

Appendix Watershed Eligible for 319(h) Grant Implementation Funding

Antietam Creek in Washington County, Maryland¹

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- Water Quality Monitoring Activity
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Water Quality Monitoring Activity

In the Antietam Creek watershed in Washington County, Maryland water quality monitoring is conducted by the State. Long term monitoring stations are part of the state's nutrient and sediment load monitoring network (see map). One station near the state boundary with Pennsylvania (ANT0366) is located to track loads entering Maryland. The other station near the confluence with the Potomac River (ANT0047) tracks loads for essentially the entire Antietam Creek watershed. Small watershed synoptic monitoring was conducted for several years by the 319-funded MDE Targeted Watershed project. Targeted Watershed FFY13 #4 project final report is anticipated to include analysis.

Water Quality Overall Condition²

In the eastern portion of the basin, sediment loadings increased but nitrogen and phosphorus loadings decreased. Nitrogen levels increased in Conococheague Creek and Antietam Creek but decreased in the lower Monocacy River and in the main river at Point of Rocks. Phosphorus levels decreased throughout the basin, and sediment levels decreased in Conococheague Creek and Antietam Creek.

Water Quality Trends³

Maryland DNR summarized trends 1999-2012 as is shown in Table 1 (Antietam Creek watershed monitoring stations are yellow highlighted). Antietam stations ANT0044 and ANT0047 are included in Figures 19, 20, 21 that graph the average annual pollutant loads from 2002 thru 2011 for nitrogen, phosphorus and sediment. The graphs in Figure 22 show annual mean concentrations from 1986 thru 2012 for the same pollutants at Antietam stations ANT0203, ANT0366 and ANT0044.

¹ Watershed Plan does not encompass portions of the Antietam Creek watershed in Pennsylvania.

² Maryland Department of Natural Resources. *Potomac River Water Quality and Habitat Assessment Overall Condition 2011-2013*. Complete report is available: <http://mddnr.chesapeakebay.net/eyesonthebay/tribsums.cfm>

³ Maryland Department of Natural Resources. *Potomac River Water and Habitat Assessment*. Complete report is available: <http://mddnr.chesapeakebay.net/eyesonthebay/tribsums.cfm>

Map: Water Quality Monitoring Station Locations³

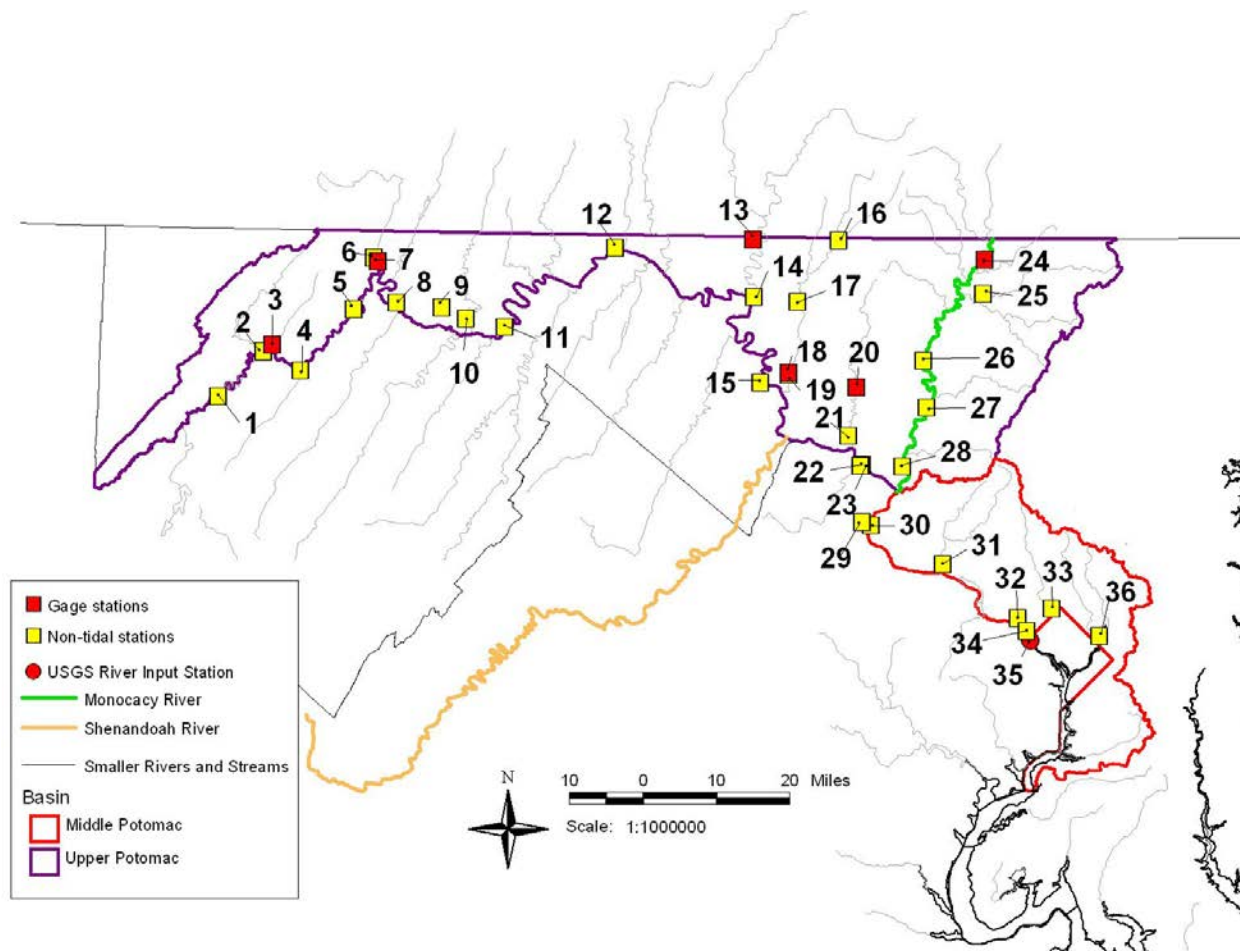


Figure 17. Long-term non-tidal water quality monitoring stations.

Stations are: 1) NBP0689, 2) NBP0534 and SAV0000, 3) **GEO0009** (USGS gage 01599000) , 4) NBP0461, 5) NBP0326, 6) BDK0000, 7) **WIL0013** (USGS gage 01601500), 8) NBP0103, 9) NBP0023, 10) TOW0030, 11) POT2766, 12) POT2386, 13) **CON0180** (UGSG gage 01614500), 14) CON0005, 15) POT1830, **16) ANT0366, 17) ANT0203, 18) ANT0047** (USGS gage 01619500), **19) ANT0444**, 20) **CAC0148** (USGS Gage 01637500), 21) CAC0031, 22) POT1596, 23) POT1595, 24) **MON0528** (USGS gage 01639000), 25) BPC0035, 26) MON0269, 27) MON0155, 28) MON0020, 29) POT1472, 30) POT1471, 31) SEN0008, 32) CJB0005, 33) RCM0111, 34) POT1184, 35) USGS RIM station 01646580), 36) ANA0082. Stations in **BOLD** are USGS gage stations (red squares). See Appendix 3 for station description and information.

Table 1. Summary of trends for non-tidal loadings (WY2002-2011) and non-tidal water quality parameters trends (1999-2012).

Map # corresponds to Figure 17 in main report. Annual trends either ‘Increase’ or ‘Decrease’ if significant at $p \leq 0.01$ or ‘Maybe Increase’ or ‘Maybe Decrease’ at $0.01 < p < 0.05$; blanks indicate no significant trend. Improving trends are in green, degrading trends are in red. Gray boxes indicate there is no data to evaluate that component.

	map#	Station	Loadings			Water Quality		
			Nitrogen	Phosphorus	Sediments	Nitrogen	Phosphorus	Sediments
Western Upper Potomac	1	NBP0689				INCREASE		INCREASE
	2	SAV0000						INCREASE
	2	NBP0534						INCREASE
	3	GEO0009			INCREASE	DECREASE		INCREASE
	4	NBP0461				DECREASE	DECREASE	
	5	NBP0326				DECREASE	DECREASE	
	6	BDK0000				DECREASE		
	7	WIL0013	DECREASE	INCREASE		DECREASE		
	8	NBP0103				DECREASE	DECREASE	
	9	NBP0023				DECREASE	DECREASE	
	10	TOW0030				DECREASE		
	11	POT2766				DECREASE		
12	POT2386				DECREASE		DECREASE	
Eastern Upper Potomac	13	CON0180		DECREASE		INCREASE	DECREASE	Maybe Decrease
	14	CON0005				INCREASE	DECREASE	DECREASE
	15	POT1830					DECREASE	
	16	ANT0366				INCREASE		DECREASE
	17	ANT0203				INCREASE	DECREASE	DECREASE
	18	ANT0044				INCREASE	DECREASE	
	20	CAC0148		DECREASE			DECREASE	
	21	CAC0031					DECREASE	Maybe Decrease
	22	POT1596				DECREASE	DECREASE	
23	POT1595					DECREASE		
Monocacy River	24	MON0528	DECREASE	DECREASE		Maybe Decrease	DECREASE	Maybe Decrease
	25	BPC0035					DECREASE	
	26	MON0269					DECREASE	
	27	MON0155				DECREASE	DECREASE	
	28	MON0020				DECREASE	DECREASE	
Middle Potomac	29	POT1472				Maybe Decrease	DECREASE	
	30	POT1471					DECREASE	
	31	SEN0008				DECREASE	DECREASE	
	32	CJB0005						
	33	RCM0111						
	34	POT1184					DECREASE	
	36	ANA0082					Maybe increase	INCREASE
	35	Potomac River at Chain Bridge, MD			INCREASE			

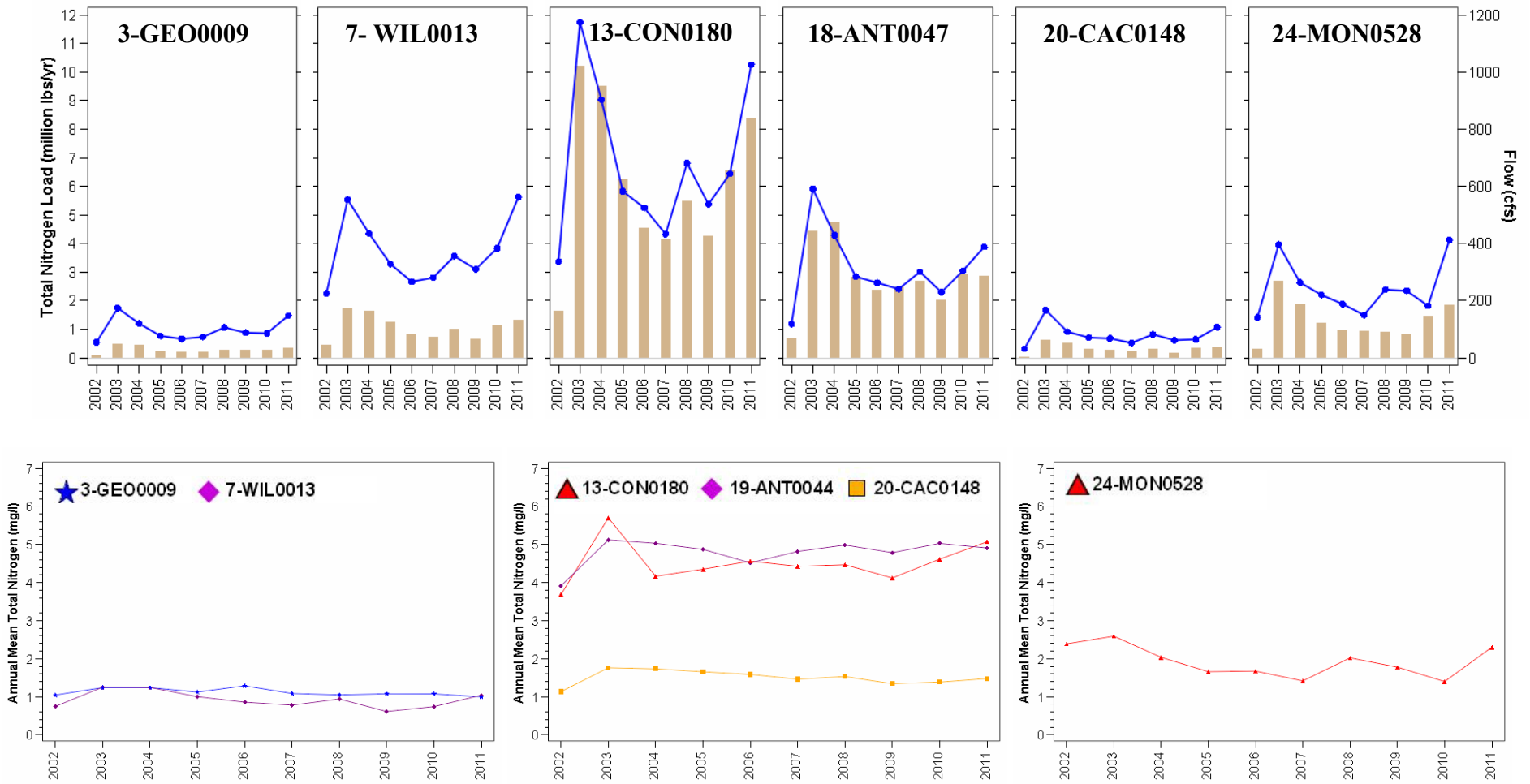


Figure 19. Annual nitrogen loadings to the Upper Potomac at USGS gage sites and water year means for TN at long-term non-tidal water quality monitoring stations.

Top graphs show annual nitrogen (tan bars, left axis) and flow (blue line, right axis) for each of the USGS gaging stations. Bottom graphs shows water year annual mean concentrations for total nitrogen for corresponding long-term non-tidal stations. Scales are the same on all of the loadings graphs and all of the annual concentrations graphs. Stations numbers correspond to station labels in Figure 17.

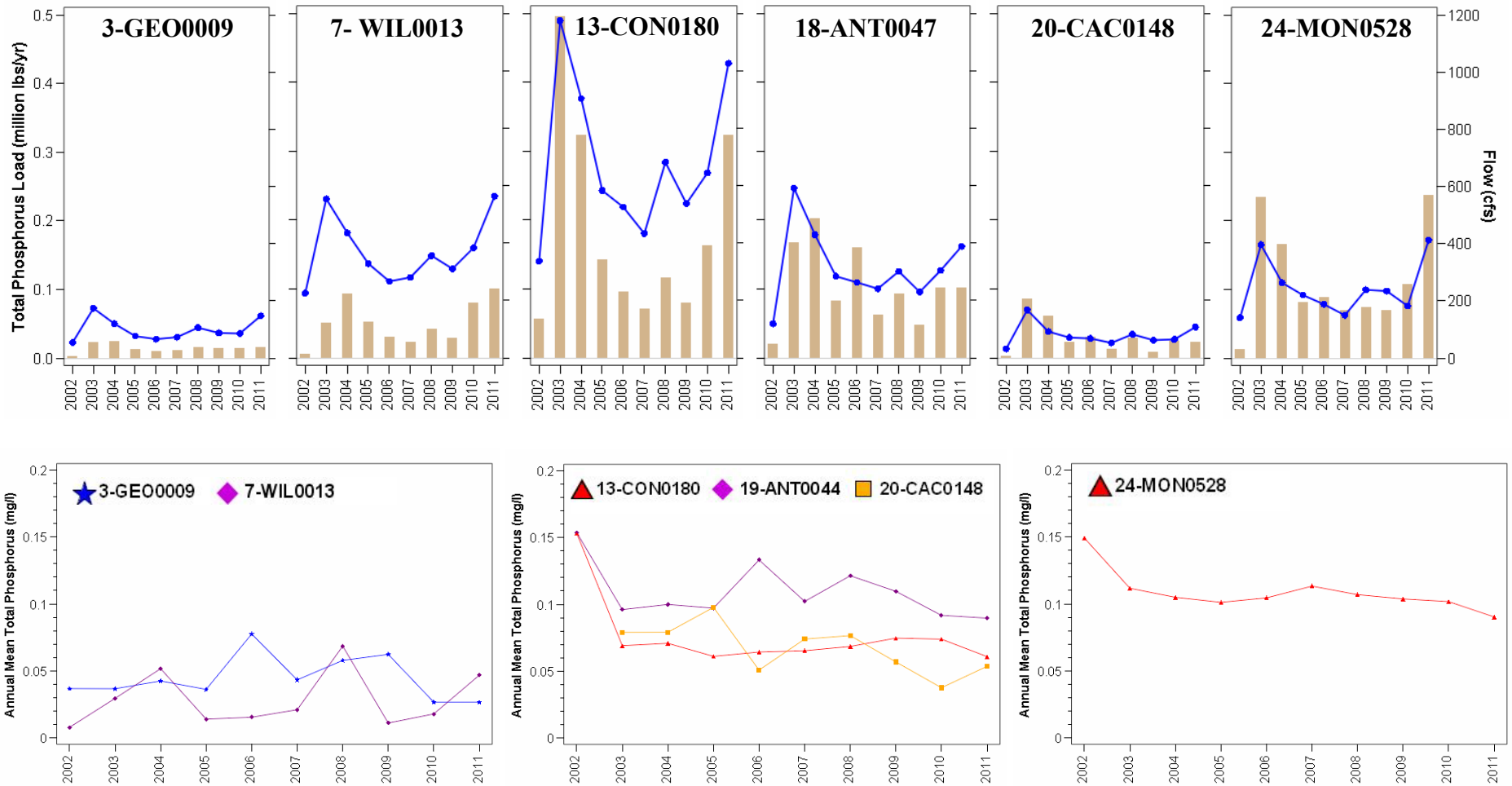


Figure 20. Annual phosphorus loadings to the Upper Potomac at USGS gaging sites and water year means for TP at long-term non-tidal water quality monitoring stations.

Top graphs show annual phosphorus (tan bars, left axis) and flow (blue line, right axis) for each of the USGS gaging stations. Bottom graphs shows water year annual mean concentrations for total phosphorus for corresponding long-term non-tidal stations. Scales are the same on all of the loadings graphs and all of the annual concentrations graphs. Stations numbers correspond to station labels in Figure 17.

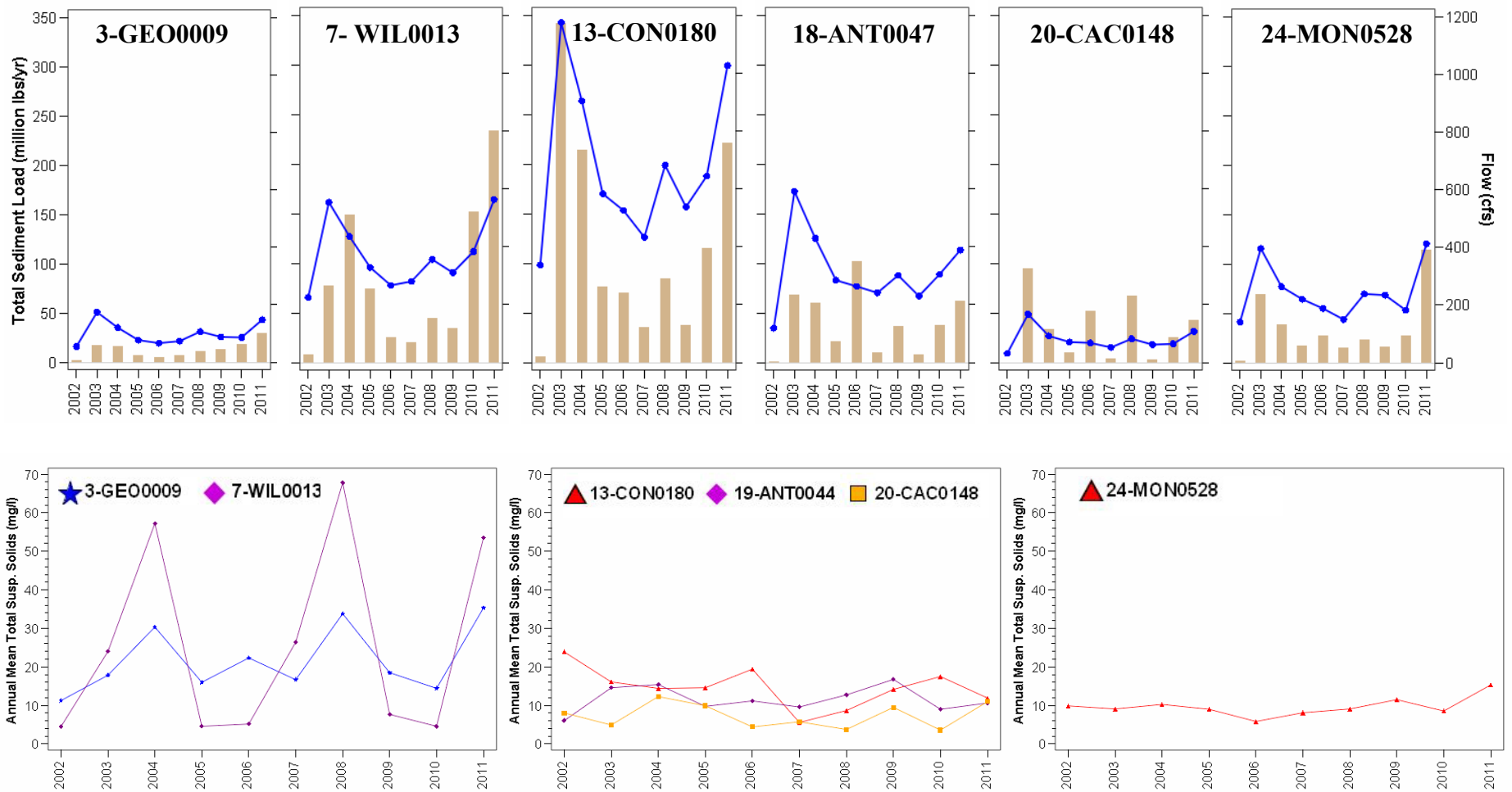


Figure 21. Annual sediment loadings to the Upper Potomac at USGS gage sites and water year means for TSS at long-term non-tidal water quality monitoring stations.

Top graphs show annual sediment (tan bars, left axis) and flow (blue line, right axis) for each of the USGS gaging stations. Bottom graphs shows water year annual mean concentrations for total suspended solids for corresponding long-term non-tidal stations. Scales are the same on all of the loadings graphs and all of the annual concentrations graphs. Stations numbers correspond to station labels in Figure 17.

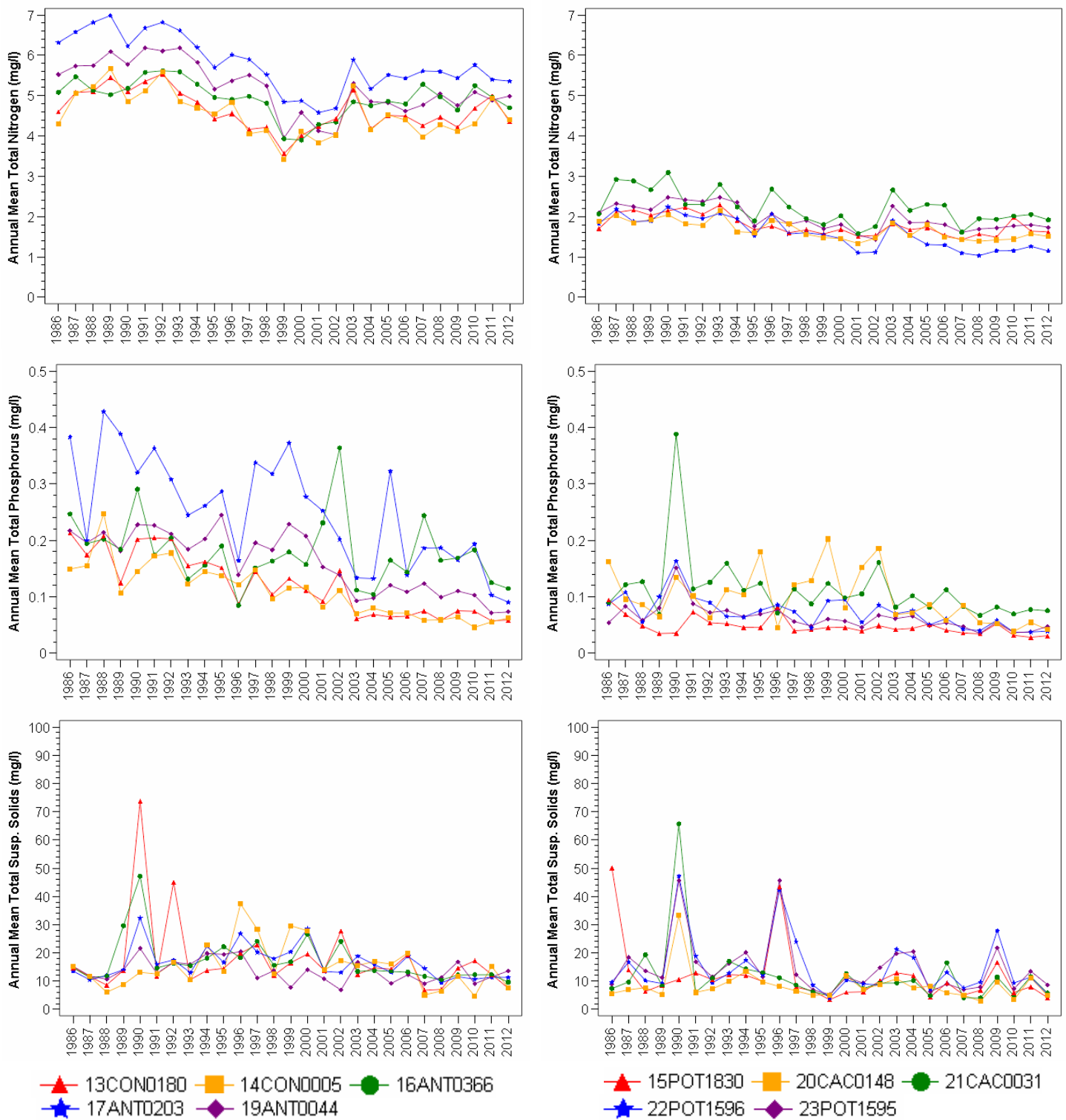


Figure 22. Annual means for total nitrogen, total phosphorus and total suspended solids in the eastern Upper Potomac basin non-tidal water quality monitoring stations.

Scales are the same on both graphs for each parameter: total nitrogen (top row), total phosphorus (middle row), total suspended solids (bottom row). Stations are the same in each column of graphs and legend for each column is at the bottom. Stations names shown in legends correspond to station labels in Figure 17.

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Appendix - Watersheds

Antietam Creek Watershed												
1994-2013 Completed NPS Implementation Projects (1)												
Project Summary			Project Expenditures					Pollutant Load Reduction				
Area/Lead	Name/Dsescription	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN/yr)	
				Federal	State							
Md Dept of Agriculture (MDA) with Washington County Soil Conservation District (SCD)	Antietam Creek Watershed Project		319 FFY1994 #6									
		1996	319 FFY1995 #13	\$112,821.00								
		1998	319 FFY1996 #15	\$52,774.00								
		1998	319 FFY1997 #16	\$91,531.00								
		1999	319 FFY1998 #17	\$105,337.00								
		2000	319 FFY1999 #12	\$120,360.00								
		2001	319 FFY2000 #8	\$99,733.00								
		2002	319 FFY2001 #9	\$125,859.00								
		2003	319 FFY2002 #6	\$134,423.00								
		2004	319 FFY2003 #7	\$124,859.00								
		2005	319 FFY2004 #11	\$106,189.90			\$70,793.27	\$176,983.17				
		2007	319 FFY2004 #27	\$129,225.23			\$86,150.15	\$215,375.38	77,692	5,686	0	0
		2006	319 FFY2005 #5	\$119,446.79			\$79,631.19	\$199,077.98	4,718	720	0	0
		2008	319 FFY2007 #5	\$139,258.68			\$92,839.12	\$232,097.80	65,216	5,862	81.2	0
2010	319 FFY2008 #6	\$155,838.12			\$103,892.08	\$259,730.20	71,239	5,553	0	0		
SCD	WCSCD Antietam Cr Watershed Plan	2012	319 FFY2008 #20	\$29,264.39		\$19,509.59	\$48,773.98	0	0	0	0	
MDA/SCD	MDA Antietam Creek Watershed Proj	2010	319 FFY2009 #3	\$151,110.82		\$100,740.55	\$251,851.37	64,590	5,067	0	0	
Washington County	Lehmans Mill Road Stream Bank Stabilization	2012	SRF Grant	\$0.00	\$191,700.00	\$0.00	\$191,700.00	101	5.35	0	0	
	Burnside Bridge Rd Stream Bank Stabilization	2012	SRF Grant	\$0.00	\$232,900.00	\$0.00	\$232,900.00	101	5.35	0	0	
TOTAL overall				\$1,798,030.93	\$424,600.00	\$553,555.95	\$1,808,489.88	283,657.0	22,898.7	81	0	
TOTALS for projects counted toward watershed plan implementation.				\$0.00	\$424,600.00	\$0.00	\$424,600.00	202	10.70	0	0	

(1) Baseline year for watershed plan implementation is 2012. Pollutant load reductions reported after that year can be counted toward meeting watershed plan goals. The watershed plan (EPA accepted 2012) accounts for all progress achieved prior to 2012 (See watershed plan Table 8 page 27 regarding sediment, page 43 regarding bacteria.)

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2014 Grant Project Activity - Antietam Creek Watershed											
Project Summary			Project Funding				Projected Pollutant Load Reduction				
Area/Lead	Name/Dsescription	End Date	Grant Funding Source	Grant Funds		Non Federal Match	Total	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN/yr)
				Federal	State						
Boonesboro	Tree Planting in the Park Project	TBD	Trust Fund SFY13	\$0	\$15,000.00		TBD	80.4	5.4	0.95	0
Hagerstown	Bioretention near Clean Water Circle	TBD	Trust Fund SFY14	\$0.00	\$455,000		TBD	100.5	20.9	5.8	TBD
	G3 Project	TBD	Trust Fund SFY14	\$0	\$107,720.00		TBD	11.78	0.48	0.04	TBD
				\$0	\$68,667.00		TBD	TBD	TBD	TBD	TBD
	Wet swales: Hagerstown Light Dept	TBD	Trust Fund SFY14	\$0	\$45,000		TBD	36.9	9.3	2.7	TBD
Washington County	Greensburg Rd Little Antietam Creek Restoration	2014	319 FFY12 #11	\$229,555.73	\$0	\$153,037.15	\$382,592.88	121	6.42	1.07	0
	Hidden Hollow Farm	2014	Trust Fund SFY13	\$0.00	\$1,904.79		\$1,904.79	86.16	5.76	1.02	0
	Devils Backbone Park Stream Restoration	TBD	319 FFY14 #8	\$390,000	\$0	\$260,000	TBD	300	102	232.5	0
Washington County Board of Education	Riparian Buffers: Fountaindale ES	2014	Trust Fund SFY14	\$0	\$625.50		\$625.50	5.90	0.24	0.05	0
	Riparian Buffers: Northern MS				\$780.62		\$780.62	35.40	1.46	0.27	0
	Riparian Buffers: Smithsburg HS				\$2,341.87		\$2,341.87	44.25	0.34	0.34	0
Washington County SCD	Barr Property Stream Restoration	TBD	319 FFY13 #10	\$148,930	\$0	\$99,287	TBD	47.5	9.9	5.5	0
	Shank/Anderson Project Phase 2 of 3	TBD	319 FFY11 #13	\$64,266	\$0	\$42,844	TBD	16.5	1.9	2.4	166 billion
	Kiwanis Park Stream Stabilization	TBD	319 FFY14 #7	\$124,998	\$0	\$83,332	TBD	34.2	10.3	16.75	0
Table: Summary of Grant Projects Completed During 2014 - Antietam Creek Watershed											
			Grant Project Expenditures				Pollutant Load Reduction Reported				
			Grant Name	Federal Grants	State Grants	Non Federal Match	Total Expenditures	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Sediment (ton/yr)	Bacteria (MPN/yr)
Completed Grant Projects		2014	319	\$229,555.73		\$153,037.15	\$382,592.88	121.00	6.42	1.07	0
			Trust Fund		\$5,652.78		\$5,652.78	171.71	7.80	1.68	0
			TOTAL	\$229,555.73	\$5,652.78	\$153,037.15	\$388,245.66	292.71	14.22	2.75	0
Active/Incomplete Grant Projects		TBD	All Grants*	\$728,194.00	\$0.00	\$485,463.00		398.20	124.10	257.13	166 billion

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Table: Antietam Creek Watershed Plan 2014 Implementation Progress Summary (1)											
Sediment Reduction Goals			Implementation Progress			Bacteria Reduction Goals			Implementation Progress		
BMP	Unit	Goal	2014	2012-13	Goal %	BMP	Unit	Goal	2014	2012-13	Goal %
Cover Crops	acres/yr	4,000	5,462		136.6%	Failing Septics Correction	systems	559	0	15	2.7%
Conservation Tillage	acres/yr	6,200	1,160		18.7%	Septic System Upgrades	systems	645	0	26	4.0%
SCWQP	acres	9,050	2,440	3,956.9	70.7%	Grass Buffers	acres	35	7.4	2.5	28.3%
Stream Protection not fenced	acres	1,300	60	40.0	7.7%	Riparian Forest Buffers	acres	260	2.5	56.8	22.8%
Stream Protection fenced	acres	780	4.62	2.6	0.9%	Stream Protection fenced	acres	300	4.62	2.6	2.4%
Buffers (grass/forest)	acres	295	9.9	59.3	23.5%	Stream Protection not fenced	acres	500	60	40.0	20.0%
Erodible Land Retirement	acres	130	0.25	8.3	6.6%	Livestock Stream Crossing	units	17	0	0	0.0%
No Till	acres/yr	4,800	495		10.3%	SCWQPs	acres	15,460	2,440	3,956.9	41.4%
Stream Restoration	acres	0.25	0	0	0.0%	Runoff Control Systems	acres	12	1	4.0	41.7%
Forest Harvest Practices	acres	250	196	722.0	367.2%	Animal Waste Mgmt Systems	units	26	7	2	34.6%

(1) 2014 is Calendar year. Zero means no progress or not reported. Washington County Soil Conservation District is the lead plan implementer/reporter and partners with other agencies.

(2) Antietam Plan BMP implementation goals address agricultural lands and septic systems. Goals are not set for urban BMP implementation.