

LEVEE FAILURE AND TIDAL ANALYSIS OF THE MOUNT VERNON GAGE

During a flood event:

Do the levee failures at Fir Island impact the Mount Vernon gage?

No.

Do the tides impact the Mount Vernon gage?

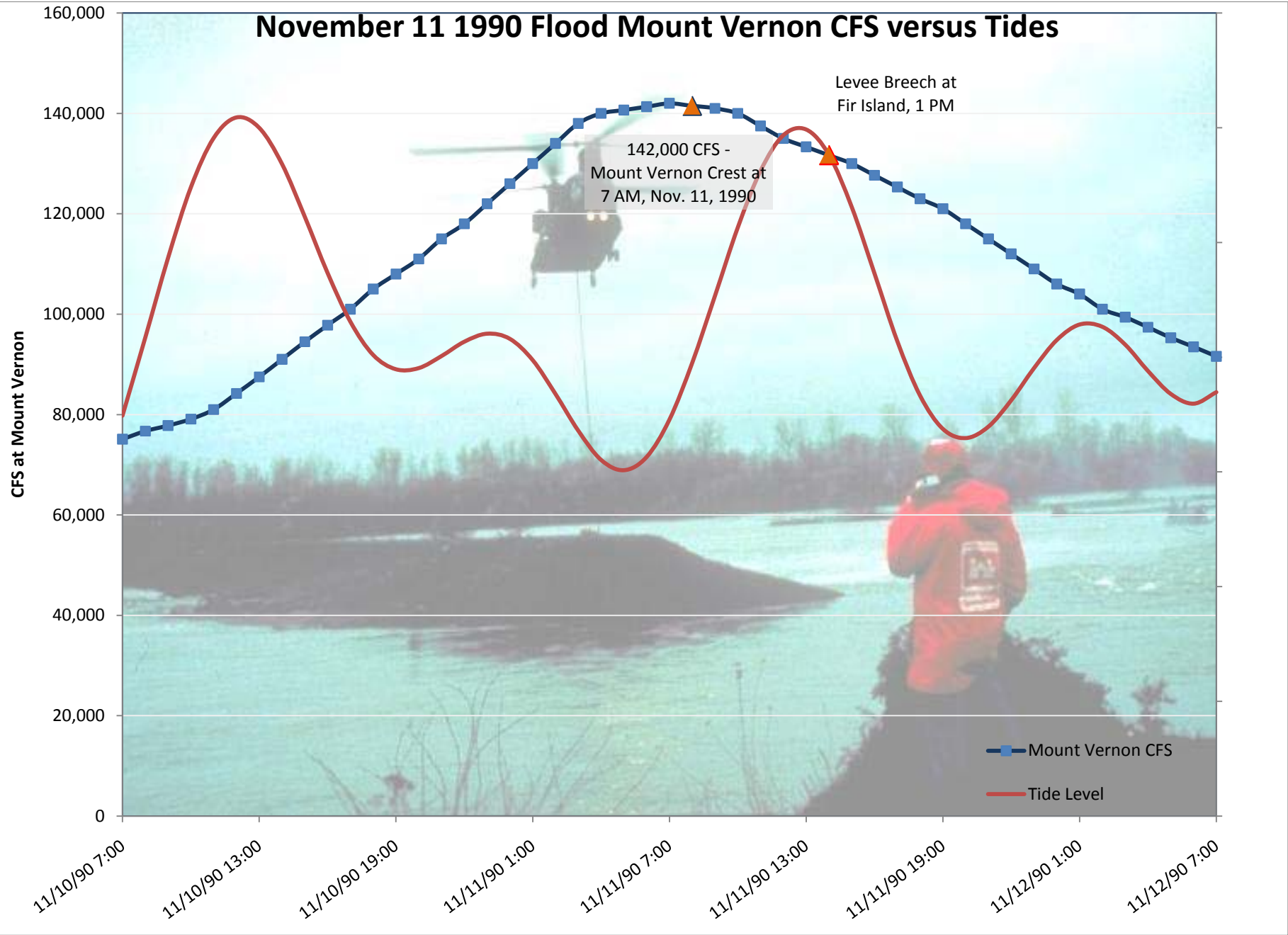
No.

If the answer to those two questions is no, what impacts the Mount Vernon gage?

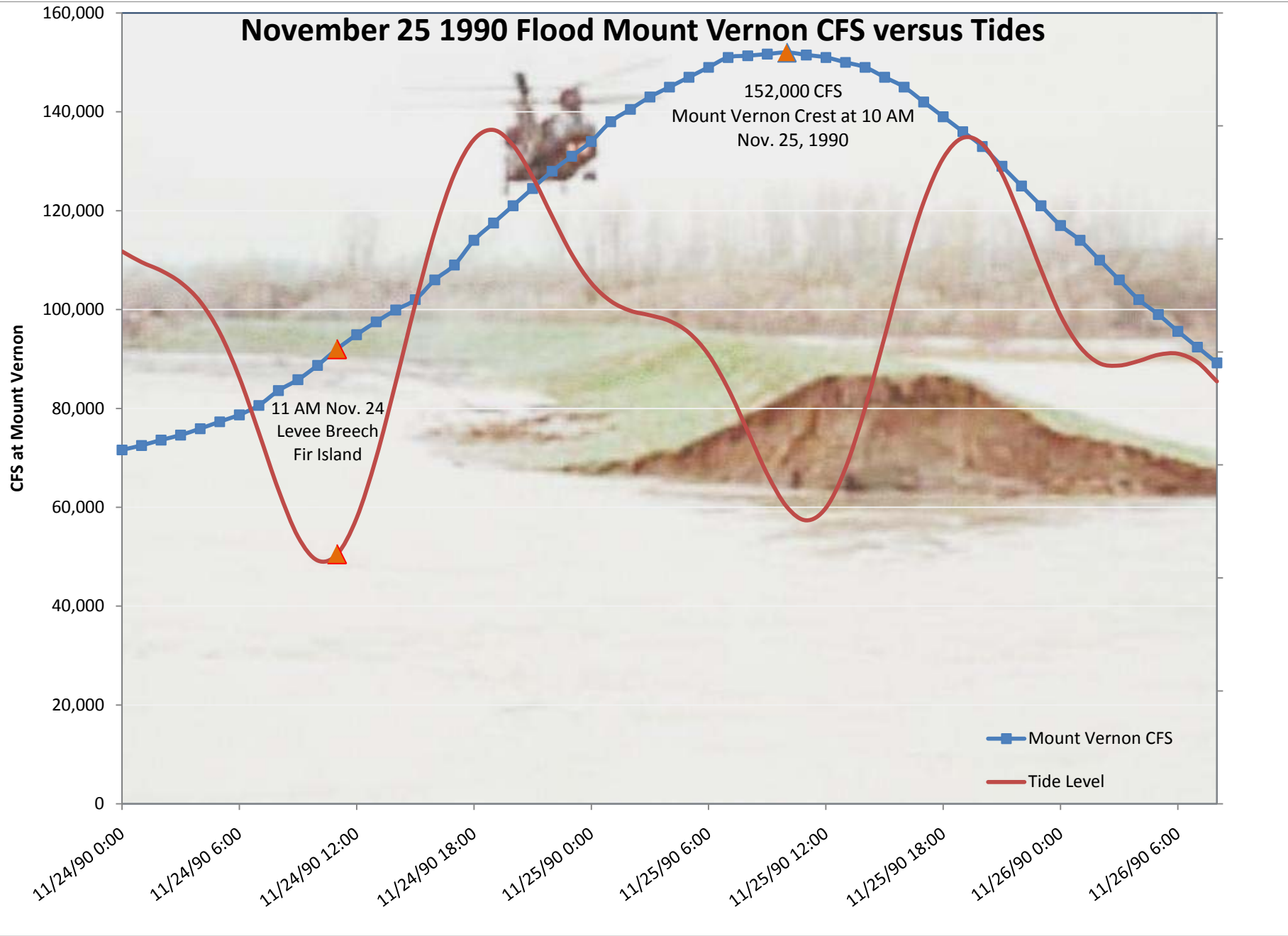
See last graphic.

(Water flowing downstream from Sedro-Woolley, levee configuration and the water draining from the artificial storage basin.)

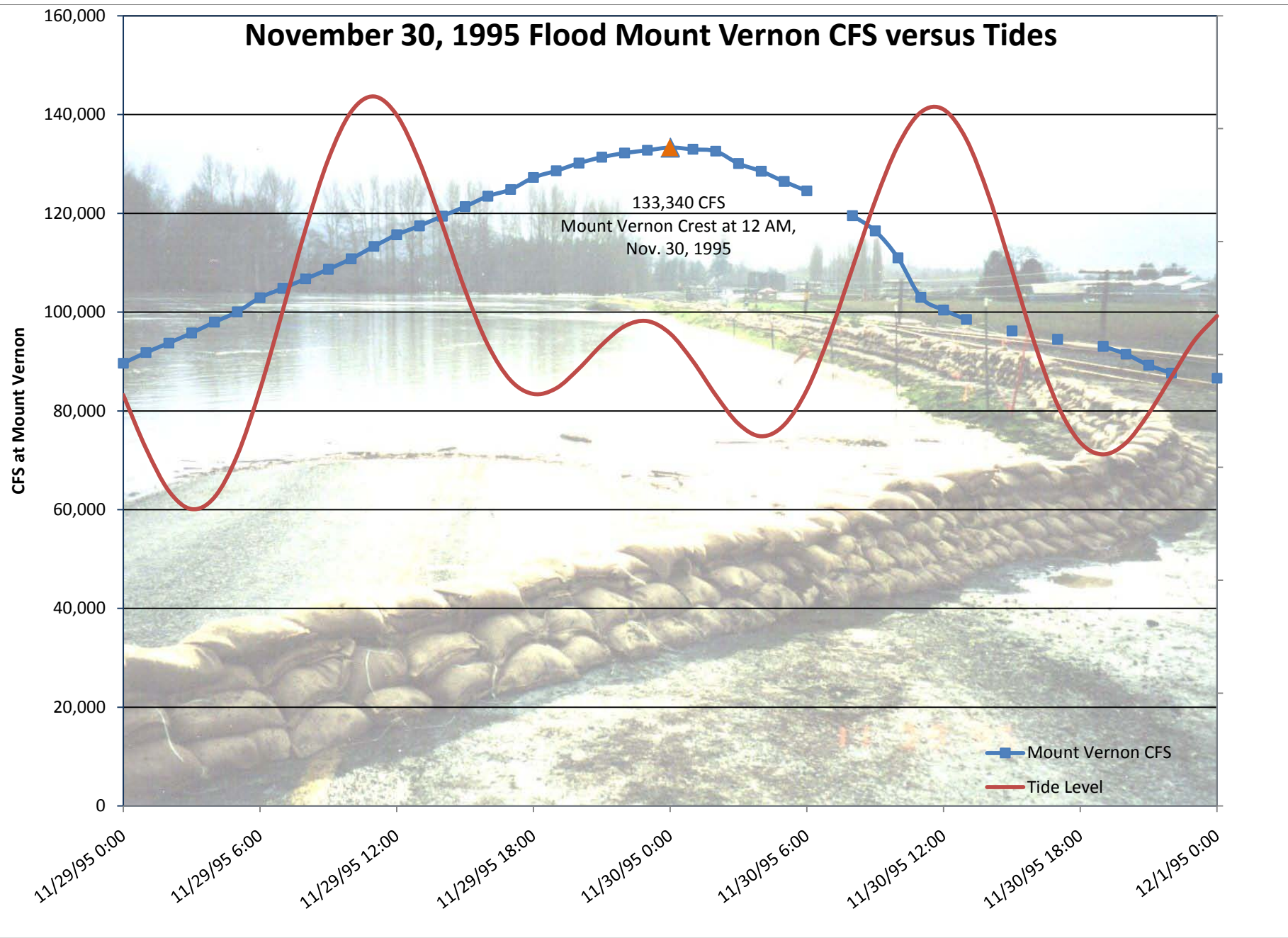
November 11 1990 Flood Mount Vernon CFS versus Tides



November 25 1990 Flood Mount Vernon CFS versus Tides

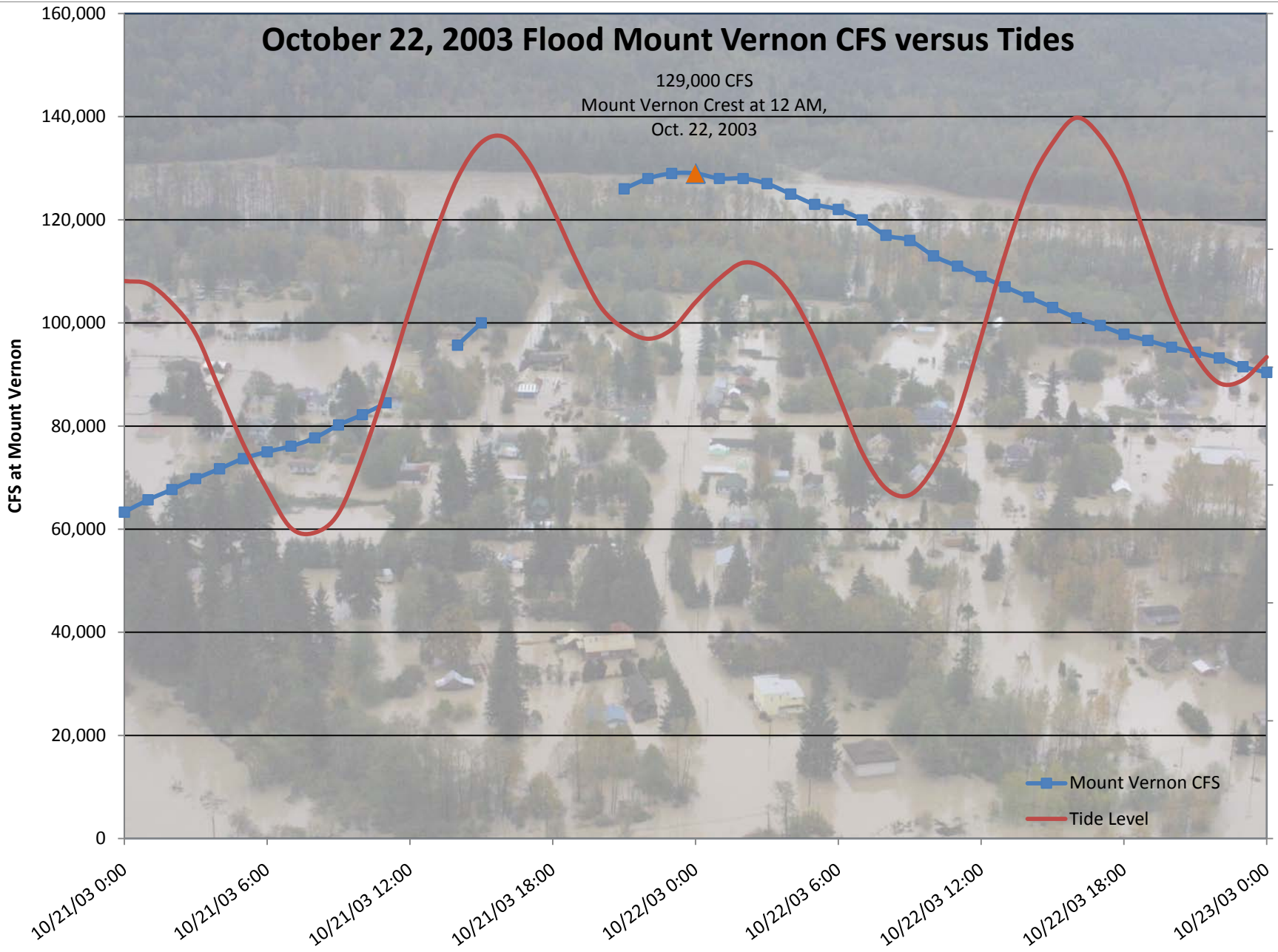


November 30, 1995 Flood Mount Vernon CFS versus Tides



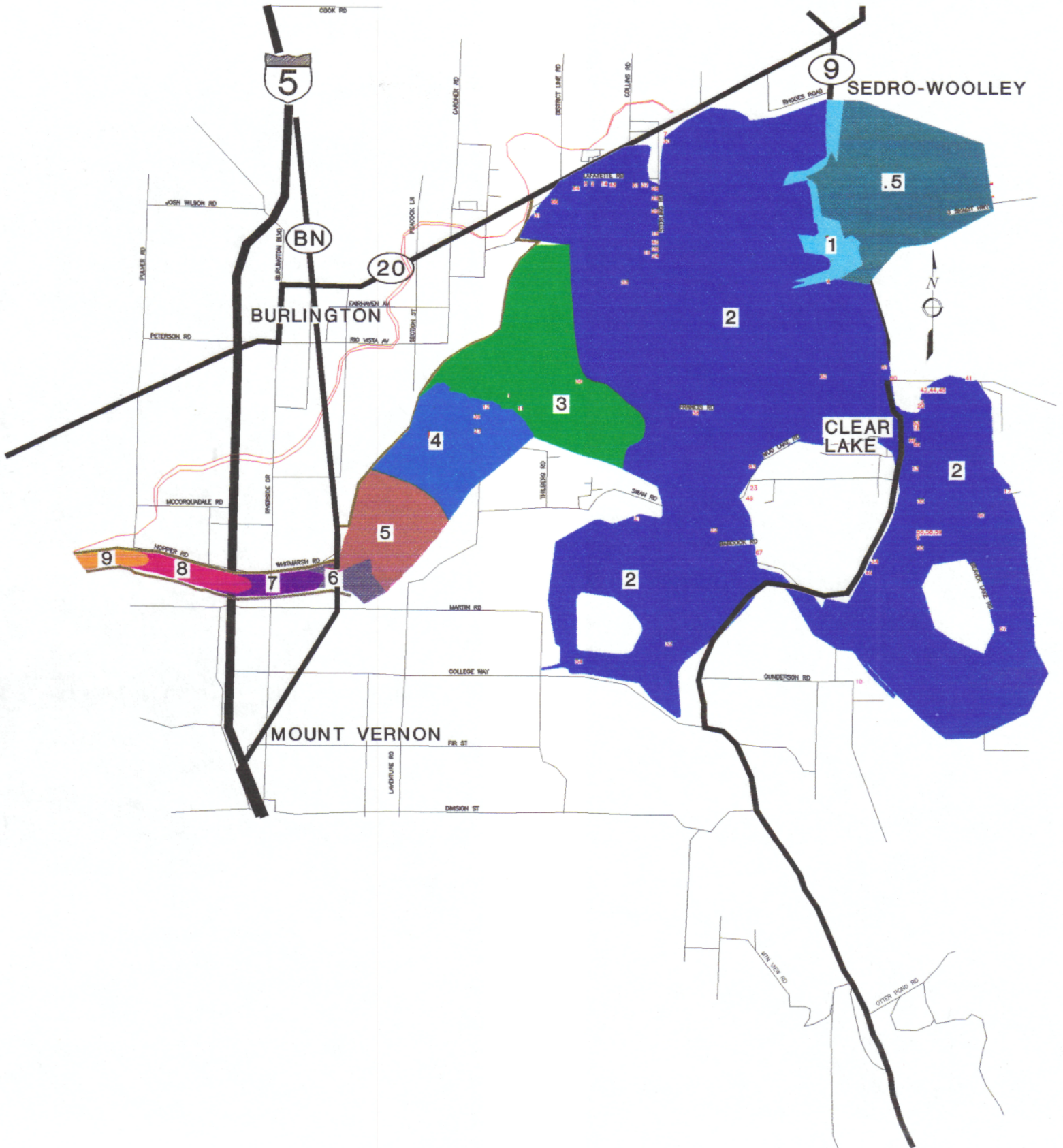
October 22, 2003 Flood Mount Vernon CFS versus Tides

129,000 CFS
Mount Vernon Crest at 12 AM,
Oct. 22, 2003



Mount Vernon CFS
Tide Level

GRAPHIC SUMMARY OF INCREASES IN 1990 FLOOD LEVELS DUE TO LEVEE SYSTEM



November 11 1990 Flood Table			
Date & Time	Mount Vernon CFS	Tide Level	Change in CFS
11/10/90 7:00	75,100.00	6.98	
11/10/90 8:00	76,700.00	8.34	1600.00
11/10/90 9:00	77,800.00	9.73	1100.00
11/10/90 10:00	79,100.00	10.96	1300.00
11/10/90 11:00	81,000.00	11.82	1900.00
11/10/90 12:00	84,200.00	12.18	3200.00
11/10/90 13:00	87,500.00	12	3300.00
11/10/90 14:00	91,000.00	11.37	3500.00
11/10/90 15:00	94,500.00	10.45	3500.00
11/10/90 16:00	97,800.00	9.47	3300.00
11/10/90 17:00	101,000.00	8.62	3200.00
11/10/90 18:00	105,000.00	8.04	4000.00
11/10/90 19:00	108,000.00	7.79	3000.00
11/10/90 20:00	111,000.00	7.81	3000.00
11/10/90 21:00	115,000.00	8.02	4000.00
11/10/90 22:00	118,000.00	8.27	3000.00
11/10/90 23:00	122,000.00	8.41	4000.00
11/11/90 0:00	126,000.00	8.32	4000.00
11/11/90 1:00	130,000.00	7.95	4000.00
11/11/90 2:00	134,000.00	7.36	4000.00
11/11/90 3:00	138,000.00	6.72	4000.00
11/11/90 4:00	140,000.00	6.21	2000.00
11/11/90 5:00	140,670.00	6.03	670.00
11/11/90 6:00	141,330.00	6.26	660.00
11/11/90 7:00	142,000.00	6.91	670.00
11/11/90 8:00	141,500.00	7.9	500.00
11/11/90 9:00	141,000.00	9.07	500.00
11/11/90 10:00	140,000.00	10.26	1000.00
11/11/90 11:00	137,500.00	11.25	2500.00
11/11/90 12:00	135,000.00	11.87	2500.00
11/11/90 13:00	133,330.00	11.97	1670.00
11/11/90 14:00	131,670.00	11.53	1660.00
11/11/90 15:00	130,000.00	10.62	1670.00
11/11/90 16:00	127,670.00	9.46	2330.00
11/11/90 17:00	125,330.00	8.28	2340.00
11/11/90 18:00	123,000.00	7.33	2330.00
11/11/90 19:00	121,000.00	6.75	2000.00
11/11/90 20:00	118,000.00	6.59	3000.00
11/11/90 21:00	115,000.00	6.79	3000.00
11/11/90 22:00	112,000.00	7.25	3000.00
11/11/90 23:00	109,000.00	7.81	3000.00

Flood crest

Levee broke at 1 PM/1300 Hours

November 11 1990 Flood Table			
Date & Time	Mount Vernon CFS	Tide Level	Change in CFS
11/12/90 0:00	106,000.00	8.3	3000.00
11/12/90 1:00	104,000.00	8.57	2000.00
11/12/90 2:00	101,000.00	8.53	3000.00
11/12/90 3:00	99,400.00	8.22	1600.00
11/12/90 4:00	97,400.00	7.76	2000.00
11/12/90 5:00	95,300.00	7.36	2100.00
11/12/90 6:00	93,500.00	7.19	1800.00
11/12/90 7:00	91,600.00	7.39	1900.00

November 25, 1990 Flood Table			
Date & Time	Mount Vernon CFS	Tide Level	Change in CFS
11/24/90 0:00	71,600	9.78	
11/24/90 1:00	72,500	9.59	900.00
11/24/90 2:00	73,600	9.44	1100.00
11/24/90 3:00	74,600	9.23	1000.00
11/24/90 4:00	75,900	8.89	1300.00
11/24/90 5:00	77,300	8.34	1400.00
11/24/90 6:00	78,700	7.55	1400.00
11/24/90 7:00	80,600	6.57	1900.00
11/24/90 8:00	83,600	5.56	3000.00
11/24/90 9:00	85,800	4.73	2200.00
11/24/90 10:00	88,700	4.31	2900.00
11/24/90 11:00	92,000	4.42	3300.00
11/24/90 12:00	94,900	5.06	2900.00
11/24/90 13:00	97,500	6.13	2600.00
11/24/90 14:00	99,900	7.46	2400.00
11/24/90 15:00	102,000	8.85	2100.00
11/24/90 16:00	106,000	10.14	4000.00
11/24/90 17:00	109,000	11.15	3000.00
11/24/90 18:00	114,000	11.76	5000.00
11/24/90 19:00	117,500	11.93	3500.00
11/24/90 20:00	121,000	11.66	3500.00
11/24/90 21:00	124,500	11.10	3500.00
11/24/90 22:00	128,000	10.40	3500.00
11/24/90 23:00	131,000	9.73	3000.00
11/25/90 0:00	134,000	9.22	3000.00
11/25/90 1:00	138,000	8.90	4000.00
11/25/90 2:00	140,500	8.73	2500.00
11/25/90 3:00	143,000	8.65	2500.00
11/25/90 4:00	145,000	8.55	2000.00
11/25/90 5:00	147,000	8.34	2000.00
11/25/90 6:00	149,000	7.95	2000.00
11/25/90 7:00	151,000	7.35	2000.00
11/25/90 8:00	151,330	6.60	330.00
11/25/90 9:00	151,670	5.84	340.00
11/25/90 10:00	152,000	5.26	330.00
11/25/90 11:00	151,500	5.02	500.00
11/25/90 12:00	151,000	5.24	500.00
11/25/90 13:00	150,000	5.94	1000.00
11/25/90 14:00	149,000	7.00	1000.00
11/25/90 15:00	147,000	8.26	2000.00
11/25/90 16:00	145,000	9.54	2000.00

Levee broke 11 AM/1100 Hours

Flood crest

November 25, 1990 Flood Table			
Date & Time	Mount Vernon CFS	Tide Level	Change in CFS
11/25/90 17:00	142,000	10.65	3000.00
11/25/90 18:00	139,000	11.43	3000.00
11/25/90 19:00	136,000	11.79	3000.00
11/25/90 20:00	133,000	11.68	3000.00
11/25/90 21:00	129,000	11.16	4000.00
11/25/90 22:00	125,000	10.35	4000.00
11/25/90 23:00	121,000	9.46	4000.00
11/26/90 0:00	117,000	8.65	4000.00
11/26/90 1:00	114,000	8.09	3000.00
11/26/90 2:00	110,000	7.80	4000.00
11/26/90 3:00	106,000	7.76	4000.00
11/26/90 4:00	102,000	7.84	4000.00
11/26/90 5:00	99,000	7.95	3000.00
11/26/90 6:00	95,600	7.97	3400.00
11/26/90 7:00	92,400	7.82	3200.00
11/26/90 8:00	89,200	7.48	3200.00

November 30, 1995 Flood Table			
Date & Time	Mount Vernon CFS	Tide Level	Change in CFS
29-Nov-1995 00:00	89643	7.28	
29-Nov-1995 01:00	91811	6.33	2168.00
29-Nov-1995 02:00	93743	5.58	1932.00
29-Nov-1995 03:00	95770	5.26	2027.00
29-Nov-1995 04:00	97983	5.47	2213.00
29-Nov-1995 05:00	100050	6.21	2067.00
29-Nov-1995 06:00	102920	7.38	2870.00
29-Nov-1995 07:00	104820	8.78	1900.00
29-Nov-1995 08:00	106740	10.22	1920.00
29-Nov-1995 09:00	108680	11.46	1940.00
29-Nov-1995 10:00	110810	12.3	2130.00
29-Nov-1995 11:00	113310	12.57	2500.00
29-Nov-1995 12:00	115670	12.24	2360.00
29-Nov-1995 13:00	117470	11.41	1800.00
29-Nov-1995 14:00	119450	10.3	1980.00
29-Nov-1995 15:00	121370	9.14	1920.00
29-Nov-1995 16:00	123490	8.17	2120.00
29-Nov-1995 17:00	124830	7.54	1340.00
29-Nov-1995 18:00	127260	7.3	2430.00
29-Nov-1995 19:00	128630	7.4	1370.00
29-Nov-1995 20:00	130180	7.75	1550.00
29-Nov-1995 21:00	131390	8.17	1210.00
29-Nov-1995 22:00	132220	8.5	830.00
29-Nov-1995 23:00	132780	8.59	560.00
30-Nov-1995 00:00	133340	8.37	560.00
30-Nov-1995 01:00	132970	7.88	370.00
30-Nov-1995 02:00	132590	7.28	380.00
30-Nov-1995 03:00	130090	6.77	2500.00
30-Nov-1995 04:00	128530	6.55	1560.00
30-Nov-1995 05:00	126450	6.75	2080.00
30-Nov-1995 06:00	124560	7.37	1890.00
30-Nov-1995 07:00		8.35	
30-Nov-1995 08:00	119540	9.53	
30-Nov-1995 09:00	116440	10.72	3100.00
30-Nov-1995 10:00	110980	11.7	5460.00
30-Nov-1995 11:00	103000	12.29	7980.00
30-Nov-1995 12:00	100430	12.34	2570.00
30-Nov-1995 13:00	98516	11.81	1914.00
30-Nov-1995 14:00		10.79	
30-Nov-1995 15:00	96179	9.5	
30-Nov-1995 16:00		8.19	

Flood crest

November 30, 1995 Flood Table			
Date & Time	Mount Vernon CFS	Tide Level	Change in CFS
30-Nov-1995 17:00	94483	7.11	
30-Nov-1995 18:00		6.44	
30-Nov-1995 19:00	93074	6.23	
30-Nov-1995 20:00	91480	6.43	1594.00
30-Nov-1995 21:00	89252	6.95	2228.00
30-Nov-1995 22:00	87637	7.6	1615.00
30-Nov-1995 23:00		8.24	
01-Dec-1995 00:00	86613	8.68	

October 22 2003 Flood Table			
Date & Time	Mount Vernon CFS	Tide Level	Change in CFS
21-Oct-2003 00:00	63300	9.46	
21-Oct-2003 01:00	65700	9.41	2400.00
21-Oct-2003 02:00	67700	9.08	2000.00
21-Oct-2003 03:00	69800	8.56	2100.00
21-Oct-2003 04:00	71700	7.62	1900.00
21-Oct-2003 05:00	73700	6.69	2000.00
21-Oct-2003 06:00	75000	5.92	1300.00
21-Oct-2003 07:00	76100	5.27	1100.00
21-Oct-2003 08:00	77700	5.19	1600.00
21-Oct-2003 09:00	80200	5.52	2500.00
21-Oct-2003 10:00	82200	6.48	2000.00
21-Oct-2003 11:00	84500	7.68	2300.00
21-Oct-2003 12:00		8.99	
21-Oct-2003 13:00		10.2	
21-Oct-2003 14:00	95,700	11.21	
21-Oct-2003 15:00	100,000	11.81	4300.00
21-Oct-2003 16:00		11.9	
21-Oct-2003 17:00		11.47	
21-Oct-2003 18:00		10.68	
21-Oct-2003 19:00		9.8	
21-Oct-2003 20:00		9.03	
21-Oct-2003 21:00	126,000	8.65	
21-Oct-2003 22:00	128,000	8.48	2000.00
21-Oct-2003 23:00	129,000	8.64	1000.00
22-Oct-2003 00:00	129,000	9.1	0.00
22-Oct-2003 01:00	128,000	9.5	1000.00
22-Oct-2003 02:00	128,000	9.77	0.00
22-Oct-2003 03:00	127,000	9.66	1000.00
22-Oct-2003 04:00	125,000	9.23	2000.00
22-Oct-2003 05:00	123,000	8.48	2000.00
22-Oct-2003 06:00	122,000	7.52	1000.00
22-Oct-2003 07:00	120,000	6.55	2000.00
22-Oct-2003 08:00	117,000	5.94	3000.00
22-Oct-2003 09:00	116,000	5.83	1000.00
22-Oct-2003 10:00	113,000	6.29	3000.00
22-Oct-2003 11:00	111,000	7.17	2000.00
22-Oct-2003 12:00	109,000	8.51	2000.00
22-Oct-2003 13:00	107,000	9.9	2000.00
22-Oct-2003 14:00	105,000	11.07	2000.00
22-Oct-2003 15:00	103,000	11.8	2000.00
22-Oct-2003 16:00	101,000	12.23	2000.00

Flood crest

October 22 2003 Flood Table			
Date & Time	Mount Vernon CFS	Tide Level	Change in CFS
22-Oct-2003 17:00	99,500	11.92	1500.00
22-Oct-2003 18:00	97,800	11.23	1700.00
22-Oct-2003 19:00	96,600	10.1	1200.00
22-Oct-2003 20:00	95,300	8.99	1300.00
22-Oct-2003 21:00	94,300	8.19	1000.00
22-Oct-2003 22:00	93,200	7.73	1100.00
22-Oct-2003 23:00	91,500	7.78	1700.00
23-Oct-2003 00:00	90,400	8.17	1100.00