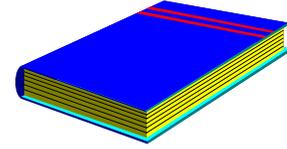


REPORT ANNOUNCEMENT

SUSQUEHANNA RIVER BASIN COMMISSION

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NUTRIENTS AND SUSPENDED SEDIMENT TRANSPORTED IN THE SUSQUEHANNA RIVER BASIN, 2005 AND TRENDS, JANUARY 1985 THROUGH DECEMBER 2005

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by: Kevin McGonigal

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 2005 at SRBC's six long-term monitoring sites at Towanda, Danville, Marietta, Lewisburg, Newport, and Conestoga, Pa. Included in the report are several data comparisons aimed at removing the effects of flow to determine if improvements are occurring. This includes comparisons of 2005 values of total nitrogen (TN), total phosphorous (TP), and SS with several baselines developed from the historical datasets and trends in flow-adjusted concentrations (FACs) for the period 1985 through 2005. Statistics for 2005 for the six long-term sites are listed in Table 1 on the back of this announcement.

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 are summarized for the 2005 Susquehanna River Watersheds above Towanda, Danville, and Marietta, and the West Branch Susquehanna, Juniata, and Conestoga River Watersheds. 2005 precipitation was above average for Towanda, Danville, Marietta, and Conestoga due to high rainfall in January and April.

Nutrient and Suspended-Sediment Loads and Yields

Nutrient and SS loads were computed for the six long-term sites for calendar year 2005. 2005 loads of TP and SS were higher than the long-term mean (LTM) at Towanda and Danville. TN and total organic nitrogen

were lower than the LTM's at all sites except for TN at Newport.

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 during the initial 5-year sampling period were used to create a linear relationship (baseline) between water discharge ratios (annual discharge/long-term discharge) and annual yields. This also was done with the first half and second half of the datasets for each site. The 2005 yields and discharge ratios then were plotted on graphs to see where improvements may have occurred. Baseline comparisons showed decreases in TN at Towanda and Danville when the second half of the dataset was compared to the first half. Additionally, improvements were found at Conestoga for TP and SS for 2005 when compared to all baselines.

Nutrient and Suspended-Sediment Trends

Trends for monthly mean flow and FAC were computed for the period January 1985 through December 2005 for flow, SS, TOC, and several forms of nitrogen and phosphorus. Flow-adjusted trends represent the trends after the affects of flow have been removed and indicate that changes have occurred in the processes that deliver constituents to the stream system. This is the concentration that relates to the effects of nutrient-reduction activities and other actions taking place in the watershed. Trends in FACs were found to be decreasing for TN, TP, and SS at all sites except for TP at Marietta, which showed no significant trends, and SS at Lewisburg, which had greater than 20 percent of the values below the method detection limit. No significant trends were found for flow.

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. 2005 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 Phosphorous (TP), and Suspended Sediment (SS) at Towanda, Danville, Lewisburg, Newport, Marietta, and Conestoga, Pa.

Parameter	Period	Towanda	Danville	Lewisburg	Newport	Marietta	Conestoga	
Precipitation	Winter	12.56	12.15	11.67	9.1	11.35	10.45	
	Spring	12.57	11.27	6.99	5.77	8.60	8.68	
	Summer	13.36	12.05	9.11	7.15	10.10	9.04	
	Fall	16.58	16.25	13.4	10.66	14.07	17.79	
	2005	55.07	51.72	41.17	32.68	44.12	45.97	
	LTM	38.56	38.88	41.33	36.1	39.78	42.42	
Flow	Winter	18,810	28,330	19,192	8,708	68,236	1,070	
	Spring	15,529	22,547	9,855	3,725	46,732	830	
	Summer	1,732	2,549	1,787	1,015	7,744	313	
	Fall	16,749	21,929	10,686	3,010	41,286	873	
	2005	13,230	18,839	10,380	4,115	40,999	744	
	LTM	11,811	16,393	11,151	4,504	39,023	675	
TN	Load	Winter	10,585	16,665	10,044	8,798	59,851	4,226
		Spring	8,045	11,288	4,560	3,168	32,910	3,035
		Summer	705	912	879	722	4,906	1,189
		Fall	8,557	11,603	5,665	3,299	41,124	3,366
		2005	27,893	40,468	31,148	15,988	138,790	11,816
		LTM	28,838	44,468	24,210	16,623	133,002	10,528
	Yield	2005	5.59	5.64	4.83	7.45	8.34	39.28
		LTM	5.78	6.19	5.53	7.74	7.00	36.00
	Concentration	2005	1.07	1.09	1.04	1.97	1.72	7.75
		LTM	1.25	1.38	1.12	1.87	1.73	7.96
	Trend	*	Improving	Improving	Improving	Improving	Improving	Improving
	TP	Load	Winter	924	1,866	594	286	3,275
Spring			1,203	2,013	268	95	2,759	108
Summer			64	85	34	26	174	30
Fall			967	1,227	352	81	1,615	288
2005			3,159	5,191	1,248	489	7,824	533
LTM			2,391	3,615	1,327	850	8,675	719
Yield		2005	0.633	0.723	0.285	0.228	0.470	1.840
		LTM	0.479	0.503	0.303	0.396	0.522	2.391
Concentration		2005	0.121	0.140	0.061	0.060	0.097	0.363
		LTM	0.104	0.112	0.061	0.095	0.113	0.544
Trend		*	Improving	Improving	Improving	Improving	NS	Improving
SS		Load	Winter	1,124,485	1,374,749	258,796	188,778	2,213,763
	Spring		3,033,391	2,434,763	138,338	46,930	2,571,460	97,532
	Summer		10,292	9,148	2,715	3,988	31,315	102,501
	Fall		1,005,684	608,996	134,732	31,682	725,689	62,342
	2005		5,173,582	4,427,656	534,581	271,377	5,542,226	285,570
	LTM		3,382,891	3,080,876	1,086,325	488,669	6,947,713	400,395
	Yield	2005	1,037	617	122	126	333	949
		LTM	678	429	248	228	418	1,331
	Concentration	2005	199	119	26	34	69	187
		LTM	147	95	50	55	90	301
	Trend	*	Improving	Improving	NS	Improving	Improving	Improving

* Trend time periods: Towanda 1989-2005; Marietta 1987-2005; Lewisburg, Danville, Newport, and Conestoga 1985-2005.