Appendix 6.

Table 1. Statistical significance tests for TN removal efficiency

Model	Predictors	Outliers removed	
		p-value	Deviance
1	Linear(LOG(*Concentration in*))	0.1508	19.21
	Spline(LOG(*Concentration in*))	0.3321	
2	Linear(LOG(*Hydraulic_loading*))	<0.0001	14.87
	Spline(LOG(*Hydraulic_loading*))	0.0339	
3	Linear(LOG(*Area*))	0.7074	19.81
	Spline(LOG(*Area*))	0.4027	
4	Linear(*Air temp*)	0.0002	16.95
	Spline(*Air temp*)	0.3195	
5	Linear(LOG(*Concentration in*))	0.6014	14.68
	Spline(LOG(*Concentration in*))	0.3378	
	Linear(LOG(*Hydraulic loading*))	<0.0001	
	Spline(LOG(*Hydraulic loading*))	0.0467	
6	Linear(LOG(*Hydraulic loading*))	<0.0001	14.32
	Spline(LOG(*Hydraulic loading*))	0.0291	
	Linear(LOG(*Area*))	0.1197	
	Spline(LOG(*Area*))	0.4965	
7	Linear(LOG(*Hydraulic loading*))	0.0002	13.05
	Spline(LOG(*Hydraulic loading*))	0.0090	
	Linear(*Air temp*)	0.0014	
	Spline(*Air temp*)	0.4746	
8	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	<0.0001	14.07
9	Spline2(LOG(*Hydraulic loading*), LOG(*Area*))	<0.0001	14.07
10	Spline2(LOG(*Hydraulic loading*), *Air temp*)	<0.0001	11.99
11	Spline2(LOG(*Hydraulic loading*), *Air temp*)	<0.0001	11.88
	Linear(LOG(*Concentration in*))	0.7336	
	Spline(*LOG(Concentration in*))	0.3877	
12	Spline2(LOG(*Hydraulic loading*), *Air temp*)	<0.0001	11.27
	Linear(LOG(*Area*))	0.0034	
	Spline(LOG(*Area*))	0.4527	
13	Spline2(LOG(*Hydraulic loading*), *Air temp*)	<0.0001	11.14
	Linear(LOG(*Concentration in*))	0.2231	
	Spline(LOG(*Concentration in*))	0.4936	
	Linear(LOG(*Area*))	0.0013	
	Spline(LOG(*Area*))	0.4713	

Table 2. Statistical significance tests for removal rate of TN.

Model	Predictors	Outliers removed	
		p-value	Deviance
14	Linear(LOG(*Concentration in*))	<0.0001	8.31
	Spline(LOG(*Concentration in*))	0.0028	
15	Linear(LOG(*Hydraulic_loading*))	0.0044	10.13
	Spline(LOG(*Hydraulic_loading*))	0.0804	
16	Linear(LOG(*Area*))	<0.0001	8.82
	Spline(LOG(*Area*))	0.0385	
17	Linear(*Air temp*)	0.8779	11.25
	Spline(*Air temp*)	0.0506	
18	Linear(LOG(*Concentration in*))	<0.0001	4.60
	Spline(LOG(*Concentration in*))	0.0016	
	Linear(LOG(*Hydraulic_loading*))	<0.0001	
	Spline(LOG(*Hydraulic_loading*))	0.0771	
19	Linear(LOG(*Concentration in*))	<0.0001	6.00
	Spline(LOG(*Concentration in*))	0.0028	
	Linear(LOG(*Area*))	<0.0001	
	Spline(LOG(*Area*))	0.0543	
20	Linear(LOG(*Concentration in*))	<0.0001	8.01
	Spline(LOG(*Concentration in*))	0.0017	
	Linear(*Air temp*)	0.9999	
	Spline(*Air temp*)	0.0871	
21	Spline2(LOG(Concentration in), LOG(Hydraulic loading))	<0.0001	3.79
22	Spline2(LOG(Concentration in), LOG(Area))	<0.0001	5.88
23	Spline2(LOG(Concentration in), Air temp)	<0.0001	8.03
24	Spline2(LOG(Concentration in), LOG(Hydraulic loading))	<0.0001	3.24
	Linear(*Air temp*)	0.0040	
	Spline(*Air temp*)	0.0343	
25	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	<0.0001	3.20
	Linear(LOG(*Area*))	0.0009	
	Spline(LOG(*Area*))	0.0963	
26	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	<0.0001	2.91
	Linear(*Air temp*)	0.0084	
	Spline(*Air temp*)	0.2982	
	Linear(LOG(*Area*))	0.0015	
	Spline(LOG(*Area*))	0.2545	

Table 3. Statistical significance tests for TP removal efficiency.

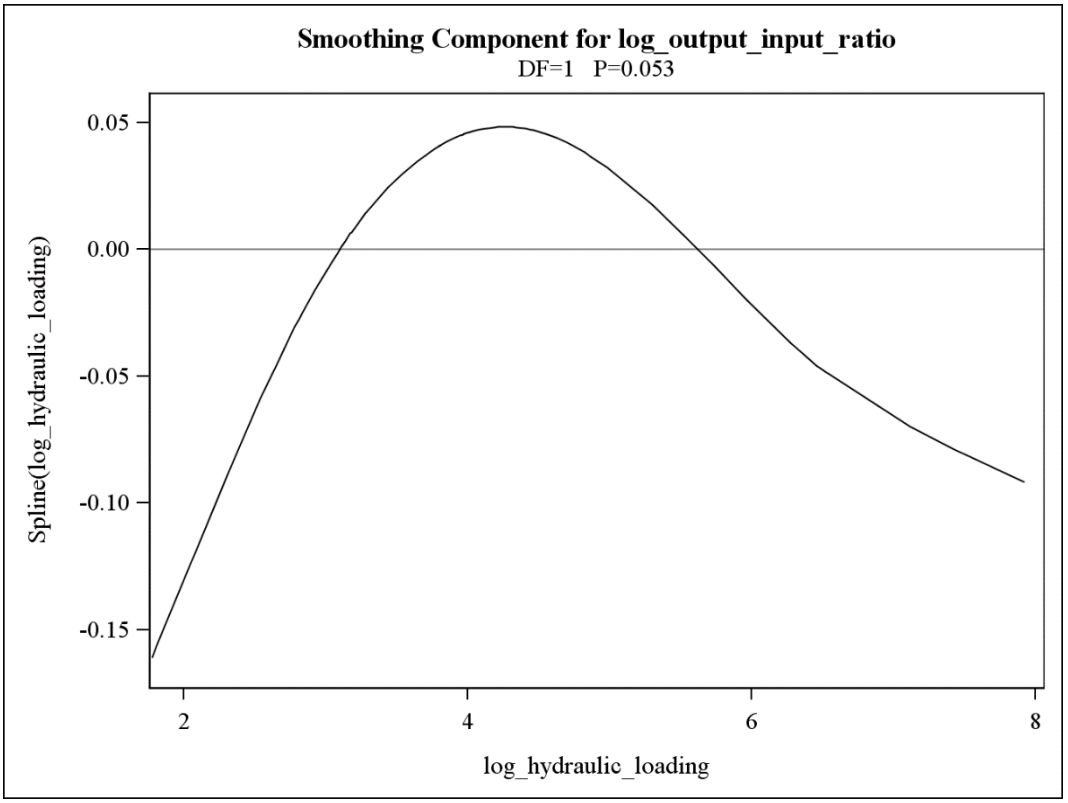
Model	Predictors	Outliers removed	
		p-value	Deviance
27	Linear(LOG(*Concentration in*))	0.7899	64.65
	Spline(LOG(*Concentration in*))	0.0063	
28	Linear(LOG(*Hydraulic_loading*))	0.0394	64.04
	Spline(LOG(*Hydraulic_loading*))	0.0360	
29	Linear(LOG(*Area*))	0.0160	64.90
	Spline(LOG(*Area*))	0.0764	
30	Linear(*Air temp*)	0.0335	64.84
	Spline(*Air temp*)	0.0317	
31	Linear(*Air temp*)	0.1959	60.36
	Spline(*Air temp*)	0.0869	
	Linear(LOG(*Hydraulic_loading*))	0.0938	
	Spline(LOG(*Hydraulic_loading*))	0.0778	
32	Linear(LOG(*Hydraulic loading*))	0.0943	59.90
	Spline(LOG(*Hydraulic loading*))	0.0982	
	Linear(LOG(*Area*))	0.0520	
	Spline(LOG(*Area*))	0.1751	
33	Linear(LOG(*Concentration in*))	0.9754	61.07
	Spline(LOG(*Concentration in*))	0.0165	
	Linear(LOG(*Hydraulic loading*))	0.0594	
	Spline(LOG(*Hydraulic loading*))	0.0557	
34	Spline2(*Air temp*, LOG(*Hydraulic loading*))	0.0187	59.61
35	Spline2(LOG(*Hydraulic loading*), LOG(*Area*))	0.0026	57.39
36	Spline2(LOG(*Concentration in*),LOG(*Hydraulic loading*))	0.0007	57.18
37	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	0.0024	53.49
	Linear(*Air temp*)	0.0927	
	Spline(*Air temp*)	0.0353	
38	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	0.0128	54.70
	Linear(LOG(*Area*))	0.1518	
	Spline(LOG(*Area*))	0.1523	
39	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	0.0099	53.10
	Linear(*Air temp*)	0.2343	
	Spline(*Air temp*)	0.0702	
	Linear(LOG(*Area*))	0.4578	
	Spline(LOG(*Area*))	0.2950	

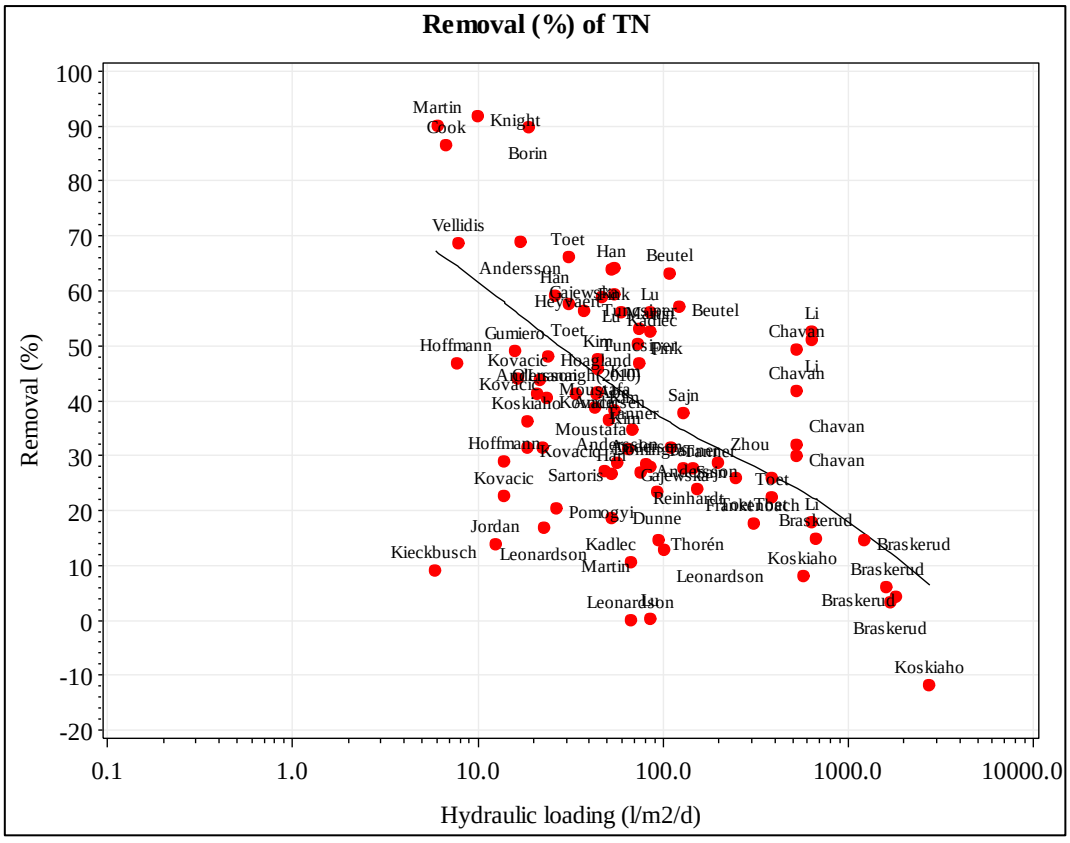
Table 4. Statistical significance tests for removal rate of TP.

Model	Predictors	Outliers removed	
		p-value	Deviance
40	Linear(LOG(*Concentration in*))	<0.0001	0.0381
	Spline(LOG(*Concentration in*))	0.0003	
41	Linear(LOG(*Hydraulic_loading*))	0.0631	0.0502
	Spline(LOG(*Hydraulic_loading*))	0.1543	
42	Linear(LOG(*Area*))	0.0423	0.0531
	Spline(LOG(*Area*))	0.3691	
43	Linear(*Air temp*)	0.3410	0.0492
	Spline(*Air temp*)	0.0002	
44	Linear(LOG(*Concentration in*))	<0.0001	0.0340
	Spline(LOG(*Concentration in*))	0.0002	
	Linear(LOG(*Hydraulic_loading*))	0.0004	
	Spline(LOG(*Hydraulic_loading*))	0.4212	
45	Linear(LOG(*Concentration in*))	<0.0001	0.0360
	Spline(LOG(*Concentration in*))	0.0019	
	Linear(LOG(*Area*))	0.0116	
	Spline(LOG(*Area*))	0.2131	
46	Linear(LOG(*Concentration in*))	<0.0001	0.0358
	Spline(LOG(*Concentration in*))	0.0004	
	Linear(*Air temp*)	0.8470	
	Spline(*Air temp*)	0.0070	
47	Spline2(LOG(Concentration in), LOG(Hydraulic loading))	<0.0001	0.0306
48	Spline2(LOG(Concentration in), LOG(Area))	<0.0001	0.0328
49	Spline2(LOG(Concentration in), Air temp)	<0.0001	0.0318
50	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	<0.0001	0.0265
	Linear(*Air temp*)	0.2427	
	Spline(*Air temp*)	0.0016	
51	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	<0.0001	0.0283
	Linear(LOG(*Area*))	0.0744	
	Spline(LOG(*Area*))	0.0655	
52	Spline2(LOG(*Concentration in*), LOG(*Hydraulic loading*))	<0.0001	0.0250
	Linear(*Air temp*)	0.2614	
	Spline(*Air temp*)	0.0042	
	Linear(LOG(*Area*))	0.0926	
	Spline(LOG(*Area*))	0.1567	

Model 2: Removal efficiency (%) of TN *vs.* hydraulic loading

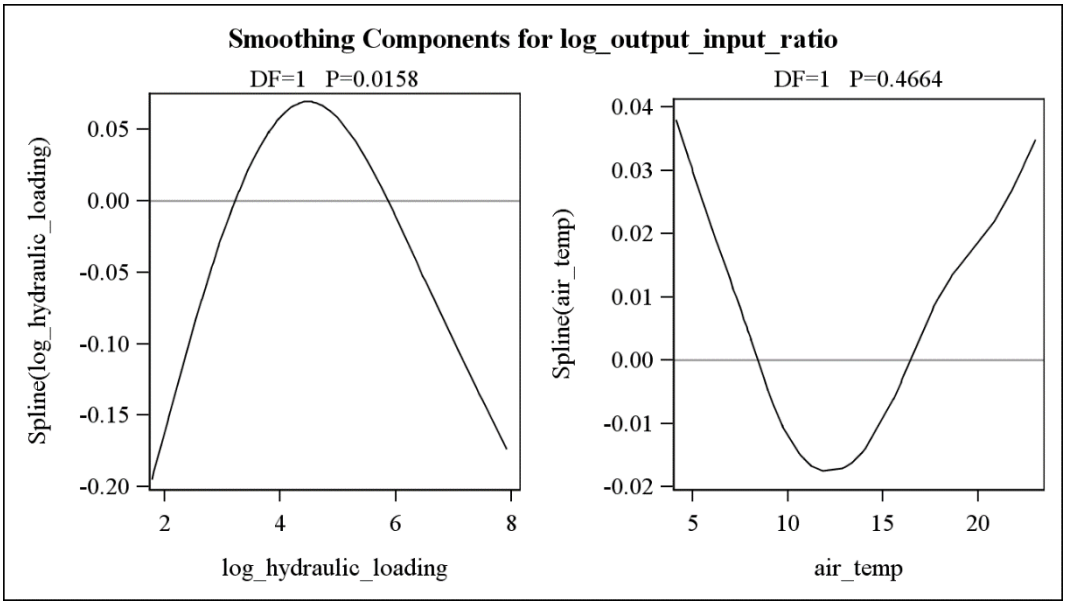
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline(log_hydraulic_loading)

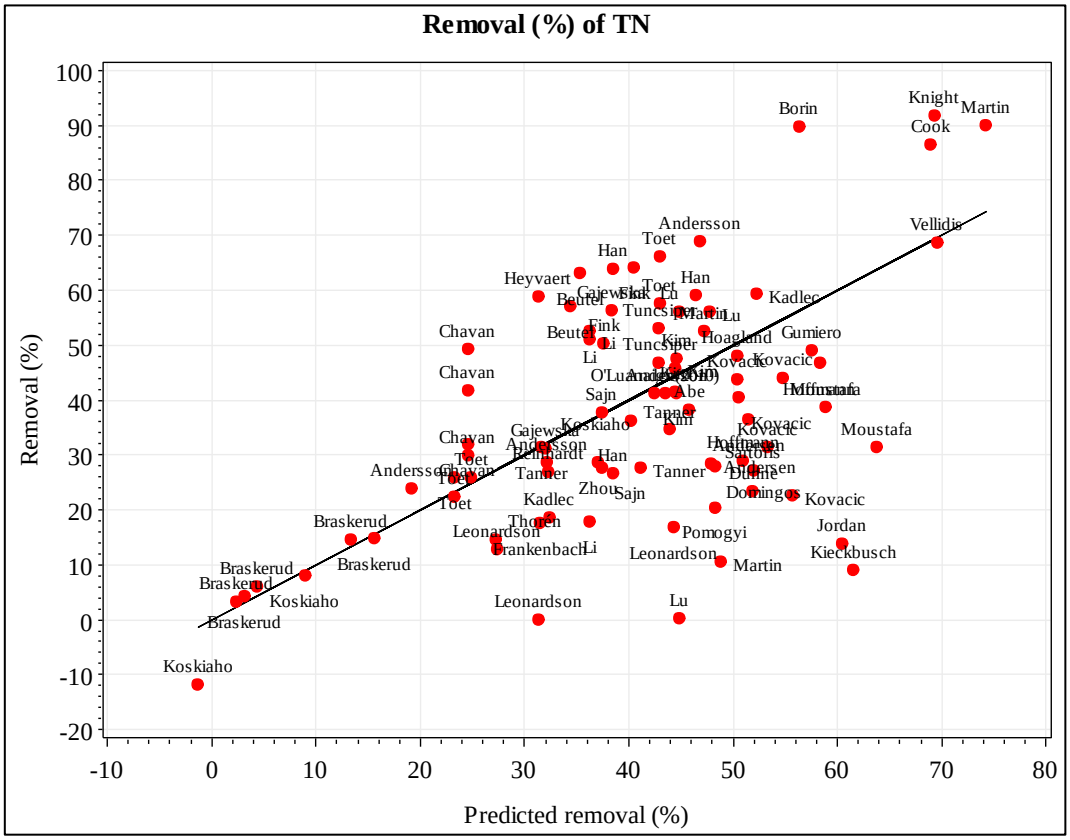




Model 7: Removal efficiency (%) of TN *vs.* hydraulic loading and air temperature

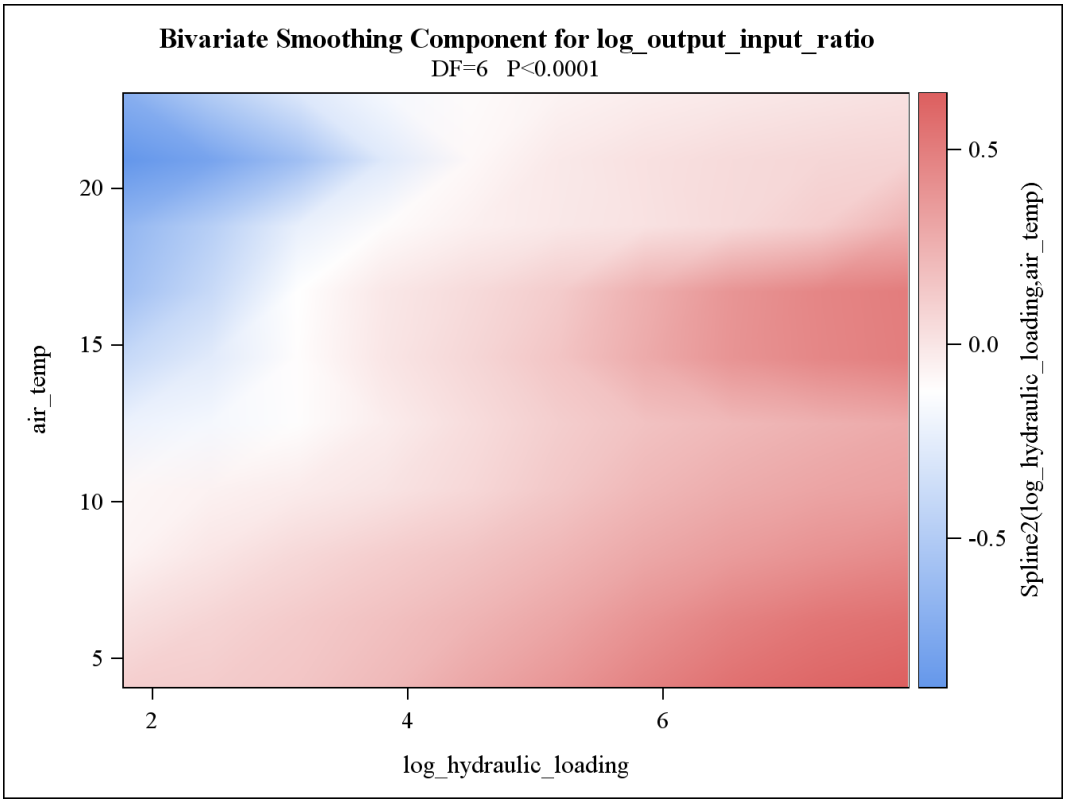
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline(log_hydraulic_loading) Spline(air_temp)

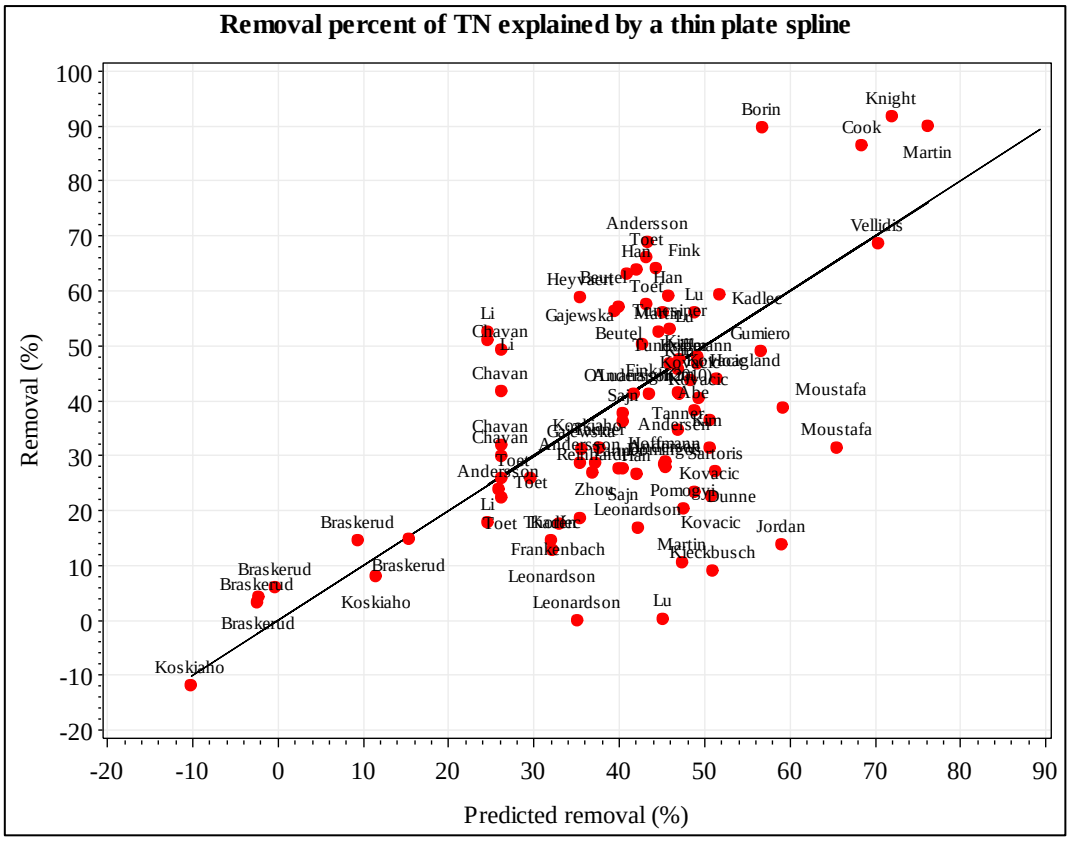




Model 10: Removal efficiency (%) of TN explained by a thin plate spline

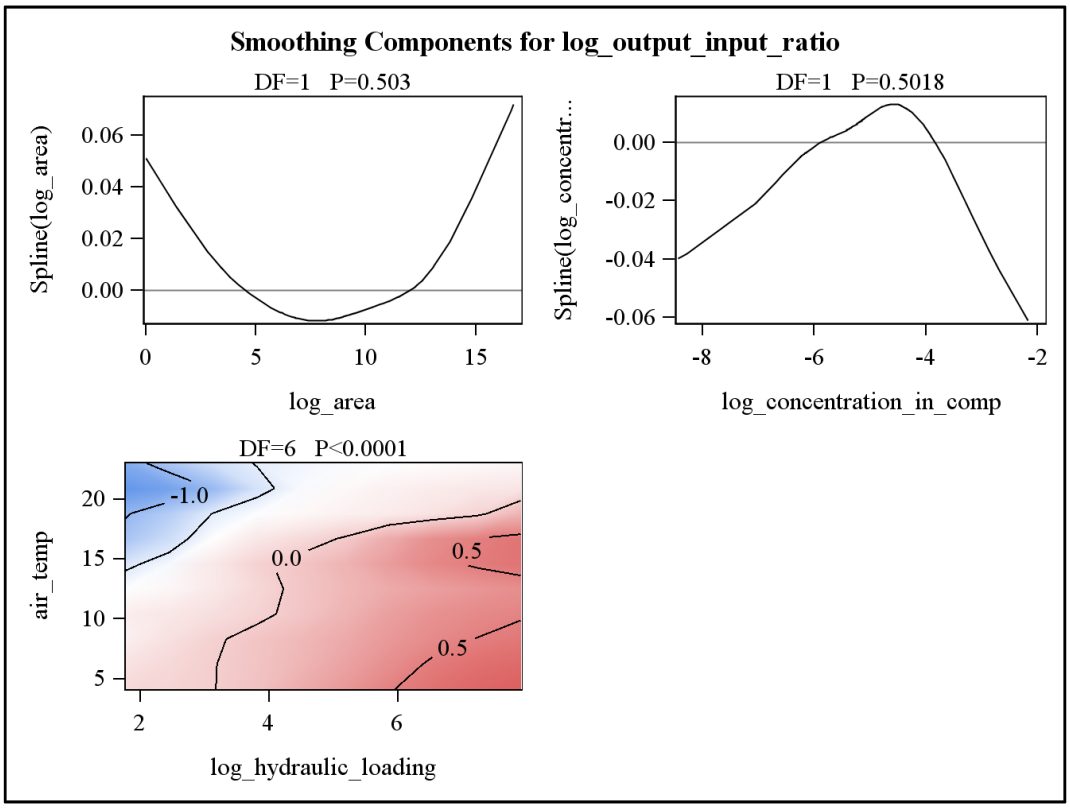
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline2(log_hydraulic_loading air_temp)

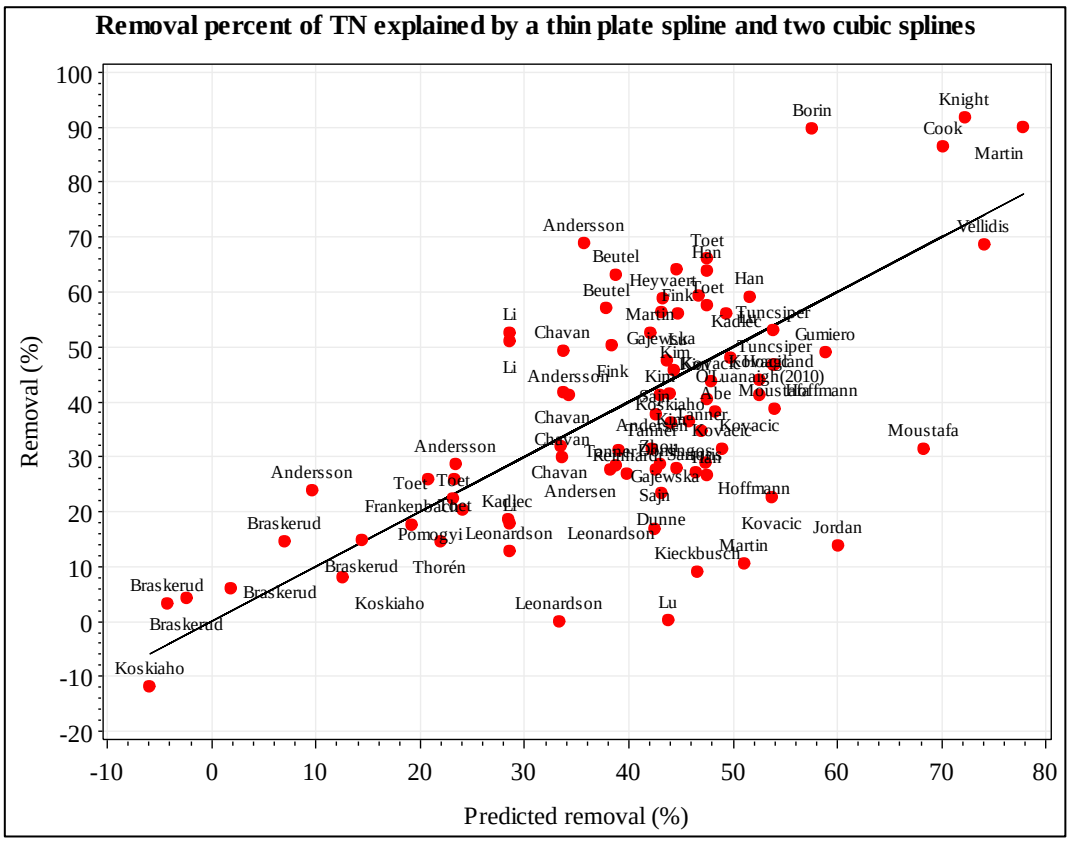




Model 13: Removal efficiency (%) of TN explained by a thin plate spline and two cubic splines

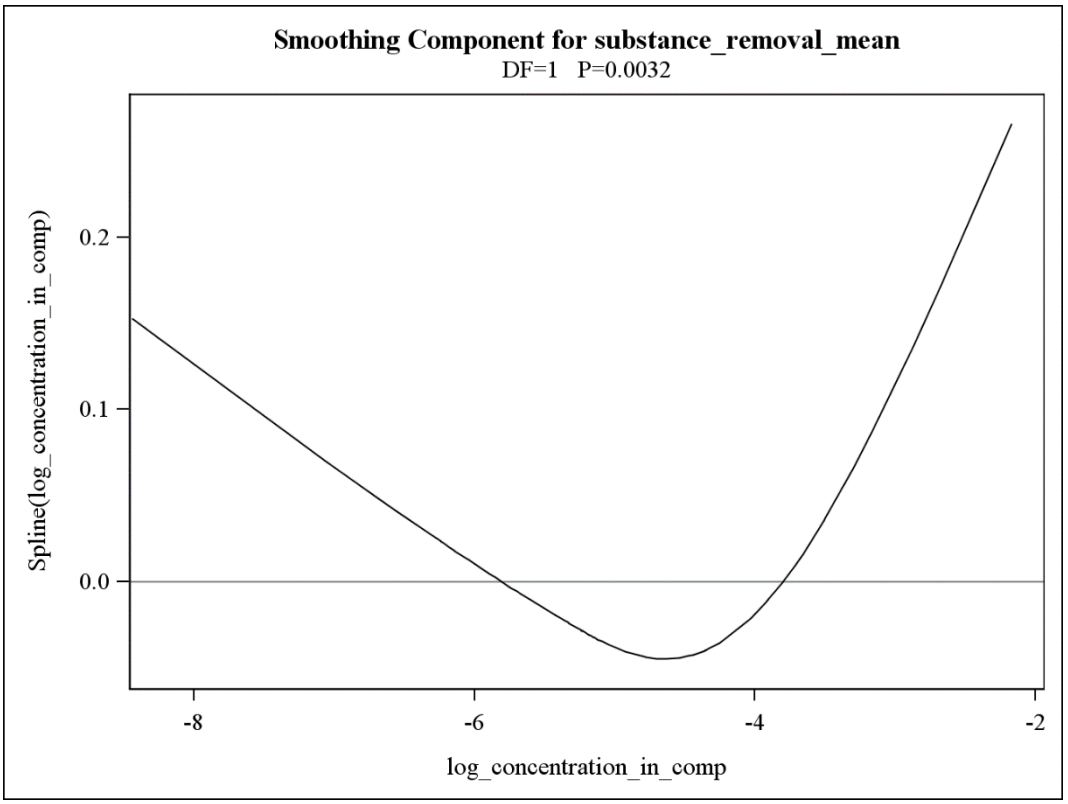
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline(log_area) spline(log_concentration_in_comp) spline2(log_hydraulic_loading air_temp)

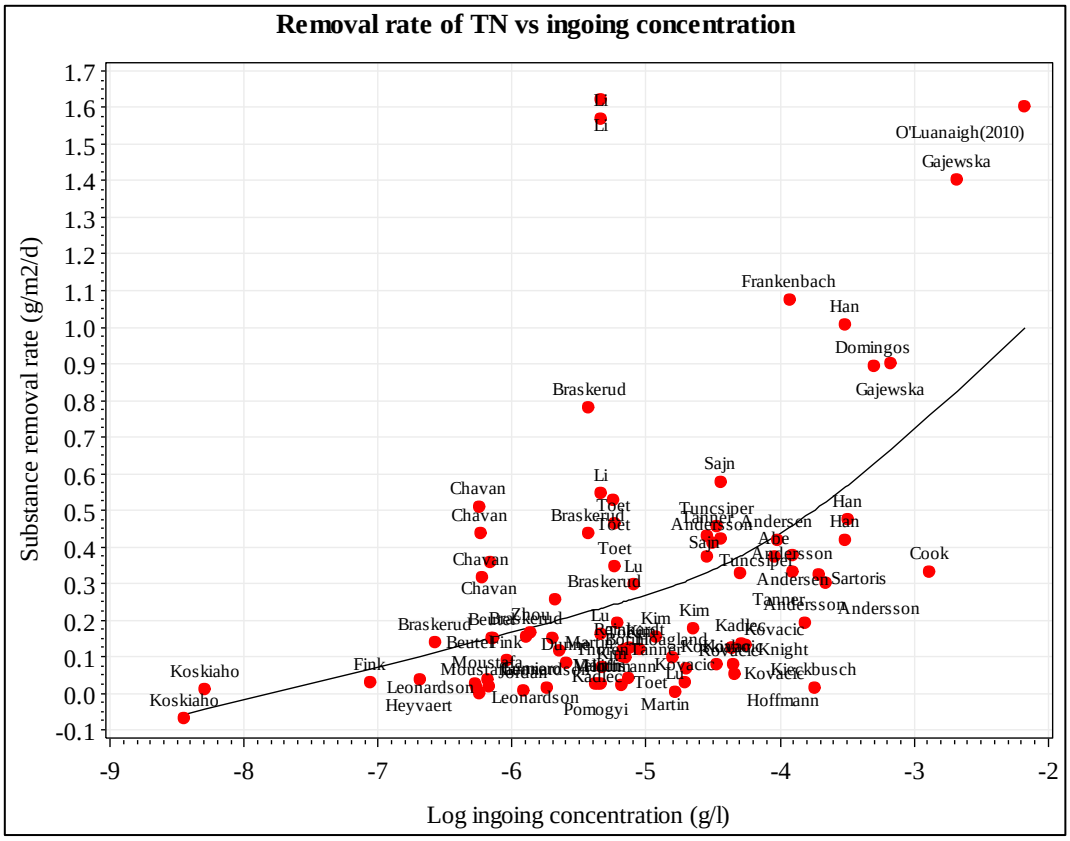




Model 14: Removal rate of TN *vs.* ingoing concentration

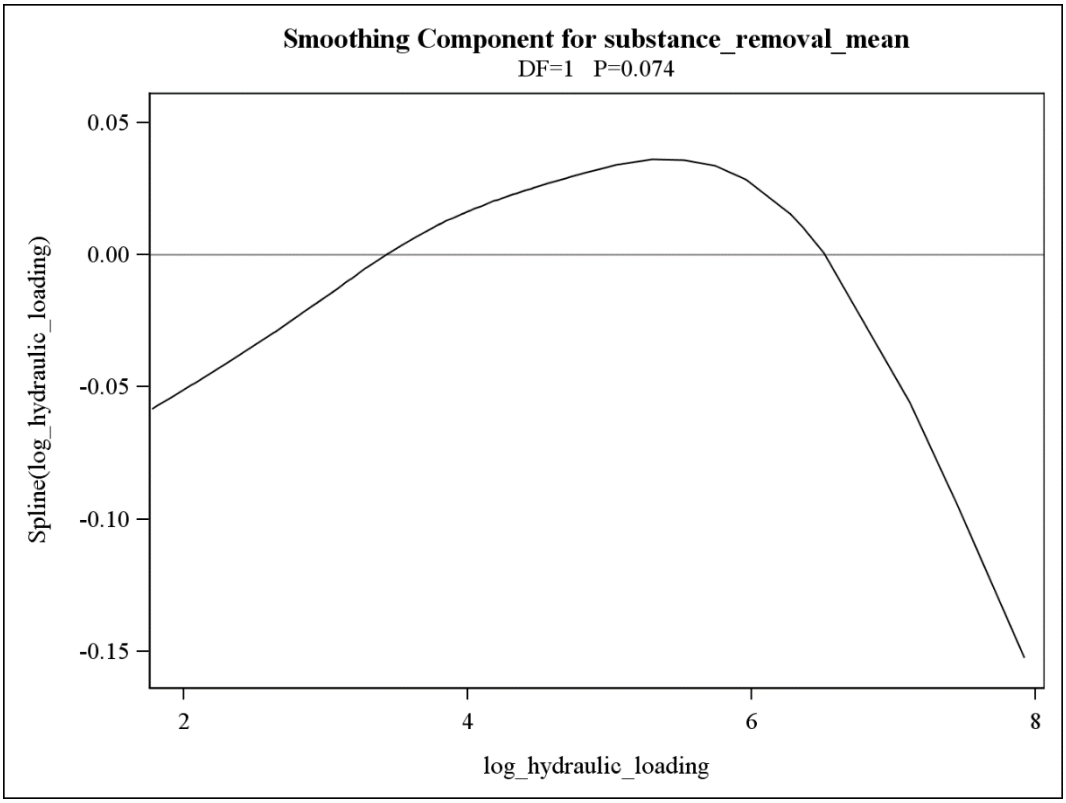
The GAM Procedure
Dependent Variable: substance_removal_mean
Smoothing Model Component(s): spline(log_concentration_in_comp)

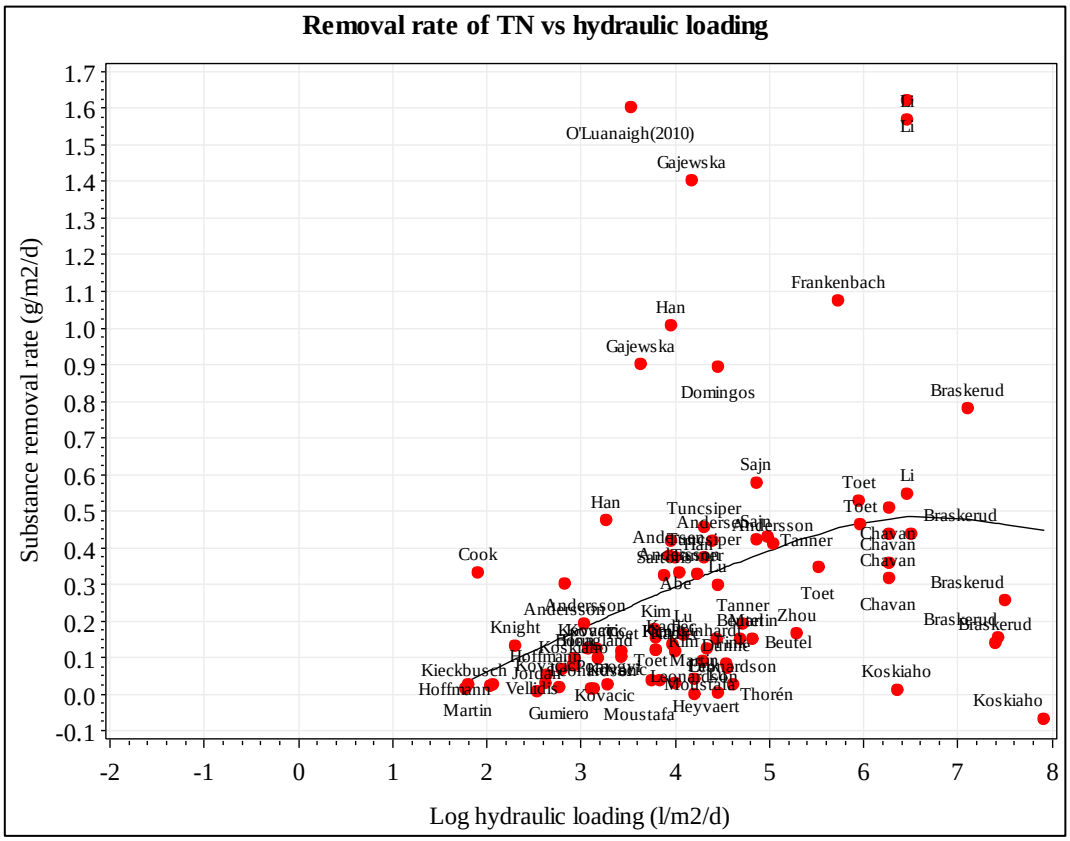




Model 15: Removal rate of TN *vs.* hydraulic loading

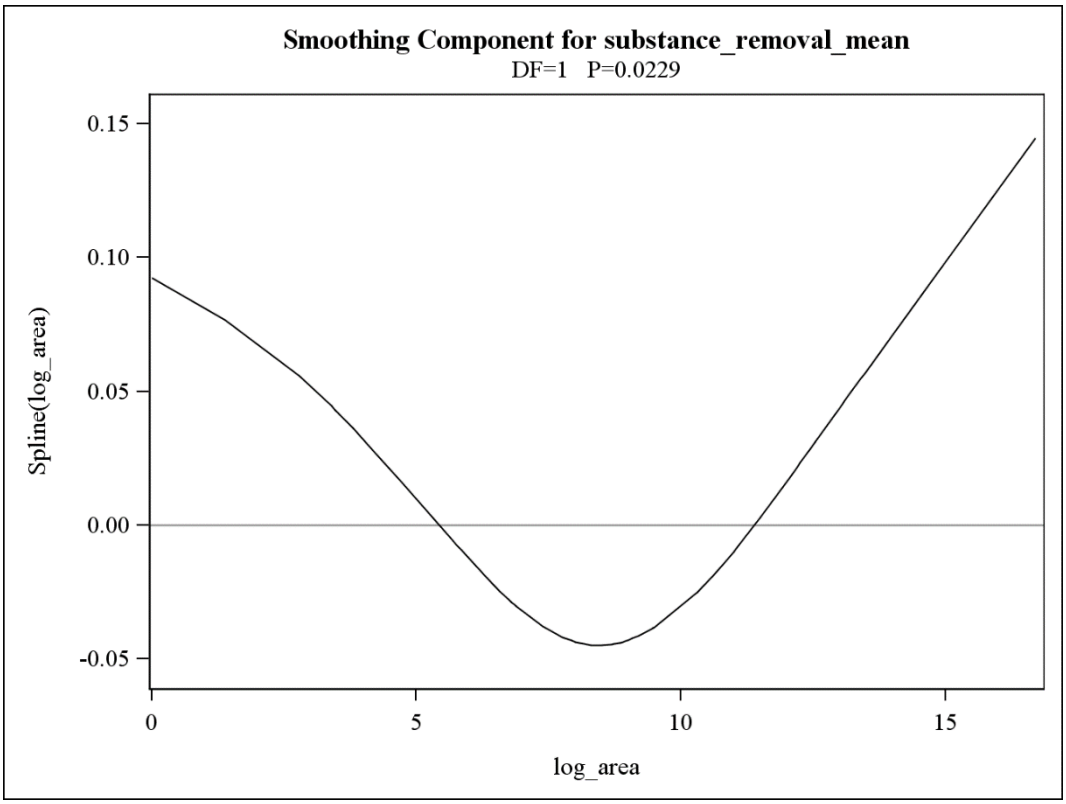
The GAM Procedure
Dependent Variable: substance_removal_mean
Smoothing Model Component(s): spline(log_hydraulic_loading)

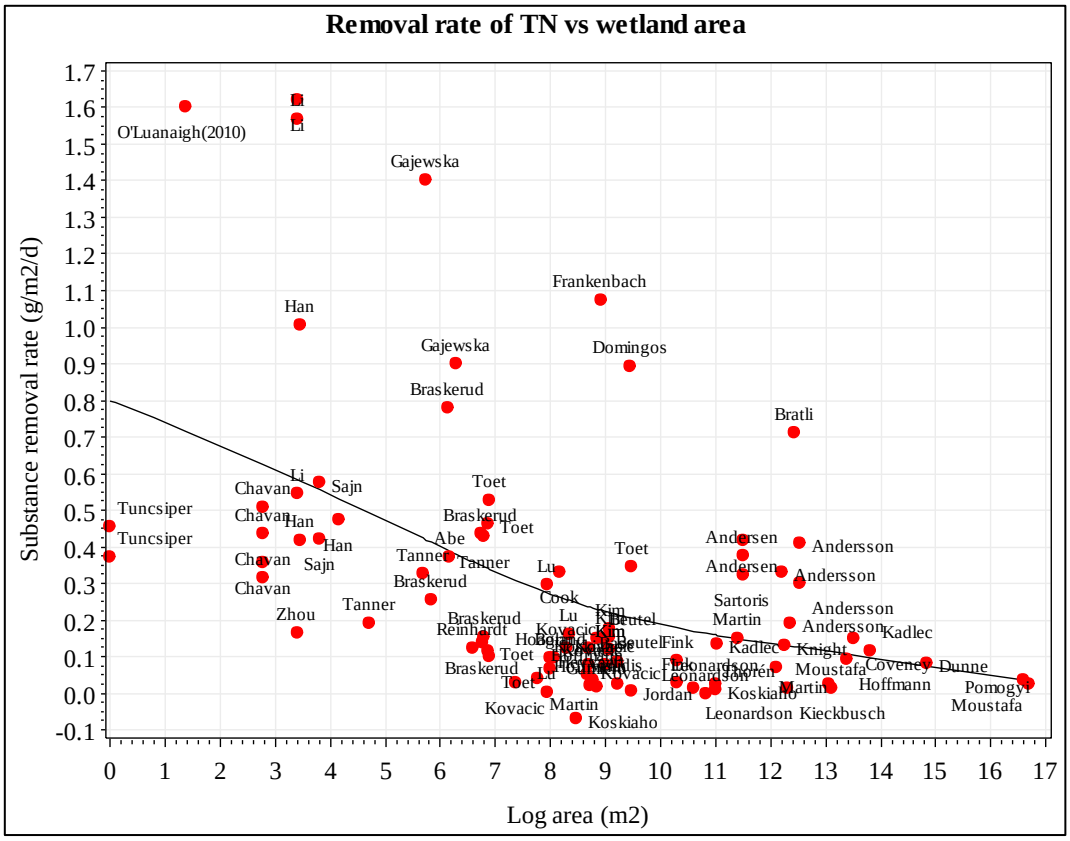




Model 16: Removal rate of TN *vs.* wetland area

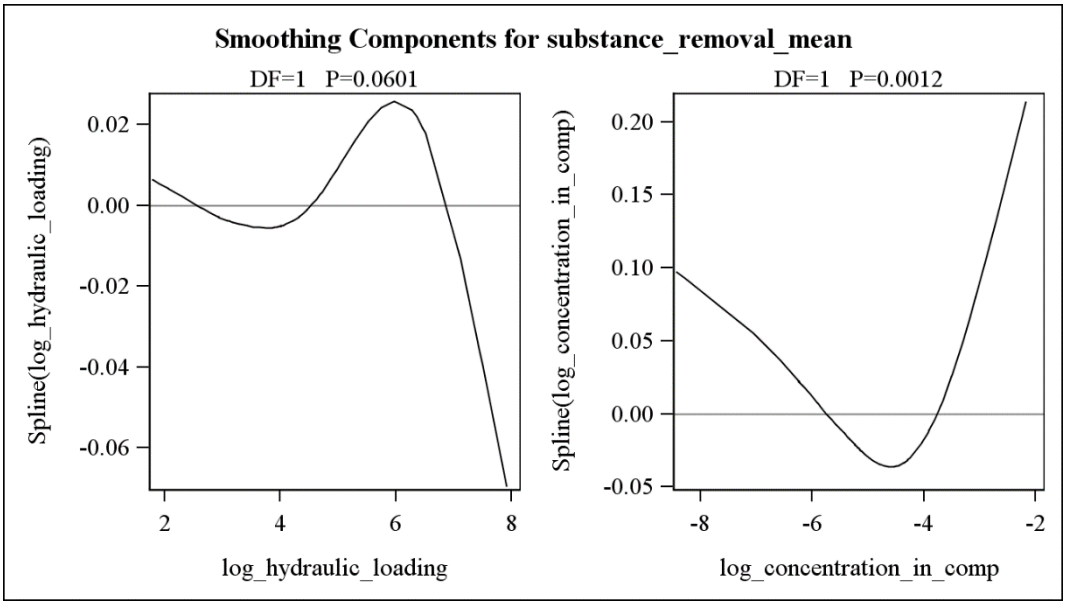
The GAM Procedure
Dependent Variable: substance_removal_mean
Smoothing Model Component(s): spline(log_area)

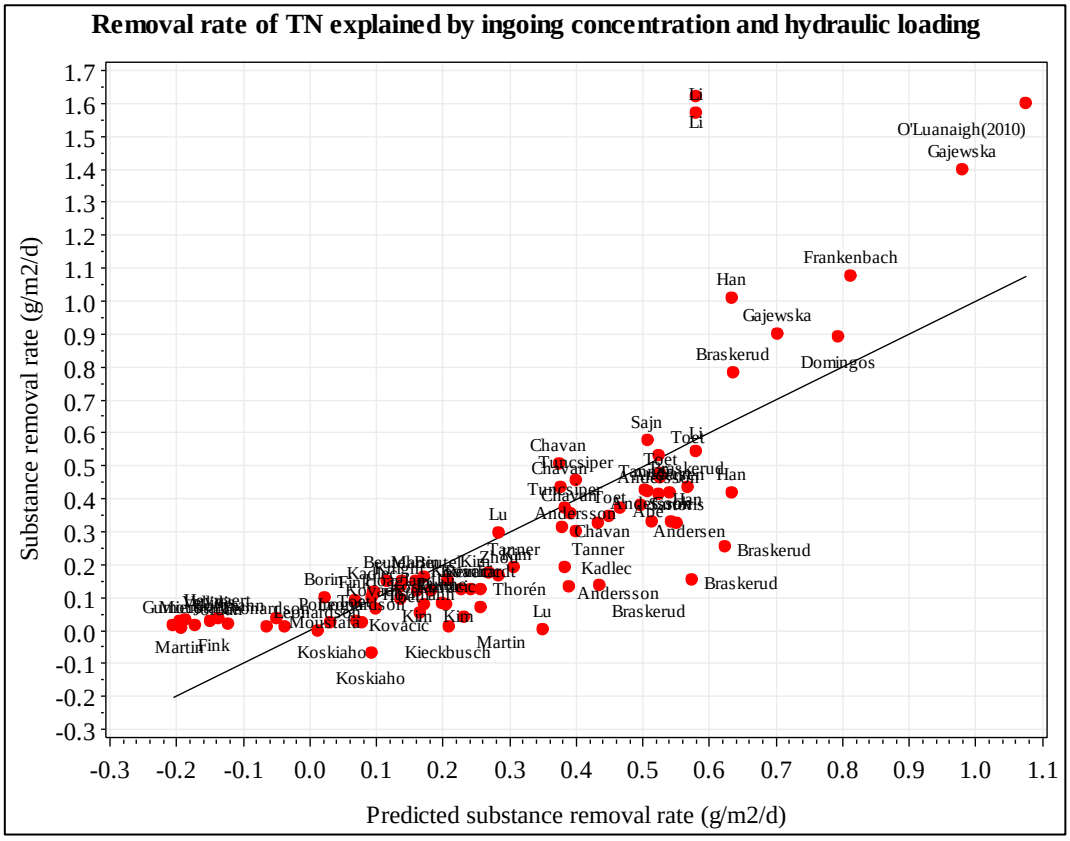




Model 18: Removal rate of TN *vs.* ingoing concentration and hydraulic loading

The GAM Procedure
Dependent Variable: substance_removal_mean
Smoothing Model Component(s): spline(log_hydraulic_loading) spline(log_concentration_in_comp)



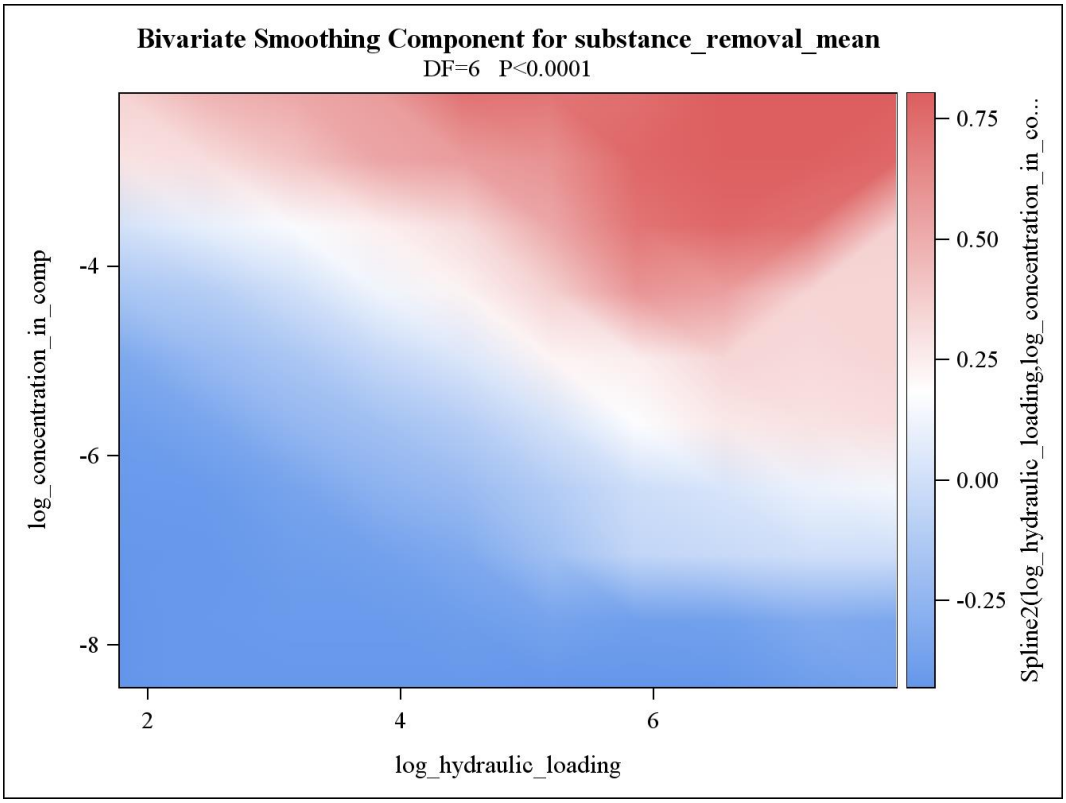


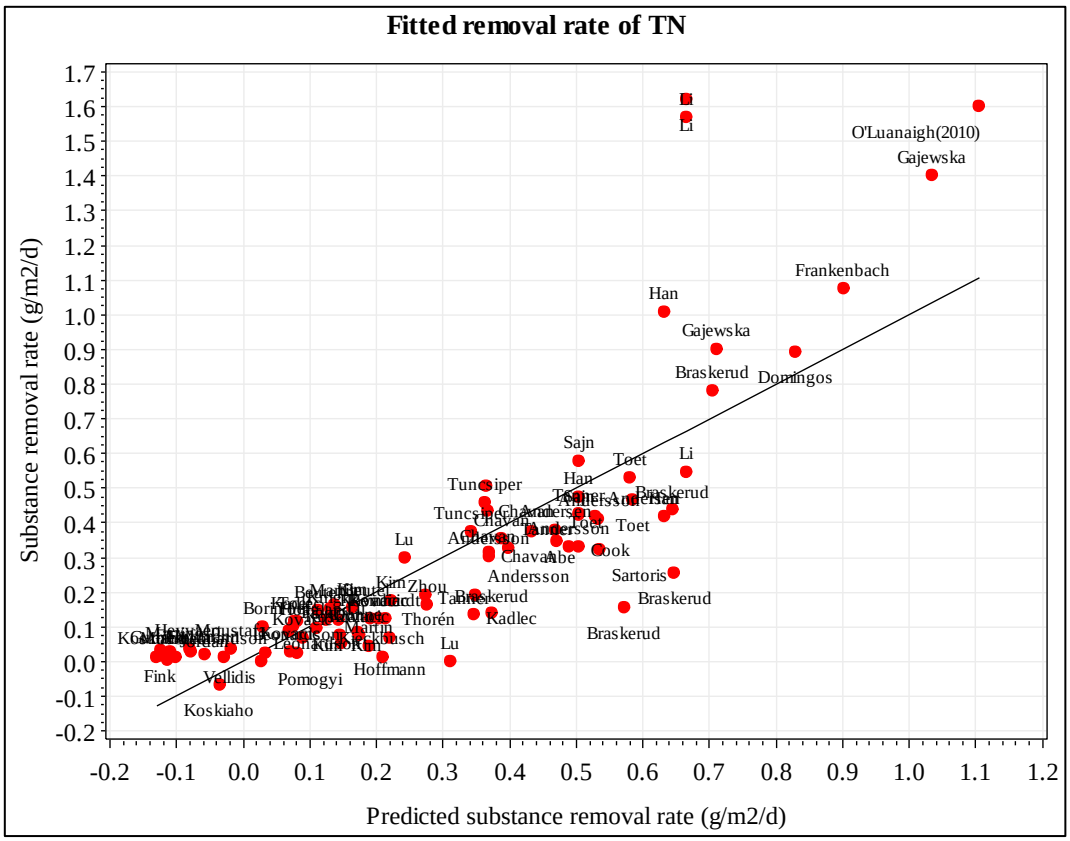
Model 21: Removal rate of TN explained by thin plate spline in log(ingoing concentration) and log(hydraulic loading)

The GAM Procedure

Dependent Variable: substance_removal_mean

Smoothing Model Component(s): spline2(log_hydraulic_loading log_concentration_in_comp)



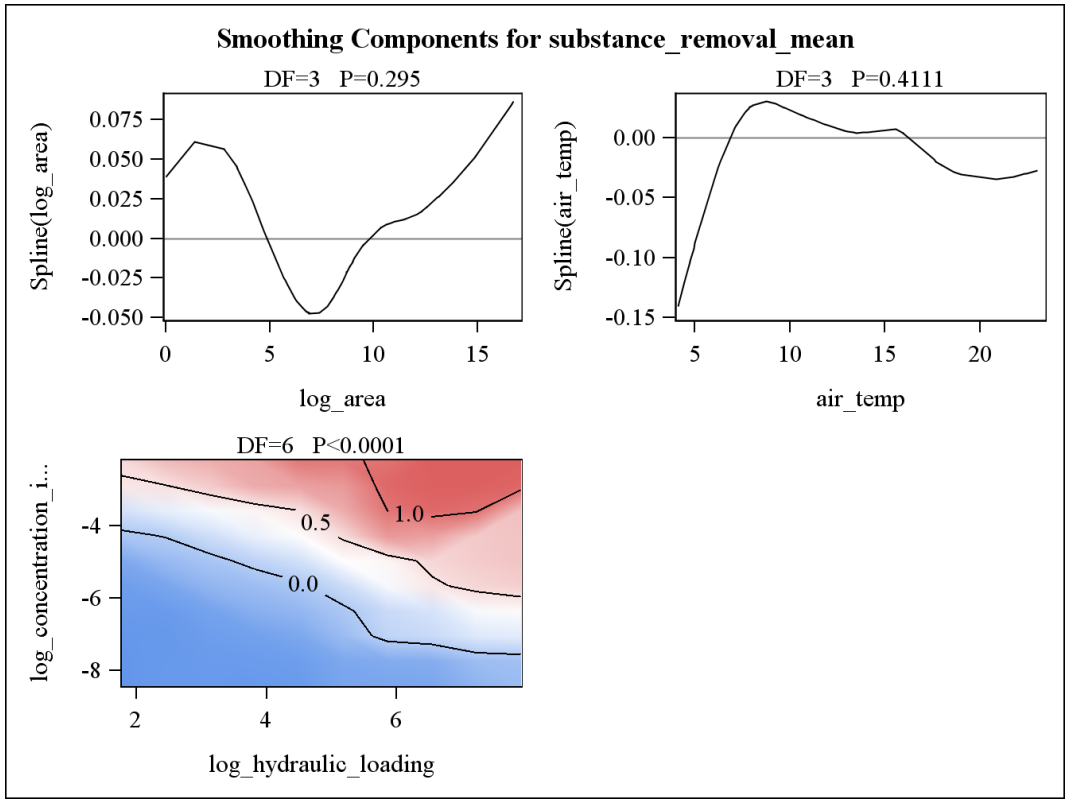


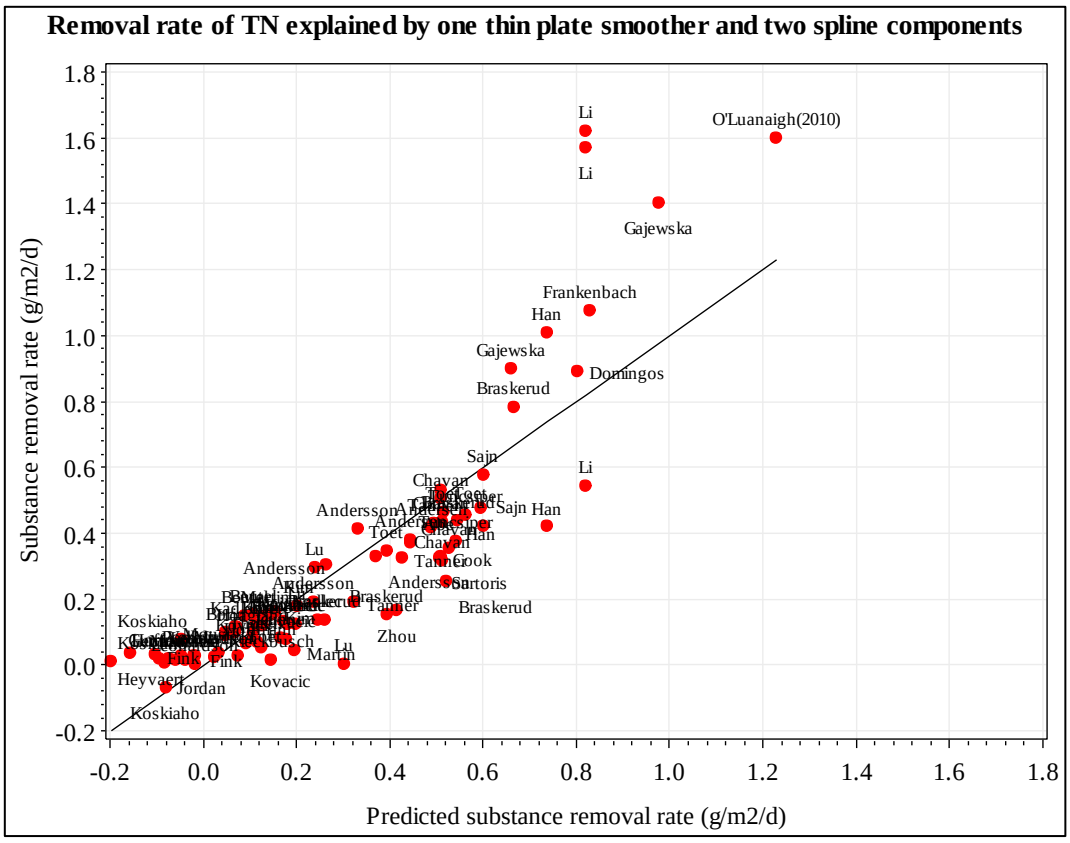
Model 26: Removal rate of TN explained by one thin plate smoother and two spline components

The GAM Procedure

Dependent Variable: substance_removal_mean

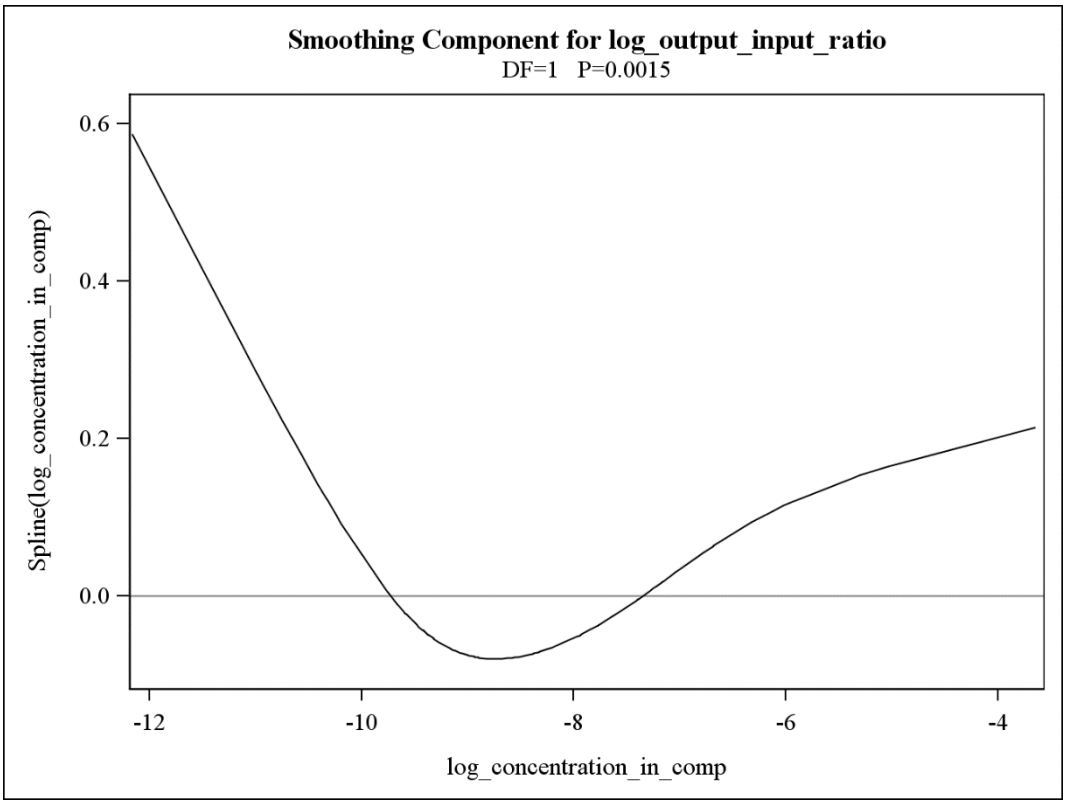
Smoothing Model Component(s): spline(log_area) spline(air_temp) spline2(log_hydraulic_loading log_concentration_in_comp)

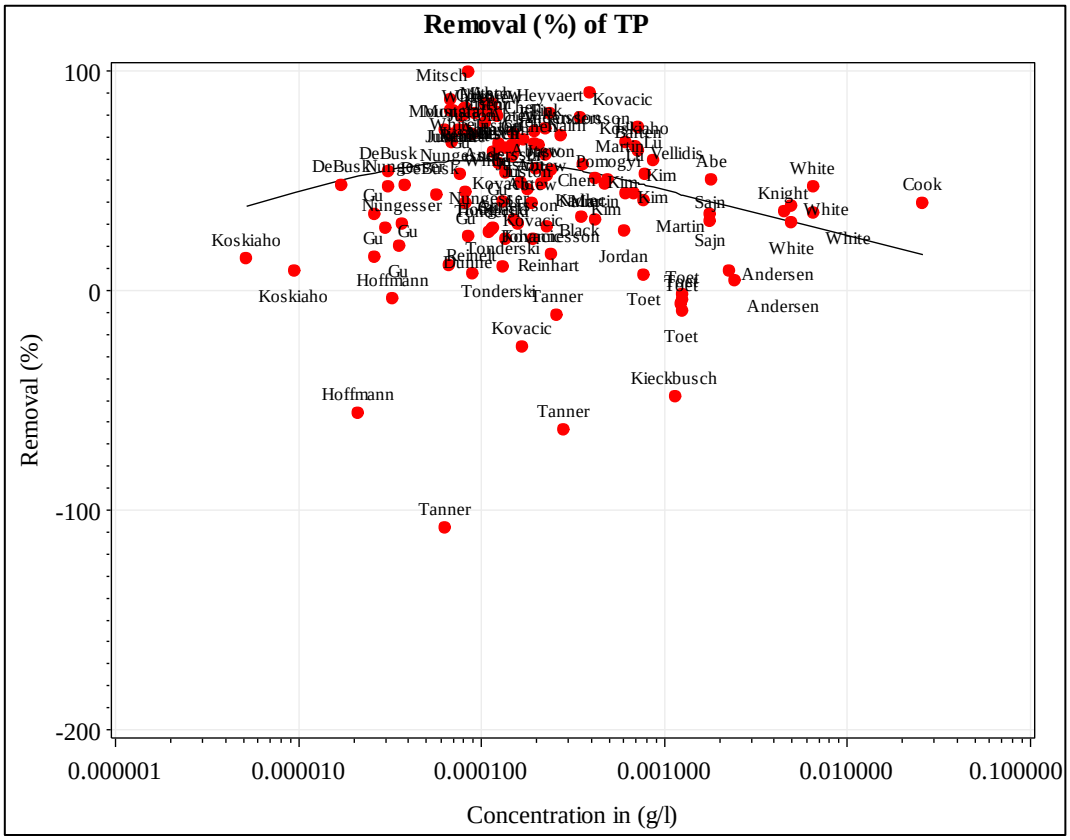




Model 27: Removal efficiency (%) of TP *vs.* concentration at inlet

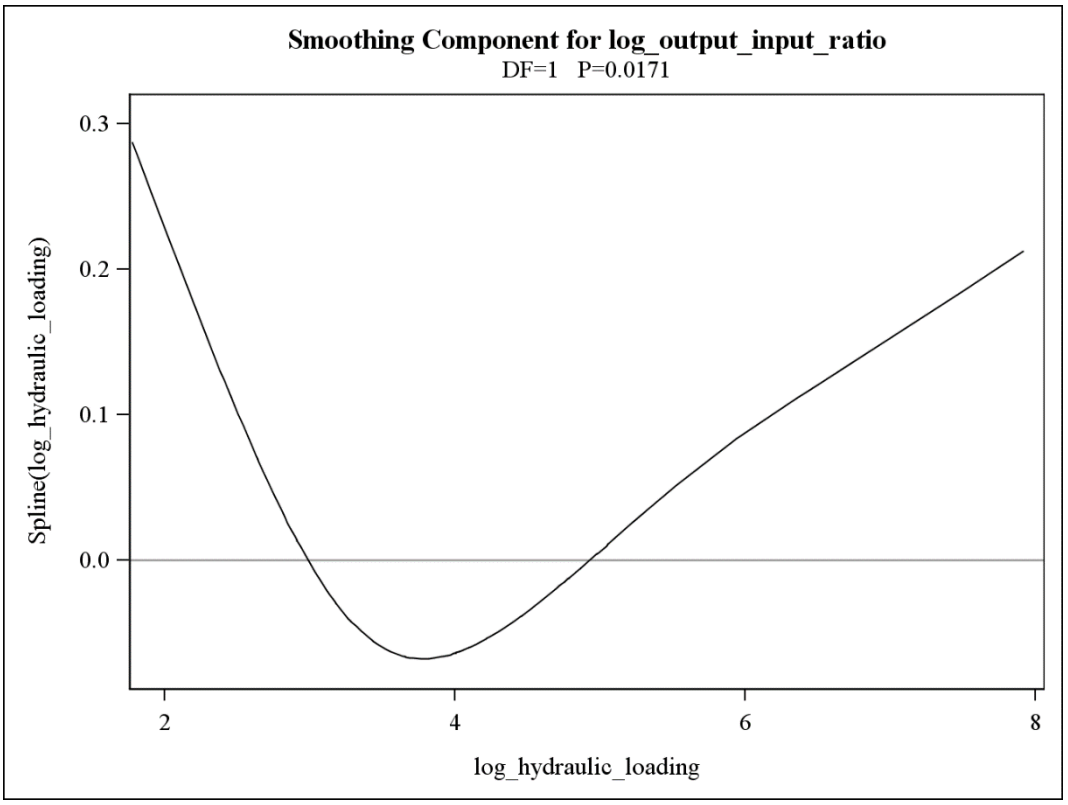
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline(log_concentration_in_comp)

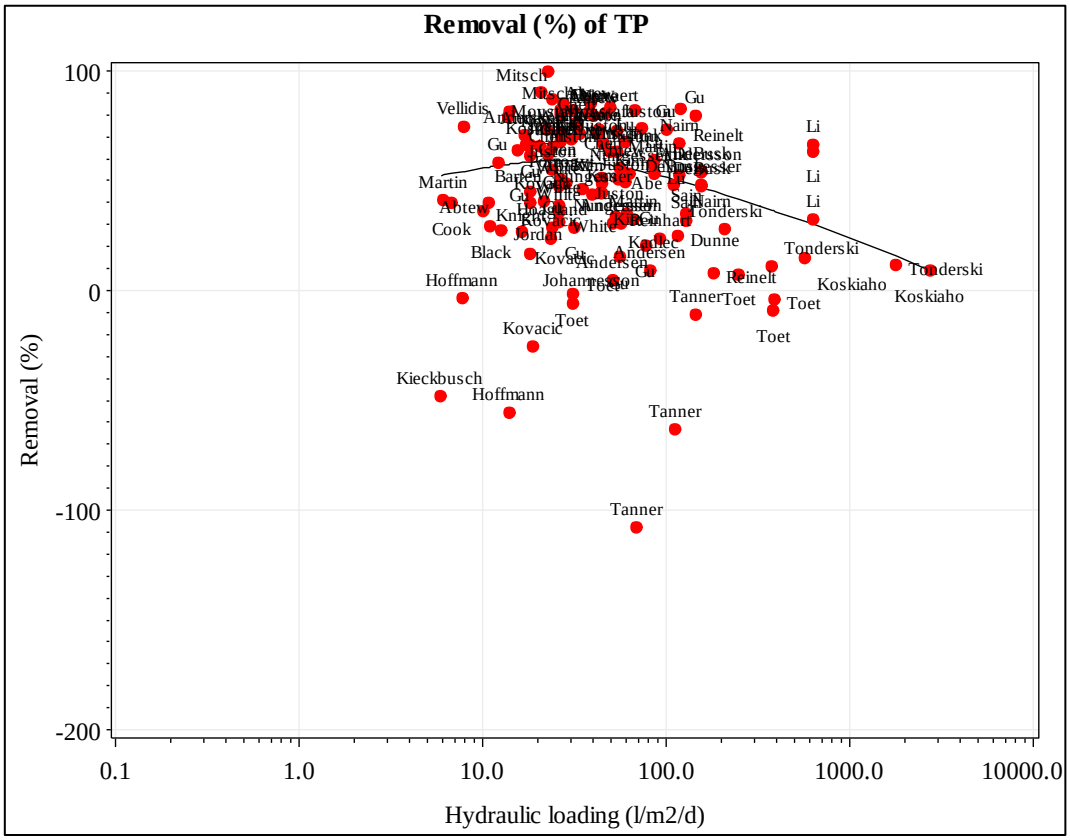




Model 28: Removal efficiency (%) of TP *vs.* hydraulic loading

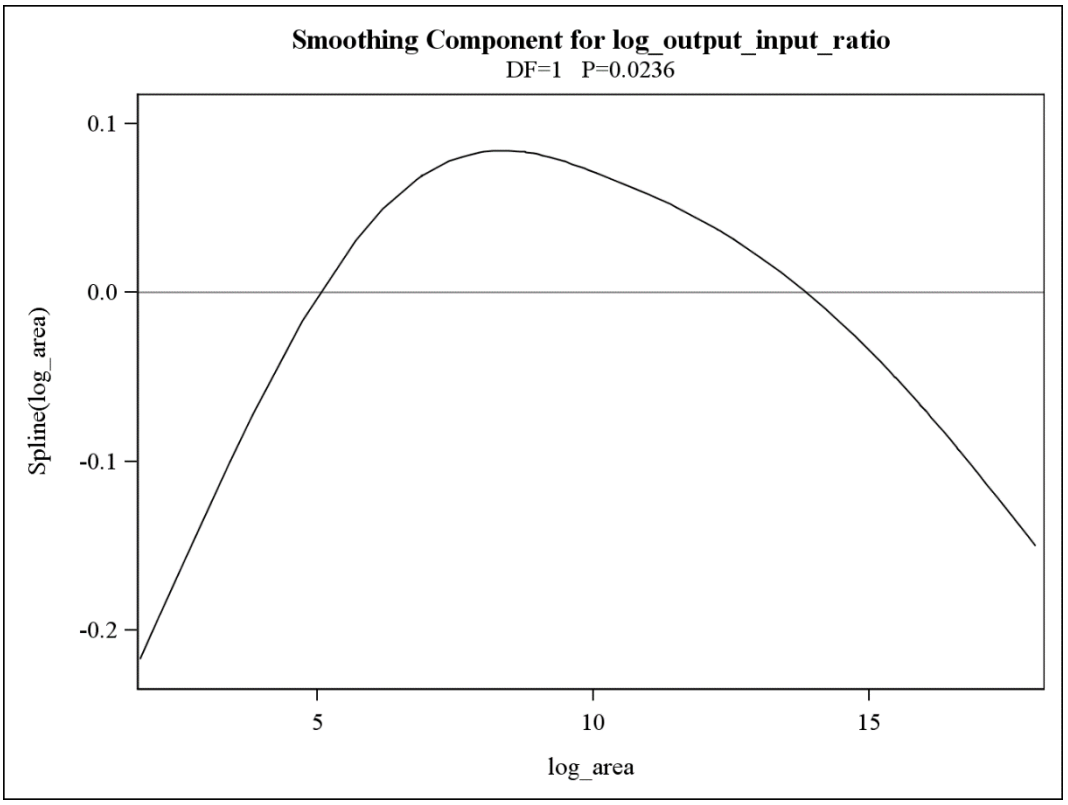
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline(log_hydraulic_loading)

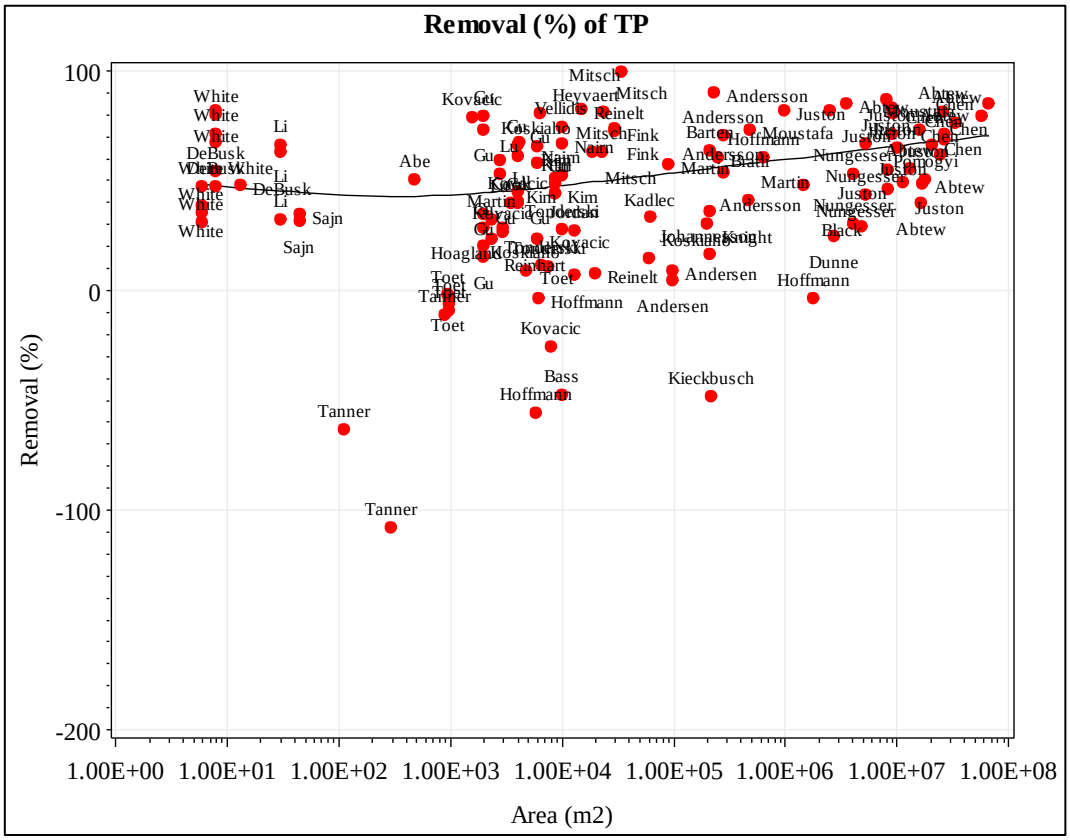




Model 29: Removal efficiency (%) of TP *vs.* wetland area

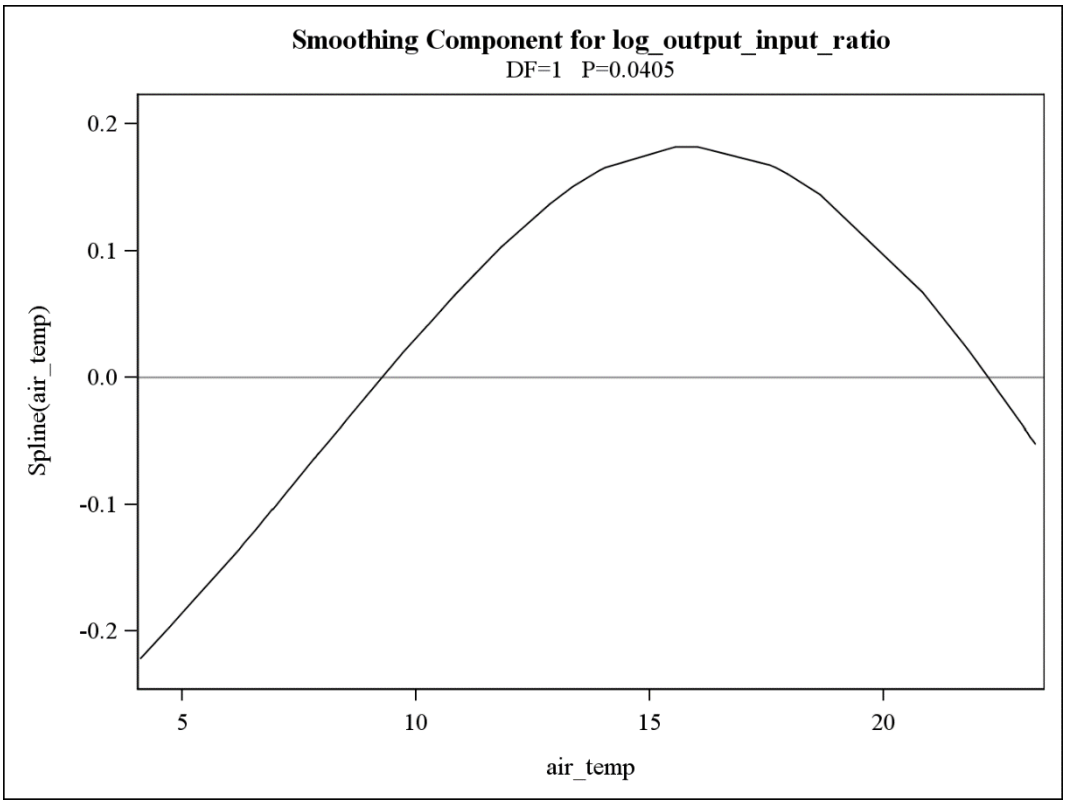
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline(log_area)

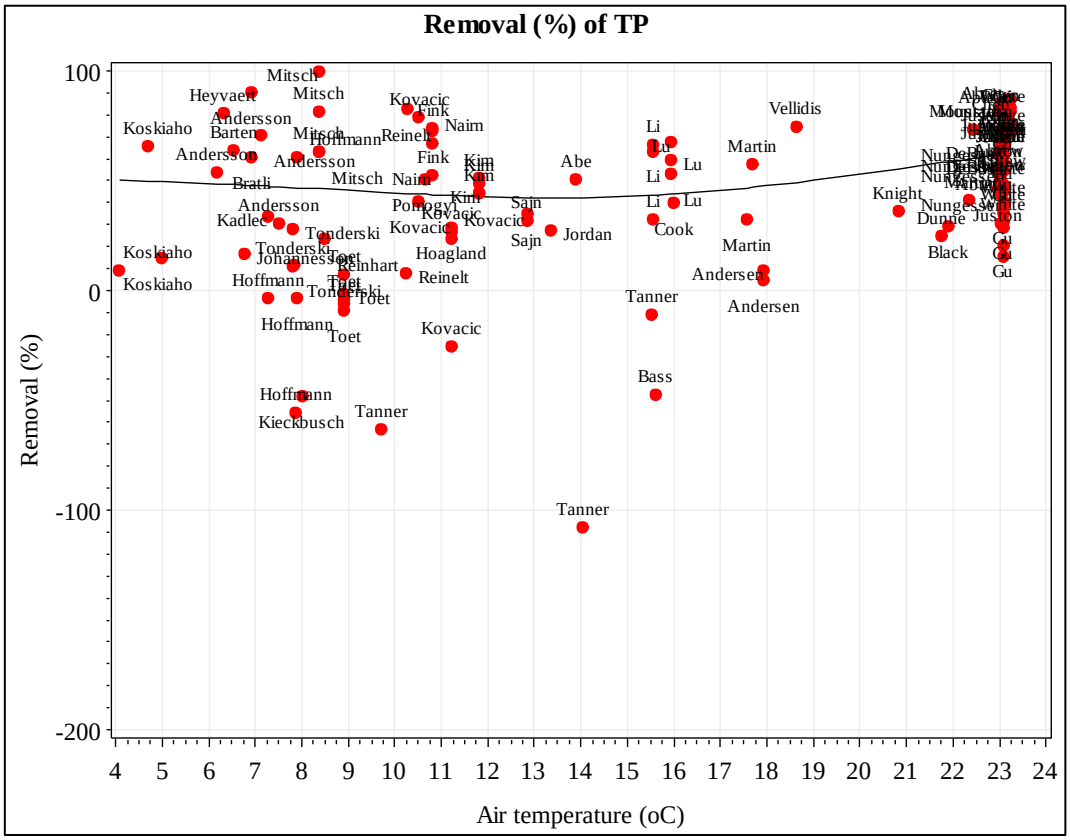




Model 30: Removal efficiency (%) of TP *vs.* annual average air temperature

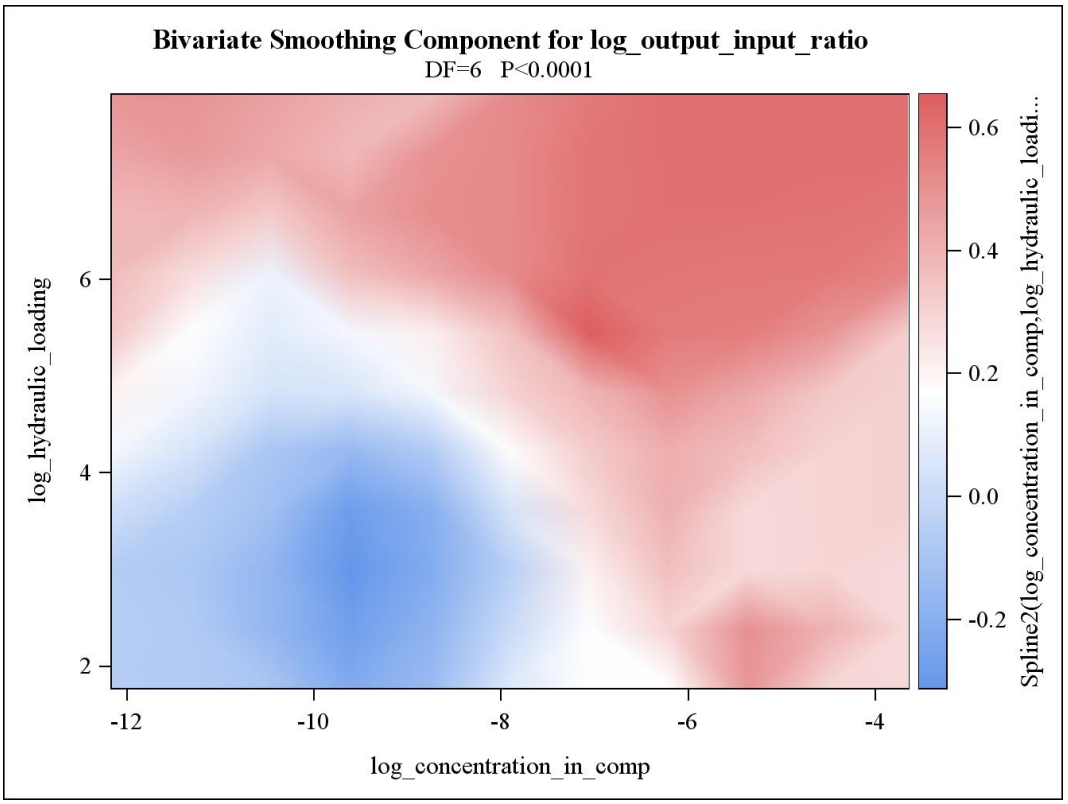
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline(air_temp)

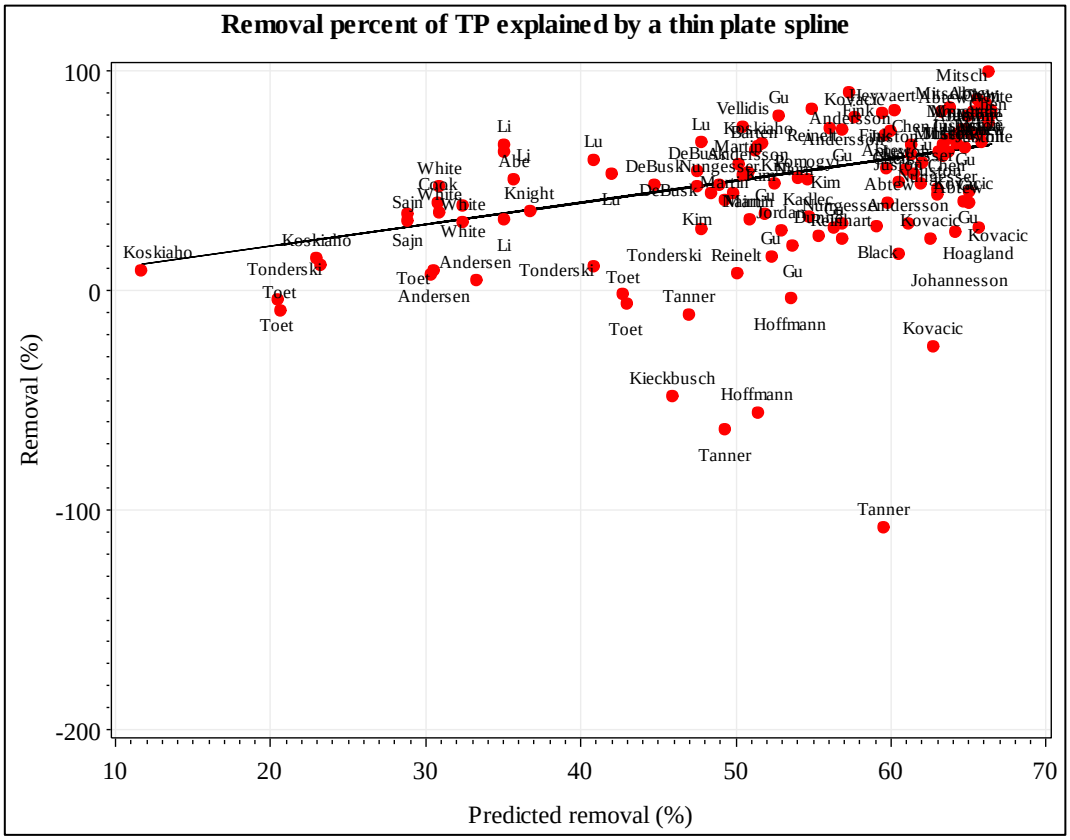




Model 36: Removal (%) of TP explained by a thin plate spline

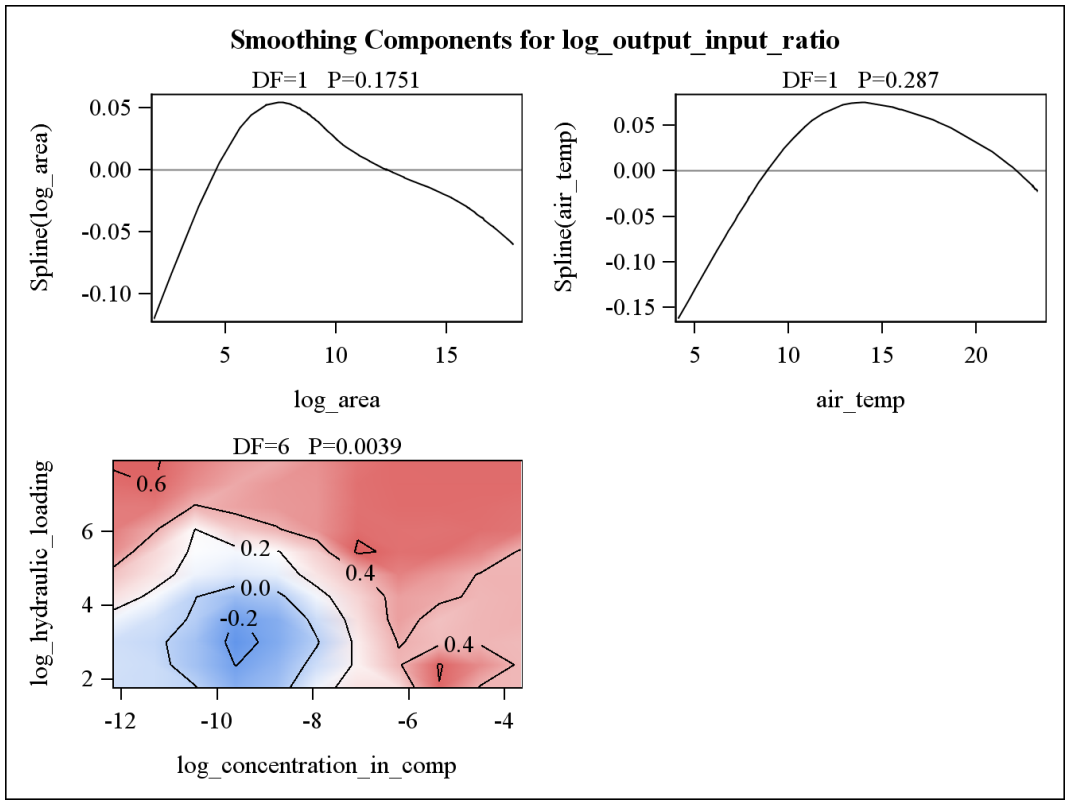
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline2(log_concentration_in_comp log_hydraulic_loading)

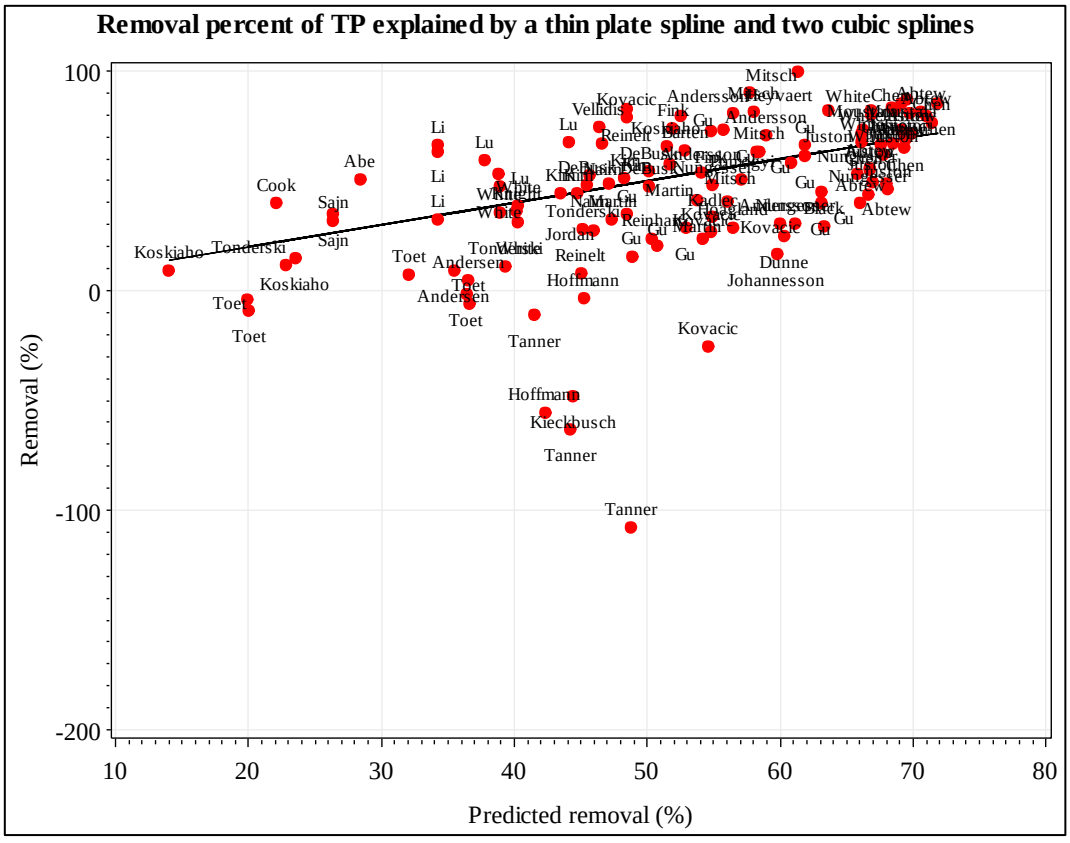




Model 39: Removal (%) of TP explained by a thin plate spline and two cubic splines

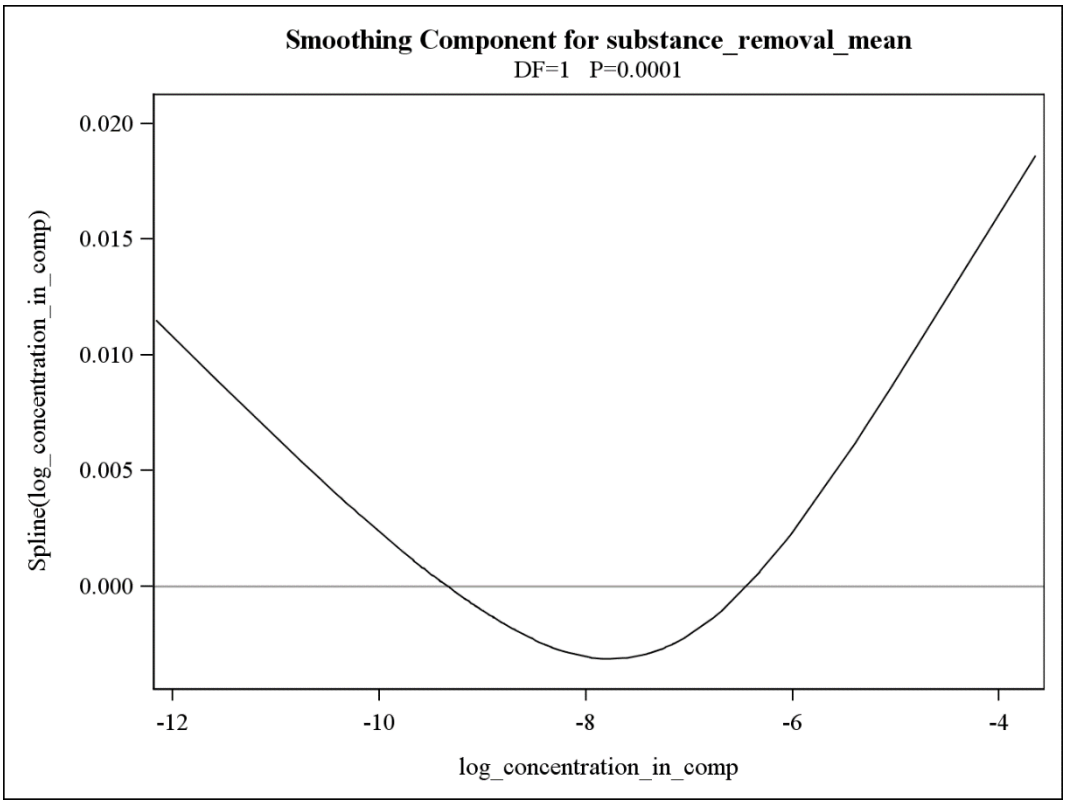
The GAM Procedure
Dependent Variable: log_output_input_ratio
Smoothing Model Component(s): spline(log_area) spline(air_temp) spline2(log_concentration_in_comp log_hydraulic_loading)

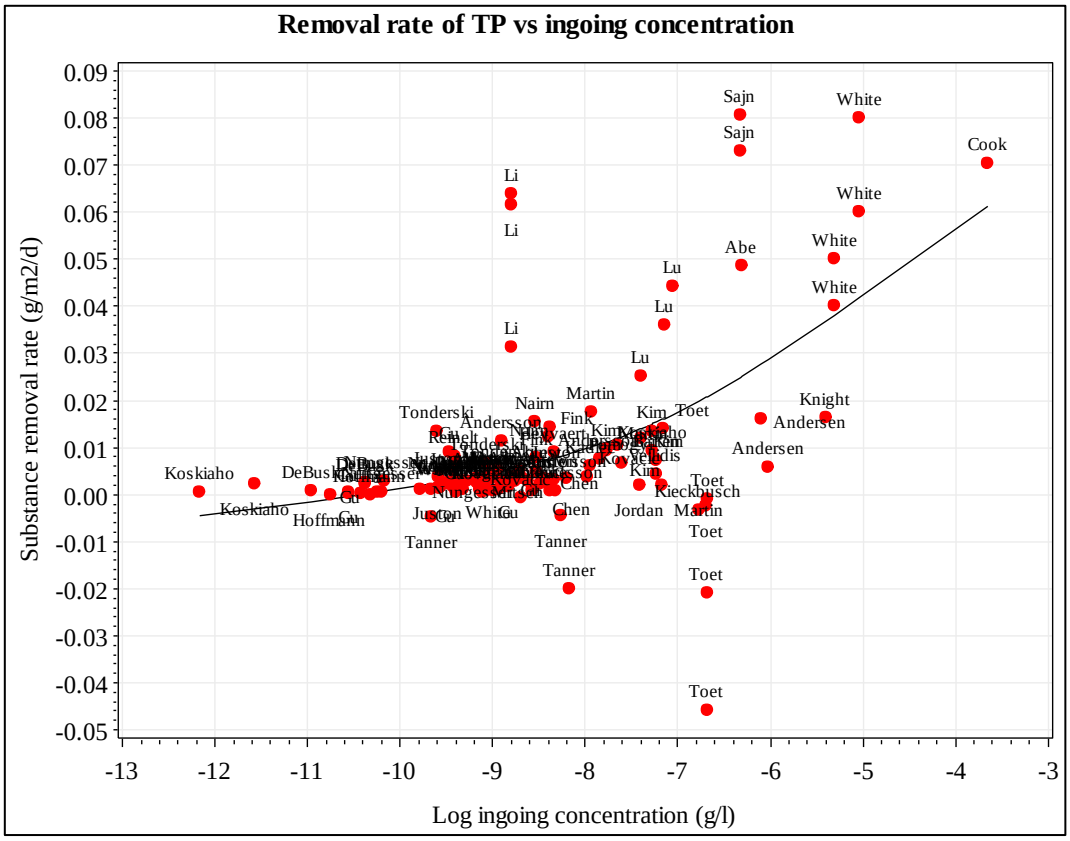




Model 40: Removal rate of TP *vs.* ingoing concentration

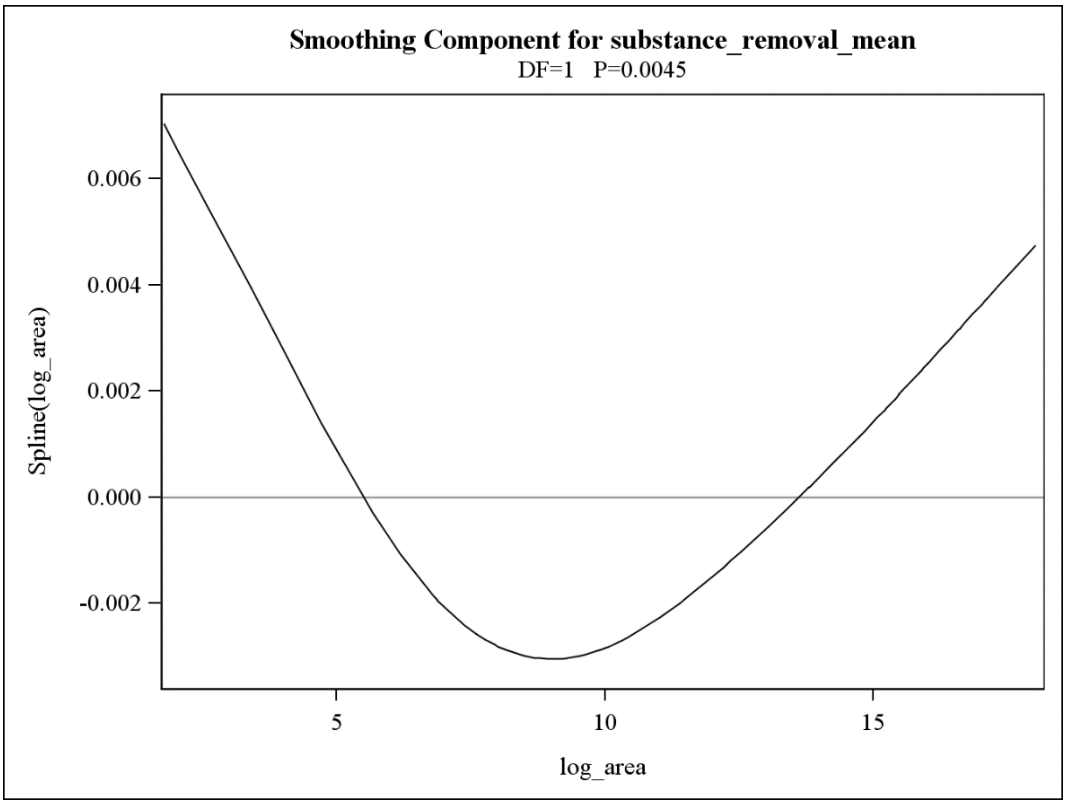
The GAM Procedure
Dependent Variable: substance_removal_mean
Smoothing Model Component(s): spline(log_concentration_in_comp)

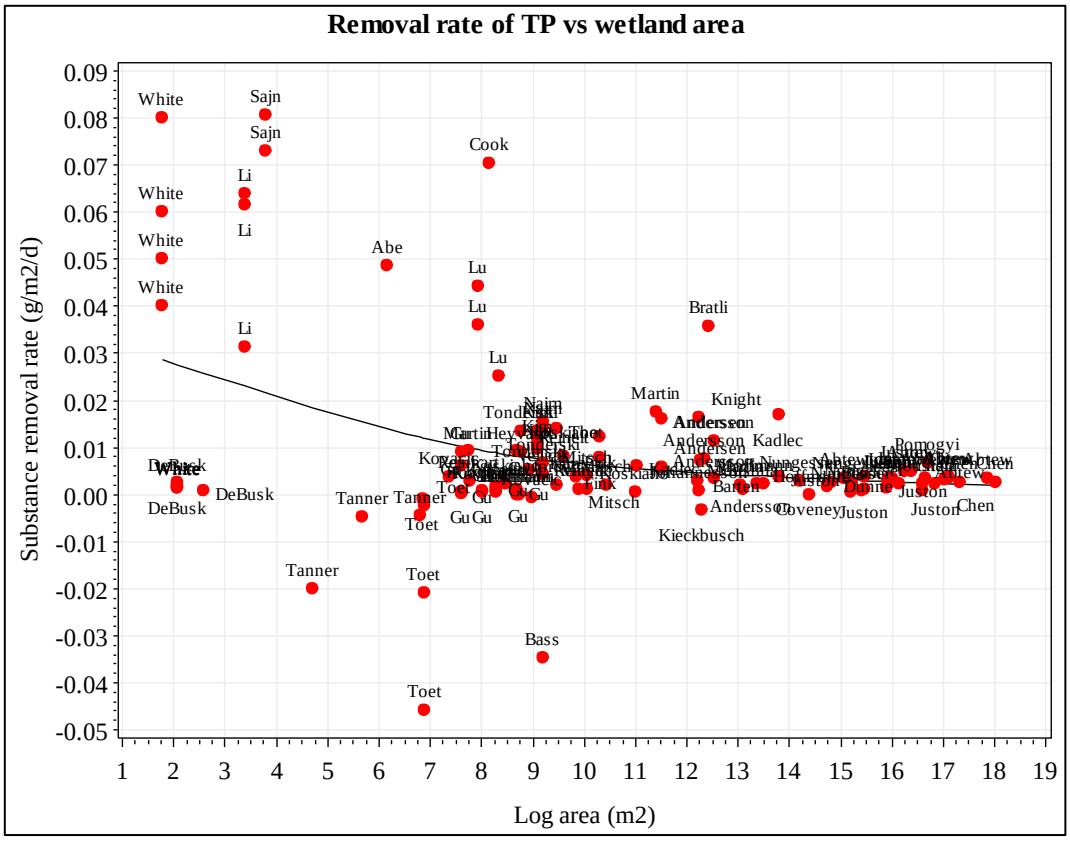




Model 42: Removal rate of TP *vs.* wetland area

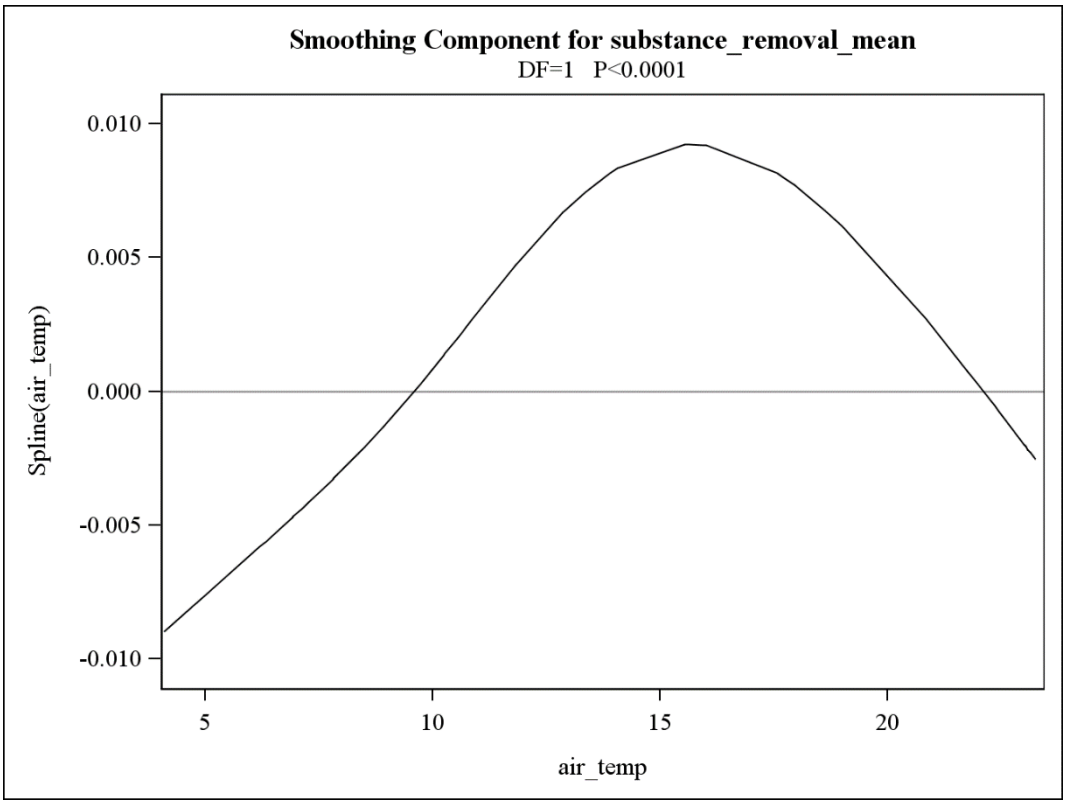
The GAM Procedure
Dependent Variable: substance_removal_mean
Smoothing Model Component(s): spline(log_area)

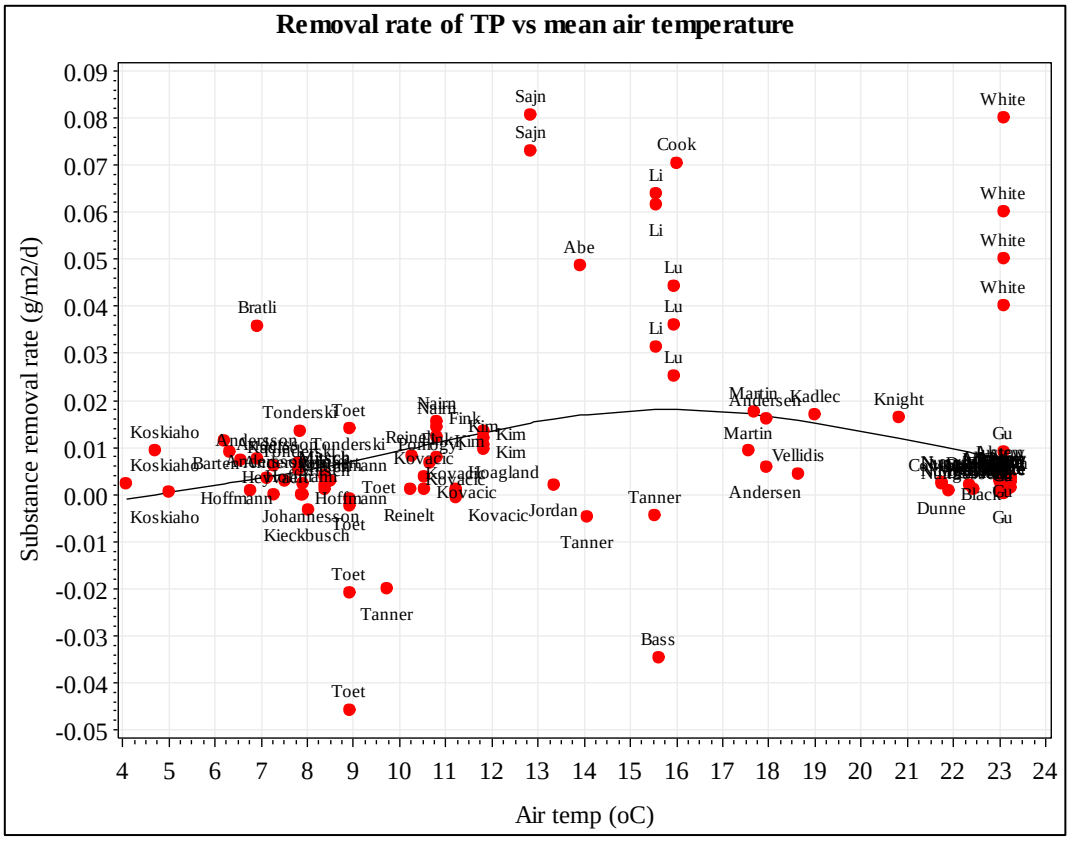




Model 43: Removal rate of TP *vs.* annual average air temperature

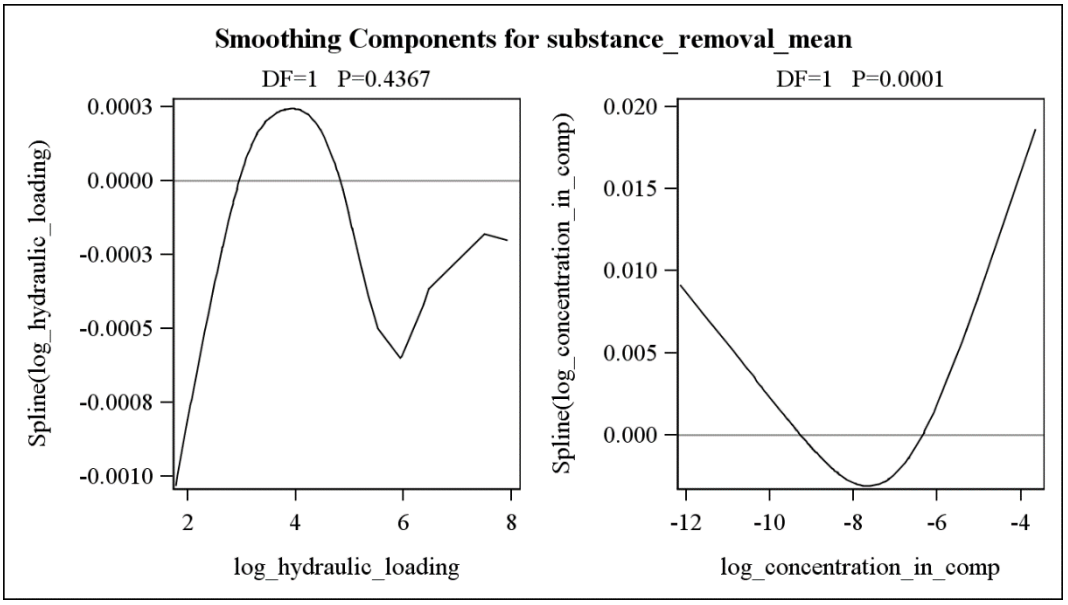
The GAM Procedure
Dependent Variable: substance_removal_mean
Smoothing Model Component(s): spline(air_temp)

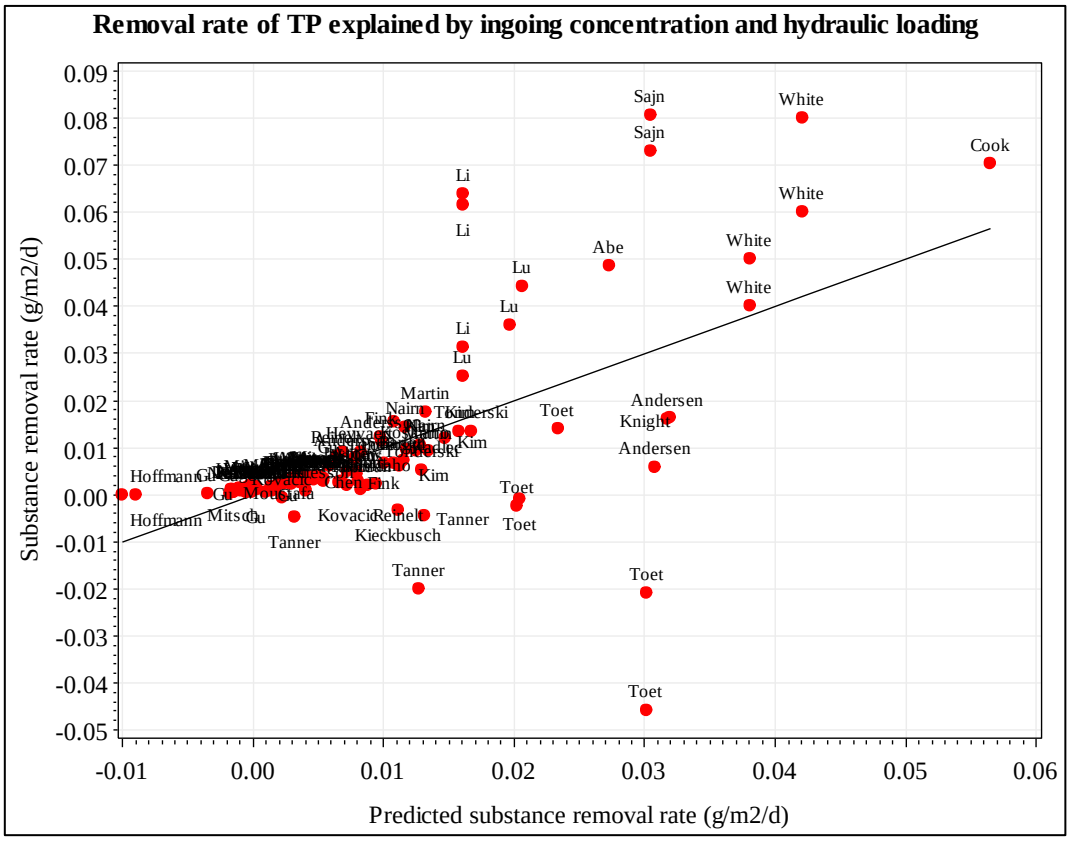




Model 44: Removal rate of TP *vs.* concentration at inlet and hydraulic loading

The GAM Procedure
Dependent Variable: substance_removal_mean
Smoothing Model Component(s): spline(log_hydraulic_loading) spline(log_concentration_in_comp)





Removal rate of TP explained by thin plate spline in log(ingoing concentration) and hydraulic loading

Model 47: *The GAM Procedure*

Dependent Variable: substance_removal_mean

Smoothing Model Component(s): spline2(log_hydraulic_loading log_concentration_in_comp)