

Appendix G DSM2-Hydro Results

The DSM2-Hydro was run from Water Year 1976 to 1991 and output was provided for a number of locations in the Delta. Figure 1 shows a map of the Delta and all of the available output locations as well as the direction of positive flow and velocity for each location. Table 1 lists these output locations along with the common name, representative DSM2 channel number and distance in channel. All of the results from DSM2-Hydro are provided in spreadsheets, but for purposes of this document only four sites were selected for display. These four sites were generally a combination of flows that represent an imaginary boundary internal to the Delta. These four sites were:

- Cross Delta flow – a combination of Georgiana Slough, North Fork of Mokelumne, and South Fork of the Mokelumne (GEORGIANA_SL, NORTH_FORK_MOKE, and RSMKL008 as respectively labeled in Figure 1).
- QWest flow – a combination of San Joaquin River at Blind Point, Three Mile Slough, and Dutch Slough (RSAN014,SLTRM004, and SLDUT007 as respectively labeled in Figure 1).
- Old and Middle River flow – a combination of Old River at Bacon Island and Middle River at Middle River (ROLD024, and RMID015 as respectively labeled in Figure 1).
- Old River at Head – described by a single output location ROLD074 as labeled in Figure 1.

One location from each of the groups was used to give an indication of the average velocity. From the Cross Delta group GEORGIANA_SL is presented for velocity. From the Qwest group RANS014 is presented for velocity, and from Old and Middle River RMID015 is presented.

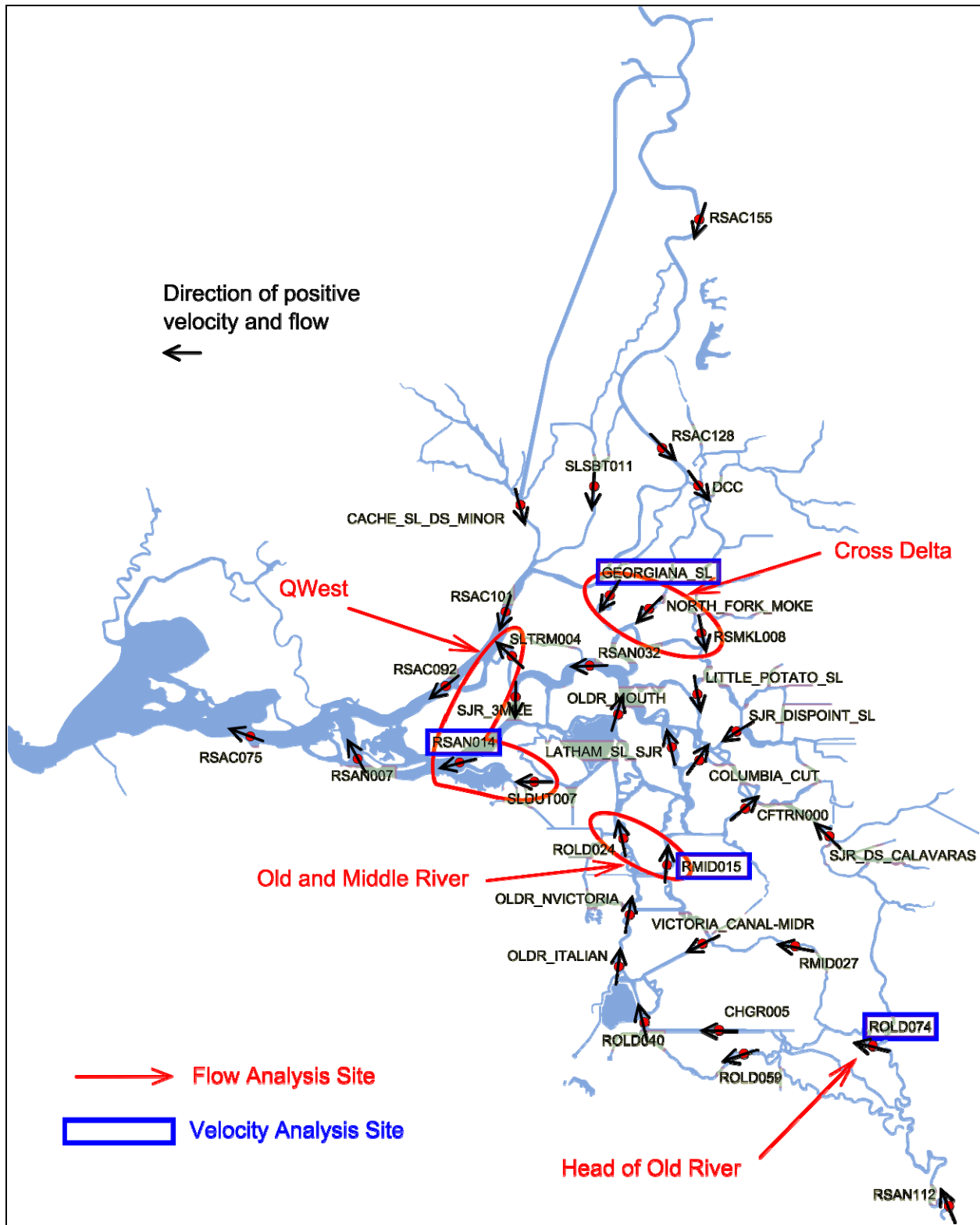


Figure 1. DSM2-Hydro locations of output for flow (cfs) and velocity (ft/s). Arrows represent the direction of positive flow and velocity.

Table 1. Definitions for the DSM2 output

DSM2 Output Name	Channel	Distance	Common Name
CFTRN000	172	727	Turner Cut
CHGRL005	211	1585	Grant Line Canal (West Position)
RMID015	144 - 145	838	Middle River at Middle River (west channel)
RMID027	133	3641	Middle River at Tracy Blvd
ROLD014	117	0	Old River at Holland Cut
ROLD024	106	2718	Old River at Bacon Island
ROLD040	82	2609	Old River at Clifton Court Ferry
ROLD059	71	3116	Old River at Tracy Road
ROLD074	54	735	Head of Old River
RSAC075	437	11108	Sacramento River at Mallard Island
RSAC092	434	435	Sacramento River at Emmaton
RSAC101	430	9684	Sacramento River at Rio Vista
RSAC128	421	8585	Sacramento River above Delta Cross Channel
RSAC155	414	11921	Sacramento River at Freeport
RSAN007	52	366	San Joaquin River at Antioch
RSAN014	49	9570	San Joaquin River at Blind Point
RSAN024	47	8246	San Joaquin River at Bradford Isl.
RSAN032	349	9672	San Joaquin River at San Andreas Landing
RSAN058	20	2520	San Joaquin River at Stockton Ship Channel
RSAN112	17	4744	San Joaquin River at Vernalis
RSMKL008	344	7088	South Fork Mokelumne at Staten Island
SLDUT007	274	7351	Dutch Slough
SLSBT011	385	2273	Steamboat Slough
SLTRM004	310	540	Three Mile Slough
DCC	365	0	Delta Cross Channel
COLUMBIA_CUT	160	50	Columbia Cut
SJR_DS_CALAVARAS	21	0	San Joaquin River downstream Calaveras River
SJR_3MILE	49	9570	San Joaquin River at Three Mile Slough
OLDR_ITALIAN	88	0	Old River at Italian Slough
OLDR_NVICTORIA	91	4119	Old River at North Victoria Canal
OLDR_MOUTH	124	7062	Mouth of Old River
LATHAM_SL_SJR	161	10808	Latham Slough at San Joaquin River
VICTORIA_CANAL_MIDR	226	4153	Victoria Canal at Middle River
SJR_DISPOINT_SL	314	8130	Disappointment Slough at San Joaquin River
LITTLE_POTATO_SL	325	9962	Little Potato Slough
NORTH_FORK_MOKE	363	6133	North Fork Mokelumne River
GEORGIANA_SL	371	7766	Georgiana Slough
CACHE_SL_DS_MINOR	398	0	Cache Slough downstream Minor Slough
OMR	144 - 145 + 106	--	Old and Middle River
QWEST	274 + 49 + 310	--	Western Flow (QWEST)
XDELTA	371 + 363 + 344	--	Cross Delta Flow

The DSM2-Hydro results were aggregated from a fifteen-minute time-step to a daily average. A Godin filter was first applied to the data to remove the tidal variations, and then a daily average of the filtered data was applied. This is the same process that the United States Geological Survey (USGS) uses to determine daily averages for locations under tidal influence. The flow results are presented in Table 2 and velocity results are presented in Table 3. Both tables present the minimum, 25 percentile, median, 75 percentile, and maximum value for water years 1976 to 1991, broken down into groups representing annual quarters, and year type groups. The monthly

output was grouped into the annual quarters: January through March (Jan-Mar), April through June (Apr-Jun), July through September (Jul-Sep), and October through December (Oct-Dec). The year types were grouped into two representative groups: Wet and Above Normal (W-AN), and Below Normal, Dry and Critical (C-D-BN). For regional flows that cross more than one individual location, for example Old and Middle River includes two output locations, a simple time period summation was conducted.

Figure 2 shows an example plot of what can be generated from the DSM2 spreadsheets as part of this appendix. Box plots show the minimum, 25 percentile, median, 75 percentile, and maximum value of either flow in cfs or velocity in ft/s. Along with the box plots results are also displayed in exceedance plots that show the percent of time in which a certain value was exceeded.

The hydrodynamic result spreadsheets provided electronically are:

- Hydro_meanFlow.xls – provides results for flow, and
- Hydro_meanVelocity.xls – provide results for velocity.

Table 2. DSM2-Hydro tidally filtered daily average flow for water years 1976 to 1991. Shading indicates negative (landward) flows. Positive flows are towards the ocean.

Name	Year Types	Month Range	Study 6.0					Study 7.0					Study 7.1					Study 8.0				
			Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max
Head of Old River	W AN	Jan-Mar	1433	3772	8297	9708	17657	1433	3782	8322	9726	17688	1195	3712	8073	9555	16726	1180	3676	8047	9557	16691
		Apr-Jun	1292	3669	5517	9014	10450	1276	3690	5544	9026	10491	0	3601	5670	8719	10098	0	3598	5659	8646	10119
		Jul-Sep	830	1354	1610	3731	9939	833	1339	1615	3732	9956	451	1736	1958	3964	9582	450	1766	1963	3924	9588
		Oct-Dec	225	715	1539	3545	9992	202	721	1544	3544	10006	141	301	857	1556	9634	126	299	851	1545	9621
	C D BN	Jan-Mar	728	1085	1441	1696	4776	728	1093	1441	1694	4785	610	1046	1307	1593	4561	517	964	1254	1564	4516
		Apr-Jun	202	411	657	893	4497	176	409	650	917	4497	0	0	663	1092	4114	0	0	569	1007	4100
		Jul-Sep	159	341	626	803	1294	110	332	616	797	1286	185	301	366	451	1263	186	302	353	447	1171
		Oct-Dec	249	568	1001	1222	1745	257	582	1003	1242	1742	155	247	410	1066	1624	147	241	407	1083	1589
Old and Middle River	W AN	Jan-Mar	-9811	-6197	-2189	3590	23765	-9811	-6343	-2271	3508	22248	-10969	-6522	-2063	4484	22446	-10993	-5916	-2654	3720	22029
		Apr-Jun	-8033	-3638	-704	1326	9011	-8041	-4094	-662	1613	8614	-7621	-3870	-2607	754	8392	-7825	-3851	-2645	797	8378
		Jul-Sep	-11481	-9831	-8699	-7877	1425	-11285	-9669	-8482	-7576	1469	-10871	-9188	-8070	-7439	1268	-11402	-9571	-8727	-7826	1312
		Oct-Dec	-10847	-8723	-7753	-4430	9519	-10845	-8793	-7908	-3575	5659	-11664	-10197	-9060	-3196	6273	-11635	-10192	-9062	-3043	6153
	C D BN	Jan-Mar	-10175	-7812	-5800	-2408	544	-10174	-7724	-5642	-3220	64	-11482	-7540	-5743	-4164	-340	-11481	-8348	-5851	-3640	682
		Apr-Jun	-9451	-4413	-1967	-1345	2021	-9709	-4702	-1997	-1382	2020	-9662	-4514	-2559	-1994	-593	-9785	-4221	-2592	-1990	-241
		Jul-Sep	-12031	-9614	-6523	-4991	-3129	-12203	-8860	-7152	-5059	-1123	-12383	-9010	-5839	-4278	-1150	-12393	-9432	-5454	-3986	-912
		Oct-Dec	-10768	-8355	-6918	-5595	-2106	-10766	-8718	-7312	-6188	-2134	-11992	-9625	-8022	-5652	-2870	-11974	-9313	-7789	-5600	-1811
QWEST	W AN	Jan-Mar	-5104	8082	19171	33695	72635	-5164	7431	19078	32600	70980	-6395	6555	18054	33265	71822	-6493	6484	17660	32651	71360
		Apr-Jun	-1869	5739	8228	17578	41974	-1937	5409	7970	18127	41570	-3594	4921	7265	17684	41546	-3788	4871	7161	17730	41550
		Jul-Sep	-6667	-2124	-971	1007	17117	-5627	-2076	-708	1794	21810	-5696	-2060	-837	1944	21523	-6123	-2571	-1299	1468	21335
		Oct-Dec	-13103	-1699	500	5628	45661	-12124	-1855	600	5608	41532	-14146	-2360	243	5198	42381	-14114	-2368	245	5223	42274
	C D BN	Jan-Mar	-9637	-2293	-63	2040	11260	-9891	-2182	-281	1926	10678	-11004	-2390	-489	1424	11640	-11159	-2353	-433	1614	11391
		Apr-Jun	-6869	-425	1096	2851	12199	-7266	-563	1059	2782	11992	-7095	-624	881	2633	10704	-7343	-736	904	2669	10655
		Jul-Sep	-8152	-3057	-1656	-408	3460	-7810	-2788	-1614	-305	4657	-8359	-2708	-1166	274	4670	-8497	-2921	-1217	313	4669
		Oct-Dec	-11901	-2510	-1096	247	6832	-11824	-2742	-1389	-56	6723	-12941	-3048	-1462	-79	5480	-12743	-2965	-1400	54	5925
Cross Delta	W AN	Jan-Mar	4817	9224	13431	16622	23914	4753	9174	13388	16632	23917	4818	8857	13351	16402	23672	4734	8895	13346	16435	23691
		Apr-Jun	3315	4402	6699	9147	18430	3286	4422	6518	9124	18437	3038	4375	6365	9149	18412	3005	4337	6295	9075	18448
		Jul-Sep	5178	6436	7109	7803	10081	5543	6539	7028	7856	10955	5358	6375	6911	7933	10666	5451	6564	7066	8018	10484
		Oct-Dec	2104	5156	7152	9344	17461	2111	5578	7232	9207	17475	2129	5516	6971	9198	17451	2118	5555	6768	9191	17483
	C D BN	Jan-Mar	1672	3036	3888	5333	10418	1984	3124	4023	5693	10134	2039	3367	4009	5799	10368	2080	3312	3977	5661	10072
		Apr-Jun	1502	2434	3165	4839	7405	1510	2421	3122	4673	7966	1443	2406	3119	4512	8072	1530	2439	3143	4371	8183
		Jul-Sep	3925	5058	5795	7183	8860	3638	4986	5814	6758	8513	3371	4382	5540	6684	8740	2953	4404	5410	6898	8900
		Oct-Dec	1980	4069	5266	5824	9625	1886	4189	5495	6022	9518	1962	4083	5197	6000	9490	1963	4076	5195	5976	9512

Table 3. DSM2-Hydro tidally filtered daily average velocity for water years 1976 to 1991. Shading indicates negative (landward) velocities. Positive velocities are towards the ocean.

Name	Year Types	Month Range	Study 6.0					Study 7.0					Study 7.1					Study 8.0				
			Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max
Head of Old River	W AN	Jan-Mar	0.89	1.70	2.55	2.61	3.29	0.89	1.70	2.56	2.62	3.29	0.74	1.68	2.52	2.58	3.19	0.73	1.68	2.52	2.58	3.19
		Apr-Jun	0.69	1.66	1.99	2.62	2.66	0.68	1.66	2.00	2.62	2.66	0.00	1.66	2.13	2.57	2.62	0.00	1.66	2.13	2.56	2.62
		Jul-Sep	0.50	0.74	0.85	1.56	2.68	0.50	0.74	0.85	1.56	2.68	0.29	0.98	1.07	1.73	2.63	0.30	1.00	1.07	1.72	2.63
		Oct-Dec	0.14	0.44	0.83	1.52	2.67	0.13	0.44	0.84	1.52	2.67	0.09	0.21	0.53	0.88	2.63	0.08	0.20	0.53	0.88	2.63
	C D BN	Jan-Mar	0.50	0.68	0.88	0.99	1.94	0.50	0.68	0.88	0.99	1.94	0.40	0.64	0.79	0.92	1.89	0.34	0.59	0.76	0.91	1.88
		Apr-Jun	0.12	0.27	0.41	0.57	1.89	0.11	0.27	0.41	0.60	1.89	0.00	0.00	0.42	0.67	1.79	0.00	0.00	0.37	0.61	1.78
		Jul-Sep	0.09	0.20	0.38	0.48	0.72	0.07	0.19	0.37	0.47	0.71	0.12	0.20	0.24	0.29	0.76	0.12	0.19	0.23	0.29	0.72
		Oct-Dec	0.16	0.34	0.59	0.75	0.99	0.17	0.35	0.59	0.76	0.99	0.10	0.16	0.28	0.67	0.92	0.10	0.16	0.27	0.67	0.90
Middle River at Middle River	W AN	Jan-Mar	-0.26	-0.16	-0.06	0.09	0.58	-0.26	-0.17	-0.06	0.09	0.54	-0.29	-0.17	-0.05	0.12	0.54	-0.29	-0.16	-0.07	0.10	0.53
		Apr-Jun	-0.22	-0.09	-0.01	0.04	0.23	-0.22	-0.11	-0.01	0.05	0.22	-0.21	-0.10	-0.07	0.03	0.22	-0.21	-0.10	-0.07	0.03	0.22
		Jul-Sep	-0.31	-0.26	-0.23	-0.21	0.04	-0.30	-0.26	-0.23	-0.20	0.04	-0.29	-0.25	-0.21	-0.19	0.04	-0.31	-0.26	-0.23	-0.20	0.04
		Oct-Dec	-0.29	-0.23	-0.21	-0.12	0.25	-0.29	-0.24	-0.21	-0.10	0.15	-0.31	-0.28	-0.25	-0.09	0.16	-0.31	-0.28	-0.25	-0.08	0.16
	C D BN	Jan-Mar	-0.27	-0.21	-0.15	-0.06	0.02	-0.27	-0.21	-0.15	-0.08	0.01	-0.31	-0.20	-0.15	-0.11	-0.01	-0.31	-0.23	-0.16	-0.10	0.02
		Apr-Jun	-0.25	-0.12	-0.05	-0.03	0.06	-0.26	-0.13	-0.05	-0.04	0.06	-0.26	-0.12	-0.07	-0.05	-0.02	-0.26	-0.11	-0.07	-0.05	-0.01
		Jul-Sep	-0.33	-0.26	-0.17	-0.13	-0.08	-0.34	-0.24	-0.19	-0.13	-0.03	-0.34	-0.24	-0.15	-0.11	-0.03	-0.34	-0.25	-0.14	-0.11	-0.02
		Oct-Dec	-0.29	-0.22	-0.19	-0.15	-0.06	-0.29	-0.24	-0.20	-0.16	-0.06	-0.33	-0.26	-0.22	-0.15	-0.08	-0.33	-0.25	-0.21	-0.15	-0.05
San Joaquin River at Blind Point	W AN	Jan-Mar	0.00	0.16	0.28	0.42	0.86	0.00	0.15	0.28	0.42	0.85	-0.01	0.14	0.27	0.42	0.85	-0.01	0.14	0.26	0.41	0.85
		Apr-Jun	0.05	0.12	0.15	0.24	0.50	0.05	0.12	0.15	0.25	0.50	0.03	0.12	0.14	0.24	0.50	0.03	0.12	0.14	0.24	0.50
		Jul-Sep	-0.02	0.04	0.06	0.08	0.24	0.00	0.04	0.06	0.09	0.28	-0.01	0.04	0.06	0.09	0.28	-0.01	0.04	0.05	0.08	0.28
		Oct-Dec	-0.06	0.05	0.07	0.14	0.56	-0.05	0.05	0.07	0.14	0.52	-0.07	0.04	0.07	0.14	0.53	-0.07	0.04	0.07	0.14	0.53
	C D BN	Jan-Mar	-0.04	0.05	0.07	0.09	0.20	-0.03	0.05	0.07	0.09	0.19	-0.04	0.04	0.06	0.09	0.20	-0.06	0.04	0.06	0.09	0.20
		Apr-Jun	0.00	0.06	0.08	0.10	0.20	0.00	0.06	0.08	0.09	0.20	0.00	0.06	0.07	0.09	0.19	0.00	0.06	0.07	0.09	0.19
		Jul-Sep	-0.02	0.03	0.05	0.06	0.10	-0.02	0.03	0.05	0.06	0.12	-0.03	0.03	0.05	0.07	0.12	-0.03	0.03	0.05	0.07	0.12
		Oct-Dec	-0.06	0.04	0.05	0.07	0.13	-0.06	0.04	0.05	0.06	0.13	-0.08	0.03	0.05	0.06	0.12	-0.07	0.04	0.05	0.06	0.12
Georgiana Slough	W AN	Jan-Mar	1.01	1.99	2.45	2.60	2.74	1.00	1.99	2.44	2.60	2.74	1.02	1.99	2.44	2.60	2.74	1.01	1.99	2.45	2.60	2.74
		Apr-Jun	0.66	0.87	1.02	1.61	2.71	0.71	0.87	1.01	1.61	2.71	0.67	0.88	1.01	1.59	2.71	0.65	0.87	1.01	1.60	2.71
		Jul-Sep	0.68	0.79	0.85	0.94	1.41	0.70	0.78	0.83	0.94	1.38	0.64	0.76	0.81	0.95	1.37	0.67	0.79	0.83	0.95	1.36
		Oct-Dec	0.51	0.73	1.00	1.69	2.76	0.51	0.74	1.00	1.81	2.76	0.42	0.75	1.00	1.73	2.76	0.39	0.75	1.00	1.66	2.76
	C D BN	Jan-Mar	0.45	0.84	1.03	1.41	2.40	0.68	0.89	1.03	1.37	2.35	0.68	0.91	1.07	1.34	2.11	0.60	0.88	1.05	1.32	2.08
		Apr-Jun	0.56	0.73	0.82	0.91	1.49	0.56	0.73	0.83	0.91	1.49	0.54	0.74	0.85	0.91	1.42	0.57	0.70	0.85	0.92	1.42
		Jul-Sep	0.54	0.66	0.74	0.87	1.06	0.54	0.65	0.73	0.83	1.02	0.50	0.60	0.70	0.83	1.05	0.47	0.60	0.70	0.84	1.06
		Oct-Dec	0.54	0.67	0.73	0.89	1.59	0.53	0.70	0.76	0.91	1.56	0.52	0.69	0.75	0.89	1.58	0.53	0.67	0.74	0.88	1.59

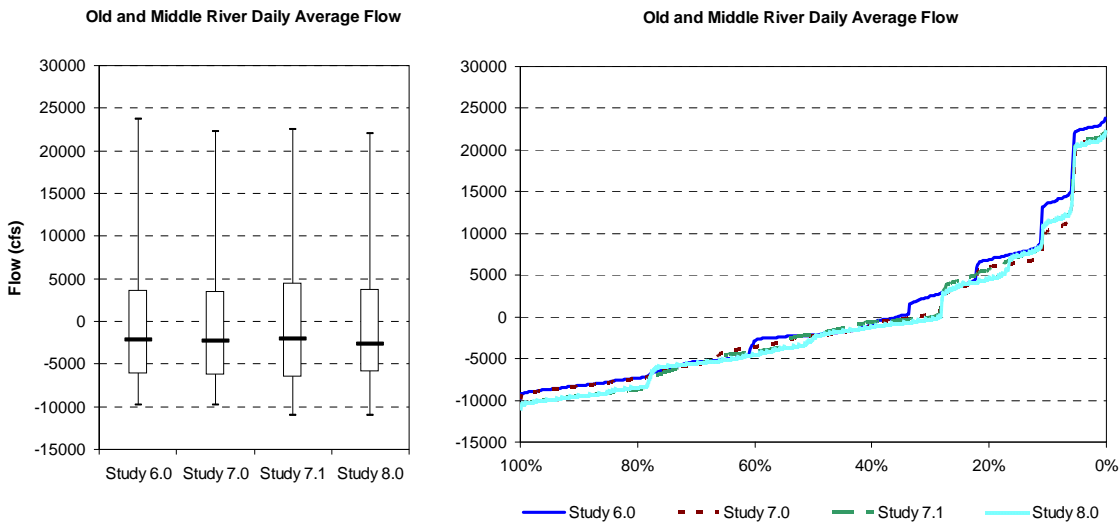


Figure 2. Example graphic for daily average flow at Old and Middle River. The left side shows box plots that describe the minimum, 25 percentile, median, 75 percentile and maximum flow at this site for a selected time period and year type. The right side exceedance plot shows the percentage of time that values are exceeded.

DSM2-PTM Results

DSM2-PTM was run for each month for water-years 1976 to 1991. 1000 Particles were injected over a period of 24 hours at the nodes described in Table 4. Particles were injected starting at the beginning of the fourth day of each month. The particles were then tracked until the end of the 25th day, so the particle locations were reported after approximately 21 days. The particles were counted at each of the output locations in Table 5. These output locations represent the major locations where particles could go. “Past Chipps” represents the percentage of particles that travel past Chipps Island and into Suisun Bay. “Exports” represents the combined percentage of particles that end up in Banks Pumping Plant and Jones Pumping Plant. “Other Diversion” represents the combined percentage of particles that end up in the Contra Costa Water District diversions on Old River and Rock Slough, North Bay Aqueduct, and agriculture diversions. The particles that remain in the Delta are grouped into two groups “In North Delta” and “In South Delta”. The delineation line between North and South is shown in Figure 3.

For the purposes of this document only three injection locations are presented, however output for all of the injection locations are available in the spreadsheets provided as an addition to this Appendix. The injection locations selected for presentation were the San Joaquin River at Mossdale (node 7), Little Potato Slough (node 249), and Sacramento River at Rio Vista (node 350).

The PTM results are presented in Table 6 for the injection at node 7, Table 7 for the injection at node 249, and Table 8 for the injection at node 350. The three tables present the minimum, 25 percentile, median, 75 percentile, and maximum value for water years 1976 to 1991, broken down into groups representing annual quarters, and year type groups. The monthly output was

grouped into the annual quarters: January through March (Jan-Mar), April through June (Apr-Jun), July through September (Jul-Sep), and October through December (Oct-Dec). The year types were grouped into two representative groups: Wet and Above Normal (W-AN), and Below Normal, Dry and Critical (C-D-BN).

The spreadsheets as part of this appendix present DSM2-PTM results in graphical form. Figure 4 through Figure 11 present example graphics found in the DSM2-PTM results spreadsheets. Figure 4 through Figure 7 presents example graphics for percent of particles at the end of 21 for each of the output locations listed in Table 5. In these graphics box plots show the minimum, 25 percentile, median, 75 percentile, and maximum particle percentage for a selected time period. Results are also displayed in exceedance plots that show the percent of time in which a certain value was exceeded.

Additionally the spreadsheets provide graphical comparisons between percent particles at the exports to Old and Middle River flow, Qwest flow, and Cross Delta flow. Figure 9 shows an example comparison between Old and Middle River flow from DSM2-Hydro and percent particles at the exports. Similarly, Figure 10 shows an example comparison between Qwest flow and percent particles at the exports and Figure 11 shows an example comparison between Cross Delta flow and percent particles at the exports.

The PTM result spreadsheets are provided electronically for each injection node with the respective filename listed in Table 4.

Table 4. Injection Locations

Node	Common Name	Spreadsheet File
335	Sacramento River at Freeport	PTM_node_335.xls
341	Sacramento River above Cross Channel	PTM_node_341.xls
321	Cache Slough	PTM_node_321.xls
350	Sacramento River at Rio Vista	PTM_node_350.xls
353	Sacramento River at Emmaton	PTM_node_353.xls
355	Sacramento River at Collinsville	PTM_node_355.xls
45	San Joaquin River at Blind Point	PTM_node_45.xls
272	Mokelumne River near San Joaquin River	PTM_node_272.xls
249	Little Potato Slough	PTM_node_249.xls
21	San Joaquin River at Stockton	PTM_node_21.xls
7	San Joaquin River at Mossdale	PTM_node_7.xls

Table 5. PTM Output

Name	Description
Past Chipps	Particles that pass Chipps Island
In North Delta	Particles that remain in the Northern Delta (Error! Reference source not
In South Delta	Particles that remain in the Southern Delta (Error! Reference source not
Exports	Combined SWP and CVP exports
Other Diversion	Agricultural Diversions, CCWD Diversions, and North Bay Aqueduct

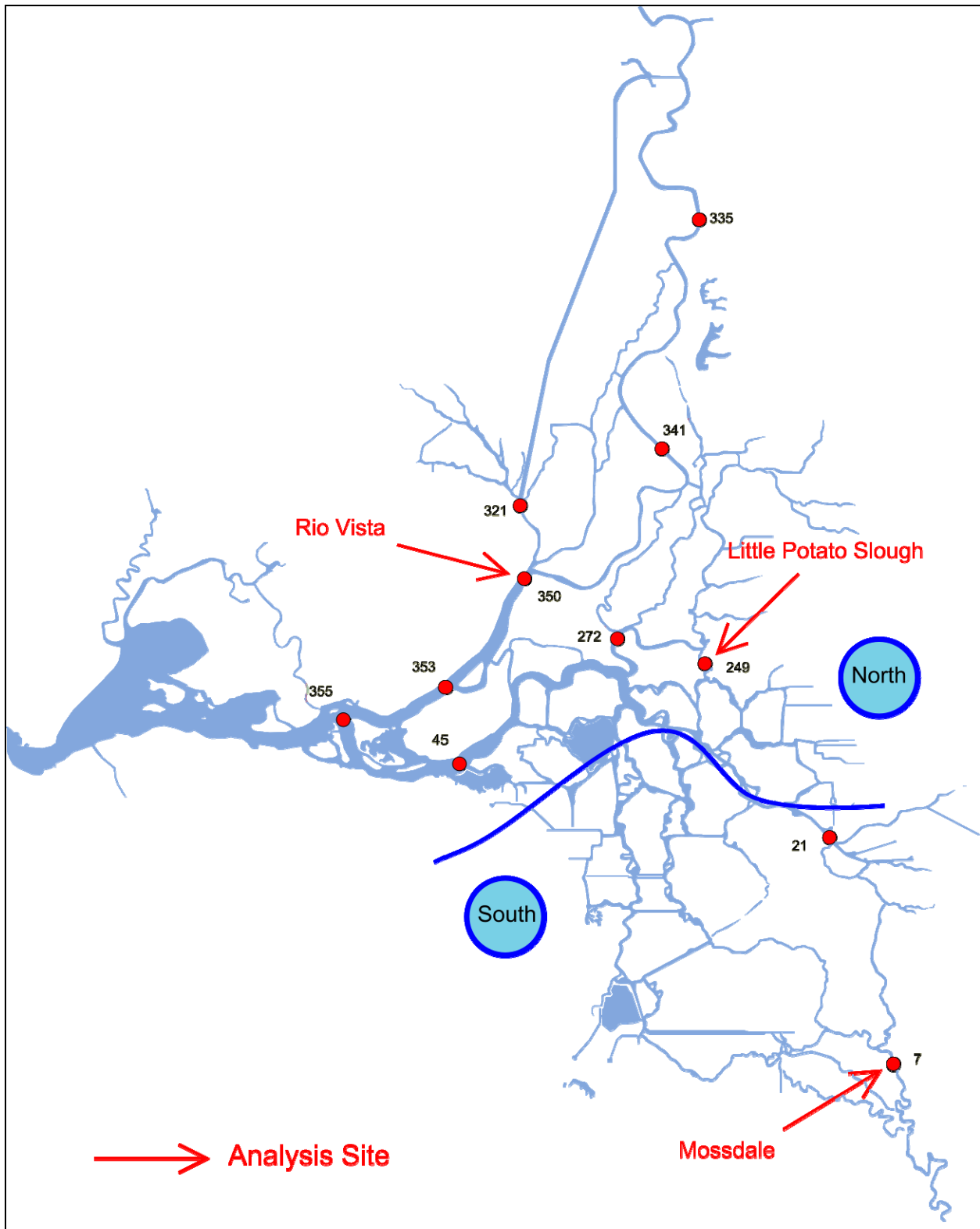


Figure 3. DSM2-PTM locations for particle injection.

Table 6. Percent particle fate percentiles after 21 days for particle injection at node 7.

Name	Year Types	Month Range	Study 6.0					Study 7.0					Study 7.1					Study 8.0				
			Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max
Past Chippis	W AN	Jan-Mar	0	2	35	60	91	0	2	36	57	89	0	2	38	61	91	0	2	36	58	91
		Apr-Jun	0	1	5	36	77	0	1	5	39	76	0	1	4	38	76	0	1	4	39	76
		Jul-Sep	0	0	0	0	40	0	0	0	0	43	0	0	0	0	44	0	0	0	0	43
		Oct-Dec	0	0	0	0	80	0	0	0	0	67	0	0	0	1	69	0	0	0	0	68
	C D BN	Jan-Mar	0	0	0	0	3	0	0	0	0	2	0	0	0	0	5	0	0	0	0	4
		Apr-Jun	0	0	0	0	5	0	0	0	0	2	0	0	0	0	10	0	0	0	0	9
		Jul-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Oct-Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
In North Delta	W AN	Jan-Mar	0	1	2	5	11	0	1	2	4	12	0	1	2	3	10	0	1	2	4	10
		Apr-Jun	1	5	14	19	34	1	5	11	19	38	1	5	11	18	43	1	5	11	18	44
		Jul-Sep	1	2	2	3	8	1	2	2	4	6	1	2	3	4	6	1	2	3	3	7
		Oct-Dec	0	2	3	6	38	1	2	3	5	37	2	2	3	5	33	1	3	4	5	43
	C D BN	Jan-Mar	0	6	10	21	29	0	5	9	21	29	1	5	9	15	31	1	5	10	22	34
		Apr-Jun	0	11	19	26	35	0	11	19	26	35	0	0	15	28	42	0	0	16	28	41
		Jul-Sep	0	0	4	12	46	0	0	3	10	46	0	1	5	14	29	0	0	5	16	47
		Oct-Dec	1	3	7	15	33	2	3	5	12	41	2	3	5	11	22	2	4	6	13	25
In South Delta	W AN	Jan-Mar	0	2	5	7	11	0	2	5	8	11	0	1	5	6	10	0	2	5	7	10
		Apr-Jun	1	8	14	19	36	1	7	13	19	33	1	9	12	16	28	1	8	13	17	28
		Jul-Sep	3	6	7	8	15	3	6	7	9	18	5	6	8	9	14	4	6	7	8	9
		Oct-Dec	2	7	8	17	38	2	6	8	16	37	2	5	5	12	49	2	5	6	11	46
	C D BN	Jan-Mar	1	6	9	13	29	1	6	8	15	19	3	8	13	19	27	2	6	12	19	49
		Apr-Jun	6	13	20	34	44	1	13	20	36	43	1	14	19	47	56	1	14	19	44	57
		Jul-Sep	2	9	14	22	50	2	11	21	25	54	0	10	16	27	38	0	7	16	30	37
		Oct-Dec	2	6	13	23	46	4	7	14	18	40	4	6	13	29	48	2	6	12	30	55
Exports	W AN	Jan-Mar	9	33	58	81	92	11	37	58	82	93	9	36	55	82	94	9	36	57	81	93
		Apr-Jun	15	33	49	54	70	15	36	50	57	71	20	35	53	62	74	20	35	55	60	74
		Jul-Sep	40	70	82	86	89	40	69	78	85	89	39	71	78	86	89	39	76	82	86	91
		Oct-Dec	16	46	78	87	89	15	59	77	87	90	21	59	79	88	93	12	60	78	88	93
	C D BN	Jan-Mar	33	61	76	83	92	49	61	76	85	91	41	61	76	84	95	7	61	73	83	95
		Apr-Jun	0	13	27	46	56	0	11	28	49	67	0	12	39	55	64	0	17	36	56	64
		Jul-Sep	0	20	30	49	80	0	15	30	51	79	12	38	55	69	78	10	31	50	70	82
		Oct-Dec	24	55	74	83	91	21	60	77	84	91	28	60	72	88	93	20	58	72	87	92
Other Diversions	W AN	Jan-Mar	0	0	0	1	4	0	0	0	0	4	0	0	0	0	4	0	0	0	1	4
		Apr-Jun	0	1	4	9	29	0	1	4	9	28	0	1	4	7	29	0	1	4	7	29
		Jul-Sep	1	5	9	19	37	1	5	9	19	35	1	4	9	13	22	1	5	9	13	30
		Oct-Dec	0	1	2	4	17	0	1	2	4	19	0	1	2	3	13	0	1	2	3	13
	C D BN	Jan-Mar	0	1	2	8	18	0	1	2	5	17	0	1	1	3	13	0	1	1	3	14
		Apr-Jun	2	14	24	45	71	3	13	23	45	71	5	9	14	30	61	5	9	16	33	66
		Jul-Sep	5	19	42	58	98	5	19	41	57	98	4	13	22	30	65	3	12	22	31	65
		Oct-Dec	2	2	4	6	19	2	2	4	7	24	1	1	3	4	11	1	2	3	5	12

Table 7. Percent particle fate percentiles after 21 days for particle injection at node 249.

Name	Year Types	Month Range	Study 6.0					Study 7.0					Study 7.1					Study 8.0				
			Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max
Past Chippis	W AN	Jan-Mar	0	28	94	99	100	0	28	94	99	100	0	24	95	99	100	0	24	94	99	100
		Apr-Jun	0	10	30	91	100	0	10	29	88	100	0	11	23	91	100	0	8	19	90	100
		Jul-Sep	0	0	0	0	88	0	0	0	0	93	0	0	0	0	93	0	0	0	0	93
		Oct-Dec	0	0	0	3	100	0	0	0	3	100	0	0	0	5	100	0	0	0	4	100
	C D BN	Jan-Mar	0	0	0	1	25	0	0	0	0	17	0	0	0	0	34	0	0	0	0	31
		Apr-Jun	0	0	0	0	24	0	0	0	0	15	0	0	0	0	18	0	0	0	0	15
		Jul-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Oct-Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
In North Delta	W AN	Jan-Mar	0	0	2	7	27	0	0	2	6	23	0	0	2	5	25	0	0	2	4	24
		Apr-Jun	0	4	28	53	73	0	5	34	55	71	0	4	38	48	64	0	3	39	51	68
		Jul-Sep	1	2	4	8	19	1	3	5	13	24	1	3	6	13	27	1	2	4	13	18
		Oct-Dec	0	3	4	9	47	0	3	6	8	40	0	3	4	9	45	0	2	5	8	53
	C D BN	Jan-Mar	1	4	14	34	72	1	5	16	29	63	2	4	13	27	59	2	4	13	30	75
		Apr-Jun	5	20	47	57	64	4	13	42	56	65	3	16	31	50	62	3	20	31	48	63
		Jul-Sep	1	2	5	11	17	1	2	5	10	33	1	2	5	20	39	1	2	8	21	42
		Oct-Dec	2	6	9	15	42	2	5	7	13	37	2	4	9	13	28	2	4	9	15	44
In South Delta	W AN	Jan-Mar	0	0	2	9	23	0	0	2	9	24	0	0	2	8	22	0	0	2	7	21
		Apr-Jun	0	3	12	19	41	0	3	13	18	40	0	3	16	19	36	0	4	17	20	36
		Jul-Sep	2	4	10	12	20	1	5	9	15	24	1	5	11	14	29	1	5	8	13	23
		Oct-Dec	0	5	7	16	46	0	6	8	12	50	0	4	7	10	47	0	4	7	11	47
	C D BN	Jan-Mar	5	11	21	39	57	5	11	27	44	54	4	12	25	39	52	4	11	24	41	54
		Apr-Jun	15	31	38	45	60	12	32	37	47	61	17	31	42	54	63	17	32	44	55	63
		Jul-Sep	2	5	22	39	53	3	9	17	36	54	3	8	28	47	54	3	7	33	49	56
		Oct-Dec	4	13	19	27	52	4	10	16	24	49	3	9	18	35	48	6	10	16	37	51
Exports	W AN	Jan-Mar	0	0	1	38	85	0	0	2	41	85	0	0	1	42	88	0	0	2	41	89
		Apr-Jun	0	0	0	9	36	0	0	1	9	35	0	0	4	15	57	0	0	4	15	62
		Jul-Sep	0	62	74	84	91	0	57	73	81	93	0	58	71	80	89	0	59	79	82	88
		Oct-Dec	0	25	72	87	92	0	18	77	85	94	0	12	79	88	93	0	10	77	88	93
	C D BN	Jan-Mar	0	7	52	80	92	0	15	53	81	92	0	24	53	77	93	0	21	60	81	92
		Apr-Jun	0	0	1	17	54	0	0	3	29	68	0	1	7	23	57	0	1	7	15	59
		Jul-Sep	15	40	61	80	93	0	42	67	81	91	0	28	46	79	88	0	24	41	79	92
		Oct-Dec	12	55	69	79	88	15	61	75	82	89	24	47	73	83	90	3	44	73	82	89
Other Diversions	W AN	Jan-Mar	0	0	0	1	3	0	0	0	1	2	0	0	0	1	2	0	0	1	1	3
		Apr-Jun	0	2	3	5	11	0	2	3	6	12	0	2	3	6	14	0	2	3	6	12
		Jul-Sep	2	5	8	10	15	3	4	8	10	16	3	4	8	12	21	3	5	8	12	16
		Oct-Dec	0	1	2	3	5	0	1	2	3	4	0	2	2	2	4	0	1	2	3	4
	C D BN	Jan-Mar	1	1	2	2	4	1	1	2	2	4	1	1	2	3	5	1	1	2	2	6
		Apr-Jun	3	4	5	16	21	3	4	6	15	21	3	5	6	17	23	3	5	6	16	21
		Jul-Sep	2	6	10	15	23	2	6	10	15	25	3	8	10	17	25	3	6	10	16	25
		Oct-Dec	2	2	3	3	5	2	2	3	3	6	1	2	3	3	7	2	2	3	4	6

Table 8. Percent particle fate percentiles after 21 days for particle injection at node 350.

Name	Year Types	Month Range	Study 6.0					Study 7.0					Study 7.1					Study 8.0				
			Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max	Min	25%	50%	75%	Max
Past Chippis	W AN	Jan-Mar	84	100	100	100	100	85	100	100	100	100	79	100	100	100	100	77	100	100	100	100
		Apr-Jun	55	93	99	100	100	45	94	99	100	100	51	91	98	100	100	51	89	98	100	100
		Jul-Sep	19	26	45	59	99	16	25	47	59	99	18	26	38	62	99	19	25	39	66	100
		Oct-Dec	12	34	74	98	100	22	32	73	99	100	10	34	66	98	100	8	37	64	98	100
	C D BN	Jan-Mar	25	60	71	85	100	38	62	73	86	100	40	64	77	86	100	42	64	76	86	100
		Apr-Jun	8	28	48	66	99	10	29	50	68	97	9	29	49	64	96	7	32	48	64	96
		Jul-Sep	7	21	25	30	43	5	18	22	29	44	6	18	22	28	45	5	18	23	29	54
		Oct-Dec	21	28	39	49	91	17	31	40	50	90	13	26	32	45	89	14	27	34	43	90
In North Delta	W AN	Jan-Mar	0	0	0	0	12	0	0	0	0	10	0	0	0	0	13	0	0	0	0	16
		Apr-Jun	0	0	0	5	39	0	0	1	4	50	0	0	2	7	41	0	0	2	9	41
		Jul-Sep	0	29	43	51	65	0	29	43	54	66	0	29	46	55	65	0	24	44	52	63
		Oct-Dec	0	1	19	52	78	0	1	19	51	72	0	1	22	50	83	0	1	23	50	84
	C D BN	Jan-Mar	0	8	23	34	72	0	9	18	33	55	0	9	18	30	56	0	10	19	31	53
		Apr-Jun	1	30	44	64	82	2	29	45	62	83	3	29	45	64	85	3	29	43	62	84
		Jul-Sep	34	46	57	67	83	37	50	59	66	85	35	50	62	70	86	27	52	60	70	86
		Oct-Dec	5	39	52	60	72	4	37	50	54	73	5	41	53	57	77	5	43	50	58	77
In South Delta	W AN	Jan-Mar	0	0	0	0	2	0	0	0	0	3	0	0	0	0	3	0	0	0	0	3
		Apr-Jun	0	0	0	0	2	0	0	0	0	2	0	0	0	0	4	0	0	0	0	3
		Jul-Sep	0	2	6	10	12	0	1	7	9	14	0	2	7	11	15	0	2	8	11	13
		Oct-Dec	0	0	4	8	11	0	0	3	7	12	0	0	5	10	13	0	0	6	10	13
	C D BN	Jan-Mar	0	1	3	5	9	0	1	2	5	9	0	2	3	5	11	0	1	2	5	11
		Apr-Jun	0	2	4	5	9	0	2	4	6	9	0	3	4	6	9	0	3	4	6	9
		Jul-Sep	5	9	10	11	13	6	8	11	11	16	4	7	9	12	14	5	6	8	11	13
		Oct-Dec	2	5	6	9	13	1	5	7	9	15	2	6	8	10	16	2	6	8	11	17
Exports	W AN	Jan-Mar	0	0	0	0	2	0	0	0	0	3	0	0	0	0	5	0	0	0	0	5
		Apr-Jun	0	0	0	0	1	0	0	0	0	1	0	0	0	0	3	0	0	0	0	2
		Jul-Sep	0	3	5	7	17	0	2	5	7	11	0	2	5	7	11	0	2	7	9	16
		Oct-Dec	0	0	3	5	9	0	0	3	6	8	0	0	4	7	14	0	0	4	6	14
	C D BN	Jan-Mar	0	0	1	5	8	0	0	1	2	9	0	1	1	3	8	0	1	1	3	12
		Apr-Jun	0	0	0	1	4	0	0	0	2	3	0	0	0	1	4	0	0	0	1	4
		Jul-Sep	1	2	4	10	20	0	2	5	8	19	0	1	3	9	17	0	1	3	11	19
		Oct-Dec	0	2	4	5	8	1	3	4	5	8	1	2	5	7	10	0	2	5	7	9
Other Diversions	W AN	Jan-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Apr-Jun	0	0	0	1	3	0	0	0	1	3	0	0	0	1	2	0	0	0	1	2
		Jul-Sep	0	1	2	2	3	0	1	2	2	3	0	1	2	2	4	0	1	2	2	3
		Oct-Dec	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1
	C D BN	Jan-Mar	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1
		Apr-Jun	0	1	1	2	4	0	1	1	2	3	0	1	1	2	4	0	1	1	2	3
		Jul-Sep	1	1	2	3	4	0	1	2	3	4	1	1	2	3	4	1	1	2	3	4
		Oct-Dec	0	0	0	0	1	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1

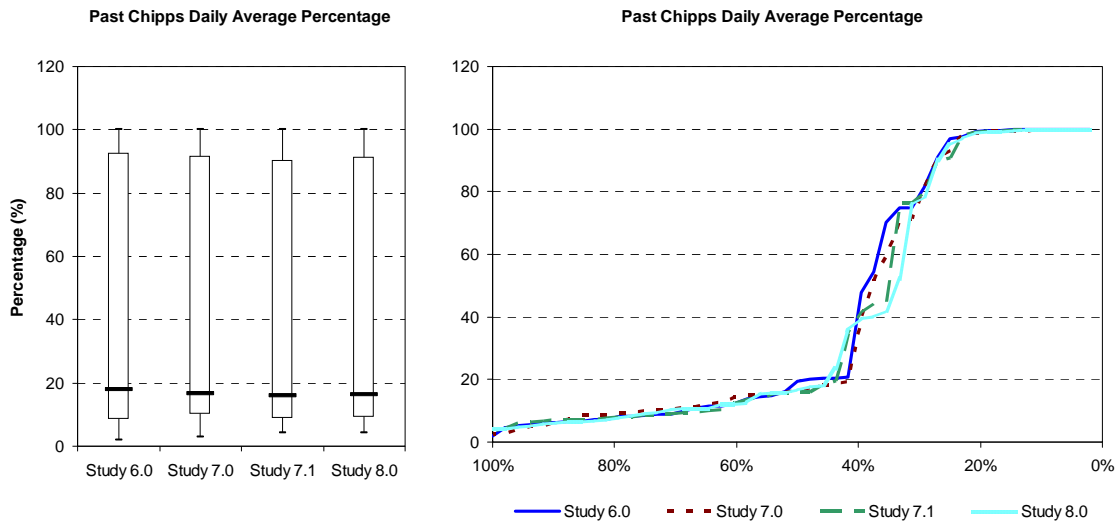


Figure 4. Example graphic for percent of particles that are past Chipps Island. The left side shows box plots that describe the minimum, 25 percentile, median, 75 percentile and maximum flow at this site for a selected time period and year type. The right side exceedance plot shows the percentage of time that values are exceeded.

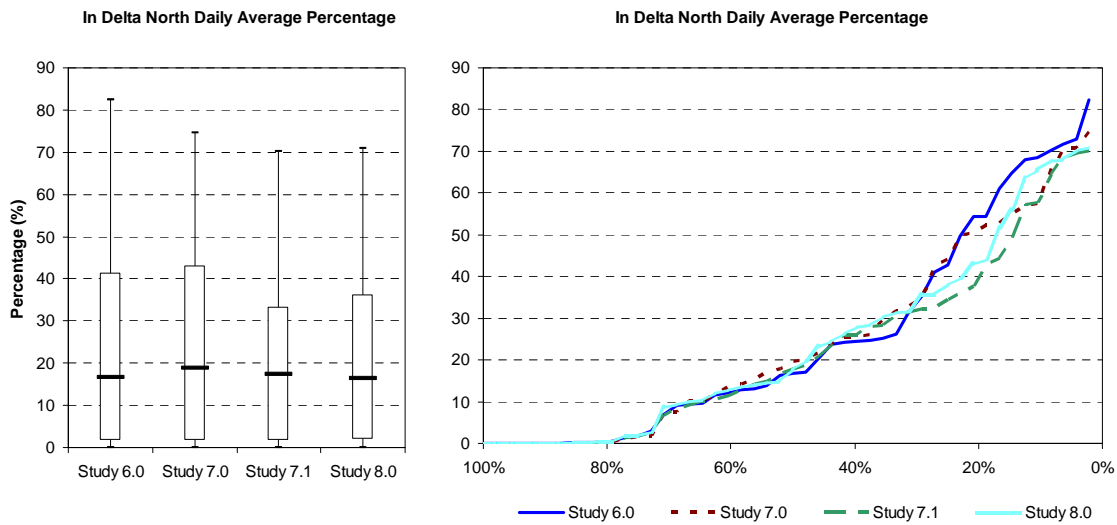


Figure 5. Example graphic for percent of particles remaining in the Northern Delta. The left side shows box plots that describe the minimum, 25 percentile, median, 75 percentile and maximum flow at this site for a selected time period and year type. The right side exceedance plot shows the percentage of time that values are exceeded.

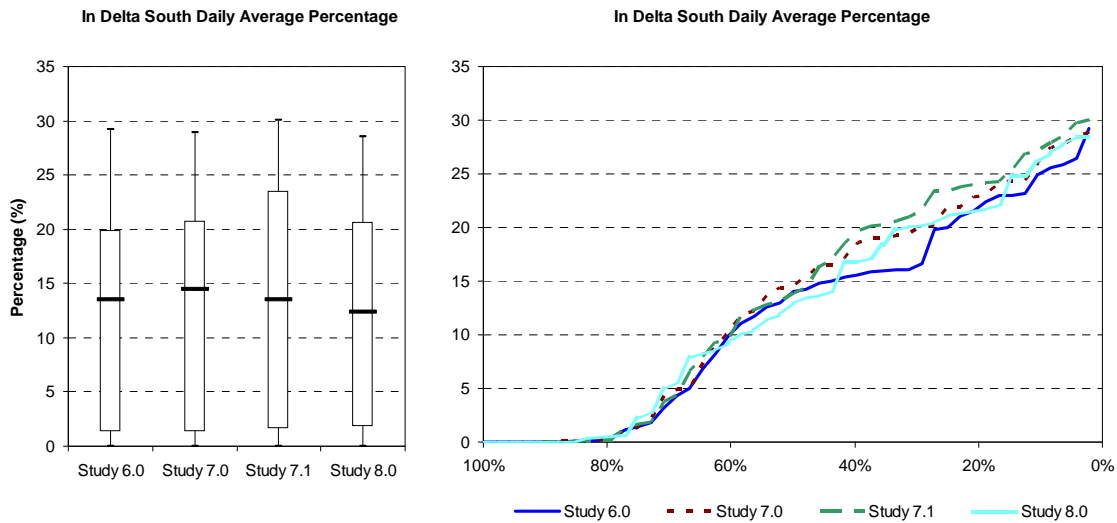


Figure 6. Example graphic for percent of particles remaining in the Southern Delta. The left side shows box plots that describe the minimum, 25 percentile, median, 75 percentile and maximum flow at this site for a selected time period and year type. The right side exceedance plot shows the percentage of time that values are exceeded.

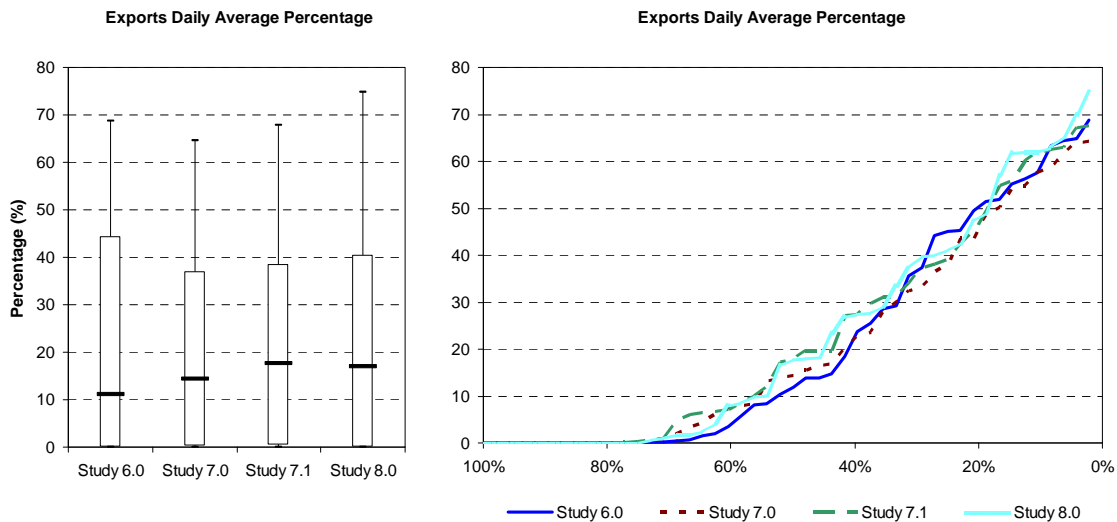


Figure 7. Example graphic for percent of particles that are in the Exports. The left side shows box plots that describe the minimum, 25 percentile, median, 75 percentile and maximum flow at this site for a selected time period and year type. The right side exceedance plot shows the percentage of time that values are exceeded.

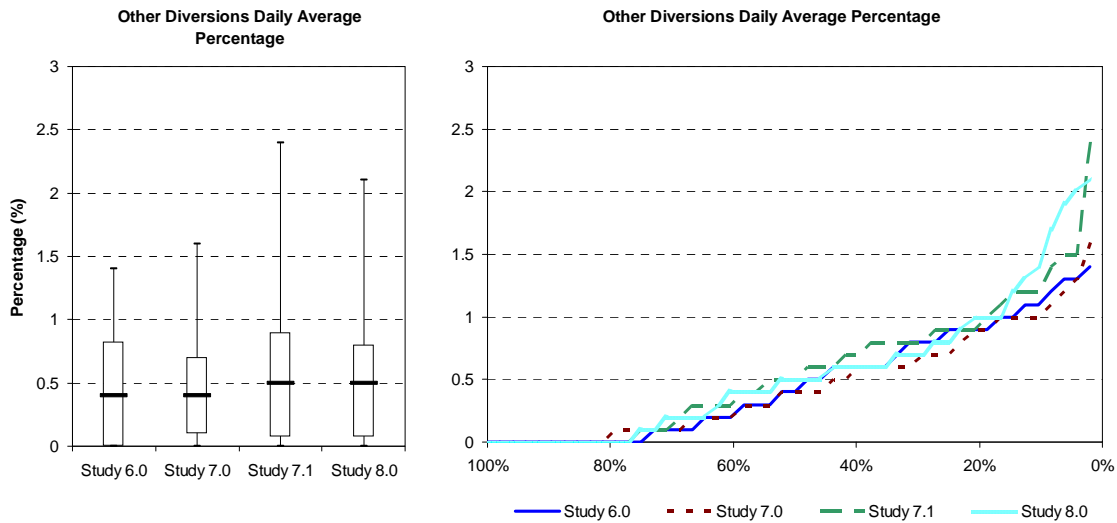


Figure 8. Example graphic for percent of particles in Other Diversions. The left side shows box plots that describe the minimum, 25 percentile, median, 75 percentile and maximum flow at this site for a selected time period and year type. The right side exceedance plot shows the percentage of time that values are exceeded.

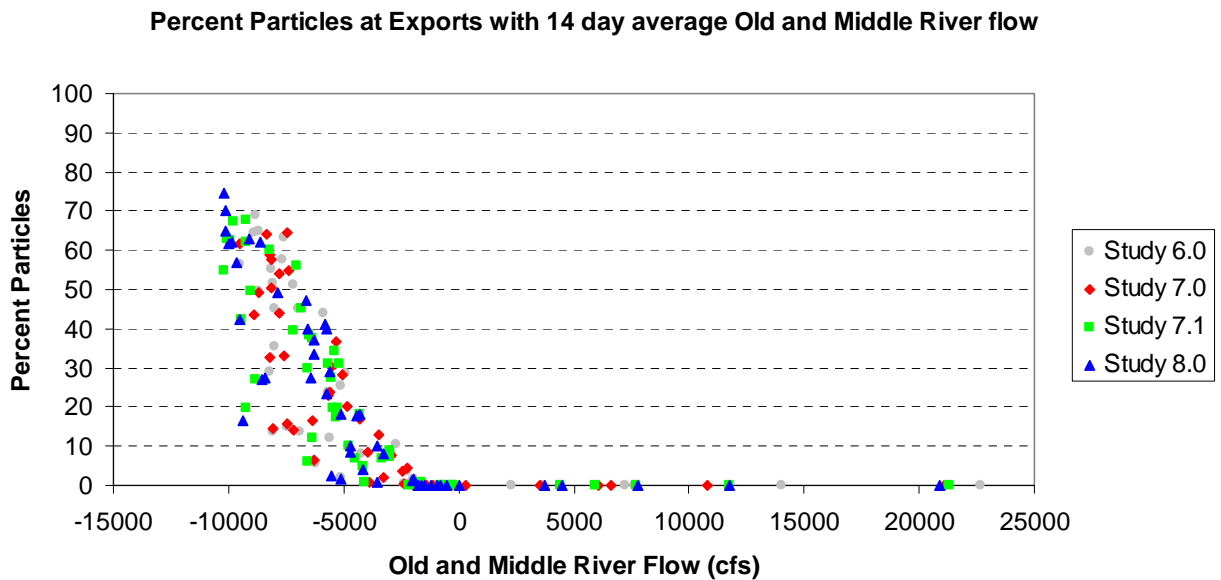


Figure 9. Example graphic of percent of particles in the Exports compared to 14 day tidally averaged Old and Middle River flow.

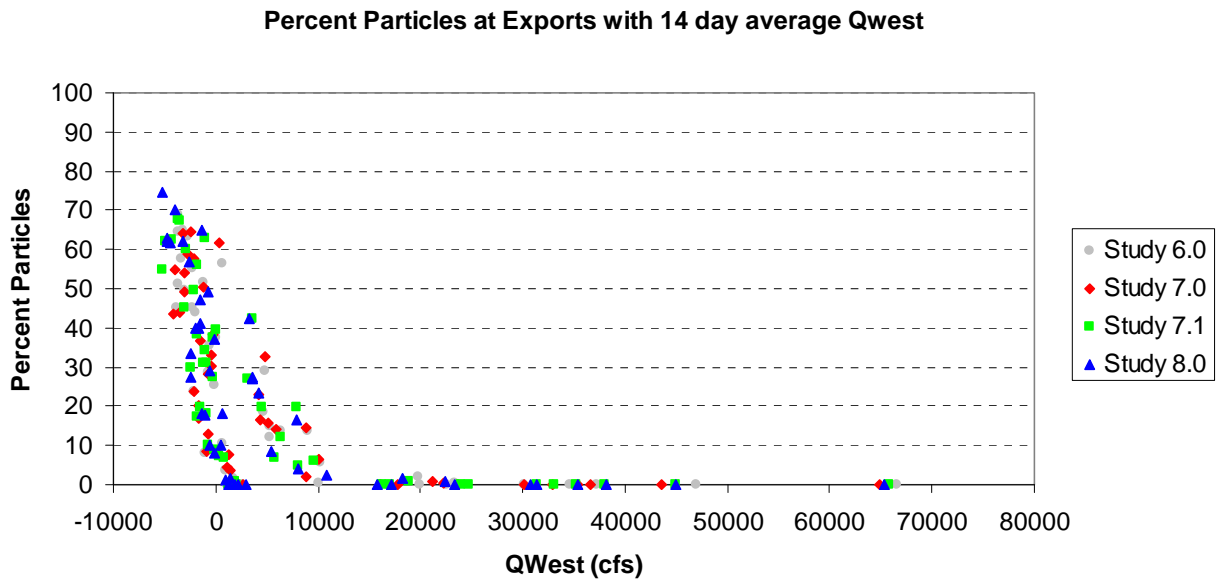


Figure 10. Example graphic of percent of particles in the Exports compared to 14 day tidally averaged QWEST flow.

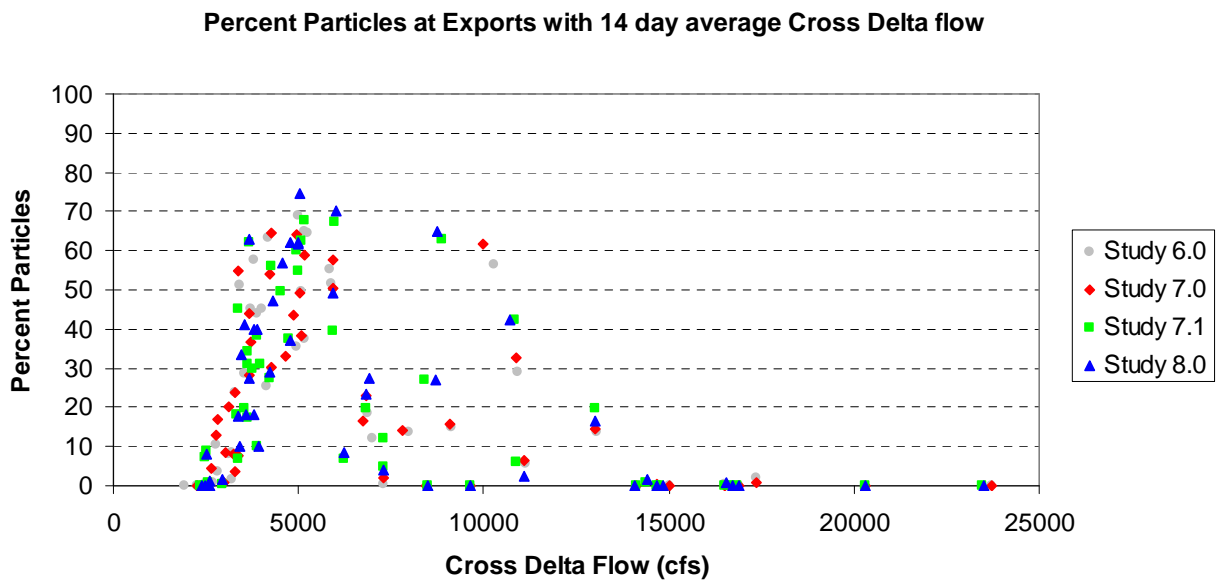


Figure 11. Example graphic of percent of particles in the Exports compared to 14 day tidally averaged Cross Delta flow.