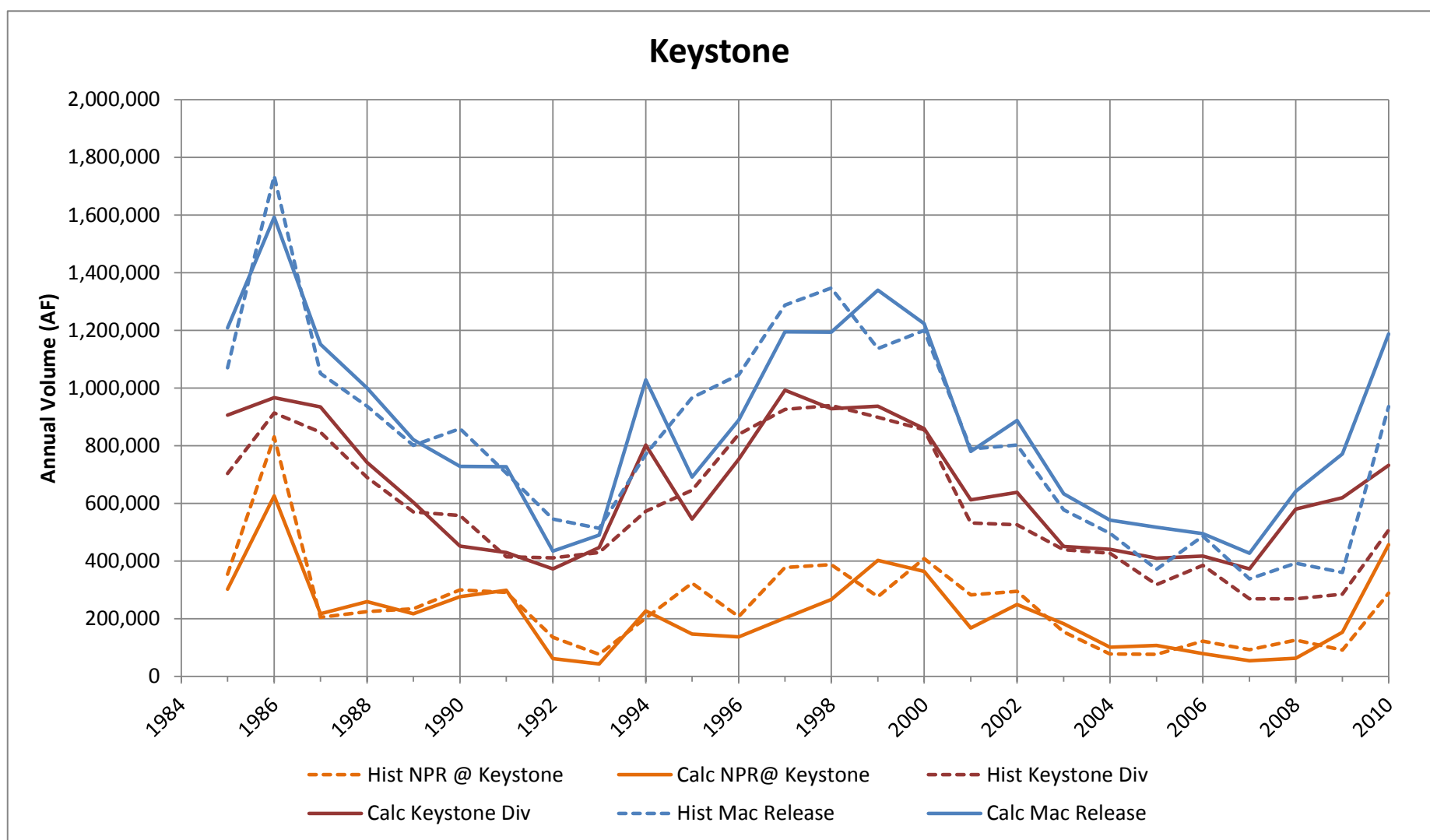


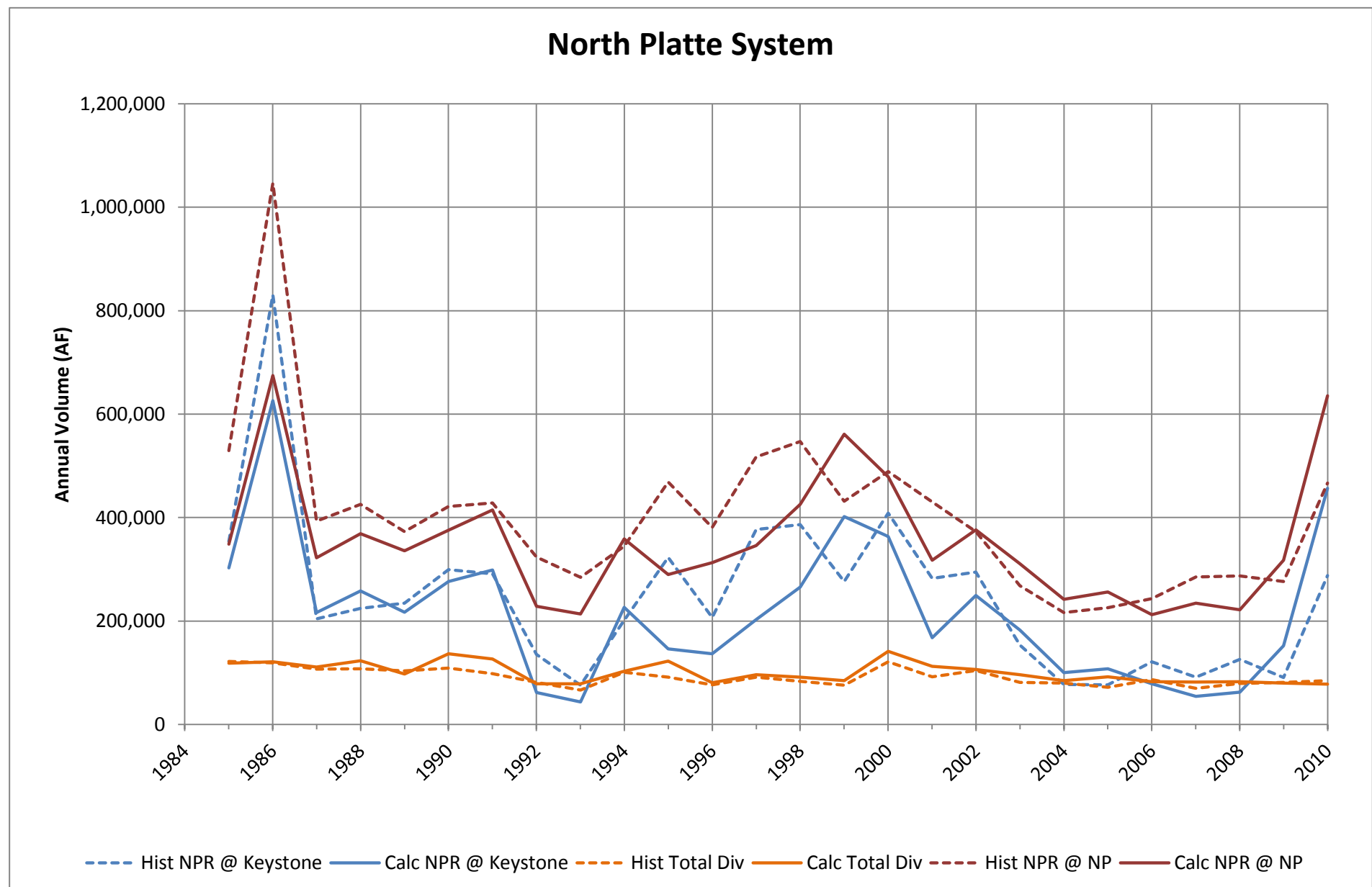
## **Integrated Model Calibration Results – Reach Scale Water Budgets**

Appendix 8-D includes annual tabular data and plots of historic and calculated water budgets terms for selected reaches/junctions for evaluating integrated model performance and inform the overall model calibration. The reaches/junctions include Keystone Analysis Point, North Platte River System, Sutherland System, CNPPID System, and the Platte River at North Platte. The water budgets terms consider inflows and outflows, reach gain loss, change in reservoir storage, and surface water loss to the system.

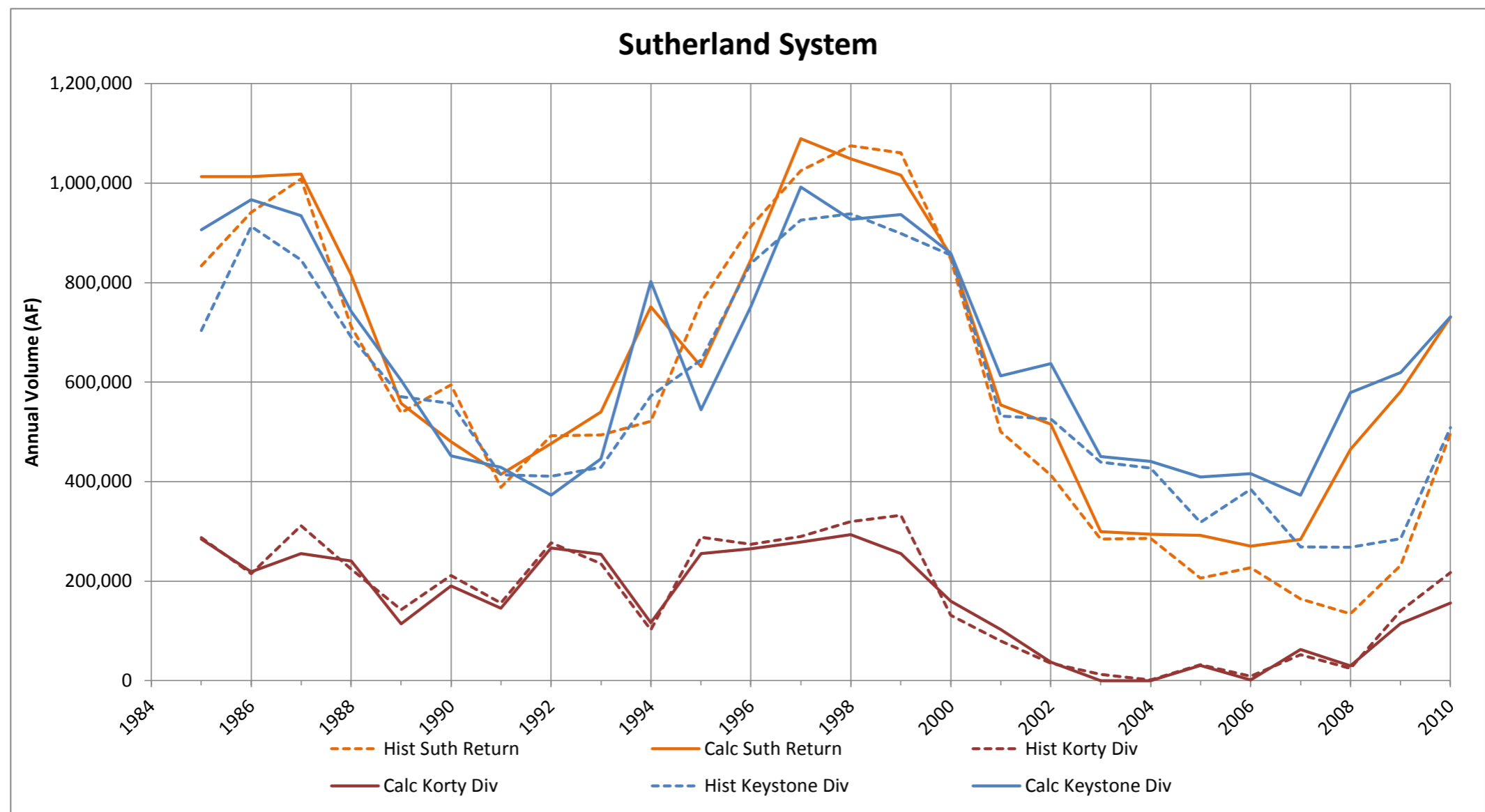
Keystone Analysis Point Water Budget						
Year	Historic Volume (AF)			Calculated Volume (AF)		
	Lake Mac Release	Keystone Div	NPR @ Keystone	Lake Mac Release	Keystone Div	NPR @ Keystone
1985	1,070,079	703,841	353,749	1,208,468	906,063	302,404
1986	1,736,025	913,283	830,323	1,592,490	966,630	625,860
1987	1,049,937	846,109	204,124	1,151,146	934,543	216,603
1988	937,250	689,942	224,430	1,000,154	741,962	258,192
1989	800,406	570,462	234,187	820,423	603,320	217,103
1990	859,331	557,046	299,107	728,128	451,784	276,343
1991	704,356	413,726	291,368	726,905	428,571	298,334
1992	545,093	410,580	135,533	434,484	372,905	61,579
1993	513,606	428,537	76,217	489,357	446,166	43,191
1994	769,886	572,279	201,606	1,028,574	802,095	226,479
1995	966,647	644,727	322,603	691,055	544,731	146,324
1996	1,045,833	839,111	206,640	889,009	752,685	136,324
1997	1,287,648	926,045	376,745	1,194,983	992,438	202,545
1998	1,346,229	938,771	386,615	1,193,322	927,461	265,860
1999	1,136,956	898,766	276,422	1,339,150	937,016	402,134
2000	1,199,776	855,219	408,632	1,222,773	859,245	363,527
2001	788,215	531,576	282,680	780,079	612,414	167,665
2002	802,329	525,842	294,771	886,714	637,544	249,170
2003	576,730	439,571	153,688	633,053	450,482	182,571
2004	495,455	427,043	77,013	541,176	440,756	100,420
2005	371,723	317,851	76,319	516,536	409,215	107,321
2006	485,923	384,522	121,131	494,821	416,378	78,443
2007	337,241	268,869	91,646	426,930	372,892	54,037
2008	391,775	268,164	125,793	641,510	579,208	62,302
2009	359,974	284,977	90,913	771,563	619,345	152,218
2010	935,687	507,227	287,929	1,187,354	731,078	456,275
<b>Grand Total</b>	<b>21,514,108</b>	<b>15,164,089</b>	<b>6,430,182</b>	<b>22,590,159</b>	<b>16,936,929</b>	<b>5,653,221</b>
			Diff (Calc-Hist)	1,076,052	1,772,840	-776,961



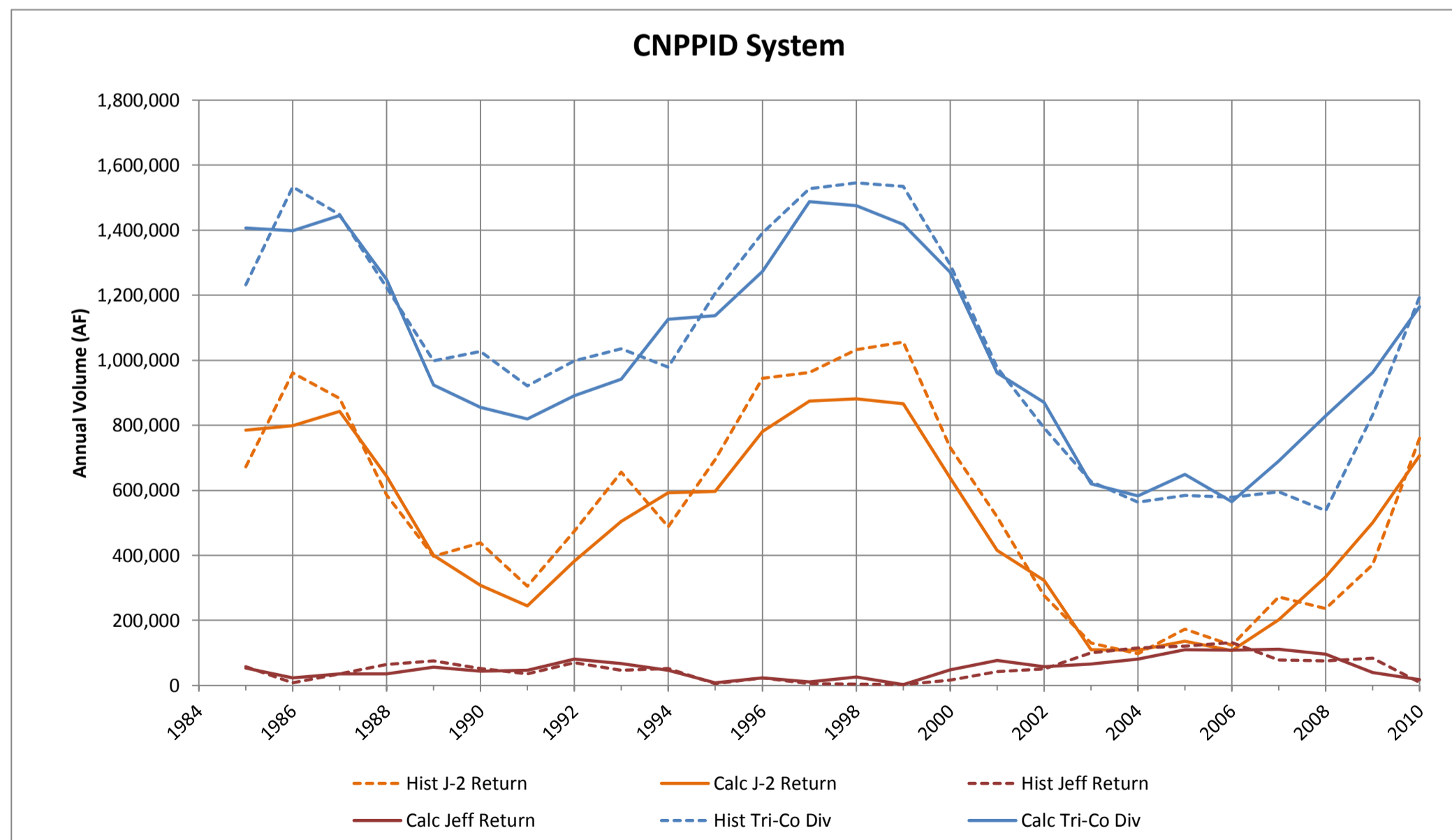
North Platte River System Water Budget									
Year	Historic Volume (AF)				Calculated Volume (AF)				
	NPR @ Keystone	Total Canal Div	NPR @ NP	Calc RGL	NPR @ Keystone	Total Canal Div	Total Canal Rtn	NPR @ NP	Calc RGL
1985	353,749	121,987	529,210	297,447	302,404	118,267	18,693	348,820	145,990
1986	830,323	119,066	1,046,632	335,375	625,860	120,943	19,151	674,726	150,658
1987	204,124	106,650	393,225	295,751	216,603	111,102	17,186	322,152	199,465
1988	224,430	107,668	425,796	309,034	258,192	123,116	19,754	368,724	213,895
1989	234,187	103,357	372,573	241,743	217,103	97,725	15,568	335,963	201,018
1990	299,107	108,672	421,202	230,767	276,343	136,482	22,900	375,501	212,740
1991	291,368	98,160	428,321	235,112	298,334	126,261	20,484	414,552	221,995
1992	135,533	81,055	323,796	269,318	61,579	78,318	12,383	228,417	232,773
1993	76,217	66,328	284,215	274,327	43,191	78,602	12,502	213,879	236,788
1994	201,606	100,666	344,438	243,497	226,479	102,639	16,564	358,767	218,363
1995	322,603	91,110	468,795	237,303	146,324	122,670	20,201	289,742	245,886
1996	206,640	76,258	380,997	250,615	136,324	80,696	12,926	313,094	244,541
1997	376,745	91,488	517,051	231,795	202,545	96,461	15,313	346,086	224,689
1998	386,615	83,288	546,770	243,443	265,860	91,110	14,523	425,771	236,498
1999	276,422	76,161	431,744	231,484	402,134	84,534	13,680	561,443	230,163
2000	408,632	121,220	488,634	201,222	363,527	141,453	24,028	478,545	232,442
2001	282,680	91,814	430,007	239,141	167,665	112,613	19,549	317,634	243,034
2002	294,771	104,557	372,895	182,681	249,170	106,493	18,711	376,289	214,901
2003	153,688	81,427	268,532	196,271	182,571	96,391	17,596	310,893	207,117
2004	77,013	80,209	216,046	219,242	100,420	84,572	15,265	241,976	210,863
2005	76,319	71,552	225,959	221,193	107,321	91,987	16,504	256,075	224,238
2006	121,131	86,855	243,521	209,245	78,443	82,365	14,809	212,272	201,385
2007	91,646	69,945	284,936	263,234	54,037	82,131	14,580	234,777	248,291
2008	125,793	79,505	287,189	240,901	62,302	82,491	14,911	221,489	226,768
2009	90,913	81,271	276,399	266,757	152,218	79,688	14,140	317,856	231,186
2010	288,058	84,728	466,828	263,498	456,275	78,023	13,627	635,644	243,765
<b>Grand Total</b>	<b>6,430,311</b>	<b>2,384,996</b>	<b>10,475,708</b>	<b>6,430,394</b>	<b>5,653,221</b>	<b>2,607,134</b>	<b>435,549</b>	<b>9,181,089</b>	<b>5,699,454</b>
				Diff (Calc-Hist)	-777,090	222,138		-1,294,619	730,940



Sutherland System Water Budget										
Year	Historic Volume (AF)					Calculated Volume (AF)				
	Keystone	Korty	Suth. Return	Delta Storage	Calc. SW Loss	Keystone	Korty	Suth. Return	Delta Storage	Calc. SW Loss
1985	703,841	287,657	833,435	-4,596	162,659	906,063	284,411	1,013,307	-5,242	182,409
1986	913,283	214,820	941,256	-5,130	191,977	966,630	218,627	1,012,943	0	172,313
1987	846,109	311,496	1,008,684	10,972	137,949	934,543	255,448	1,018,643	793	170,555
1988	689,942	224,110	711,263	-6,842	209,632	741,962	240,553	814,840	-572	168,247
1989	570,462	142,247	538,235	3,970	170,504	603,320	114,104	557,609	1,735	158,081
1990	557,046	211,309	594,992	6,980	166,383	451,784	190,619	480,321	-1,132	163,214
1991	413,726	155,924	388,274	-8,136	189,512	428,571	145,713	414,346	1,946	157,992
1992	410,580	277,408	492,151	-5,192	201,030	372,905	266,704	476,688	69	162,852
1993	428,537	234,918	493,478	7,370	162,608	446,166	254,147	540,377	-1,877	161,813
1994	572,279	102,319	521,187	1,731	151,681	802,095	116,274	751,260	-36	167,145
1995	644,727	288,266	760,689	-1,324	173,628	544,731	255,124	631,332	1,036	167,487
1996	839,111	274,122	912,724	320	200,189	752,685	265,023	846,856	-1,151	172,002
1997	926,045	289,710	1,024,861	6,226	184,667	992,438	278,283	1,089,111	0	181,610
1998	938,771	319,307	1,075,299	-5,221	188,000	927,461	293,413	1,049,146	1,970	169,758
1999	898,766	332,569	1,060,901	-8,331	178,765	937,016	255,732	1,015,987	-1,970	178,731
2000	855,219	131,704	847,410	4,560	134,954	859,245	160,012	854,829	1,970	162,458
2001	531,576	79,987	500,366	3,372	107,826	612,414	102,832	554,168	-1,970	163,048
2002	525,842	34,570	412,979	1,172	146,261	637,544	37,044	515,483	1,970	157,135
2003	439,571	12,469	284,473	-5,646	173,212	450,482	117	299,361	-1,970	153,208
2004	427,043	1,093	286,110	-195	142,222	440,756	0	294,175	0	146,581
2005	317,851	32,118	206,346	9,019	134,604	409,215	30,441	291,912	0	147,744
2006	384,522	9,119	226,830	3,099	163,712	416,378	1,036	270,636	0	146,778
2007	268,869	51,938	164,380	202	156,225	372,892	62,223	284,036	0	151,080
2008	268,164	24,312	134,634	-1,013	158,855	579,208	30,047	464,646	0	144,609
2009	284,977	140,581	231,665	9,970	183,923	619,345	114,537	581,238	0	152,644
2010	508,667	217,052	496,451	-14,701	243,969	731,078	155,946	730,970	0	156,054
<b>Grand Total</b>	<b>15,165,529</b>	<b>4,401,127</b>	<b>15,149,072</b>	<b>2,636</b>	<b>4,414,948</b>	<b>16,936,929</b>	<b>4,128,411</b>	<b>16,854,221</b>	<b>-4,429</b>	<b>4,215,549</b>
					Diff (Calc-Hist)	1,771,400	-272,715	1,705,148	-7,065	-199,399



CNPPID System Water Budget																
Year	Historic Volume (AF)								Calculated Volume (AF)							
	Tri-County	Jeffrey Return	E-65	E-67	Phelps	J-2 Return	Delta Storage	SW Loss	Tri-County	Jeffrey Return	E-65	E-67	Phelps	J-2 Return	Delta Storage	SW Loss
1985	1,232,162	58,237	51,011	11,909	109,071	672,456	2,137	327,341	1,406,745	53,926	96,389	10,171	116,843	784,677	-6,513	351,252
1986	1,532,932	7,563	55,922	12,454	121,800	960,938	-735	374,990	1,398,634	22,979	95,657	10,973	125,541	798,469	480	344,535
1987	1,447,640	35,055	51,685	11,044	102,536	883,146	3,780	360,394	1,444,799	36,042	89,068	9,536	110,452	843,372	-742	357,070
1988	1,223,480	64,278	61,730	11,566	139,218	585,039	-3,465	365,115	1,249,257	35,341	104,156	12,429	140,006	642,913	362	314,052
1989	998,168	75,938	62,749	11,659	119,529	397,206	3,061	328,026	924,461	55,923	90,713	10,036	114,592	399,614	1	253,583
1990	1,027,420	52,370	63,261	11,558	150,706	438,825	-179	310,880	854,867	43,666	109,863	13,321	134,350	307,368	459	245,841
1991	921,317	35,464	58,294	10,848	160,483	304,949	1,926	349,353	819,117	46,707	118,761	14,663	153,550	244,250	-544	241,730
1992	997,678	70,620	60,377	10,996	124,909	473,834	4,307	252,636	891,216	80,314	86,133	9,335	92,280	382,139	1,309	239,706
1993	1,035,191	46,600	34,836	4,649	48,123	655,263	-7,151	252,871	942,204	66,638	61,742	5,953	64,555	504,912	333	238,072
1994	979,095	51,993	58,675	14,428	107,966	488,049	8,731	249,253	1,126,367	47,144	86,356	9,234	106,921	592,269	946	283,497
1995	1,205,982	4,701	65,052	13,311	145,527	694,544	2,621	280,225	1,137,636	7,435	100,601	11,828	133,792	596,924	202	286,854
1996	1,391,439	22,733	38,563	10,159	78,847	944,543	-842	297,436	1,273,276	23,026	69,877	6,901	84,731	781,136	-652	308,257
1997	1,527,253	5,300	59,860	14,051	148,451	962,565	-543	337,570	1,487,294	10,404	100,974	11,883	134,550	874,294	535	354,654
1998	1,545,680	4,467	61,129	11,958	102,998	1,032,520	656	331,952	1,475,905	25,299	87,507	9,255	107,878	881,620	-955	365,302
1999	1,534,850	2,828	89,088	10,449	107,379	1,055,685	-5,392	274,813	1,418,104	1,977	85,244	9,042	106,228	866,638	-80	349,056
2000	1,293,658	16,969	103,740	12,371	129,594	731,697	4,755	294,533	1,270,880	47,605	105,304	12,650	142,078	638,328	481	324,435
2001	977,244	41,942	86,581	10,738	116,559	518,763	101	202,560	961,168	76,176	94,727	10,866	105,821	415,547	754	257,278
2002	792,062	51,060	95,815	9,424	137,451	276,526	4,218	217,568	870,840	57,126	102,880	7,664	134,639	323,128	-552	245,956
2003	626,926	100,655	90,917	6,456	131,673	130,770	-2,751	169,205	619,979	66,328	102,179	7,903	110,733	109,317	277	223,243
2004	563,316	115,373	82,650	5,629	121,156	96,785	6,598	135,125	583,244	81,116	86,166	5,730	90,124	109,038	387	210,682
2005	583,867	120,688	50,685	3,388	77,811	172,606	1,792	156,897	648,854	109,818	87,828	5,129	88,196	135,523	-1,463	223,823
2006	579,172	131,510	60,593	3,762	79,162	123,435	3,915	176,794	564,777	108,541	74,293	3,695	64,815	107,295	384	205,754
2007	595,706	78,615	49,999	1,867	57,928	272,592	-1,752	136,456	689,768	111,795	73,872	3,137	81,269	202,005	-375	218,065
2008	537,644	75,550	53,785	2,435	58,661	236,771	-67	110,508	828,796	95,899	77,543	3,689	84,607	334,569	-149	232,638
2009	832,306	83,552	67,772	3,493	90,127	371,451	-4,734	220,646	962,824	39,701	77,615	3,719	96,718	499,827	-110	245,355
2010	1,195,433	9,246	88,480	4,089	77,724	760,124	-3,066	258,836	1,164,177	17,162	66,941	2,260	77,814	706,130	148	293,723
<b>Grand Total</b>	<b>27,177,619</b>	<b>1,363,308</b>	<b>1,703,247</b>	<b>234,690</b>	<b>2,845,388</b>	<b>14,241,081</b>	<b>17,921</b>	<b>6,771,983</b>	<b>27,015,190</b>	<b>1,368,086</b>	<b>2,332,385</b>	<b>221,001</b>	<b>2,803,083</b>	<b>13,081,300</b>	<b>-5,078</b>	<b>7,214,413</b>
								Diff (Calc-Hist)	-162,429	4,778	629,138	-13,690	-42,305	-1,159,781	-22,998	442,429



North Platte River System Water Budget								
Year	Historic Volume (AF)				Calculated Volume (AF)			
	NPR @ NP	SP @ NP	Suth Rtn	PR @ NP	NPR @ NP	SP @ NP	Suth Rtn	PR @ NP
1985	529,210	397,396	833,435	1,760,041	348,820	288,708	1,013,307	1,650,834
1986	1,046,632	547,797	941,256	2,535,685	674,726	405,931	1,012,943	2,093,600
1987	393,225	476,172	1,008,684	1,878,081	322,152	433,395	1,018,643	1,774,189
1988	425,796	274,776	711,263	1,411,834	368,724	192,355	814,840	1,375,919
1989	372,573	142,857	538,235	1,053,665	335,963	105,192	557,609	998,764
1990	421,202	121,311	594,992	1,137,505	375,501	124,183	480,321	980,005
1991	428,321	161,181	388,274	977,776	414,552	133,675	414,346	962,573
1992	323,796	204,797	492,151	1,020,744	228,417	180,616	476,688	885,721
1993	284,215	237,582	493,478	1,015,275	213,879	153,536	540,377	907,792
1994	344,438	154,608	521,187	1,020,232	358,767	106,865	751,260	1,216,893
1995	468,795	1,053,602	760,689	2,283,086	289,742	983,409	631,332	1,904,483
1996	380,997	290,344	912,724	1,584,065	313,094	222,286	846,856	1,382,236
1997	517,051	684,754	1,024,861	2,226,666	346,086	600,723	1,089,111	2,035,920
1998	546,770	383,151	1,075,299	2,005,220	425,771	383,736	1,049,146	1,858,653
1999	431,744	829,626	1,060,901	2,322,272	561,443	831,007	1,015,987	2,408,438
2000	488,634	213,140	847,410	1,549,184	478,545	190,217	854,829	1,523,591
2001	430,007	190,090	500,366	1,120,463	317,634	138,539	554,168	1,010,341
2002	372,895	103,160	412,979	889,033	376,289	99,098	515,483	990,870
2003	268,532	78,494	284,473	631,500	310,893	62,140	299,361	672,395
2004	216,046	77,925	286,110	580,080	241,976	59,484	294,175	595,635
2005	225,959	134,291	206,346	566,597	256,075	114,996	291,912	662,984
2006	243,521	95,344	226,830	565,694	212,272	74,084	270,636	556,992
2007	284,936	154,738	164,380	604,054	234,777	142,549	284,035	661,361
2008	287,189	125,076	134,634	546,899	221,489	115,860	464,646	801,996
2009	276,399	332,904	231,665	840,968	317,856	138,271	581,238	1,037,365
2010	466,828	541,446	496,451	1,504,725	635,644	189,719	730,970	1,556,333
<b>Grand Total</b>	<b>10,475,708</b>	<b>8,006,562</b>	<b>15,149,072</b>	<b>33,631,343</b>	<b>9,181,089</b>	<b>6,470,574</b>	<b>16,854,221</b>	<b>32,505,884</b>
				Diff (Calc-Hist)	-1,294,619	-1,535,989	1,705,148	-1,125,459

