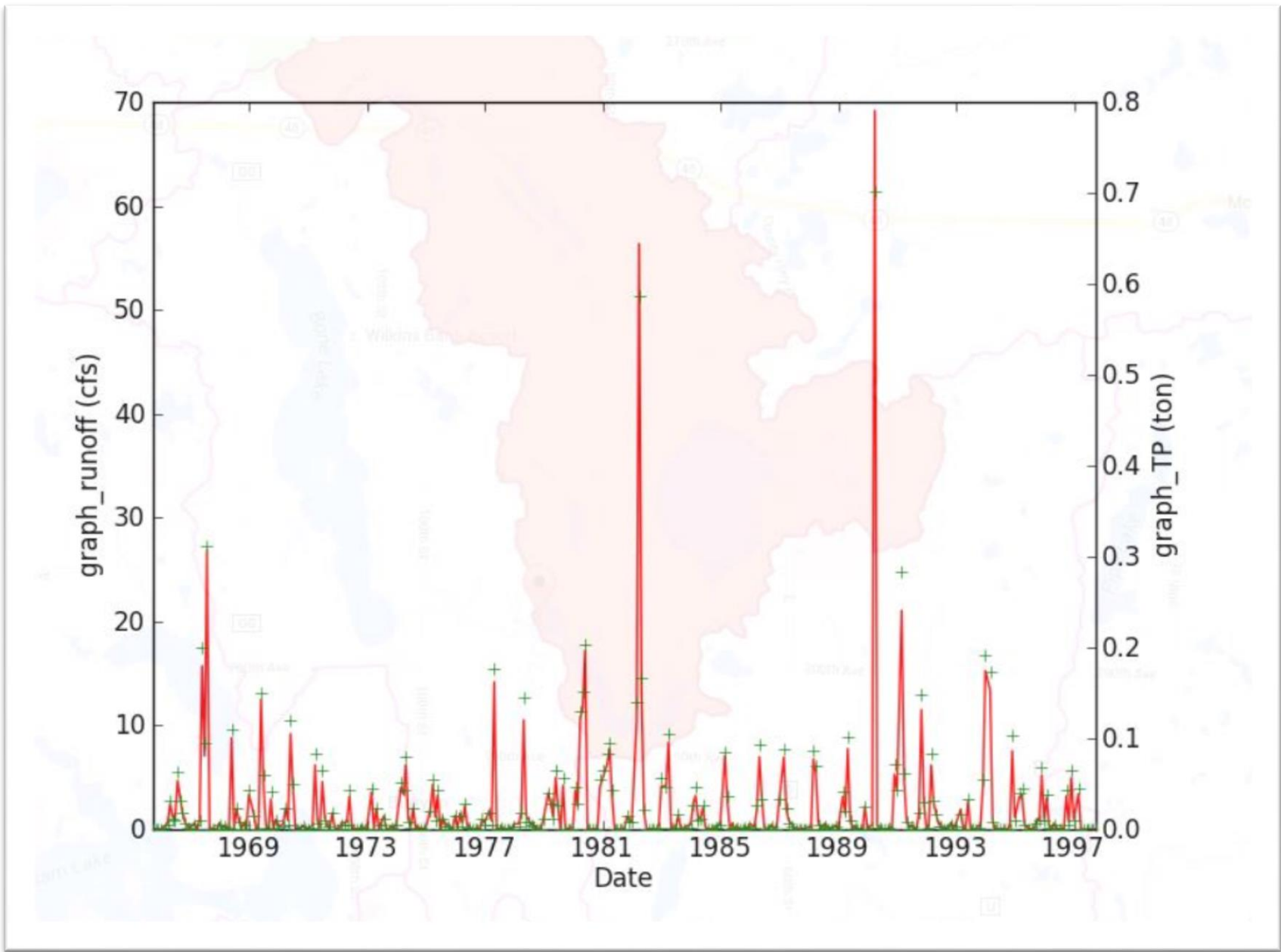
# Watershed Modeling



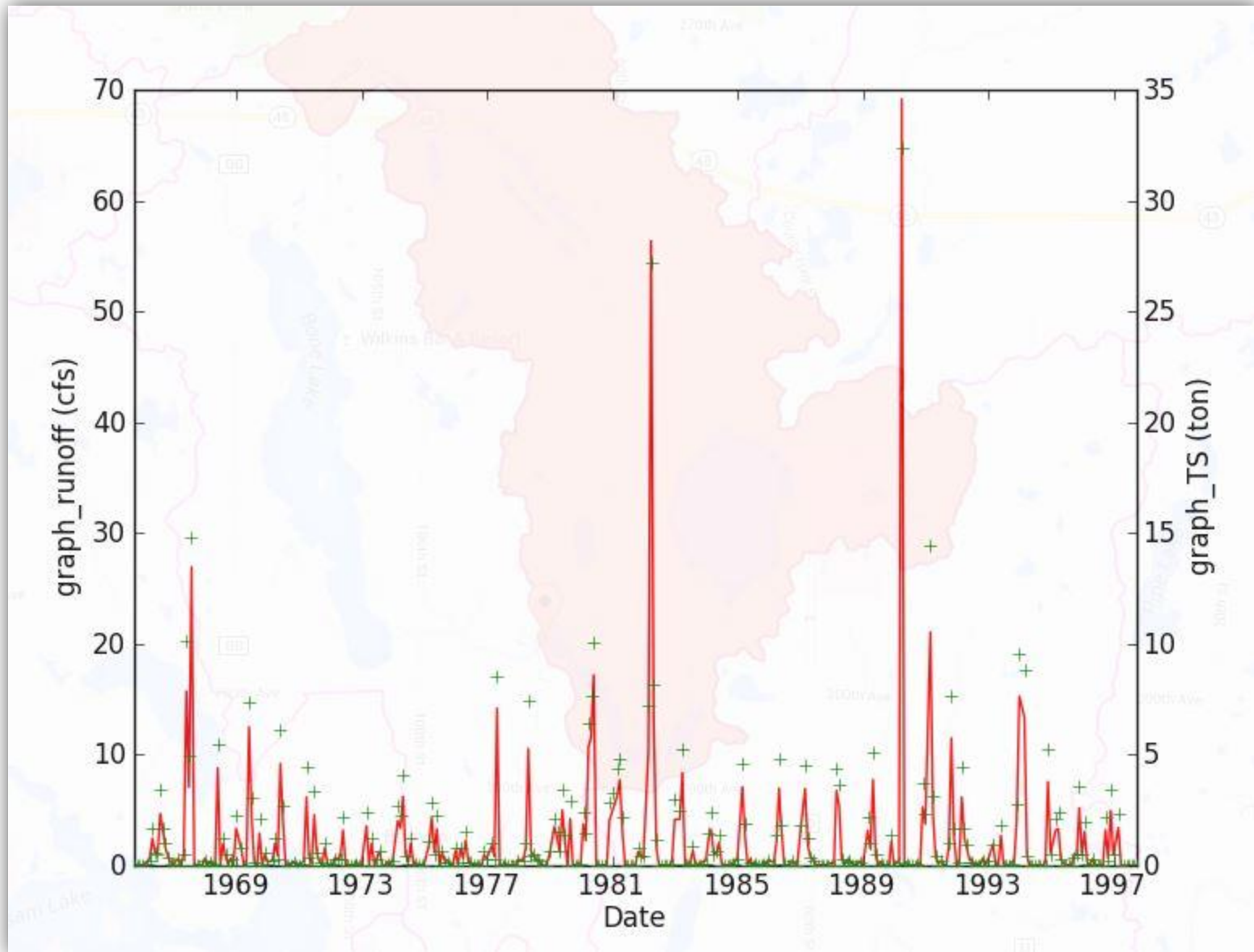




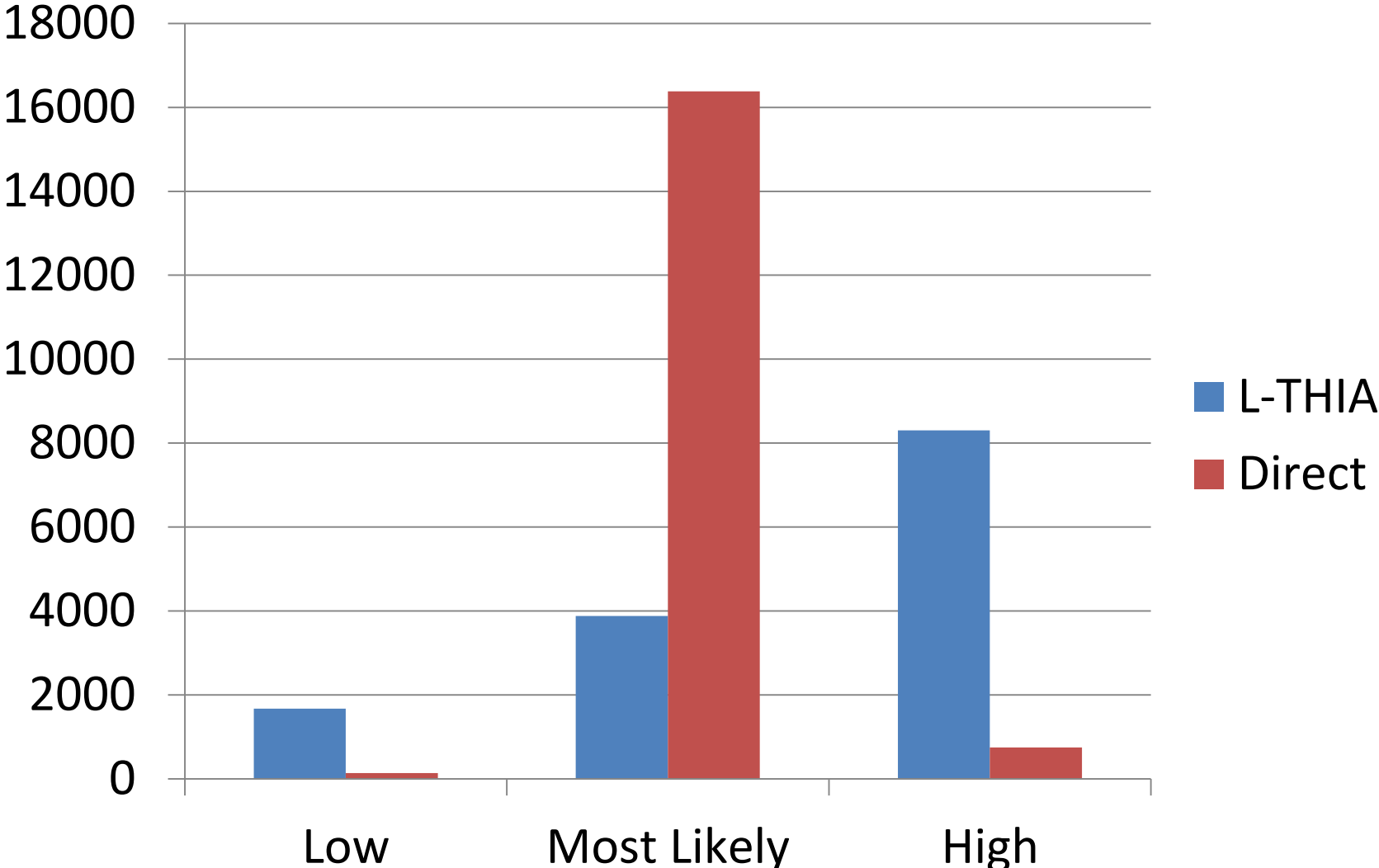






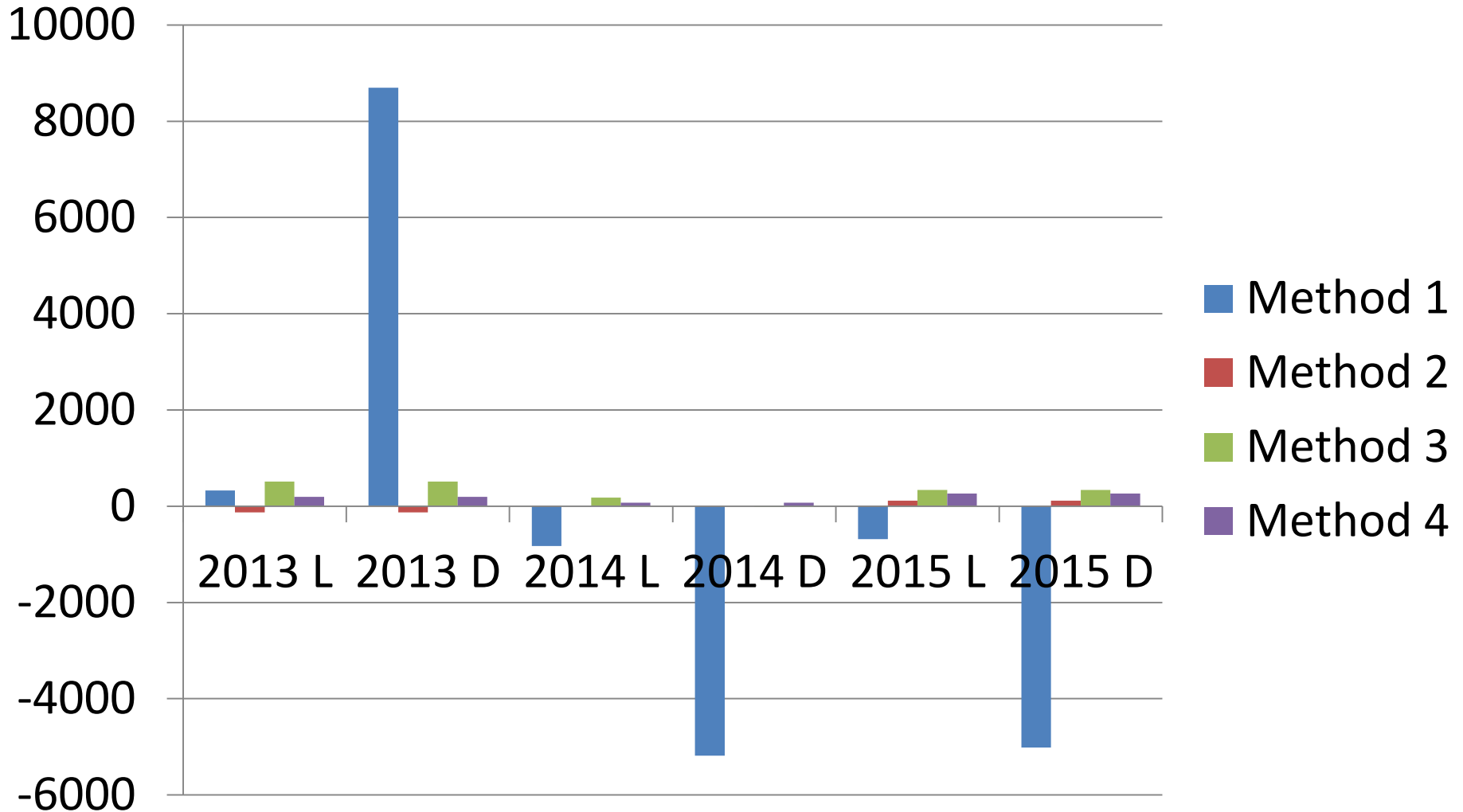


# External Loading





# Internal Loading



# Nurnberg Model

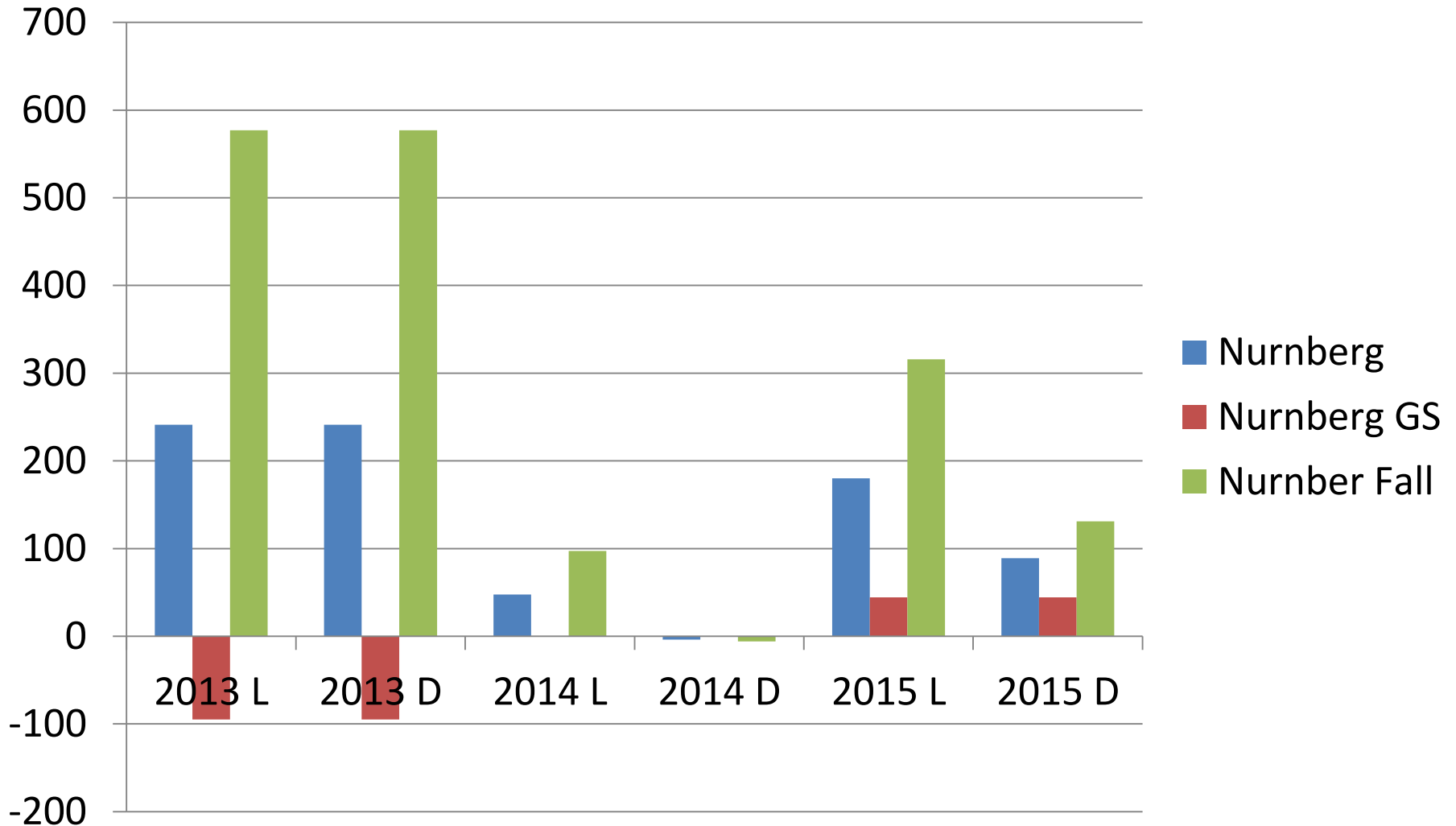
$$P = \frac{L_{Ext}}{q_s} (1 - R) + \frac{L_{int}}{q_s}$$

Where

$$R = \frac{15}{18 + q_s}$$



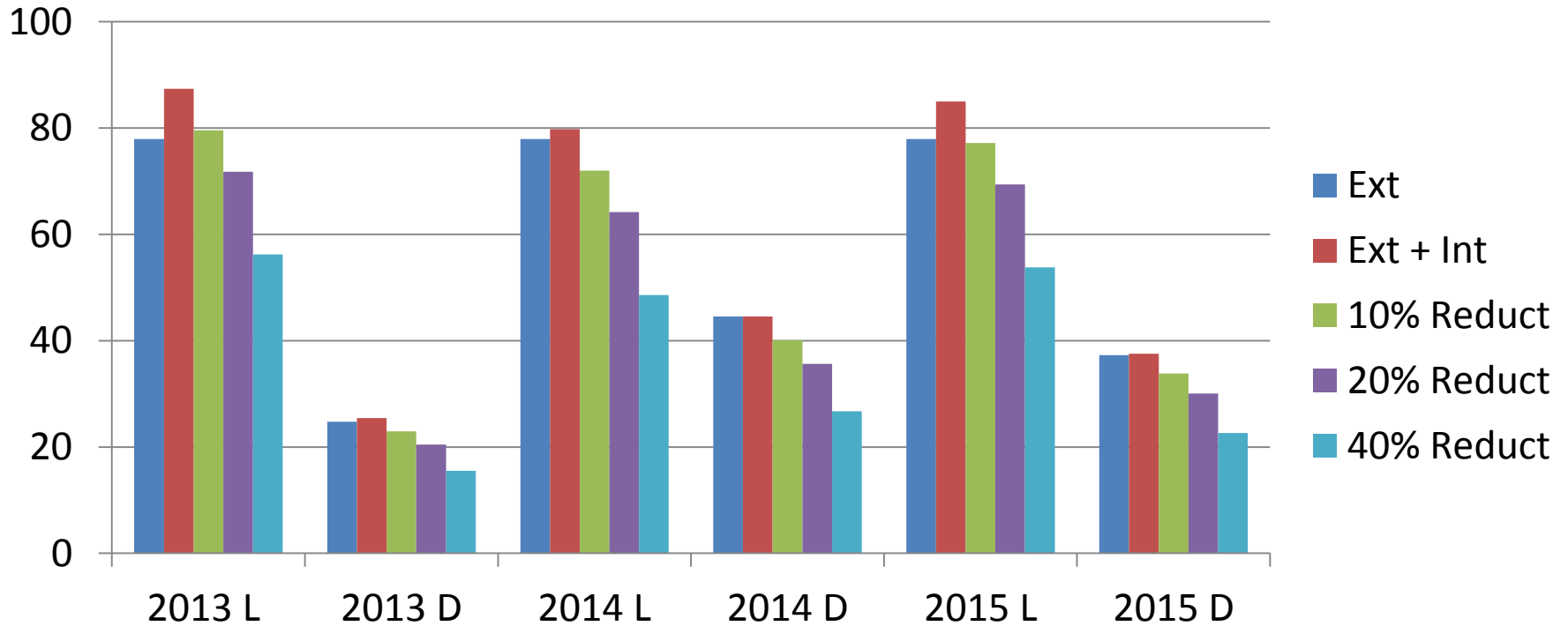
# Nurnberg Model



# Reckhow Model

$$P = \frac{L}{0.17z + 1.13z/T_w}$$

# Reckhow Model



	2013 L	2013 D	2014 L	2014 D	2015 L	2015 D
Ext	77.91	24.76	77.91	44.57	77.91	37.3
Ext + Int	87.37	25.43	79.78	44.57	84.98	37.55
10% Reduct	79.58	22.96	71.98	40.12	77.19	33.82
20% Reduct	71.79	20.48	64.19	35.66	69.4	30.09
40% Reduct	56.21	15.53	48.61	26.74	53.81	22.63