

# Water Quality Monitoring Report

## Illinois River Basin

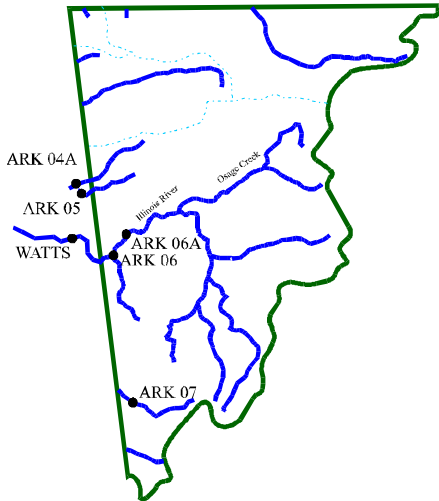
### Arkansas-Oklahoma Compact

**Stations**

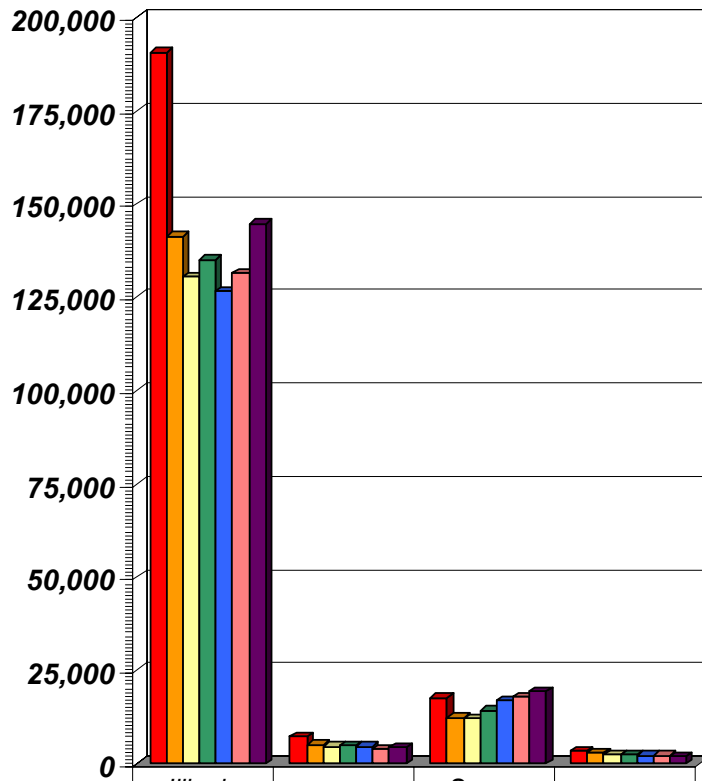
ARK 04A	Flint Creek near West Siloam Springs
ARK 05	Sager Creek near Siloam Springs
ARK 06	Illinois River South of Siloam Springs
ARK 07	Baron Fork at Dutch Mills
Watts	Illinois River near Watts
Tahlequah	Illinois River near Tahlequah
Kansas	Flint Creek near Kansas
Eldon	Baron Fork near Eldon



# ARKANSAS

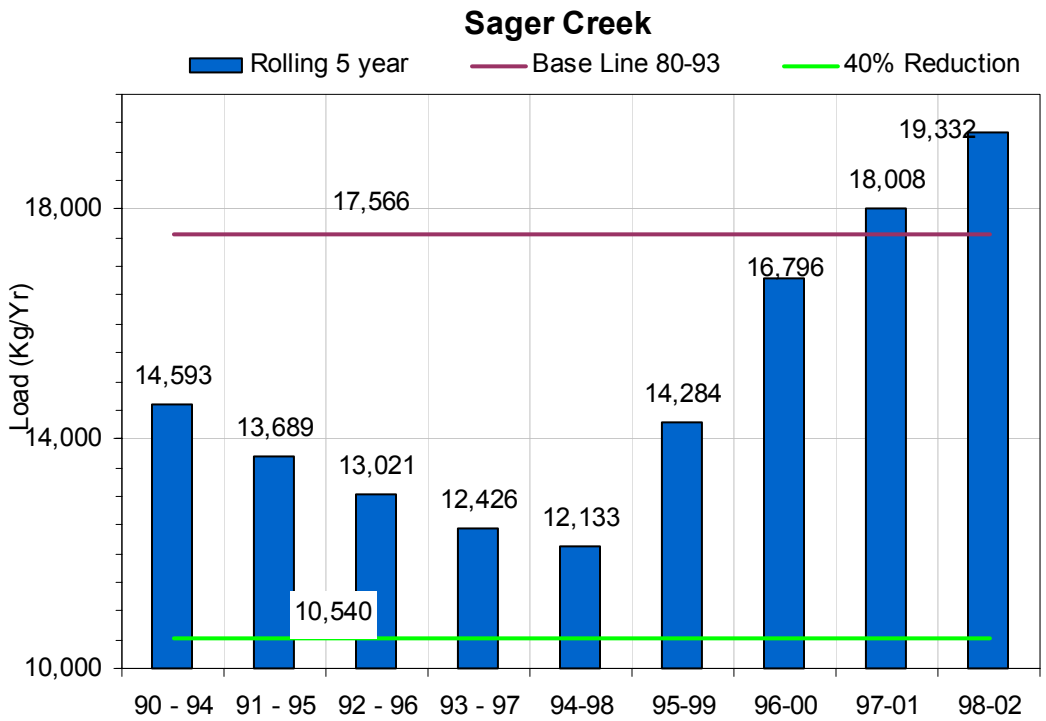
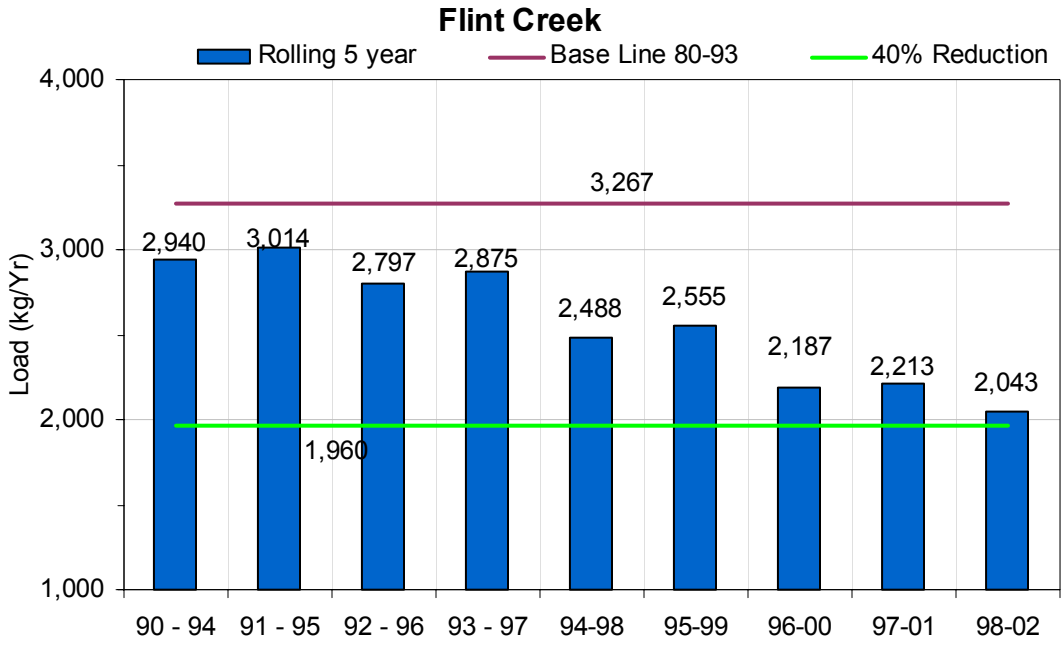


**Average Annual Total P Loading  
in Kilograms per Year**

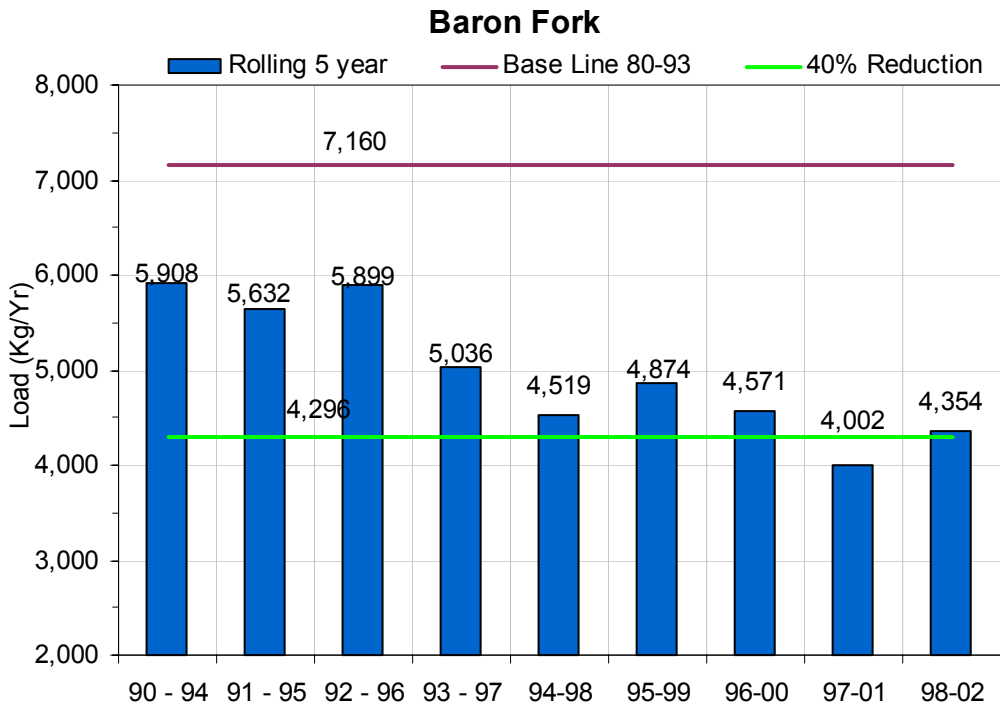
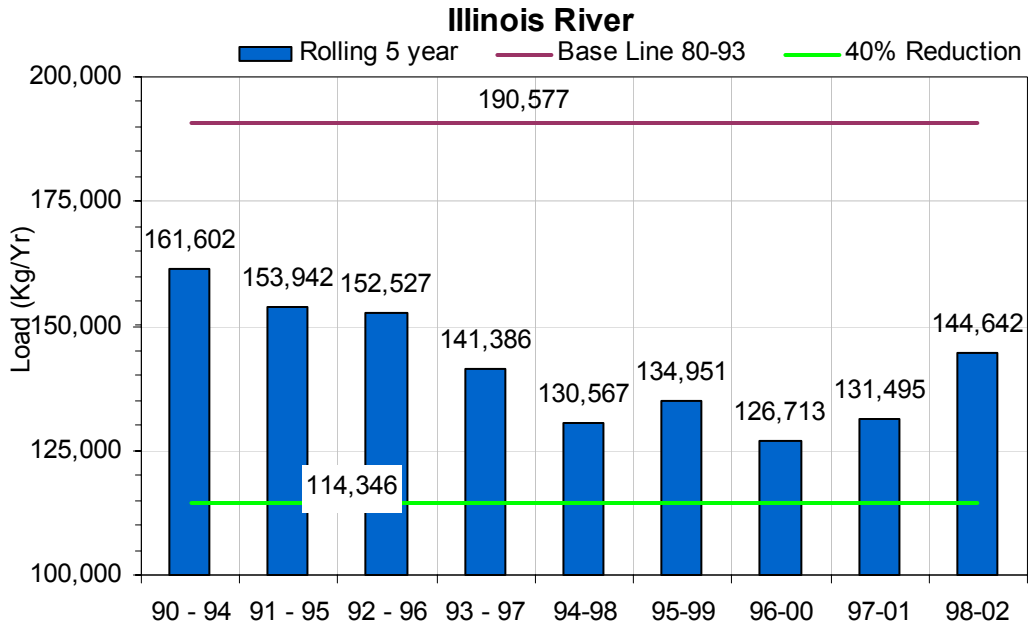


	Illinois River ARK06	Baron Fork ARK07	Sager Creek ARK05	Flint Creek ARK04a
Total P 80-93	190,577	7,160	17,566	3,267
Total P 93-97	141,386	5,036	12,426	2,875
Total P 94-98	130,567	4,519	12,133	2,488
Total P 95-99	134,951	4,874	14,284	2,555
Total P 96-00	126,713	4,571	16,796	2,187
Total P 97-01	131,495	4,002	18,008	2,213
Total P 98-02	144,642	4,354	19,332	2,043

# ARKANSAS

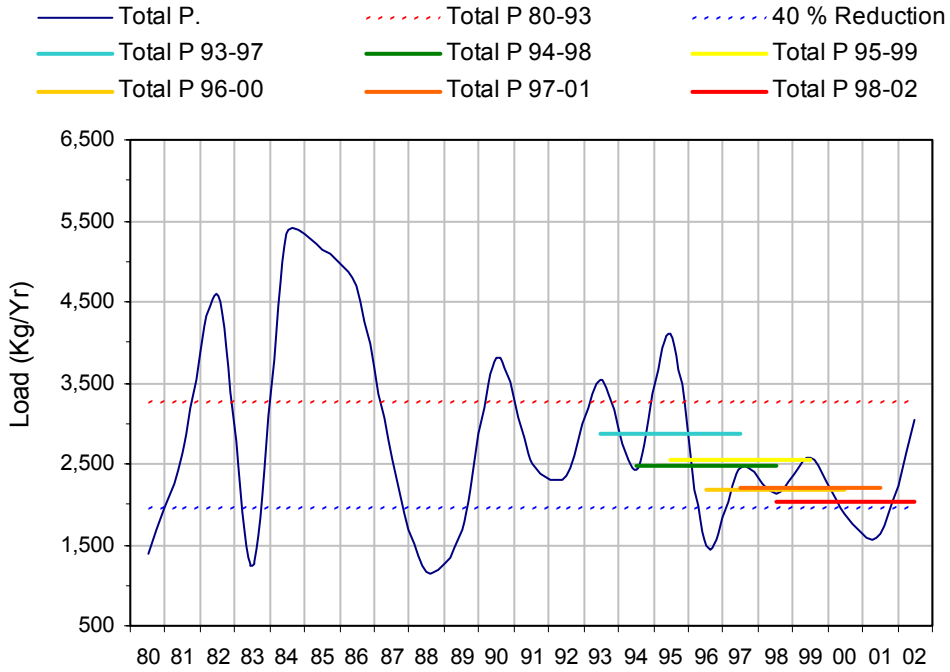


# ARKANSAS

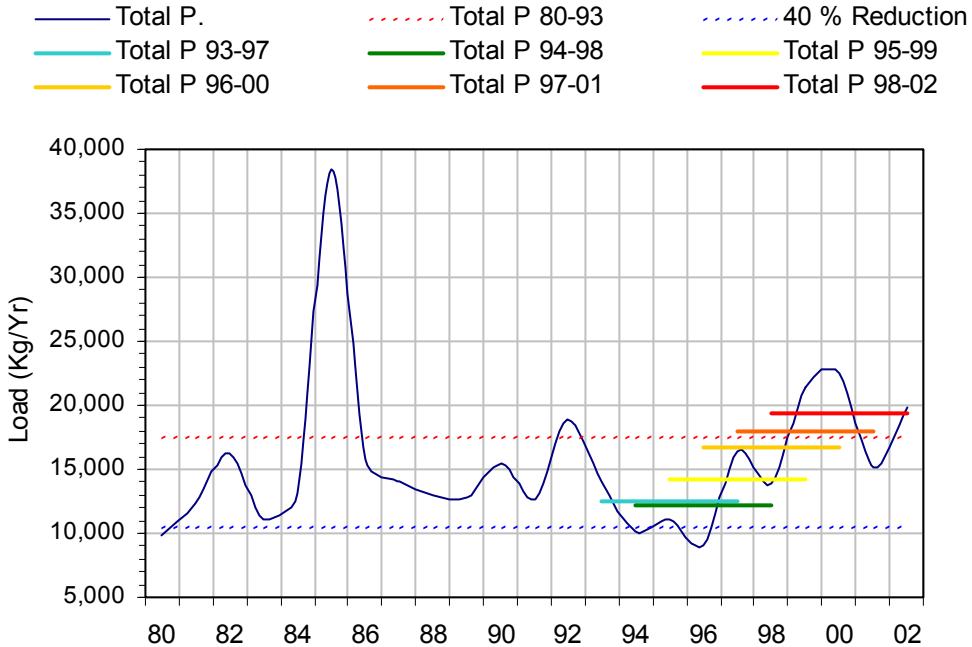


# ARKANSAS

## Flint Creek Near West Siloam Springs Total P Loading



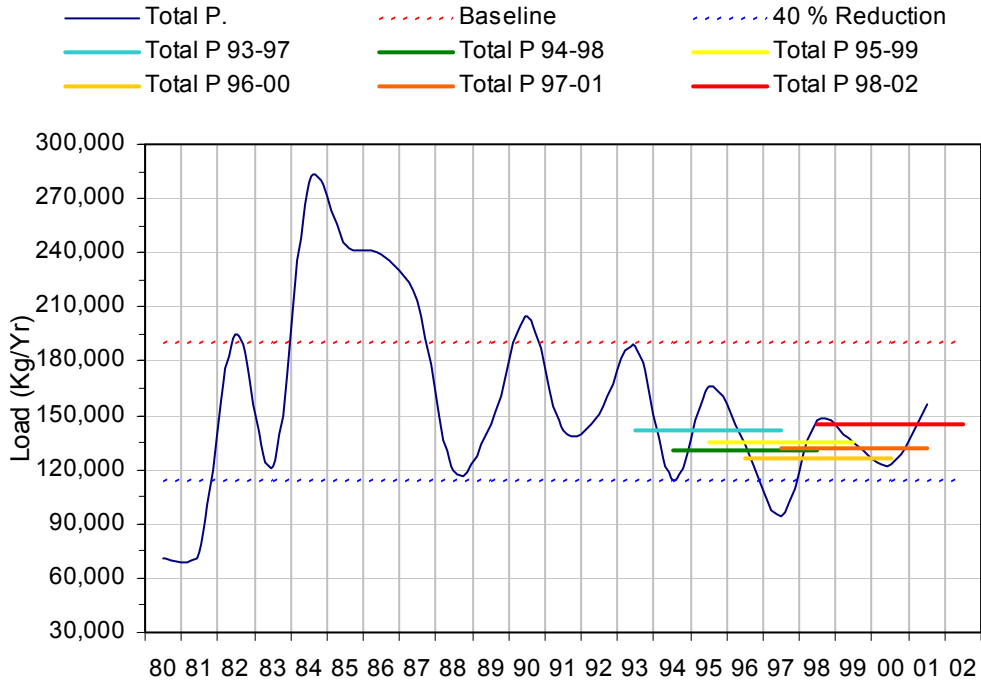
## Sager Creek Near Siloam Springs Total P Loading



# ARKANSAS

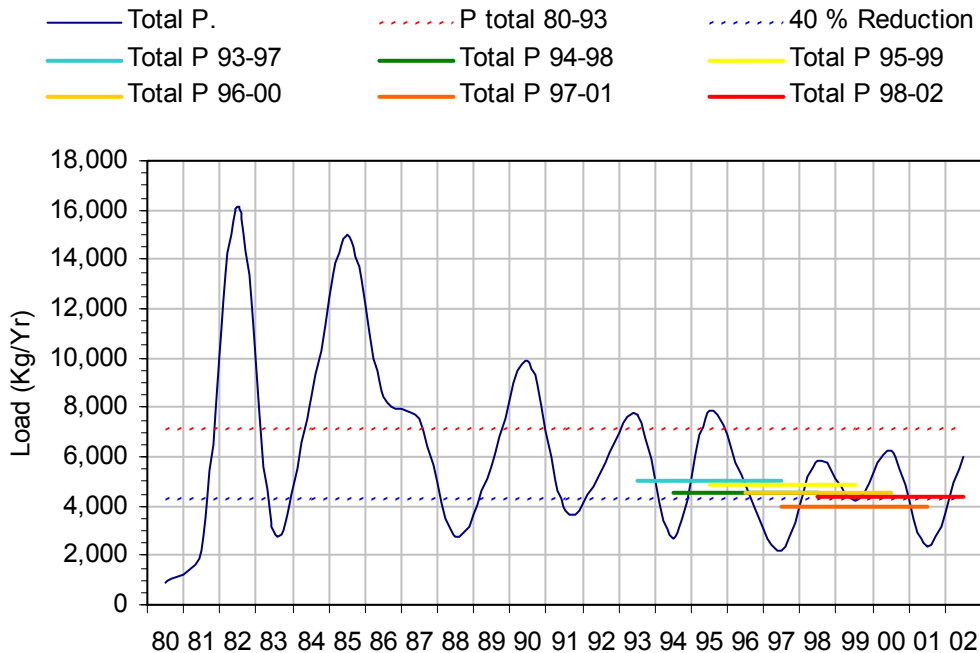
## Illinois River Near Siloam Springs

### Total P Loading



## Baron Fork at Dutch Mills

### Total P Loading



## ARKANSAS

<b>Ark04 - Fint Creek</b>			
ARK04A	Flow (cfs)	Pt (mg/L)	Pt (kg/yr)
1980	11.9	0.130	1,382
1981	19.8	0.149	2,635
1982	29.9	0.171	4,566
1983	19.0	0.073	1,239
1984	53.5	0.112	5,351
1985	91.3	0.063	5,137
1986	78.4	0.067	4,691
1987	58.3	0.049	2,551
1988	41.8	0.031	1,157
1989	38.0	0.050	1,697
1990	71.3	0.060	3,821
1991	51.6	0.054	2,489
1992	56.1	0.047	2,355
1993	88.2	0.045	3,545
1994	53.0	0.051	2,414
1995	61.3	0.075	4,106
1996	33.5	0.050	1,496
1997	37.3	0.074	2,448
1998	42.9	0.056	2,142
1999	63.5	0.045	2,578
2000	55.6	0.038	1,893
2001	39.4	0.047	1,636
2002	44.6	0.047	1,850
<b>Avg.</b>	<b>50</b>	<b>0.069</b>	<b>3,047</b>

<b>Ark05 - Sager Creek</b>			
ARK05	Flow (cfs)	Pt (mg/L)	Pt (kg/yr)
1980	4.5	2.430	9,766
1981	6.5	2.125	12,336
1982	9.0	2.025	16,277
1983	6.3	1.964	11,050
1984	15.4	0.950	13,066
1985	24.8	1.736	38,450
1986	21.1	0.834	15,716
1987	16.7	0.948	14,136
1988	12.6	1.154	12,986
1989	11.7	1.227	12,821
1990	20.2	0.860	15,515
1991	15.5	0.914	12,653
1992	16.5	1.284	18,921
1993	24.6	0.637	13,995
1994	15.7	0.721	10,110
1995	17.8	0.697	11,080
1996	11.0	0.919	9,028
1997	17.8	1.029	16,354
1998	18.1	0.858	13,876
1999	24.5	0.979	21,429
2000	30.7	0.820	22,469
2001	21.2	0.803	15,201
2002	21.8	1.192	23,231
<b>Avg.</b>	<b>19</b>	<b>1.179</b>	<b>19,816</b>

NOTES: 1) Flow data provided by USGS Arkansas & Oklahoma 2) P concentrations provided

## ARKANSAS

<b>Ark06 - Illinois River</b>				<b>Ark07 - Baron Fork</b>			
ARK06A	Flow (cfs)	Pt (mg/L)	Pt kg/yr	ARK07	Flow (cfs)	Pt (mg/L)	Pt kg/yr
1980	169	0.470	70,939	1980	9.5	0.103	878
1981	197	0.420	73,895	1981	18.4	0.135	2,218
1982	591	0.370	195,294	1982	37.4	0.484	16,167
1983	352	0.386	121,347	1983	27.2	0.125	3,037
1984	706	0.442	278,693	1984	51.8	0.183	8,466
1985	947	0.289	244,426	1985	79.4	0.211	14,962
1986	879	0.305	239,436	1986	64.0	0.147	8,402
1987	815	0.294	213,996	1987	63.2	0.134	7,563
1988	531	0.253	119,982	1988	31.8	0.097	2,755
1989	558	0.291	145,020	1989	50.2	0.124	5,559
1990	1127	0.204	205,331	1990	102.0	0.109	9,929
1991	724	0.220	142,253	1991	49.4	0.086	3,794
1992	760	0.222	150,684	1992	47.9	0.127	5,433
1993	1163	0.181	188,000	1993	104.0	0.083	7,709
1994	674	0.190	114,370	1994	37.0	0.081	2,677
1995	783	0.237	165,733	1995	54.2	0.162	7,842
1996	667	0.225	134,032	1996	64.4	0.084	4,831
1997	497	0.213	94,504	1997	35.9	0.067	2,151
1998	668	0.246	146,960	1998	61.1	0.107	5,822
1999	737	0.206	135,413	1999	45.8	0.102	4,176
2000	597	0.230	122,831	2000	52.6	0.133	6,230
2001	598	0.293	156,581	2001	41.4	0.065	2,387
2002	619	0.282	156,009	2002	38.0	0.104	3,536
Avg.	668	0.281	167,762	Avg.	51	0.133	6,012

NOTES: 1) Flow data provided by USGS Arkansas & Oklahoma 2) P concentrations provided by the ADEQ Technical Services Division



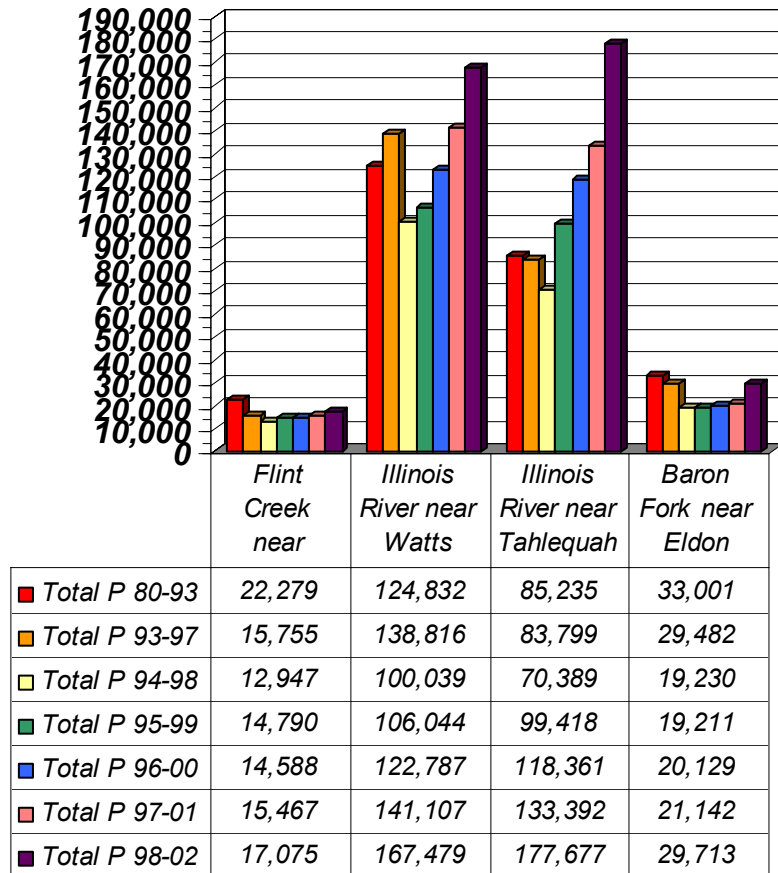
ARKANSAS

<b>Five-Year Average Values by Station</b>				
<b>Ark 04A - Flint Creek (07195855)</b>				
Year	Pt (mg/l)	Flow (cfs)	Pt (kg/yr)	% Decrease
80-93	0.079	50.7	3,267	0.0%
90-94	0.051	64.0	2,940	10.0%
91-95	0.054	62.0	3,014	7.7%
92-96	0.054	58.4	2,797	14.4%
93-97	0.059	54.7	2,875	12.0%
94-98	0.061	45.6	2,488	23.9%
95-99	0.060	47.7	2,555	21.8%
96-00	0.053	46.6	2,187	33.1%
97-01	0.052	47.7	2,213	32.3%
98-02	0.046	49.2	2,043	37.5%
<b>Ark 05 - Sager Creek (07195865)</b>				
Year	Pt (mg/l)	Flow (cfs)	Pt (kg/yr)	% Decrease
80-93	1.363	14.7	17,566	0.0%
90-94	0.883	18.5	14,593	16.9%
91-95	0.851	18.0	13,689	22.1%
92-96	0.852	17.1	13,021	25.9%
93-97	0.801	17.4	12,426	29.3%
94-98	0.845	16.1	12,133	30.9%
95-99	0.896	17.8	14,284	18.7%
96-00	0.921	20.4	16,796	4.4%
97-01	0.898	22.5	18,008	-2.5%
98-02	0.930	23.3	19,332	-10.1%
<b>Ark06 - Illinois River (07195430)</b>				
Year	Pt (mg/l)	Flow (cfs)	Pt (kg/yr)	% Decrease
80-93	0.311	679.9	190,577	0.0%
90-94	0.203	889.6	161,602	15.2%
91-95	0.210	820.8	153,942	19.2%
92-96	0.211	809.4	152,527	20.0%
93-97	0.209	756.8	141,386	25.8%
94-98	0.222	657.8	130,567	31.5%
95-99	0.225	670.4	134,951	29.2%
96-00	0.224	633.2	126,713	33.5%
97-01	0.238	619.4	131,495	31.0%
98-02	0.252	643.9	144,642	24.1%
<b>Ark 07 - Baron Fork (07196900)</b>				
Year	Pt (mg/l)	Flow (cfs)	Pt (kg/yr)	% Decrease
80-93	0.153	52.6	7,160	0.0%
90-94	0.097	68.1	5,908	17.5%
91-95	0.108	58.5	5,632	21.3%
92-96	0.107	61.5	5,899	17.6%
93-97	0.095	59.1	5,036	29.7%
94-98	0.100	50.5	4,519	36.9%
95-99	0.104	52.3	4,874	31.9%
96-00	0.099	52.0	4,571	36.2%
97-01	0.095	47.4	4,002	44.1%
98-02	0.102	47.8	4,354	39.2%

# OKLAHOMA

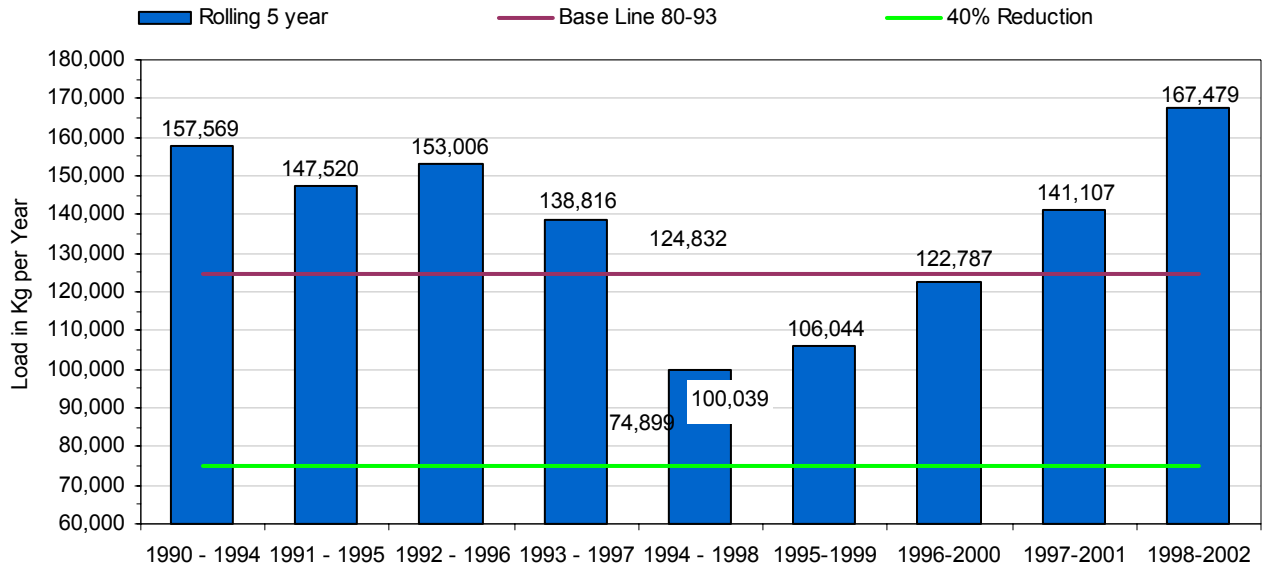


**Average Annual Total P Loading  
in Kilograms per Year**

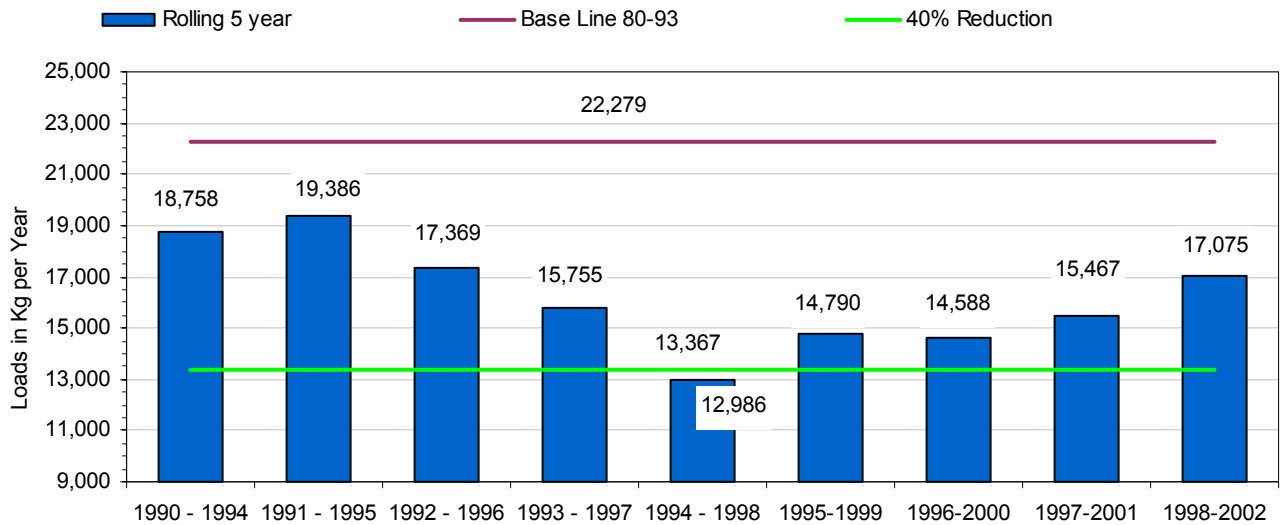


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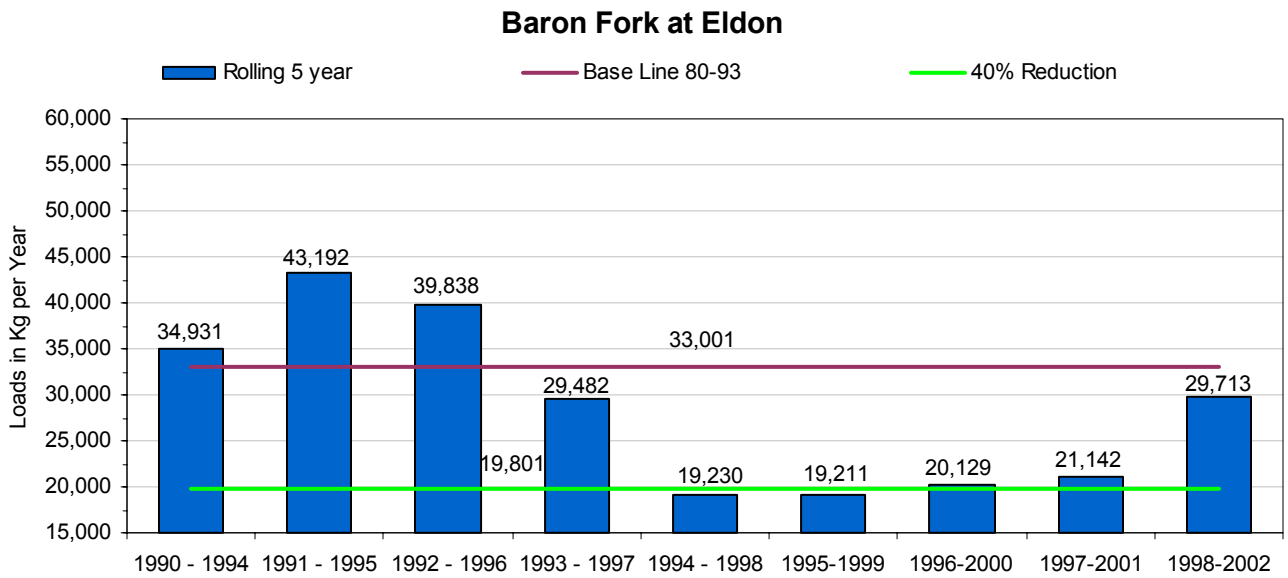
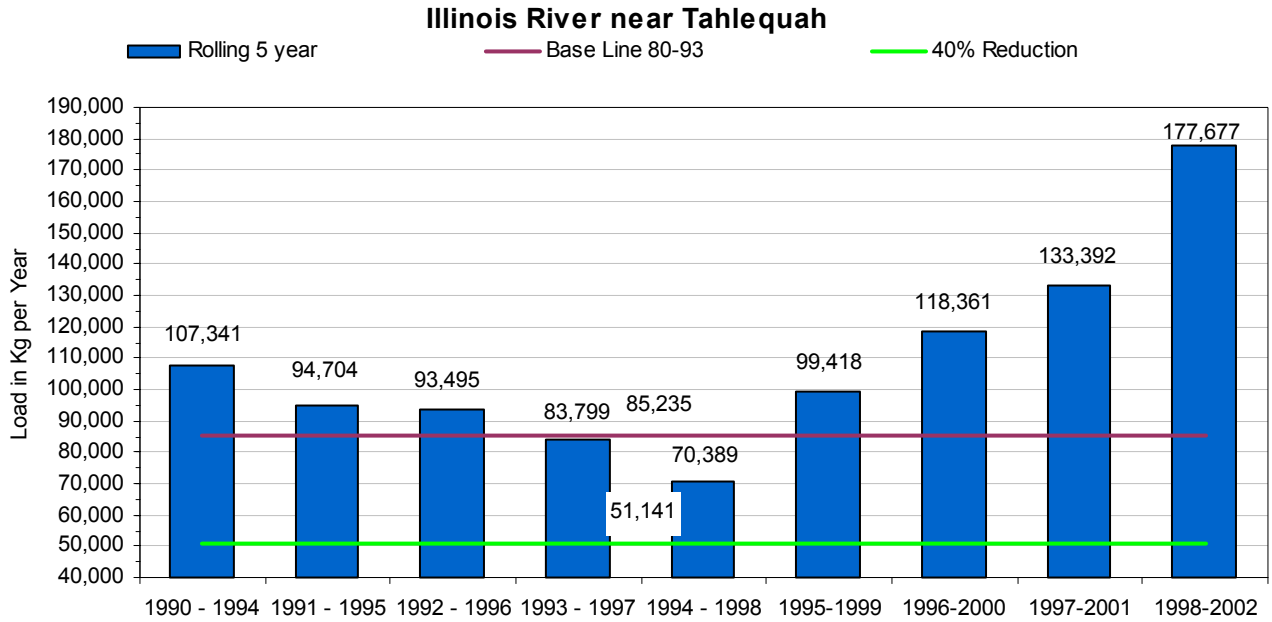
## Illinois River near Watts



## Flint Creek near Kansas

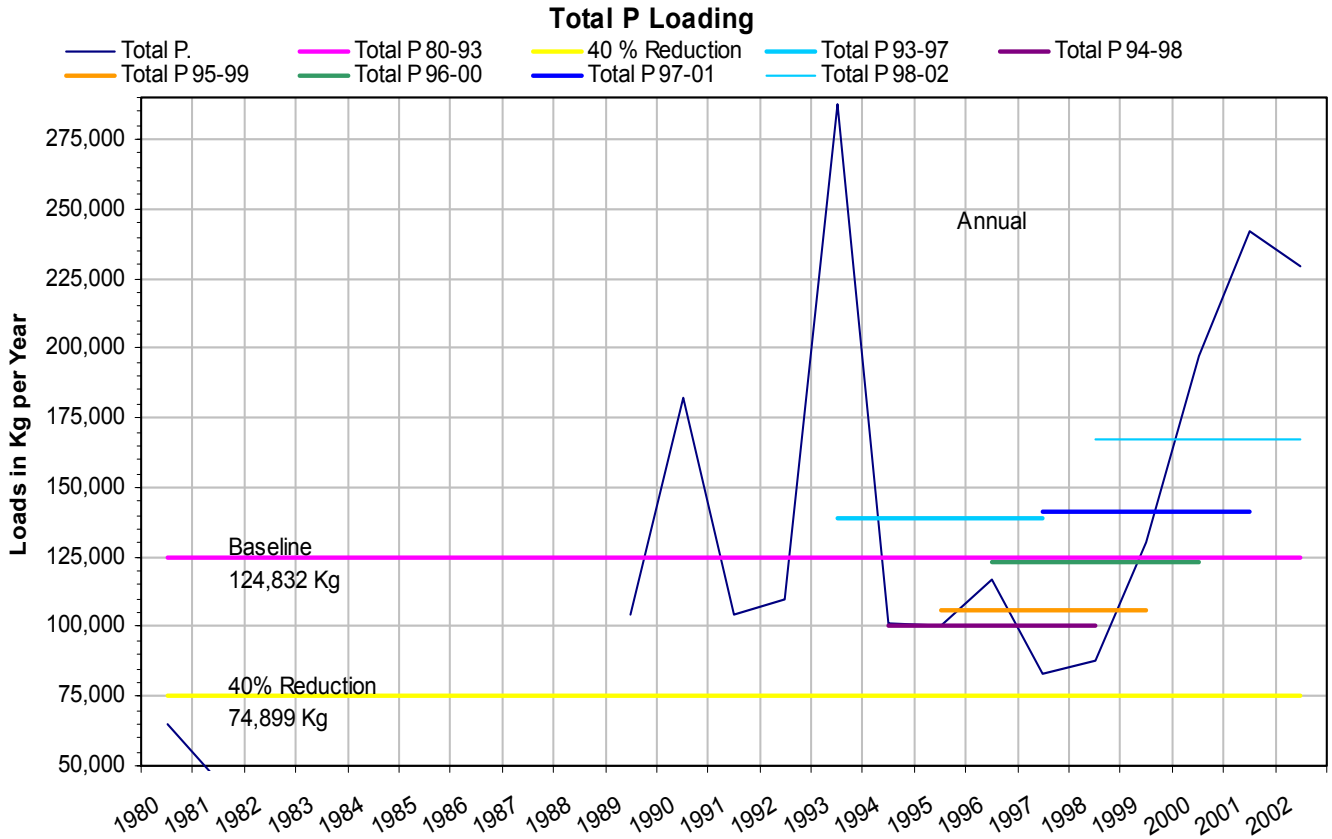


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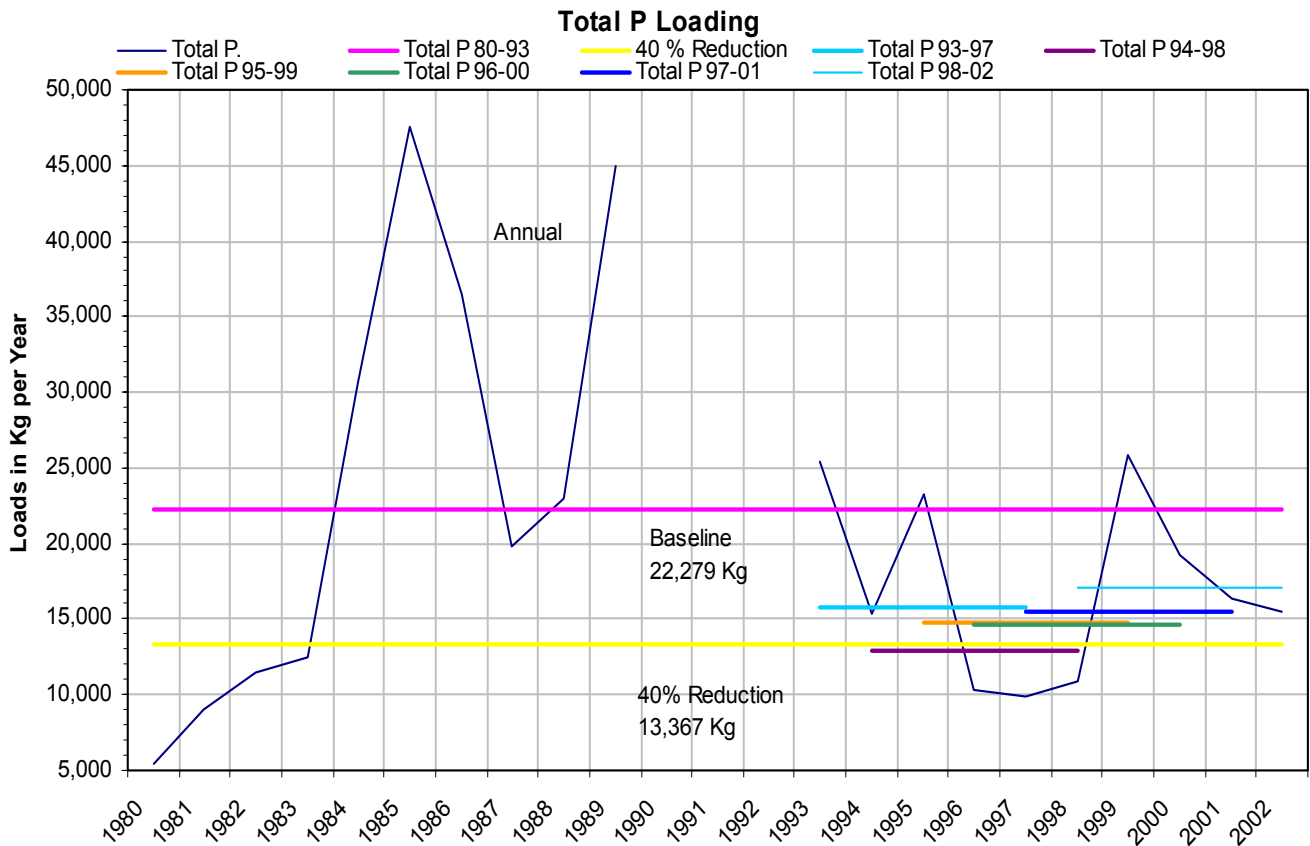


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## Illinois River near Watts

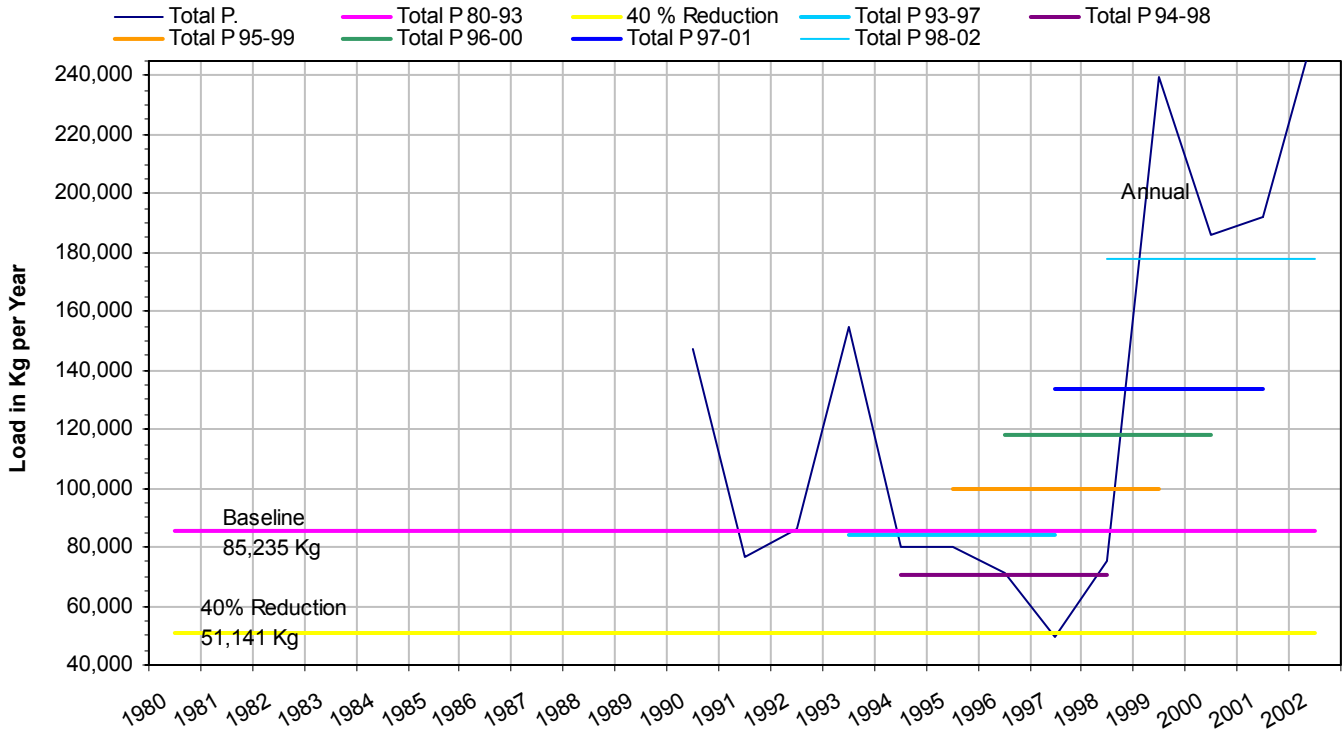


## Flint Creek near Kansas, Oklahoma

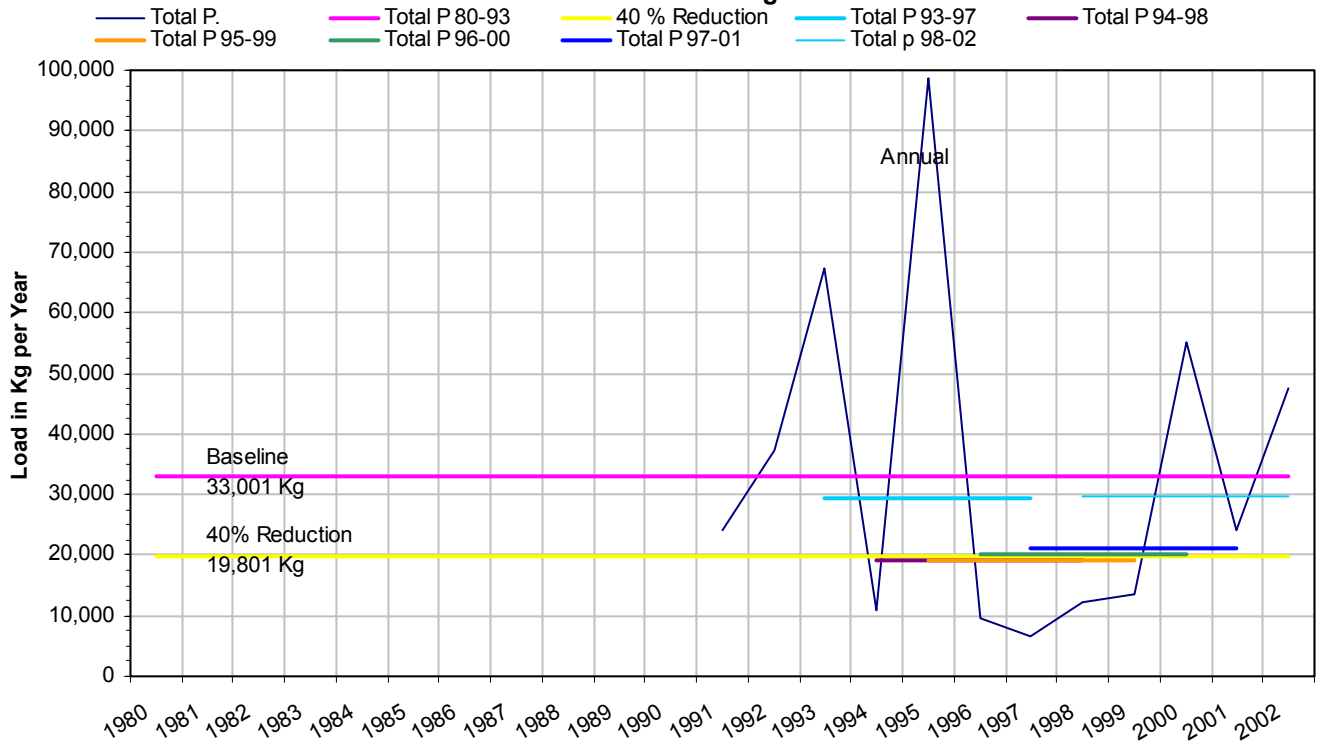


# OKLAHOMA

## Illinois River near Tahlequah Total P Loading



## Baron Fork at Eldon Total P Loading



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Illinois River near Watts			Loadings
Year	Flow (cfs)	Total P (mg/L)	Total P kg/year
1980	173	0.423	65,279
1981	260	0.190	44,119
1982	591		
1983	352		
1984	706		
1985	947		
1986	879		
1987	815		
1988	531		
1989	558	0.210	104,653
1990	1,127	0.181	182,432
1991	724	0.162	104,534
1992	760	0.161	109,571
1993	1,163	0.277	287,317
1994	674	0.168	101,127
1995	783	0.143	100,233
1996	693	0.188	116,542
1997	573	0.163	83,415
1998	713	0.138	87,876
1999	793	0.184	130,314
2000	648	0.341	197,346
2001	649	0.385	223,154
2002	619	0.415	229,424
<b>Average</b>	<b>684</b>	<b>0.233</b>	<b>142,368</b>

Illinois River Near Tahlequah			Loadings
Year	Flow (cfs)	Total P (mg/L)	Total P kg/year
1980	249		
1981	384		
1982	812		
1983	537		
1984	1,157		
1985	1,651		
1986	1,452		
1987	1,218		
1988	820		
1989	808		
1990	1,695	0.098	147,579
1991	1,094	0.079	76,796
1992	1,207	0.080	86,205
1993	1,751	0.099	154,647
1994	1,071	0.084	80,223
1995	1,123	0.080	80,229
1996	938	0.085	71,207
1997	812	0.069	49,797
1998	1,044	0.081	75,524
1999	1,143	0.235	239,891
2000	1,083	0.192	185,708
2001	1,033	0.187	172,521
2002	851	0.337	256,129
<b>Average</b>	<b>1,041</b>	<b>0.131</b>	<b>121,852</b>

NOTES : Flow & Water quality data provided by USGS Oklahoma District

OKLAHOMA

Flint Creek Near Kansas			Loadings
Year	Flow (cfs)	Total P (mg/L)	Total P kg/year
1980	32	0.189	5,454
1981	57	0.178	9,077
1982	69	0.186	11,537
1983	49	0.284	12,415
1984	143	0.240	30,532
1985	237	0.224	47,591
1986	183	0.223	36,430
1987	141	0.157	19,840
1988	97	0.265	22,946
1989	90	0.557	44,981
1990		0.114	
1991		0.120	
1992		0.118	
1993	182	0.156	25,359
1994	136	0.127	15,418
1995	140	0.185	23,207
1996	76	0.152	10,294
1997	94.8	0.117	9,871
1998	96.5	0.127	10,945
1999	137	0.211	25,817
2000	133	0.162	19,243
2001	101	0.168	15,154
2002	82	0.211	15,452
Average	114	0.194	19,774

Baron Fork at Eldon			Loadings
Year	Flow (cfs)	Total Phos. (mg/L)	Total P kg/year
1980	77		
1981	201		
1982	296		
1983	184		
1984	364		
1985	593		
1986	536		
1987	491		
1988	269		
1989	320		
1990	666		
1991	451	0.060	24,145
1992	440	0.095	37,315
1993	700	0.108	67,234
1994	328	0.037	10,878
1995	422	0.263	98,819
1996	432	0.025	9,645
1997	332	0.023	6,671
1998	409	0.033	12,054
1999	361	0.042	13,541
2000	376	0.164	55,072
2001	343	0.076	23,281
2002	262	0.203	47,500
Average	385	0.094	32,305

\*1999 TP was modified to include less than detect values (1/2 LTD, n=5)

\*2002 TP was modified to include less than detect values (1/2 LTD, n=2)



OKLAHOMA

<b>Five-Year Average Values by Station</b>				
<b>Illinois River at Watts</b>				
Year	Pt (mg/l)	Flow (cfs)	Pt (kg/yr)	% Decrease
80-93	0.204	685	124,832	0.0%
90-94	0.198	890	157,569	-26.2%
91-95	0.201	821	147,520	-18.2%
92-96	0.210	815	153,006	-22.6%
93-97	0.200	777	138,816	-11.2%
94-98	0.163	687	100,039	19.9%
95-99	0.167	711	106,044	15.1%
96-00	0.201	684	122,787	1.6%
97-01	0.234	675	141,107	-13.0%
98-02	0.274	684	167,479	-34.2%
<b>Flint Creek near Kansas</b>				
Year	Pt (mg/l)	Flow (cfs)	Pt (kg/yr)	% Decrease
80-93	0.214	117	22,279	0.0%
90-94	0.132	159	18,758	15.8%
91-95	0.142	153	19,386	13.0%
92-96	0.146	134	17,369	22.0%
93-97	0.140	126	15,755	29.3%
94-98	0.133	109	12,947	41.9%
95-99	0.152	109	14,790	33.6%
96-00	0.152	107	14,588	34.5%
97-01	0.154	112	15,467	30.6%
98-02	0.174	110	17,075	23.4%
<b>Illinois River near Tahlequah</b>				
Year	Pt (mg/l)	Flow (cfs)	Pt (kg/yr)	% Decrease
80-93	0.090	1060	85,235	0.0%
90-94	0.088	1364	107,341	-25.9%
91-95	0.085	1249	94,704	-11.1%
92-96	0.086	1218	93,495	-9.7%
93-97	0.082	1139	83,799	1.7%
94-98	0.079	998	70,389	17.4%
95-99	0.110	1012	99,418	-16.6%
96-00	0.132	1004	118,361	-38.9%
97-01	0.146	1023	133,392	-56.5%
98-02	0.193	1031	177,677	-108.5%
<b>Baron Fork at Eldon</b>				
Year	Pt (mg/l)	Flow (cfs)	Pt (kg/yr)	% Decrease
80-93	0.093	399	33,001	0.0%
90-94	0.076	517	34,931	-5.8%
91-95	0.103	468	43,192	-30.9%
92-96	0.096	464	39,838	-20.7%
93-97	0.075	443	29,482	10.7%
94-98	0.056	384	19,230	41.7%
95-99	0.055	391	19,211	41.8%
96-00	0.059	382	20,129	39.0%
97-01	0.065	364	21,142	35.9%
98-02	0.095	350	29,713	10.0%