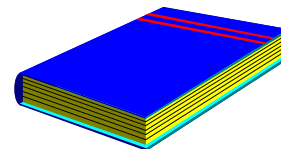


REPORT ANNOUNCEMENT

SUSQUEHANNA RIVER BASIN COMMISSION

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NUTRIENTS AND SUSPENDED SEDIMENT TRANSPORTED IN THE SUSQUEHANNA RIVER BASIN, 2008, AND TRENDS, JANUARY 1985 THROUGH DECEMBER 2008

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The purpose of this report is to present basic information on annual and seasonal loads and yields of nutrients and suspended sediment (SS) measured during calendar year 2008 at SRBC's six long-term monitoring sites listed in Table 1 on the back of this announcement. Included in the report are several data comparisons aimed at removing the effects of flow to determine if improvements occurred. These analyses included comparisons of 2008 values of total nitrogen (TN), total phosphorus (TP), and SS with several baselines developed from the historical datasets and trends in flow-adjusted concentrations (FACs) for the period 1985 through 2008. Statistics for 2008 for the six long-term sites are listed in Table 1. Summary statistics for all 23 sites that are part of the Chesapeake Bay Program's Non-tidal Water Quality Monitoring Network also are included.

Data were collected from six sites on the Susquehanna River, three sites on the West Branch Susquehanna River, and 14 sites on smaller tributaries in the basin. These 23 sites were selected for long-term monitoring of nutrient and SS transport in the basin. All samples were analyzed for various species of TN and TP, total organic carbon (TOC), and SS.

Precipitation data were summarized for the 2008 Susquehanna River Watersheds above Towanda, Danville, and Marietta, and the West Branch Susquehanna, Juniata, and Conestoga River Watersheds. Precipitation for 2008 was above average at sites. Highest departure from the long-term mean (LTM) for precipitation was recorded at Danville, Pa., with 6.82 inches above the LTM. Highest precipitation occurred during the winter months at all sites.

Nutrient and Suspended-Sediment Loads and Yields

Nutrient and SS loads were computed for the six long-term sites for calendar year 2008. TN at Newport

and TP at Towanda, Danville, and Newport were above the LTMs for 2008. TN and TP were below the LTMs at all other sites, while SS was well below the LTM at all sites.

Baseline Comparison

The annual fluctuations of nutrient and SS loads and water discharge make it difficult to determine whether the changes were related to land use, nutrient availability, or annual water discharge. To make that determination, data collected were used to create a linear relationship (baseline) between water discharge ratios (annual discharge/long-term discharge) and annual yields. Linear plots were created using the initial five years of each dataset, the first and second halves of each dataset, and the entire dataset. 2008 yields and discharge ratios then were plotted on these graphs to see where improvements may have occurred. Lower than predicted yields in TN, TP, and SS were found in 2008 for all baseline comparisons at all sites except for TP at Towanda and Danville. Seasonal yields at Towanda were higher than baseline predictions for both spring and winter for TP and during winter for SS. 2008 annual yields were dramatically lower than baseline predictions at Conestoga for TN, TP, and SS.

Nutrient and Suspended-Sediment Trends

Trends for monthly mean flow and FAC were computed for the period January 1985 through December 2008 for flow, SS, TOC, and several forms of nitrogen and phosphorus. FAC trends represent the trends after the effects of flow have been removed and represent the concentration that relates to the effects of nutrient-reduction activities and other actions taking place in the watershed. TN, TP, and SS trends improved at all sites during 2008, except for TP at Towanda, which had no significant trend. Upward trends were found at Towanda and Newport for DOP. The most southern site, Marietta, showed downward trends for all parameters except DOP, which had no significant trend due to more than 20 percent of the values being below the method detection limit (BMDL). No significant trends were found for flow for the time period.

This report is available in electronic format at www.srbc.net. It is also available on CD by contacting Ava Stoops at 717-238-0423 or srbc@srbc.net.

Table 1. 2008 Annual, Seasonal, and Annual Long-term Mean Precipitation (inches); Flow (cfs); Loads (in 1000's of pounds), Yields (lbs/ac/yr), Concentration (mg/L), and Trends for Total Nitrogen (TN), Total Phosphorus (TP), and Suspended Sediment (SS) at Towanda, Danville, Lewisburg, Newport, Marietta, and Conestoga, Pa.

Parameter	Period	Towanda	Danville	Lewisburg	Newport	Marietta	Conestoga	
Precipitation	Winter	11.42	14.30	12.31	9.92	11.69	9.89	
	Spring	8.64	10.22	10.96	13.43	10.38	11.03	
	Summer	12.19	11.90	10.82	9.10	11.23	13.28	
	Fall	10.10	9.47	9.16	8.70	9.44	10.50	
	2008	42.35	45.89	43.25	41.15	42.74	44.70	
	LTM	38.41	39.07	41.52	36.49	39.90	42.82	
Flow	Winter	25,694	39,563	22,425	6,017	87,436	1,059	
	Spring	9,373	14,682	10,215	3,602	41,176	616	
	Summer	2,474	3,916	1,950	1,270	9,209	334	
	Fall	8,028	12,526	5,977	2,342	26,777	535	
	2008	11,359	17,620	10,108	4,851	41,023	635	
	LTM	11,841	16,558	10,848	4,400	39,128	678	
TN	Load	Winter	13,096	21,831	10,281	7,937	65,856	3,441
		Spring	4,267	6,742	4,065	5,327	25,445	1,888
		Summer	891	1,385	845	672	4,830	970
		Fall	3,572	6,192	2,741	2,525	20,457	1,597
		2008	21,826	36,150	17,932	16,461	116,588	7,896
		LTM	28,003	43,662	23,565	16,287	130,264	10,351
	Yield	2008	4.37	5.03	4.09	7.67	7.01	26.25
		LTM	5.61	6.08	5.38	7.59	7.83	34.41
	Concentration	2008	0.98	1.04	0.90	1.72	1.44	6.32
		LTM	1.20	1.34	1.10	1.88	1.69	7.76
	Trend	*	Improving	Improving	Improving	Improving	Improving	Improving
	TP	Load	Winter	1,532	2,396	672	351	3,957
Spring			455	584	231	311	1,093	51
Summer			116	119	35	39	201	40
Fall			365	527	144	114	866	73
2008			2,468	3,626	1,082	815	6,117	264
LTM			2,381	3,620	1,274	796	7,711	674
Yield		2008	0.495	0.505	0.247	0.379	0.368	0.883
		LTM	0.477	0.504	0.291	0.374	0.464	2.239
Concentration		2008	0.110	0.105	0.054	0.085	0.076	0.213
		LTM	0.102	0.111	0.060	0.092	0.100	0.505
Trend		*	No trend	Improving	Improving	Improving	Improving	Improving
SS		Load	Winter	1,025,754	1,530,299	387,145	214,612	4,195,698
	Spring		182,115	215,948	66,576	139,141	589,154	11,078
	Summer		12,563	19,801	3,897	4,089	44,009	5,229
	Fall		80,545	160,271	41,265	28,793	467,345	24,543
	2008		1,300,977	1,926,319	498,883	386,635	5,296,206	80,638
	LTM		3,016,634	3,297,939	1,181,569	519,129	6,721,101	361,198
	Yield	2008	261	268	114	180	318	268
		LTM	605	459	270	242	404	1,201
	Concentration	2008	58	56	25	41	66	65
		LTM	129	101	55	60	87	271
	Trend	*	Improving	Improving	Improving	Improving	Improving	Improving

* Trend time periods: Towanda 1989-2008; Marietta 1987-2008; Lewisburg, Danville, Newport, and Conestoga 1985-2008.