

2016 Flow Normalized Trends; Susquehanna River at Towanda

Trend period (Water Year) = 1989-2016

FNC – Flow Normalized Concentration – mg/L

FNF – Flow Normalized Flux – 10⁶ kg/yr

FNC/FNF alpha level – 0.1

SMK – Seasonal Mann-Kendall for flow trends, alpha level – 0.05

NS – Not significant, UP – Increasing trend, DOWN – Decreasing trend

HL – Highly Likely ≥ 0.95 and ≤ 1.00

VL – Very Likely ≥ 0.90 and < 0.95

L – Likely ≥ 0.66 and < 0.90

ALAN – About as Likely as Not > 0.33 and < 0.66

Towanda Parameter/code	Trend Test	Change	Likelihood Test		
			Value	Descriptor	Trend
FLOW / 60	SMK	-	-	-	NS
TN / 600	FNC	-0.60	0.99	HL	Down
	FNF	-7.08	0.99	HL	Down
TNO _x / 630	FNC	-0.31	0.99	HL	Down
	FNF	-3.25	0.99	HL	Down
TON / 605	FNC	-0.21	0.99	HL	Down
	FNF	-3.09	0.99	HL	Down
TNH ₃ / 610	FNC	-0.02	0.97	HL	Down
	FNF	-0.35	0.97	VL	Down
DN / 602	FNC	-0.461	0.99	HL	Down
	FNF	-5.13	0.99	HL	Down
DNO _x / 631	FNC	-0.31	0.99	HL	Down
	FNF	-3.22	0.99	HL	Down
DON / 607	FNC	-0.11	0.99	HL	Down
	FNF	-1.64	0.99	HL	Down
DNH ₃ / 608	FNC	-0.018	0.97	HL	Down
	FNF	-0.25	0.93	VL	Down
TP / 665	FNC	-0.036	0.99	HL	Down
	FNF	-0.20	0.84	L	Down
DP / 666	FNC	-0.029	0.99	HL	Down
	FNF	-0.30	0.99	HL	Down
DOP / 671	FNC	-0.0009	0.66	ALAN	Down
	FNF	0.021	0.66	ALAN	UP
TOC / 680	FNC	-0.45	0.97	HL	Down
	FNF	-0.087	0.58	ALAN	Down
SSC / 80154	FNC	-2.99	0.74	L	Down
	FNF	-162.6	0.71	L	Down

2016 Flow Normalized Trends; Susquehanna River at Danville

Trend period (Water Year) = 1985-2016

FNC – Flow Normalized Concentration – mg/L

FNF – Flow Normalized Flux – 10⁶ kg/yr

FNC/FNF alpha level – 0.1

SMK – Seasonal Mann-Kendall for flow trends, alpha level – 0.05

NS – Not significant, UP – Increasing trend, DOWN – Decreasing trend

HL – Highly Likely ≥ 0.95 and ≤ 1.00

VL – Very Likely ≥ 0.90 and < 0.95

L – Likely ≥ 0.66 and < 0.90

ALAN – About as Likely as Not > 0.33 and < 0.66

Danville Parameter/code	Trend Test	Change	Likelihood Test		
			Value	Descriptor	Trend
FLOW / 60	SMK	-	-	-	NS
TN / 600	FNC	-0.799	0.99	HL	Down
	FNF	-11.77	0.99	HL	Down
TNOx / 630	FNC	-0.321	0.99	HL	Down
	FNF	-4.26	0.99	HL	Down
TON / 605	FNC	-0.469	0.99	HL	Down
	FNF	-7.74	0.97	HL	Down
TNH ₃ / 610	FNC	-0.063	0.99	HL	Down
	FNF	-1.0	0.99	HL	Down
DN / 602	FNC	-0.61	0.99	HL	Down
	FNF	-9.25	0.99	HL	Down
DNOx / 631	FNC	-0.34	0.99	HL	Down
	FNF	-4.63	0.97	HL	Down
DON / 607	FNC	-0.27	0.99	HL	Down
	FNF	-4.57	0.99	HL	Down
DNH ₃ / 608	FNC	-0.067	0.99	HL	Down
	FNF	-1.02	0.99	HL	Down
TP / 665	FNC	-0.053	0.99	HL	Down
	FNF	-0.403	0.79	L	Down
DP / 666	FNC	-0.022	0.99	HL	Down
	FNF	-0.37	0.99	HL	Down
DOP / 671	FNC	-0.003	0.69	L	Down
	FNF	-0.03	0.56	ALAN	Down
TOC / 680	FNC	-1.55	0.99	HL	Down
	FNF	-15.84	0.99	HL	Down
SSC / 80154	FNC	8.8	0.84	L	UP
	FNF	1,299	0.89	L	UP

2016 Flow Normalized Trends; Susquehanna River at Marietta

Trend period (Water Year) = 1987-2016

FNC – Flow Normalized Concentration – mg/L

FNF – Flow Normalized Flux – 10⁶ kg/yr

FNC/FNF alpha level – 0.1

SMK – Seasonal Mann-Kendall for flow trends, alpha level – 0.05

NS – Not significant, UP – Increasing trend, DOWN – Decreasing trend

HL – Highly Likely ≥0.95 and ≤1.00

VL – Very Likely ≥0.90 and <0.95

L – Likely ≥0.66 and <0.90

ALAN – About as Likely as Not >0.33 and <0.66

Marietta Parameter/code	Trend Test	Change	Likelihood Test		
			Value	Descriptor	Trend
FLOW / 60	SMK	-	-	-	NS
TN / 600	FNC	-0.72	0.99	HL	Down
	FNF	-26.79	0.99	HL	Down
TNOx / 630	FNC	-0.33	0.97	HL	Down
	FNF	-11.01	0.99	HL	Down
TON / 605	FNC	-0.19	0.99	HL	Down
	FNF	-7.51	0.86	L	Down
TNH ₃ / 610	FNC	-0.03	0.99	HL	Down
	FNF	-1.28	0.99	HL	Down
DN / 602	FNC	-0.554	0.99	HL	Down
	FNF	-18.74	0.99	HL	Down
DNOx / 631	FNC	-0.328	0.97	HL	Down
	FNF	-11.37	0.97	HL	Down
DON / 607	FNC	-0.18	0.99	HL	Down
	FNF	-5.62	0.99	HL	Down
DNH ₃ / 608	FNC	-0.031	0.99	HL	Down
	FNF	-1.25	0.99	HL	Down
TP / 665	FNC	-0.04	0.99	HL	Down
	FNF	-0.86	0.79	L	Down
DP / 666	FNC	-0.02	0.99	HL	Down
	FNF	-0.64	0.95	HL	Down
DOP / 671	FNC	0.007	0.97	HL	UP
	FNF	0.30	0.99	HL	UP
TOC / 680	FNC	-0.21	0.64	ALAN	Down
	FNF	-0.32	0.59	ALAN	UP
SSC / 80154	FNC	-12.3	0.93	VL	Down
	FNF	-646	0.72	L	Down

2016 Flow Normalized Trends; West Branch Susquehanna River at Lewisburg

Trend period (Water Year) = 1985-2016

FNC – Flow Normalized Concentration – mg/L

FNF – Flow Normalized Flux – 10^6 kg/yr

FNC/FNF alpha level – 0.1

SMK – Seasonal Mann-Kendall for flow trends, alpha level – 0.05

NS – Not significant, UP – Increasing trend, DOWN – Decreasing trend

HL – Highly Likely ≥ 0.95 and ≤ 1.00

VL – Very Likely ≥ 0.90 and < 0.95

L – Likely ≥ 0.66 and < 0.90

ALAN – About as Likely as Not > 0.33 and < 0.66

Lewisburg Parameter/code	Trend Test	Change	Likelihood Test		
			Value	Descriptor	Trend
FLOW / 60	SMK	-	-	-	NS
TN / 600	FNC	-0.64	0.99	HL	Down
	FNF	-5.46	0.99	HL	Down
TNO _x / 630	FNC	-0.26	0.99	HL	Down
	FNF	-1.80	0.99	HL	Down
TON / 605	FNC	-0.36	0.99	HL	Down
	FNF	-3.55	0.97	HL	Down
TNH ₃ / 610	FNC	-0.039	0.99	HL	Down
	FNF	-0.314	0.99	HL	Down
DN / 602	FNC	-0.50	0.99	HL	Down
	FNF	-4.28	0.99	HL	Down
DNO _x / 631	FNC	-0.234	0.99	HL	Down
	FNF	-1.76	0.99	HL	Down
DON / 607	FNC	-0.243	0.99	HL	Down
	FNF	-2.35	0.99	HL	Down
DNH ₃ / 608	FNC	-0.03	0.99	HL	Down
	FNF	-0.26	0.99	HL	Down
TP / 665	FNC	-0.039	0.99	HL	Down
	FNF	-0.194	0.97	HL	Down
DP / 666	FNC	-0.03	0.99	HL	Down
	FNF	-0.259	0.99	HL	Down
DOP / 671	FNC	-0.009	0.97	HL	Down
	FNF	-0.026	0.76	L	Down
TOC / 680	FNC	-0.51	0.99	HL	Down
	FNF	0.234	0.44	ALAN	UP
SSC / 80154	FNC	-3.43	0.74	L	Down
	FNF	11.74	0.49	ALAN	UP

2016 Flow Normalized Trends; Juniata River at Newport

Trend period (Water Year) = 1985-2016

FNC – Flow Normalized Concentration – mg/L

FNF – Flow Normalized Flux – 10⁶ kg/yr

FNC/FNF alpha level – 0.1

SMK – Seasonal Mann-Kendall for flow trends, alpha level – 0.05

NS – Not significant, UP – Increasing trend, DOWN – Decreasing trend

HL – Highly Likely ≥ 0.95 and ≤ 1.00

VL – Very Likely ≥ 0.90 and < 0.95

L – Likely ≥ 0.66 and < 0.90

ALAN – About as Likely as Not > 0.33 and < 0.66

Newport Parameter/code	Trend Test	Change	Likelihood Test		
			Value	Descriptor	Trend
FLOW / 60	SMK	-	-	-	NS
TN / 600	FNC	-0.519	0.99	HL	Down
	FNF	-2.34	0.99	HL	Down
TNOx / 630	FNC	-0.164	0.97	HL	Down
	FNF	-0.892	0.97	HL	Down
TON / 605	FNC	-0.343	0.99	HL	Down
	FNF	-1.45	0.95	HL	Down
TNH ₃ / 610	FNC	-0.033	0.99	HL	Down
	FNF	-0.15	0.99	HL	Down
DN / 602	FNC	-0.36	0.99	HL	Down
	FNF	-1.66	0.99	HL	Down
DNOx / 631	FNC	-0.108	0.81	L	Down
	FNF	-0.607	0.99	HL	Down
DON / 607	FNC	-0.213	0.99	HL	Down
	FNF	-0.90	0.99	HL	Down
DNH ₃ / 608	FNC	-0.019	0.97	HL	Down
	FNF	-0.103	0.97	HL	Down
TP / 665	FNC	-0.064	0.99	HL	Down
	FNF	-0.217	0.99	HL	Down
DP / 666	FNC	-0.042	0.99	HL	Down
	FNF	-0.123	0.99	HL	Down
DOP / 671	FNC	-0.03	0.99	HL	Down
	FNF	-0.062	0.95	HL	Down
TOC / 680	FNC	-1.82	0.99	HL	Down
	FNF	-7.63	0.95	HL	Down
SSC / 80154	FNC	-14.1	0.93	VL	Down
	FNF	-114.2	0.83	L	Down

2016 Flow Normalized Trends; Conestoga River at Conestoga

Trend period (Water Year) = 1985-2016

FNC – Flow Normalized Concentration – mg/L

FNF – Flow Normalized Flux – 10⁶ kg/yr

FNC/FNF alpha level – 0.1

SMK – Seasonal Mann-Kendall for flow trends, alpha level – 0.05

NS – Not significant, UP – Increasing trend, DOWN – Decreasing trend

HL – Highly Likely ≥ 0.95 and ≤ 1.00

VL – Very Likely ≥ 0.90 and < 0.95

L – Likely ≥ 0.66 and < 0.90

ALAN – About as Likely as Not > 0.33 and < 0.66

Conestoga Parameter/code	Trend Test	Change	Likelihood Test		
			Value	Descriptor	Trend
FLOW / 60	SMK	-	-	-	NS
TN / 600	FNC	-2.61	0.99	HL	Down
	FNF	-2.00	0.99	HL	Down
TNO _x / 630	FNC	-1.45	0.99	HL	Down
	FNF	-0.929	0.99	HL	Down
TON / 605	FNC	-0.803	0.97	HL	Down
	FNF	-0.82	0.95	HL	Down
TNH ₃ / 610	FNC	-0.327	0.99	HL	Down
	FNF	-0.257	0.99	HL	Down
DN / 602	FNC	-1.92	0.97	HL	Down
	FNF	-1.32	0.99	HL	Down
DNO _x / 631	FNC	-1.34	0.97	HL	Down
	FNF	-0.85	0.97	HL	Down
DON / 607	FNC	-0.33	0.99	HL	Down
	FNF	-0.224	0.99	HL	Down
DNH ₃ / 608	FNC	-0.306	0.99	HL	Down
	FNF	-0.24	0.99	HL	Down
TP / 665	FNC	-0.316	0.97	HL	Down
	FNF	-0.223	0.97	HL	Down
DP / 666	FNC	-0.167	0.99	HL	Down
	FNF	-0.07	0.99	HL	Down
DOP / 671	FNC	-0.17	0.97	HL	Down
	FNF	-0.054	0.89	L	Down
TOC / 680	FNC	-5.66	0.99	HL	Down
	FNF	-4.045	0.99	HL	Down
SSC / 80154	FNC	-101	0.99	HL	Down
	FNF	-185	0.95	HL	Down