

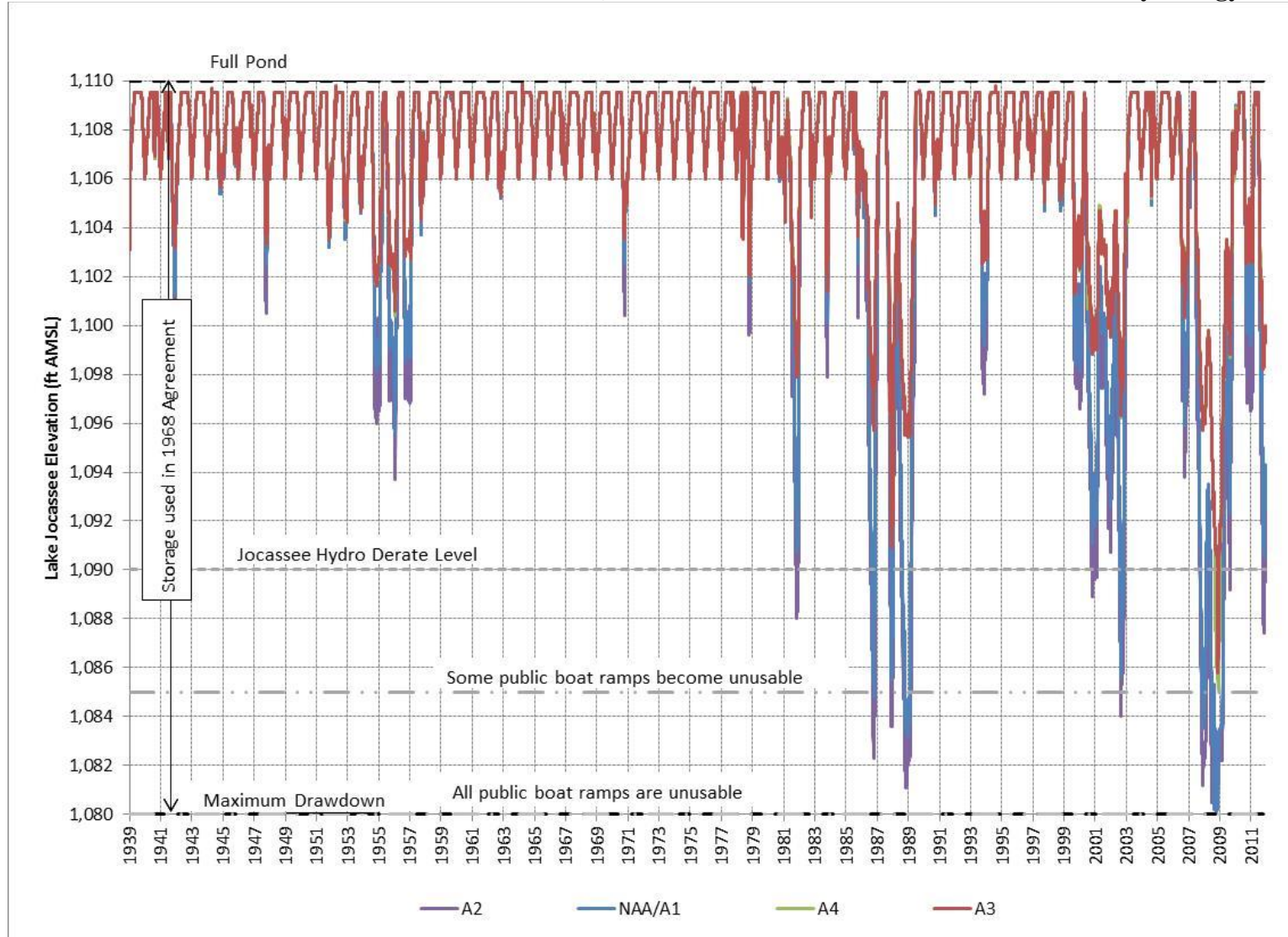
## **APPENDIX M**

### **LAKE ELEVATION AND FLOW RELEASES SENSITIVITY ANALYSIS RESULTS**

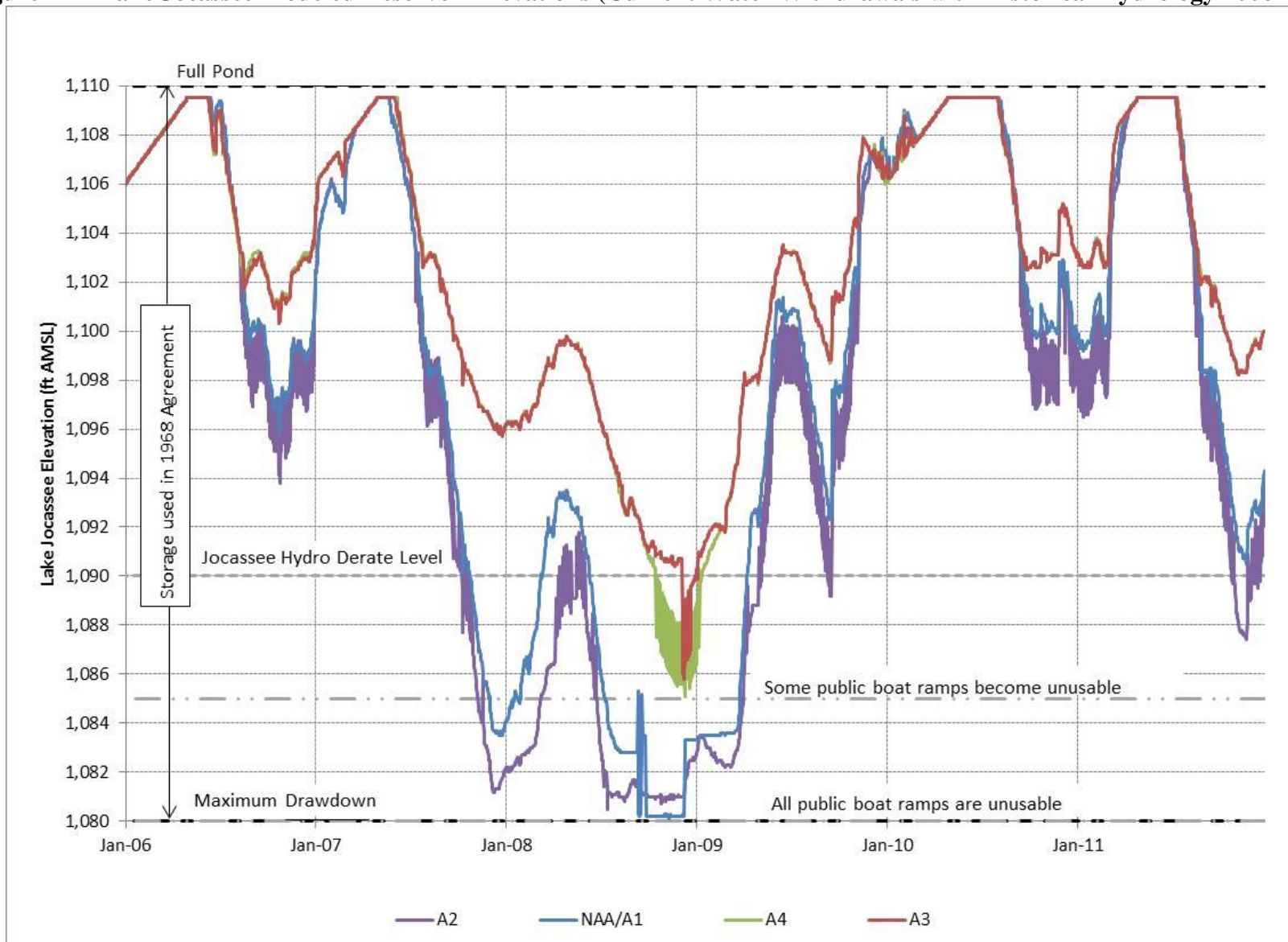
## Appendix M

### Lake Elevation and Flow Releases Sensitivity Analysis Results

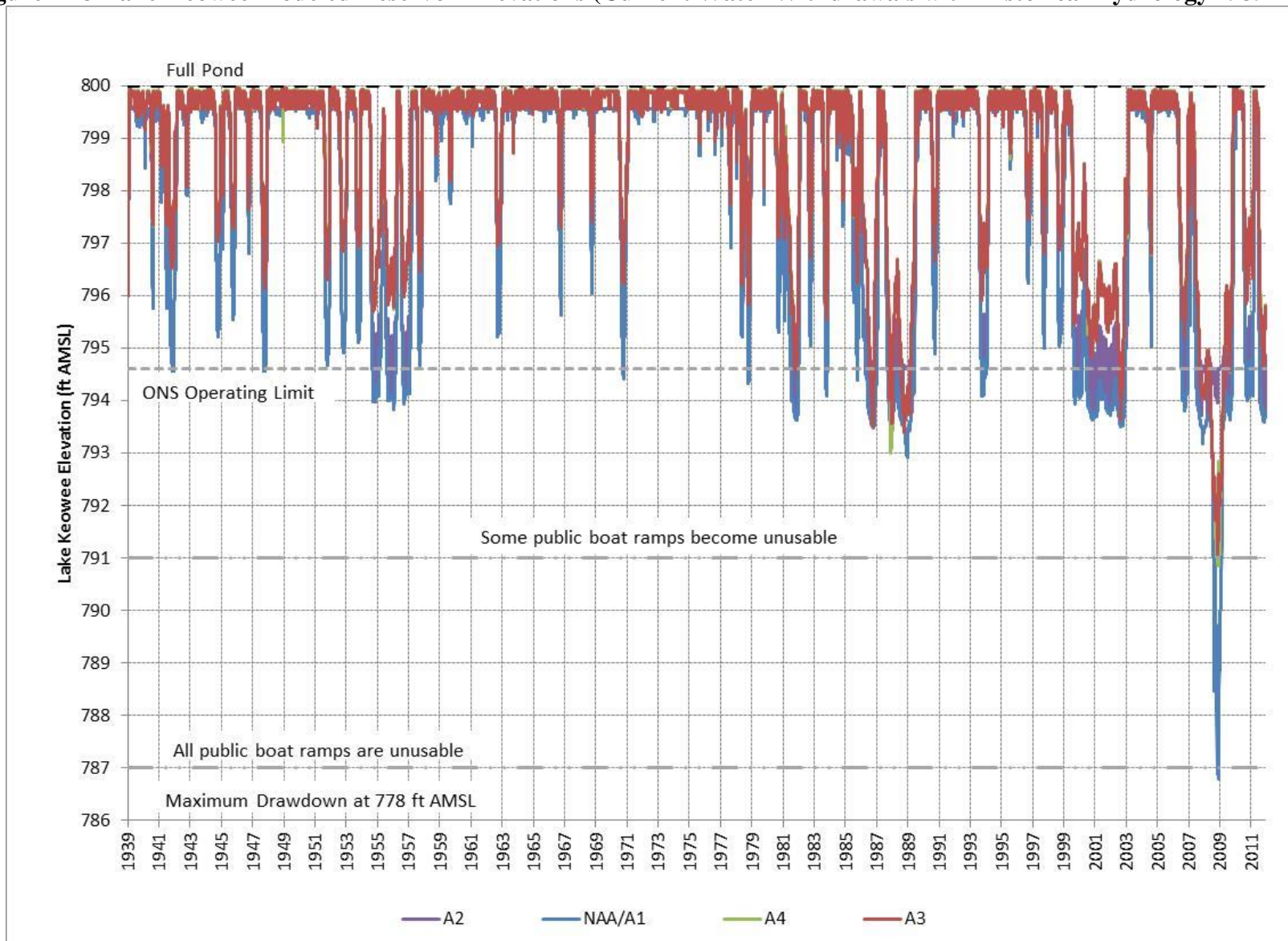
Figure M-1 Lake Jocassee Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 1939-2011)



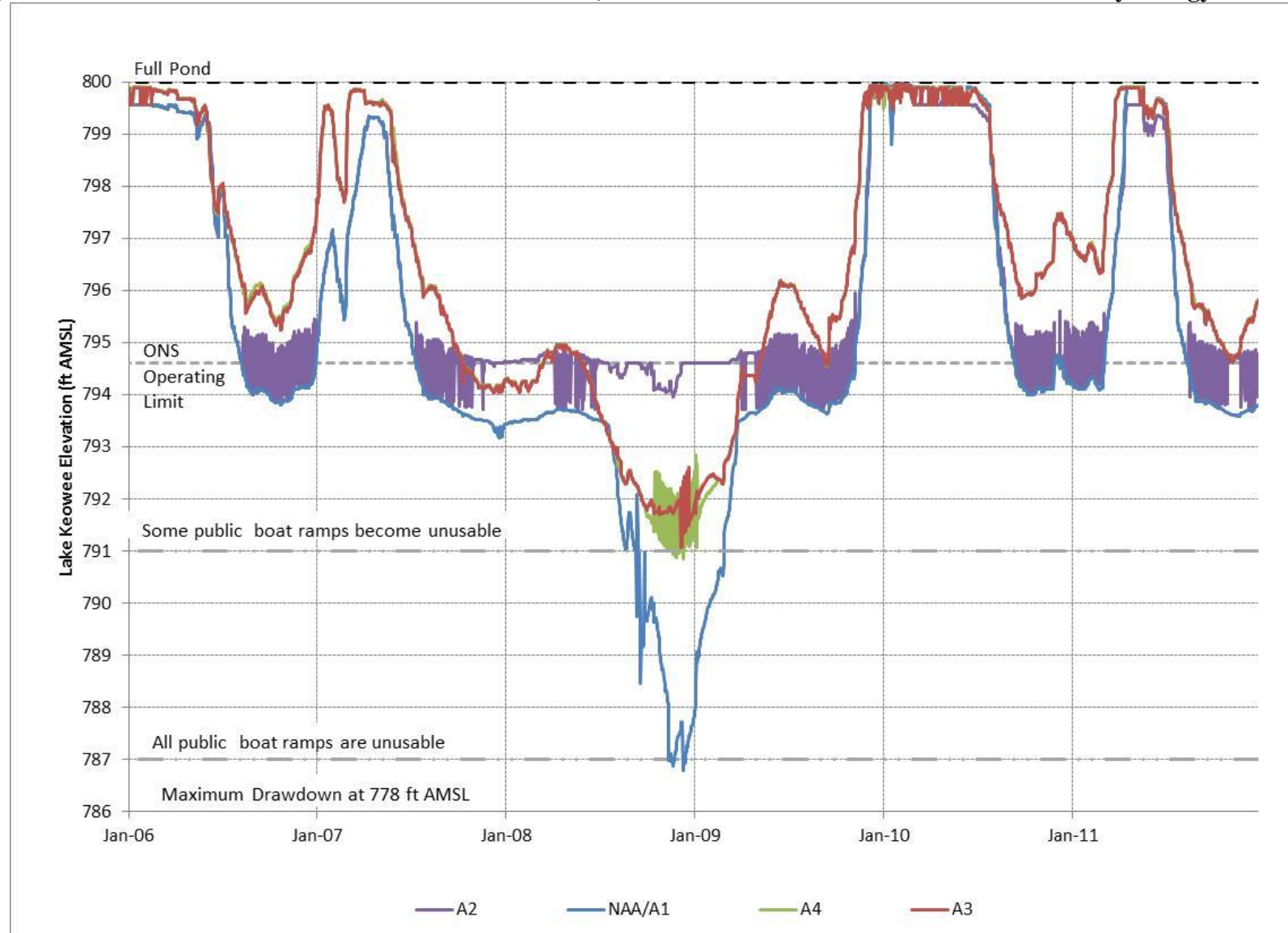
**Figure M-2 Lake Jocassee Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 2006-2011)**



**Figure M-3 Lake Keowee Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 1939-2011)**

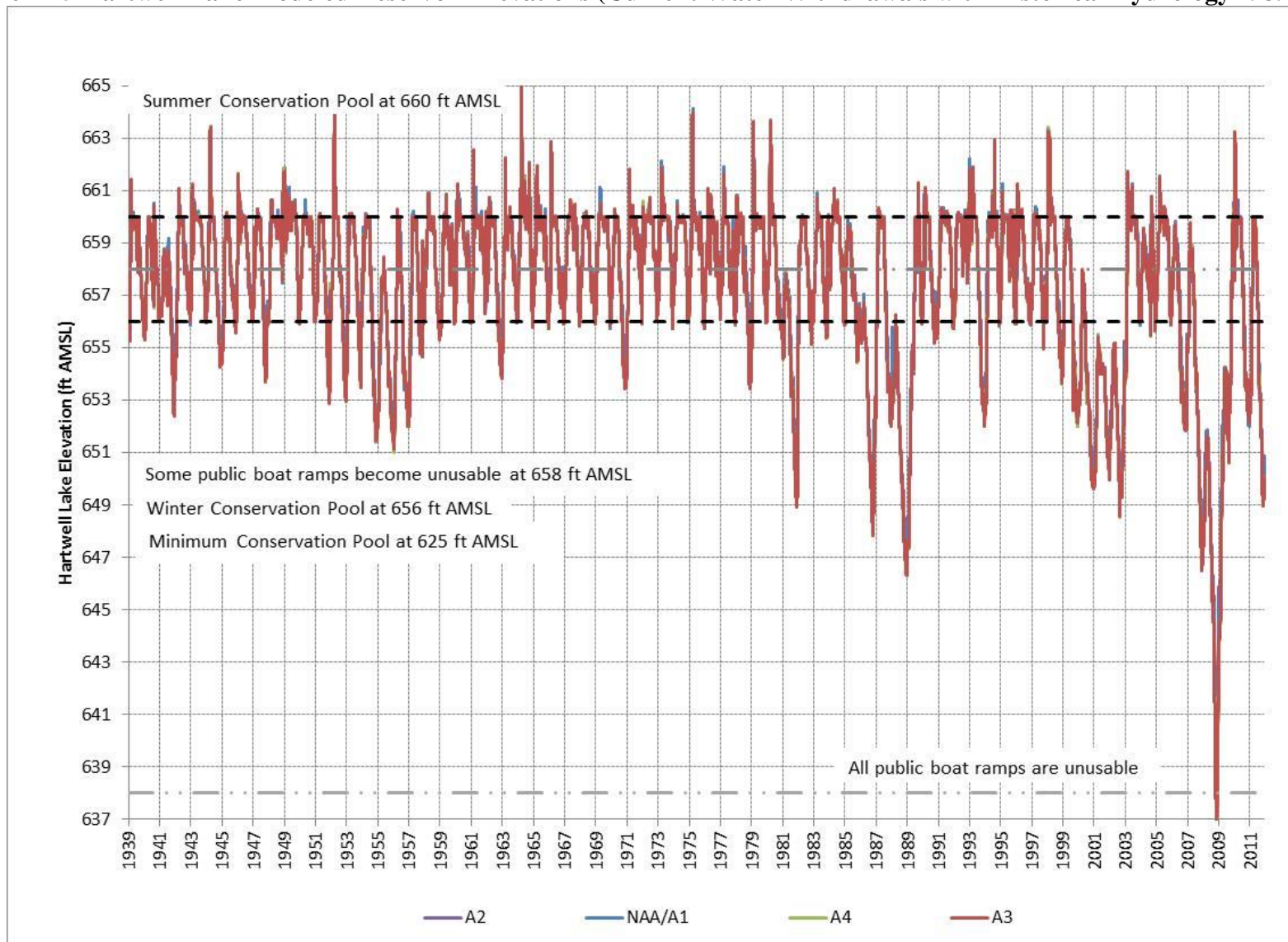


**Figure M-4 Lake Keowee Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 2006-2011)**

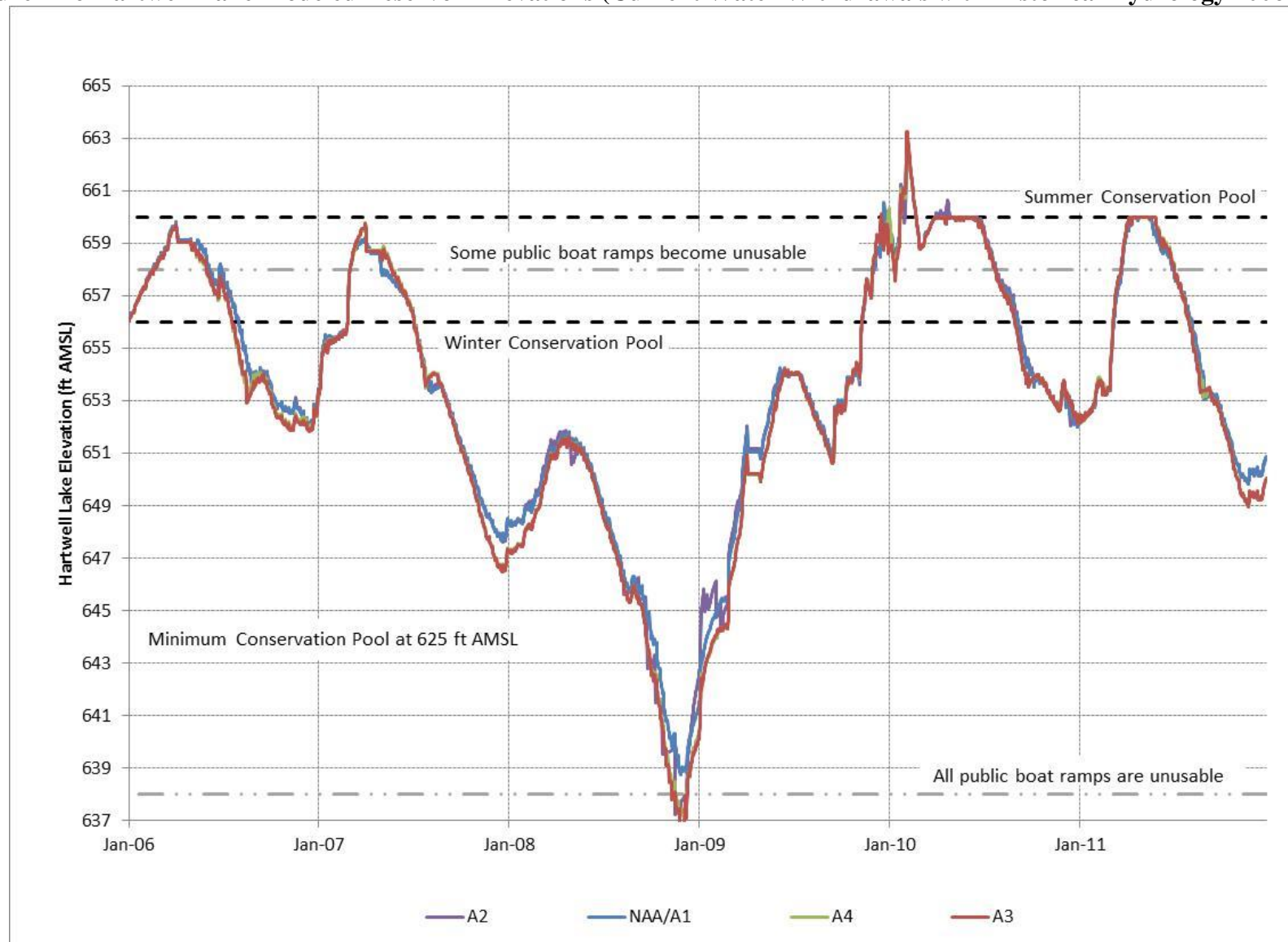




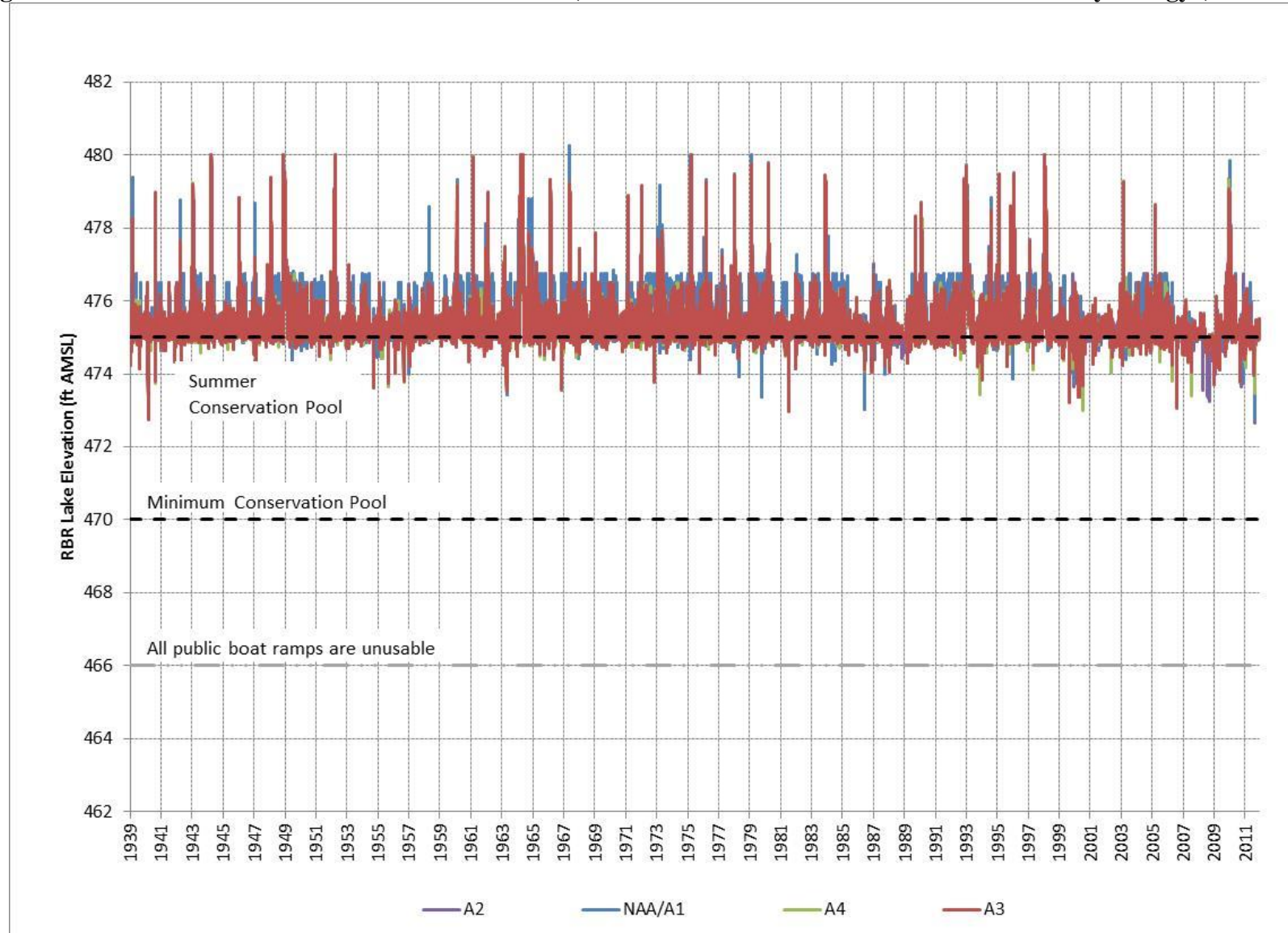
**Figure M-5 Hartwell Lake Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 1939-2011)**



**Figure M-6 Hartwell Lake Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 2006-2011)**

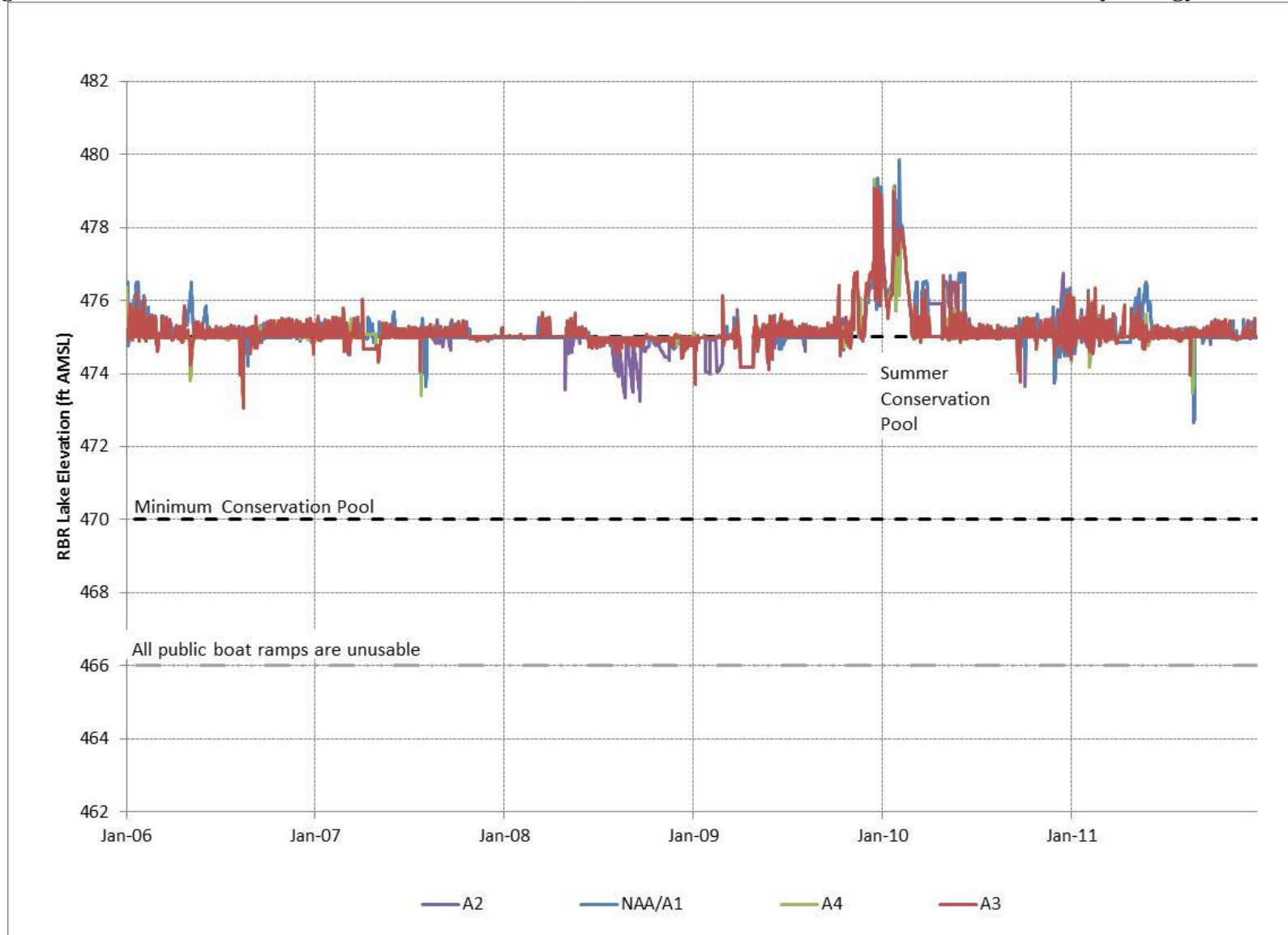


**Figure M-7 RBR Lake Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology (1939-2011))**

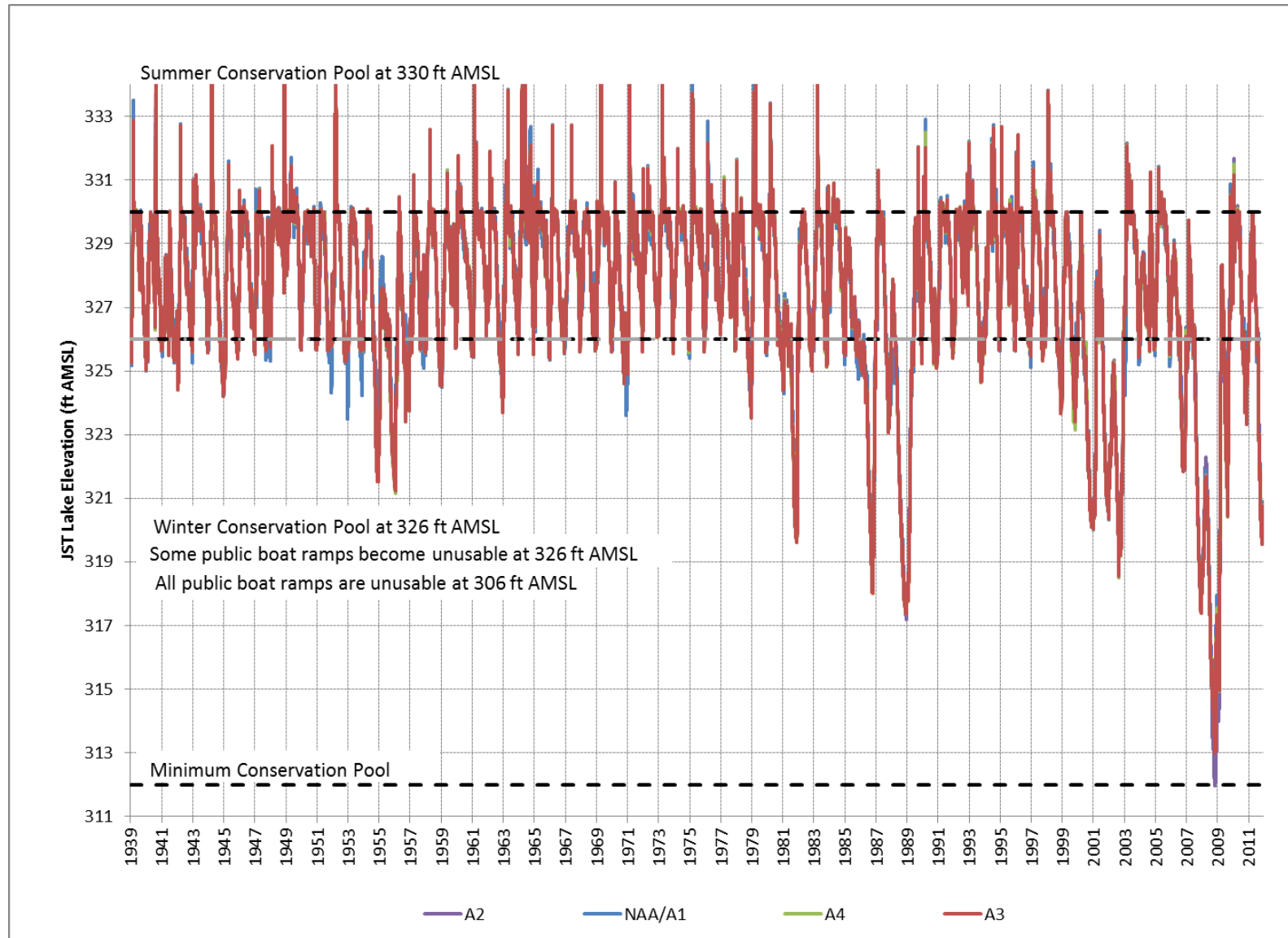




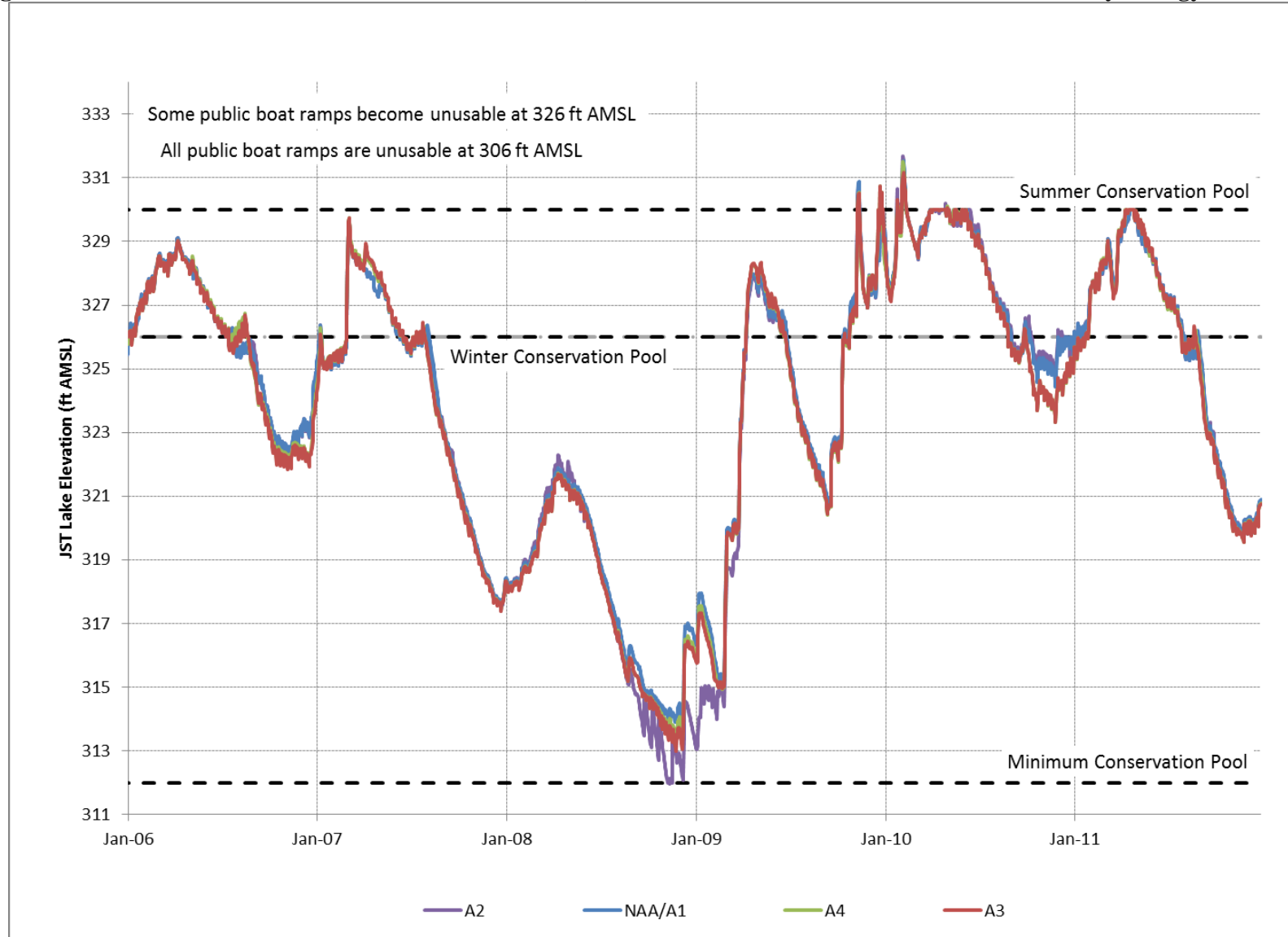
**Figure M-8 RBR Lake Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 2006-2011)**



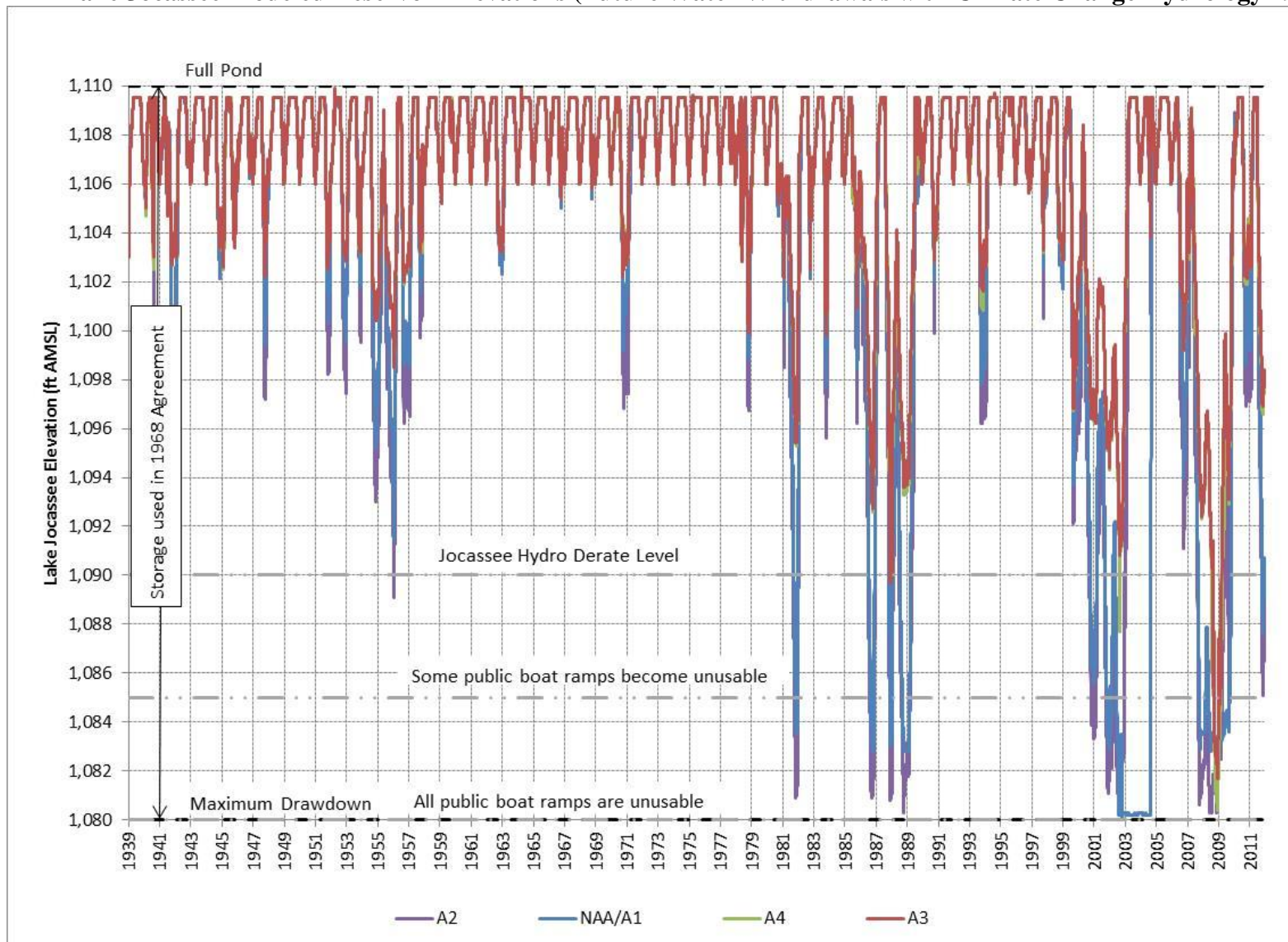
**Figure M-9 JST Lake Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 1939-2011)**



**Figure M-10 JST Lake Modeled Reservoir Elevations (Current Water Withdrawals with Historical Hydrology 2006-2011)**



**Figure M-11 Lake Jocassee Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 1939-2011)**





**Figure M-12 Lake Jocassee Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 2006-2011)**

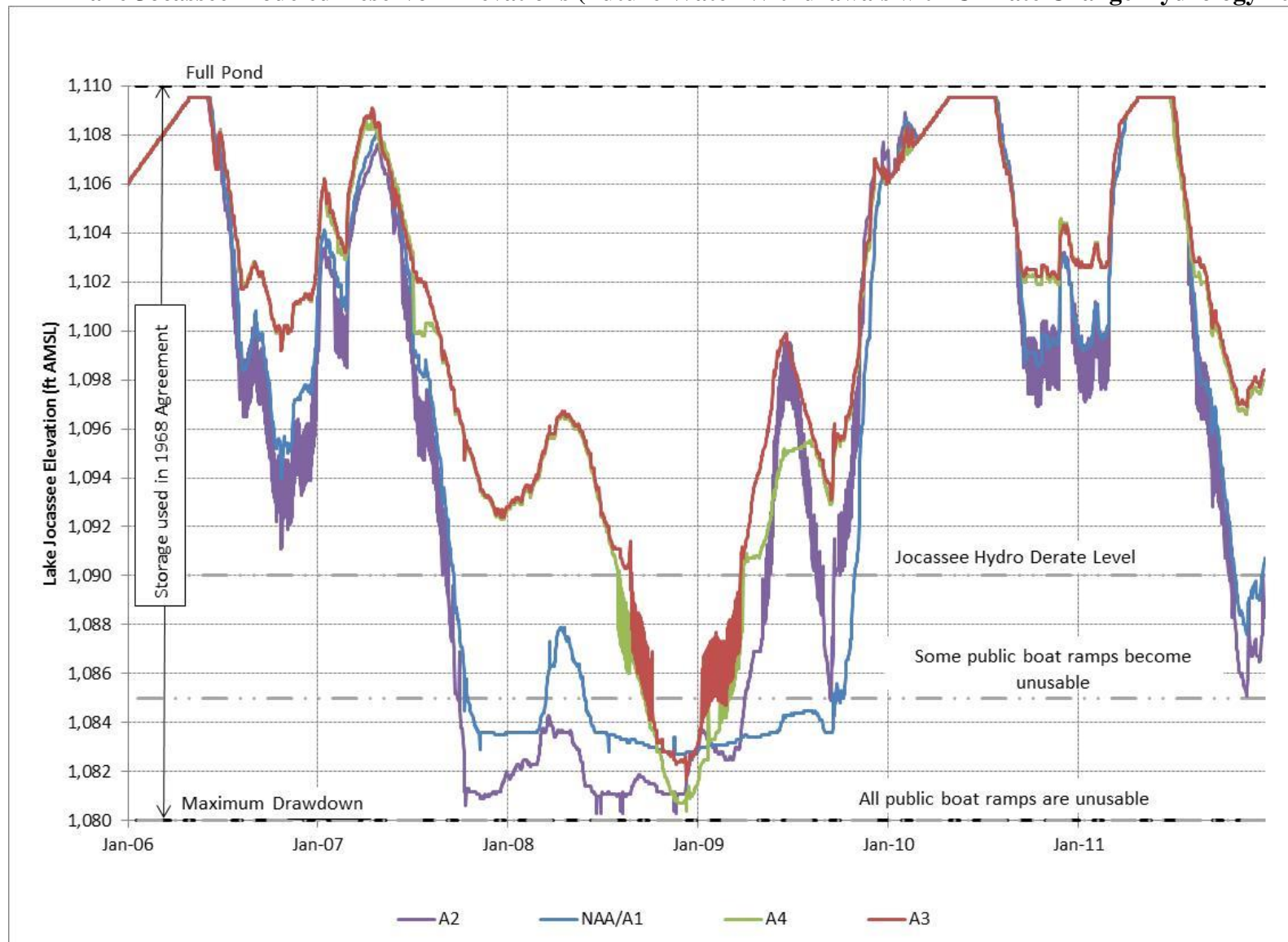


Figure M-13 Lake Keowee Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 1939-2011)

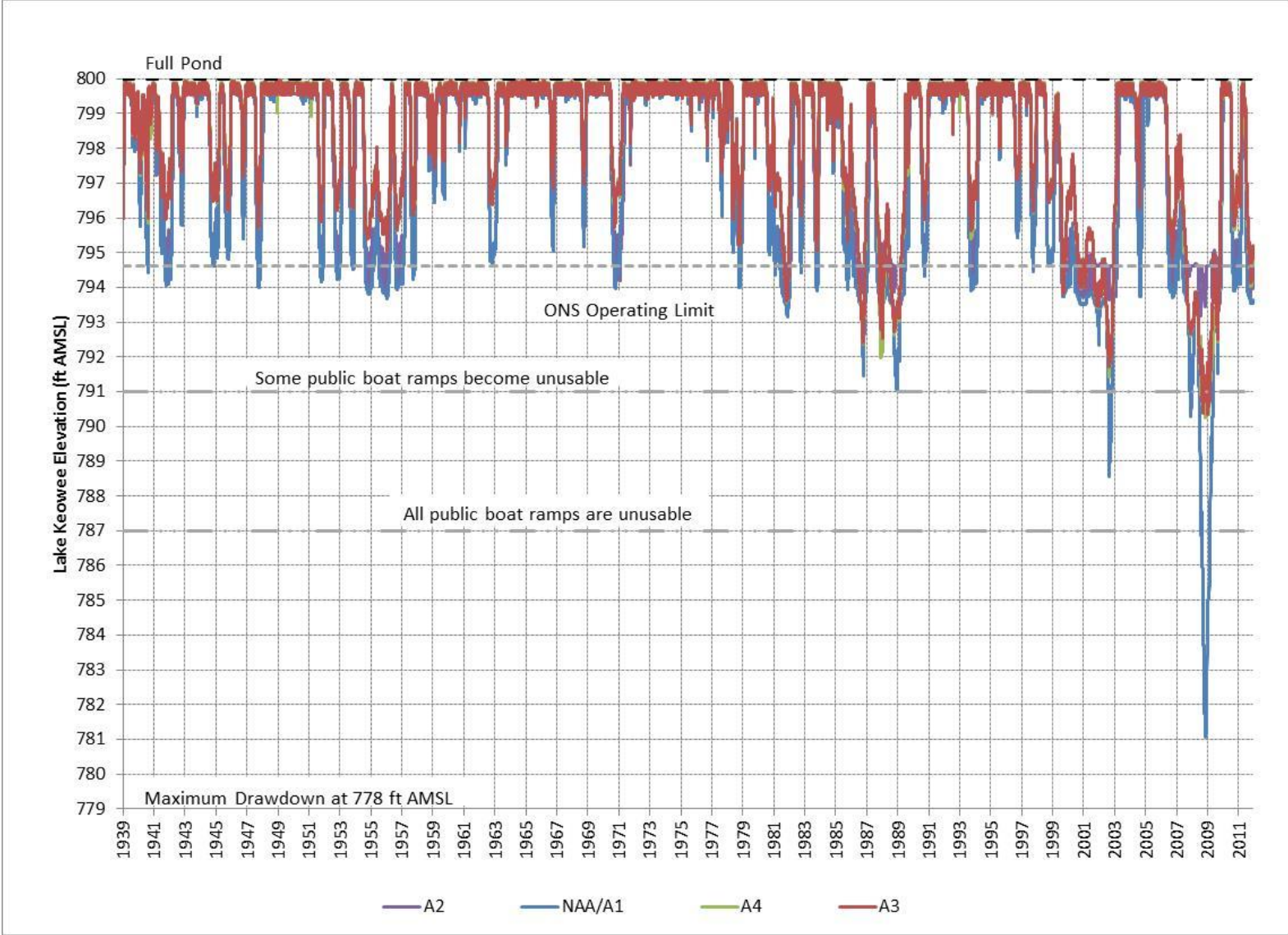
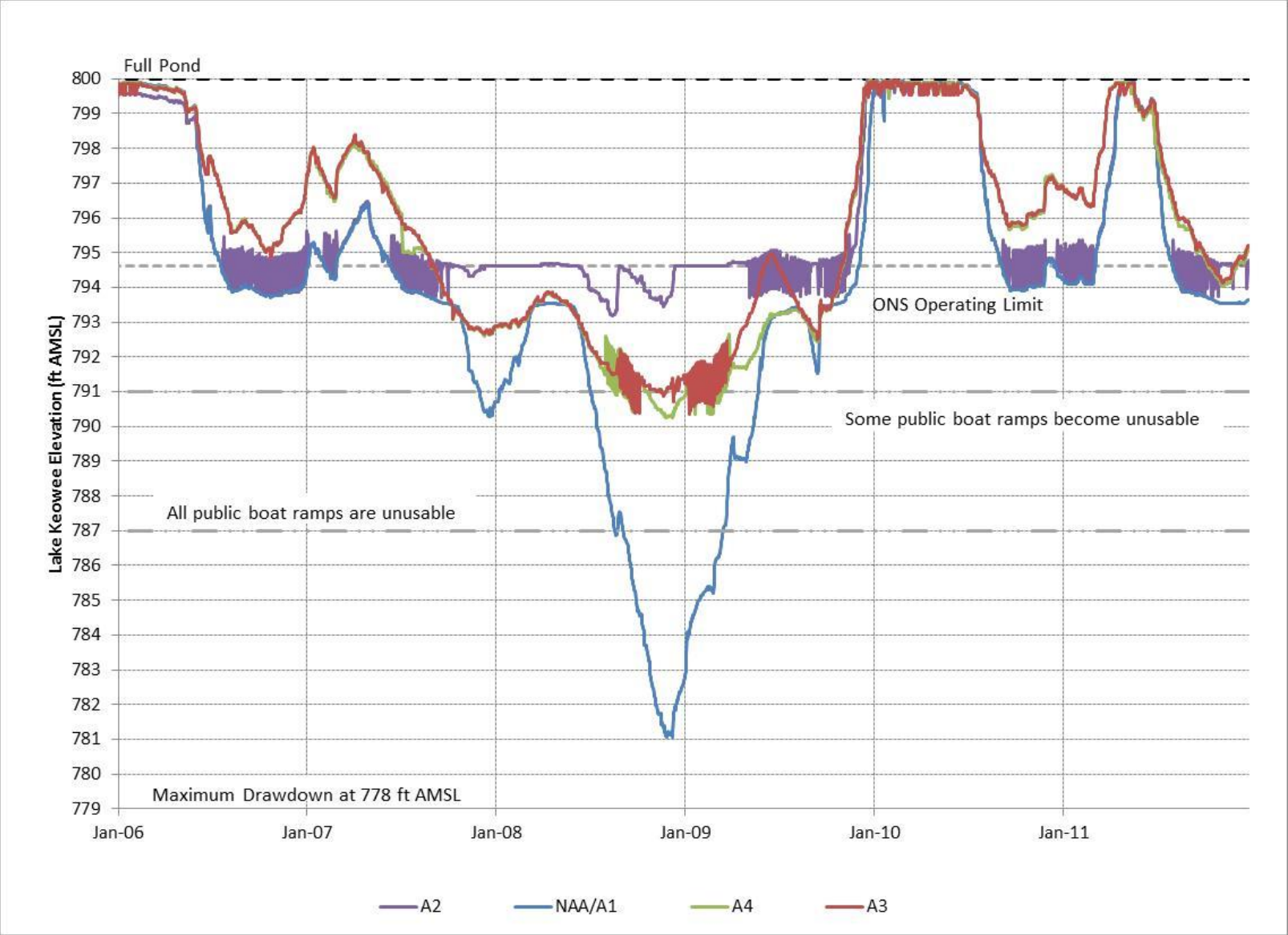
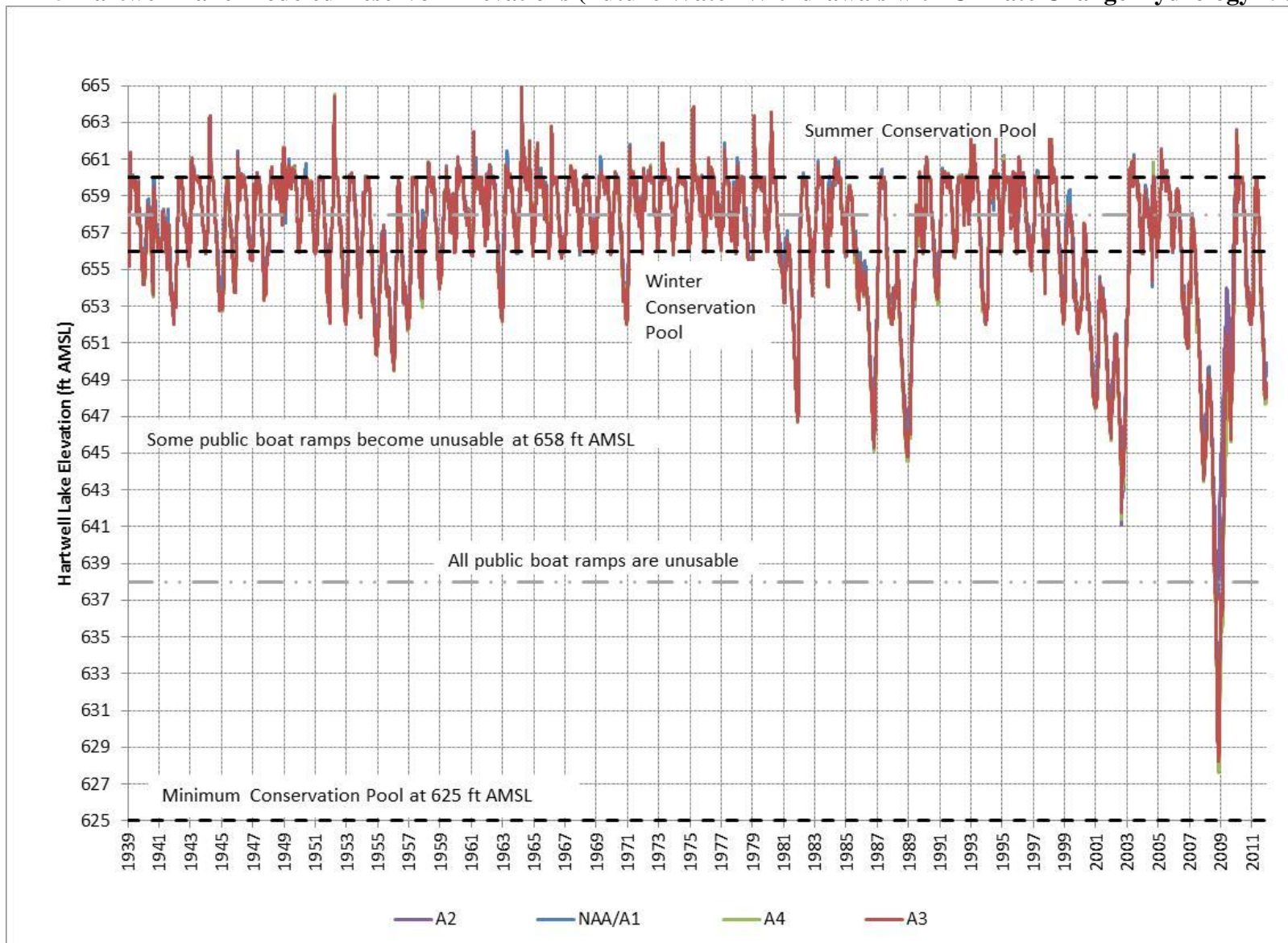


Figure M-14 Lake Keowee Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 2006-2011)



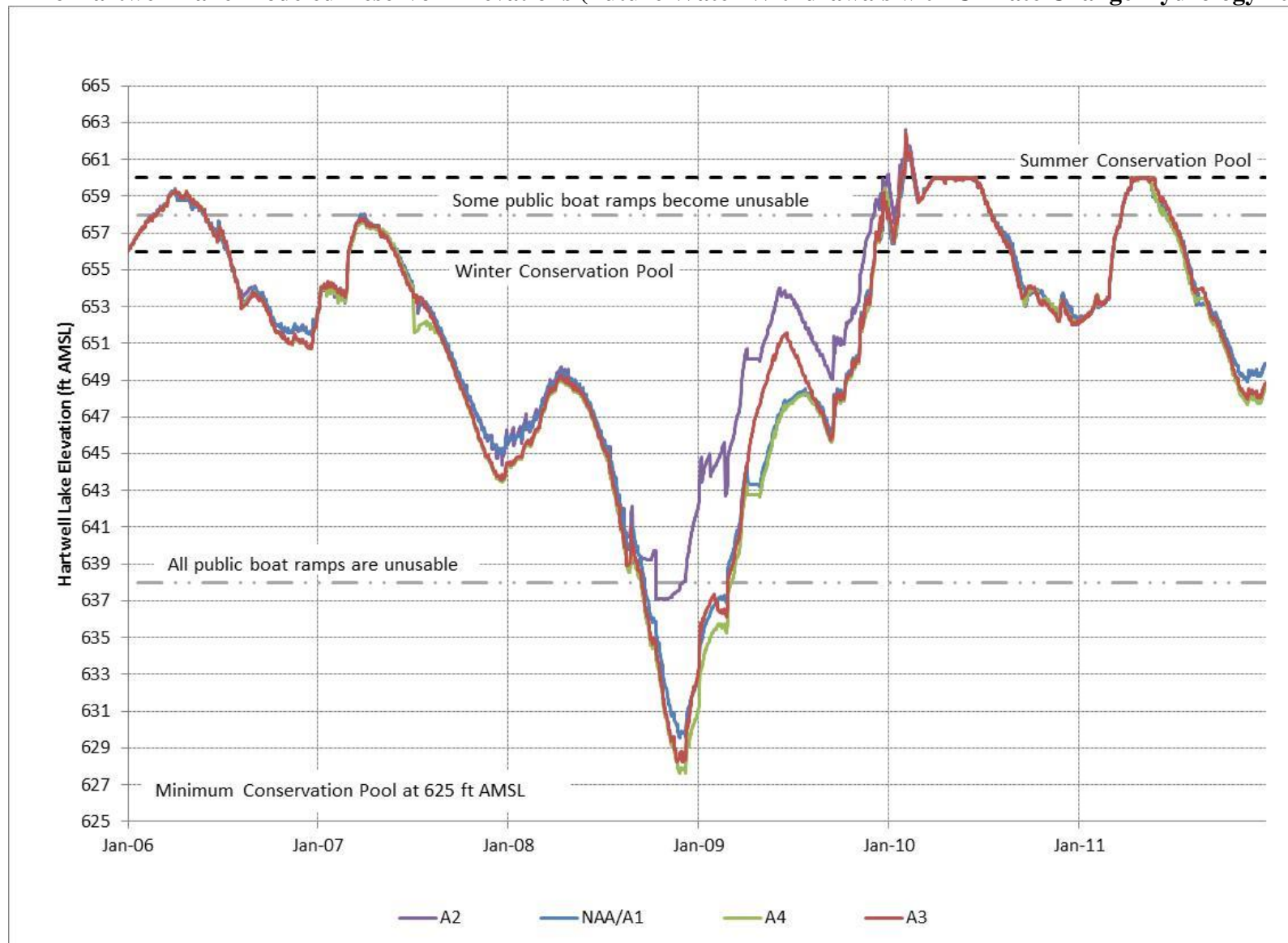


**Figure M-15 Hartwell Lake Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 1939-2011)**

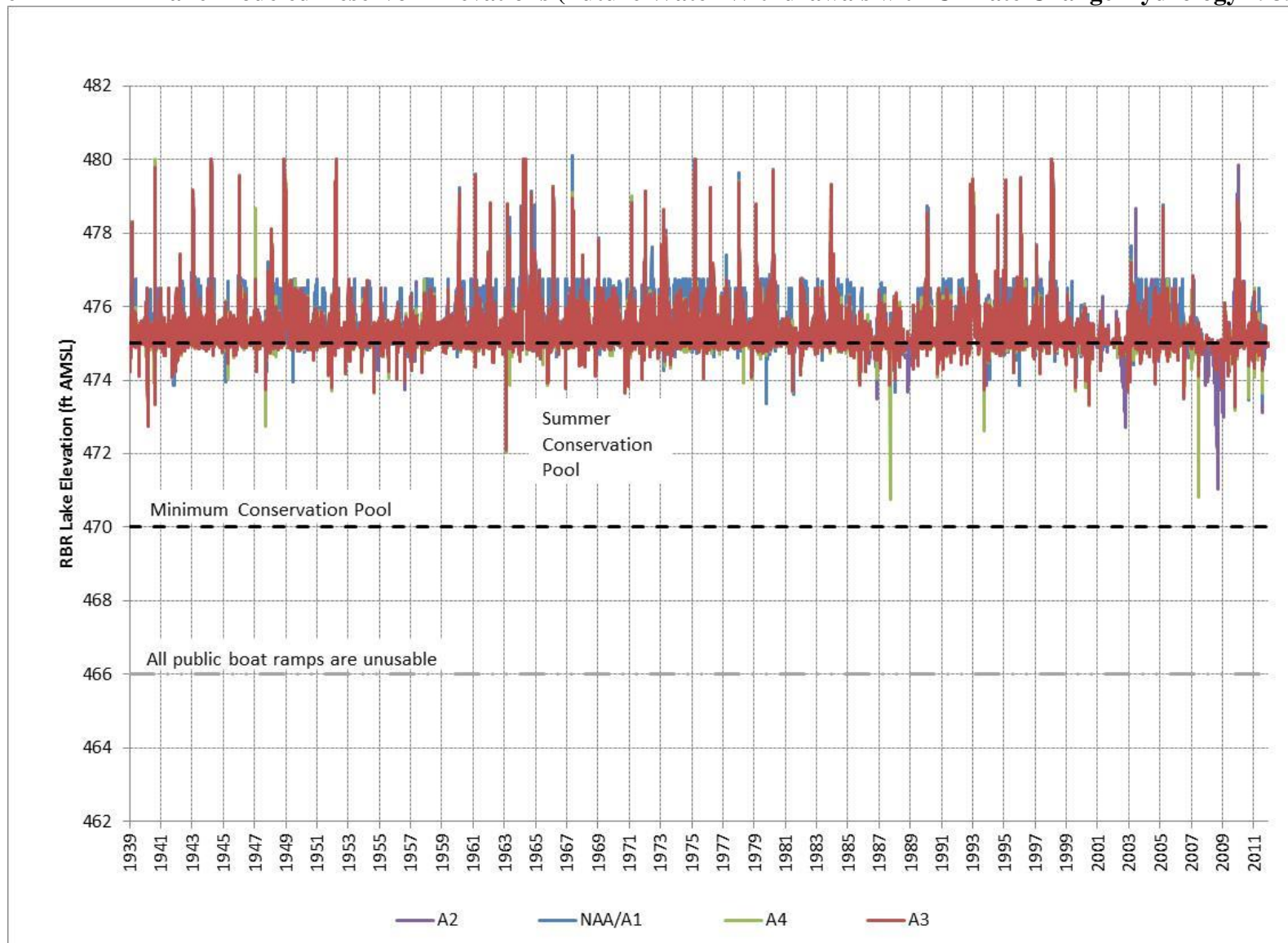




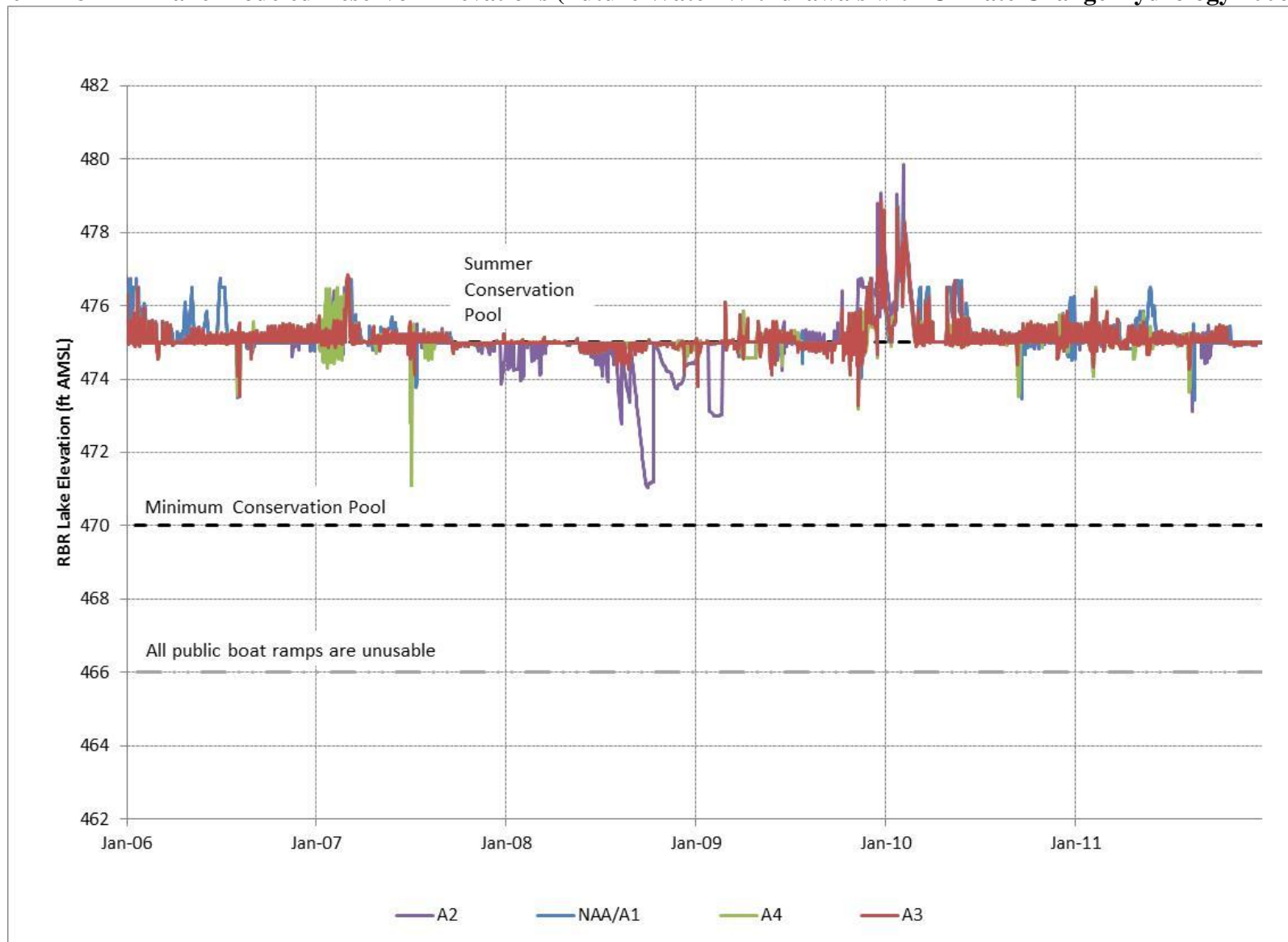
**Figure M-16 Hartwell Lake Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 2006-2011)**



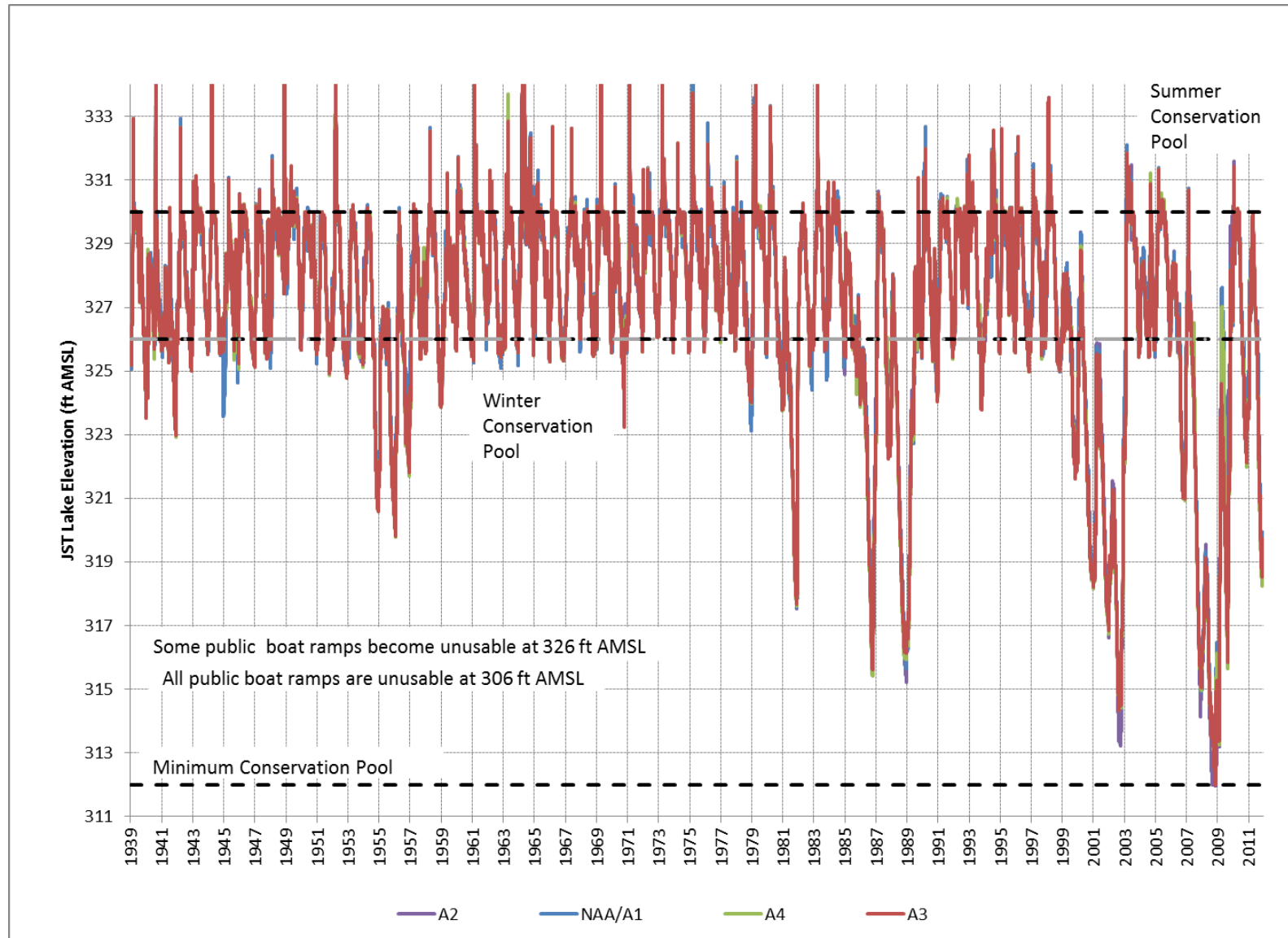
**Figure M-17 RBR Lake Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 1939-2011)**



**Figure M-18 RBR Lake Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 2006-2011)**



**Figure M-19 JST Lake Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 1939-2011)**





**Figure M-20 JST Lake Modeled Reservoir Elevations (Future Water Withdrawals with Climate Change Hydrology 2006-2011)**

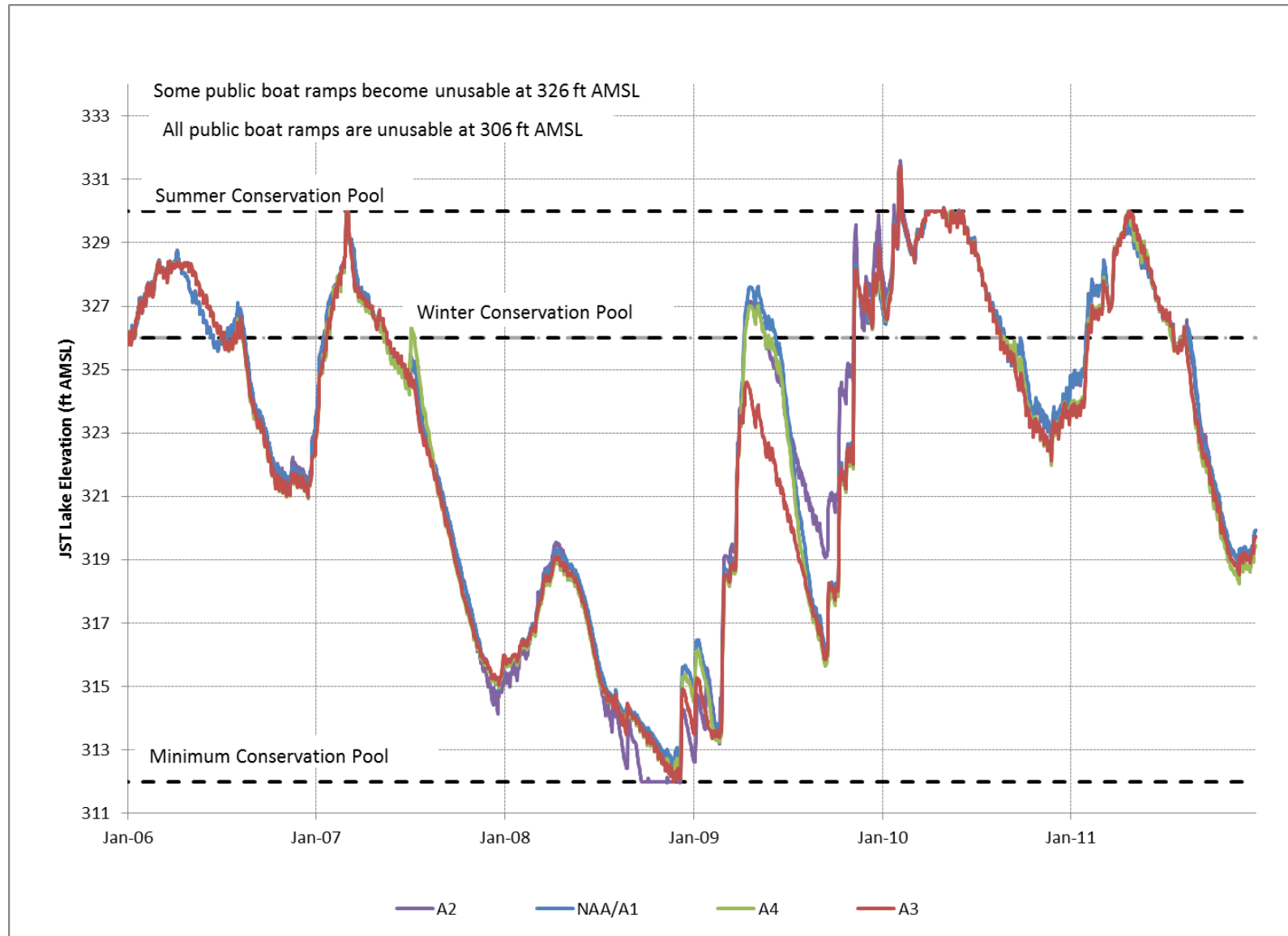


Table M-1 Annual Average JST Lake Flow Releases From April 1 – December 31 During Drought Years  
Current Water Withdrawals with Historical Hydrology

Year	Average Flow (cfs)				Percent Difference Compared with NAA/A1		
	NAA / A1	A2	A3	A4	A2	A3	A4
1941	5,802	5,802	5,837	5,837	0.0%	0.6%	0.6%
1942	6,509	6,509	6,474	6,474	0.0%	-0.6%	-0.5%
1944	7,985	7,985	8,005	7,992	0.0%	0.2%	0.1%
1945	6,856	6,856	6,820	6,834	0.0%	-0.5%	-0.3%
1947	7,815	7,815	7,788	7,787	0.0%	-0.3%	-0.4%
1951	6,234	6,234	6,202	6,208	0.0%	-0.5%	-0.4%
1952	7,158	7,158	7,046	7,046	0.0%	-1.6%	-1.6%
1953	6,634	6,634	6,648	6,647	0.0%	0.2%	0.2%
1954	5,142	5,142	5,159	5,158	0.0%	0.3%	0.3%
1955	4,459	4,459	4,339	4,359	0.0%	-2.7%	-2.3%
1956	4,783	4,793	4,747	4,724	0.2%	-0.8%	-1.3%
1957	7,027	7,034	7,204	7,202	0.1%	2.4%	2.4%
1962	6,776	6,776	6,777	6,775	0.0%	0.0%	0.0%
1963	7,864	7,864	7,930	7,930	0.0%	0.8%	0.8%
1970	5,480	5,480	5,374	5,373	0.0%	-2.0%	-2.0%
1971	7,509	7,509	7,578	7,578	0.0%	0.9%	0.9%
1978	5,691	5,691	5,773	5,765	0.0%	1.4%	1.3%
1979	9,939	9,939	10,016	10,017	0.0%	0.8%	0.8%
1980	8,269	8,269	8,279	8,258	0.0%	0.1%	-0.1%
1981	4,095	4,095	4,057	4,062	0.0%	-0.9%	-0.8%
1982	6,626	6,626	6,632	6,632	0.0%	0.1%	0.1%
1983	9,183	9,183	9,085	9,091	0.0%	-1.1%	-1.0%
1985	5,199	5,199	5,142	5,136	0.0%	-1.1%	-1.2%
1986	3,978	3,976	3,938	3,938	0.0%	-1.0%	-1.0%
1987	5,205	5,208	5,130	5,128	0.1%	-1.5%	-1.5%
1988	3,946	3,946	4,032	4,032	0.0%	2.1%	2.1%
1989	6,985	7,007	7,116	7,110	0.3%	1.8%	1.8%
1990	5,802	5,802	5,794	5,793	0.0%	-0.1%	-0.2%
1993	6,948	6,944	6,874	6,863	-0.1%	-1.1%	-1.2%
1994	9,935	9,941	9,789	9,830	0.1%	-1.5%	-1.1%
1997	7,324	7,324	7,341	7,341	0.0%	0.2%	0.2%
1998	8,559	8,559	8,536	8,531	0.0%	-0.3%	-0.3%
1999	4,832	4,790	4,711	4,747	-0.9%	-2.6%	-1.8%
2000	4,225	4,223	4,236	4,235	0.0%	0.2%	0.2%
2001	3,918	3,918	3,918	3,918	0.0%	0.0%	0.0%
2002	4,069	4,103	4,040	4,051	0.8%	-0.7%	-0.5%
2003	9,761	9,785	9,780	9,780	0.3%	0.2%	0.2%
2004	7,746	7,746	7,743	7,731	0.0%	0.0%	-0.2%
2006	4,333	4,333	4,314	4,290	0.0%	-0.4%	-1.0%
2007	4,126	4,127	4,127	4,127	0.0%	0.0%	0.0%
2008	3,737	3,731	3,732	3,732	-0.2%	-0.1%	-0.1%
2009	6,006	5,989	6,162	6,118	-0.3%	2.5%	1.8%
2010	5,260	5,249	5,116	5,116	-0.2%	-2.8%	-2.8%
2011	4,426	4,427	4,495	4,494	0.0%	1.5%	1.5%
Drought Year Average					0.0%	-0.2%	-0.2%
Drought Year Minimum					-0.9%	-2.8%	-2.8%
Drought Year Maximum					0.8%	2.5%	2.4%

Table M-2 Monthly Average Flow Releases From April 1 – December 31 During Drought Years  
Current Water Withdrawals with Historical Hydrology

Month	Average Flow (cfs)				Percent Difference Compared with NAA/A1		
	NAA / A1	A2	A3	A4	A2	A3	A4
April	9,503	9,517	9,520	9,517	0.1%	0.2%	0.1%
May	6,476	6,475	6,590	6,598	0.0%	1.7%	1.8%
June	5,288	5,286	5,270	5,247	0.0%	-0.3%	-0.8%
July	5,857	5,854	5,916	5,915	0.0%	1.0%	1.0%
August	5,730	5,728	5,724	5,733	0.0%	-0.1%	0.1%
September	5,148	5,147	5,144	5,143	0.0%	-0.1%	-0.1%
October	5,002	5,009	4,906	4,903	0.1%	-2.0%	-2.0%
November	5,789	5,774	5,712	5,723	-0.3%	-1.4%	-1.2%
December	7,312	7,318	7,256	7,252	0.1%	-0.8%	-0.8%
Drought Year Average					0.0%	-0.2%	-0.2%
Drought Year Minimum					-0.3%	-2.0%	-2.0%
Drought Year Maximum					0.1%	1.7%	1.8%

Table M-3 Annual Average JST Lake Flow Releases From April 1 – December 31 During Drought Years  
Future Water Withdrawals with Climate Change Hydrology

Year	Average Flow (cfs)				Percent Difference Compared with NAA/A1		
	NAA/A1	A2	A3	A4	A2	A3	A4
1940	6,896	6,896	6,799	6,765	0.0%	-1.4%	-1.9%
1941	5,604	5,603	5,502	5,499	0.0%	-1.9%	-1.9%
1942	5,875	5,875	5,977	5,973	0.0%	1.7%	1.7%
1944	7,869	7,869	7,714	7,732	0.0%	-2.0%	-1.8%
1945	6,194	6,194	6,182	6,129	0.0%	-0.2%	-1.1%
1946	7,115	7,115	7,134	7,117	0.0%	0.3%	0.0%
1947	7,528	7,527	7,453	7,448	0.0%	-1.0%	-1.1%
1951	5,929	5,929	5,881	5,868	0.0%	-0.8%	-1.0%
1952	6,793	6,794	6,768	6,796	0.0%	-0.4%	0.0%
1953	6,331	6,359	6,359	6,375	0.4%	0.4%	0.7%
1954	5,055	5,055	5,061	5,048	0.0%	0.1%	-0.1%
1955	4,102	4,103	4,086	4,085	0.0%	-0.4%	-0.4%
1956	4,378	4,355	4,389	4,400	-0.5%	0.2%	0.5%
1957	6,487	6,464	6,696	6,679	-0.4%	3.1%	2.9%
1958	6,262	6,262	6,355	6,354	0.0%	1.5%	1.4%
1959	6,753	6,752	6,696	6,695	0.0%	-0.8%	-0.9%
1962	6,528	6,530	6,502	6,503	0.0%	-0.4%	-0.4%
1963	7,566	7,566	7,581	7,581	0.0%	0.2%	0.2%
1966	6,132	6,132	6,206	6,201	0.0%	1.2%	1.1%
1968	6,461	6,461	6,463	6,462	0.0%	0.0%	0.0%
1970	5,217	5,310	5,216	5,212	1.7%	0.0%	-0.1%
1971	7,056	7,013	7,195	7,190	-0.6%	1.9%	1.9%
1978	5,615	5,614	5,568	5,569	0.0%	-0.8%	-0.8%
1979	9,587	9,586	9,658	9,665	0.0%	0.7%	0.8%
1980	8,158	8,159	8,159	8,163	0.0%	0.0%	0.1%
1981	4,013	4,013	4,086	4,089	0.0%	1.8%	1.8%
1982	6,231	6,189	6,274	6,272	-0.7%	0.7%	0.7%
1983	8,866	8,902	8,850	8,857	0.4%	-0.2%	-0.1%
1985	4,996	4,986	4,999	5,028	-0.2%	0.1%	0.6%
1986	3,937	3,873	3,854	3,850	-1.6%	-2.1%	-2.2%
1987	5,038	5,038	5,051	5,034	0.0%	0.3%	-0.1%
1988	3,952	3,909	3,887	3,879	-1.1%	-1.7%	-1.9%
1989	6,298	6,382	6,480	6,431	1.3%	2.8%	2.1%
1990	5,684	5,677	5,766	5,792	-0.1%	1.4%	1.9%
1991	8,133	8,133	8,083	8,095	0.0%	-0.6%	-0.5%
1993	6,662	6,647	6,540	6,544	-0.2%	-1.9%	-1.8%
1994	9,286	9,314	9,433	9,411	0.3%	1.6%	1.3%
1996	6,809	6,809	6,869	6,830	0.0%	0.9%	0.3%
1997	7,067	7,063	7,049	7,048	-0.1%	-0.3%	-0.3%
1998	8,237	8,237	8,228	8,220	0.0%	-0.1%	-0.2%
1999	4,472	4,477	4,377	4,362	0.1%	-2.2%	-2.5%
2000	4,185	4,184	4,115	4,126	0.0%	-1.7%	-1.4%
2001	3,935	3,920	3,920	3,920	-0.4%	-0.4%	-0.4%
2002	3,771	3,794	3,763	3,757	0.6%	-0.2%	-0.4%
2003	9,353	9,230	9,386	9,386	-1.3%	0.4%	0.4%
2004	7,032	7,386	7,345	7,345	4.8%	4.3%	4.3%
2006	4,203	4,205	4,156	4,159	0.0%	-1.1%	-1.1%
2007	3,984	3,977	3,969	3,936	-0.2%	-0.4%	-1.2%
2008	3,708	3,041	3,669	3,704	-22.0%	-1.1%	-0.1%
2009	5,274	5,547	5,288	5,224	4.9%	0.3%	-1.0%
2010	5,008	5,008	4,997	4,978	0.0%	-0.2%	-0.6%
2011	4,243	4,242	4,276	4,339	0.0%	0.8%	2.2%
Drought Year Average					-0.3%	0.70	0.0%
Drought Year Minimum					-22.0%	-2.2%	-2.5%
Drought Year Maximum					4.9%	4.3%	4.3%

Table M-4 Monthly Average Flow Releases From April 1 – December 31 During Drought Years  
Future Water Withdrawals with Climate Change Hydrology

Month	Average Flow (cfs)				Percent Difference Compared with NAA/A1		
	NAA / A1	A2	A3	A4	A2	A3	A4
April	9,097	9,087	9,098	9,080	-0.1%	0.0%	-0.2%
May	6,544	6,506	6,623	6,605	-0.6%	1.2%	0.9%
June	5,301	5,330	5,304	5,317	0.5%	0.1%	0.3%
July	5,804	5,795	5,869	5,888	-0.1%	1.1%	1.4%
August	5,837	5,859	5,913	5,906	0.4%	1.3%	1.2%
September	5,045	5,045	4,952	4,971	0.0%	-1.9%	-1.5%
October	4,771	4,729	4,713	4,710	-0.9%	-1.2%	-1.3%
November	5,442	5,460	5,383	5,348	0.3%	-1.1%	-1.7%
December	6,848	6,853	6,906	6,904	0.1%	0.8%	0.8%
Drought Year Average					0.0%	0.0%	0.0%
Drought Year Minimum					-0.9%	-1.9%	-1.7%
Drought Year Maximum					0.5%	1.3%	1.4%

Table M-5 Annual Summary of Days Within Drought Levels Future Water Withdrawals with Historical Hydrology																
Year	Drought Level 1				Drought Level 2				Drought Level 3				Total			
	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4
1939	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1940	16	16	21	25	0	0	0	0	0	0	0	0	16	16	21	25
1941	130	130	60	60	0	0	91	92	0	0	0	0	130	130	151	152
1942	48	48	1	1	0	0	48	48	0	0	0	0	48	48	49	49
1943	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1944	72	72	105	102	0	0	0	0	0	0	0	0	72	72	105	102
1945	40	40	124	150	0	0	0	0	0	0	0	0	40	40	124	150
1946	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
1947	36	36	29	31	40	40	57	55	0	0	0	0	76	76	86	86
1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1949	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	89	89	102	102	0	0	0	0	0	0	0	0	89	89	102	102
1952	95	95	97	96	0	0	6	6	0	0	0	0	95	95	103	102
1953	89	89	89	89	0	0	30	40	0	0	0	0	89	89	119	129
1954	32	32	25	24	98	98	112	112	0	0	0	0	130	130	137	136
1955	69	67	47	50	235	235	248	249	0	0	0	0	304	302	295	299
1956	55	55	33	33	210	210	217	219	0	0	0	0	265	265	250	252
1957	79	79	84	84	63	63	59	59	0	0	0	0	142	142	143	143
1958	3	3	1	1	0	0	0	0	0	0	0	0	3	3	1	1
1959	18	18	19	19	0	0	0	0	0	0	0	0	18	18	19	19
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	80	80	113	113	0	0	0	0	0	0	0	0	80	80	113	113
1963	10	10	22	22	0	0	0	0	0	0	0	0	10	10	22	22
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	3	3	17	16	0	0	0	0	0	0	0	0	3	3	17	16
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	1	1	5	5	0	0	0	0	0	0	0	0	1	1	5	5
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	115	115	35	32	0	0	87	93	0	0	0	0	115	115	122	125
1971	25	25	1	1	0	0	33	35	0	0	0	0	25	25	34	36
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	78	78	99	97	0	0	0	0	0	0	0	0	78	78	99	97
1979	19	19	19	19	0	0	0	0	0	0	0	0	19	19	19	19
1980	5	5	30	29	0	0	0	0	0	0	0	0	5	5	30	29
1981	124	123	152	151	174	175	177	177	0	0	0	0	298	298	329	328
1982	24	24	67	67	33	32	33	33	0	0	0	0	57	56	100	100
1983	23	23	61	69	0	0	0	0	0	0	0	0	23	23	61	69
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	57	56	46	57	53	53	55	64	0	0	0	0	110	109	101	121
1986	104	110	115	60	245	236	189	242	0	0	56	58	349	346	360	360
1987	28	27	31	27	118	118	125	126	0	0	0	0	146	145	156	153
1988	0	0	0	0	352	322	312	313	14	44	54	53	366	366	366	366
1989	3	1	1	1	125	125	121	122	61	59	63	63	189	185	185	186
1990	33	33	91	91	0	0	0	0	0	0	0	0	33	33	91	91
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	27	27	28	29	84	84	92	91	0	0	0	0	111	111	120	120
1994	1	1	1	1	60	60	60	60	0	0	0	0	61	61	61	61
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2
1997	29	29	40	42	0	0	0	0	0	0	0	0	29	29	40	42
1998	101	101	110	110	0	0	0	0	0	0	0	0	101	101	110	110
1999	56	56	54	58	119	119	130	127	0	0	0	0	175	175	184	185
2000	46	47	45	50	266	265	270	269	0	0	0	0	312	312	315	319
2001	0	0	0	0	365	365	365	365	0	0	0	0	365	365	365	365
2002	0	0	0	0	256	249	240	217	109	116	125	148	365	365	365	365
2003	1	1	1	1	57	64	64	64	0	0	0	0	58	65	65	65
2004	15	15	21	21	0	0	0	0	0	0	0	0	15	15	21	21
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	26	26	30	30	137	144	145	145	0	0	0	0	163	170	175	175
2007	76	80	72	69	157	151	139	136	23	30	42	45	256	261	253	250
2008	0	0	0	0	130	125	118	118	236	241	248	248	366	366	366	366






Year	Drought Level 1				Drought Level 2				Drought Level 3				Total			
	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4
2009	1	1	4	1	180	232	175	173	155	84	154	155	336	317	333	329
2010	26	26	23	26	98	98	105	105	0	0	0	0	124	124	128	131
2011	25	25	24	24	203	203	203	203	0	0	0	0	228	228	227	227
Total	2033	2037	2198	2189	3858	3866	4106	4158	598	574	742	770	6489	6477	7046	7117
<div> <div>  <div> Drought Level 1  4,000 - 4,200 cfs </div> </div> <div>  <div> Drought Level 2  3,800 - 4,000 cfs  3,600 cfs (Nov - Jan) </div> </div> <div>  <div> Drought Level 3  3,800 cfs  3,100 cfs (Nov - Jan) </div> </div> </div>																

Table M-6 Annual Summary of Days Within Drought Levels  
Current Water Withdrawals with Historical Hydrology

Year	Drought Level 1				Drought Level 2				Drought Level 3				Total			
	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4
1939	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1941	85	85	100	100	0	0	0	0	0	0	0	0	85	85	100	100
1942	0	0	4	4	0	0	0	0	0	0	0	0	0	0	4	4
1943	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1944	0	0	47	42	0	0	0	0	0	0	0	0	0	0	47	42
1945	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
1946	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1947	53	53	67	68	0	0	0	0	0	0	0	0	53	53	67	68
1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1949	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	60	60	93	92	0	0	0	0	0	0	0	0	60	60	93	92
1952	68	68	89	89	0	0	0	0	0	0	0	0	68	68	89	89
1953	21	21	77	77	0	0	0	0	0	0	0	0	21	21	77	77
1954	26	26	31	31	92	92	100	100	0	0	0	0	118	118	131	131
1955	53	53	40	41	197	197	190	190	0	0	0	0	250	250	230	231
1956	32	28	30	33	179	183	190	190	0	0	0	0	211	211	220	223
1957	24	24	77	77	56	56	39	39	0	0	0	0	80	80	116	116
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	1	1	60	60	0	0	0	0	0	0	0	0	1	1	60	60
1963	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	49	49	109	109	0	0	0	0	0	0	0	0	49	49	109	109
1971	2	2	4	4	0	0	0	0	0	0	0	0	2	2	4	4
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	9	9	72	70	0	0	0	0	0	0	0	0	9	9	72	70
1979	7	7	9	7	0	0	0	0	0	0	0	0	7	7	9	7
1980	0	0	4	2	0	0	0	0	0	0	0	0	0	0	4	2
1981	70	70	71	67	156	156	163	162	0	0	0	0	226	226	234	229
1982	1	1	5	4	3	3	5	4	0	0	0	0	4	4	10	8
1983	1	1	13	15	0	0	0	0	0	0	0	0	1	1	13	15
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	35	35	56	57	0	0	0	0	0	0	0	0	35	35	56	57
1986	110	109	110	110	189	190	190	190	0	0	0	0	299	299	300	300
1987	118	118	42	42	22	24	105	105	0	0	0	0	140	142	147	147
1988	117	117	0	0	211	211	366	366	0	0	0	0	328	328	366	366
1989	1	1	1	1	172	174	172	172	0	0	0	0	173	175	173	173
1990	11	11	30	30	0	0	0	0	0	0	0	0	11	11	30	30







Year	Drought Level 1				Drought Level 2				Drought Level 3				Total			
	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	102	102	27	28	0	0	84	84	0	0	0	0	102	102	111	112
1994	45	45	1	1	0	0	60	60	0	0	0	0	45	45	61	61
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	9	9	24	24	0	0	0	0	0	0	0	0	9	9	24	24
1998	18	18	82	80	0	0	0	0	0	0	0	0	18	18	82	80
1999	30	24	38	34	93	99	101	105	0	0	0	0	123	123	139	139
2000	55	55	48	45	255	255	257	257	0	0	0	0	310	310	305	302
2001	0	0	0	0	365	365	365	365	0	0	0	0	365	365	365	365
2002	1	1	0	0	363	361	365	365	0	0	0	0	364	362	365	365
2003	7	2	1	1	0	0	49	51	0	0	0	0	7	2	50	52
2004	5	5	14	15	0	0	0	0	0	0	0	0	5	5	14	15
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	30	30	32	25	128	128	138	142	0	0	0	0	158	158	170	167
2007	43	43	38	42	165	165	167	164	0	0	0	0	208	208	205	206
2008	0	0	0	0	231	224	224	224	135	142	142	142	366	366	366	366
2009	1	1	1	1	241	247	233	233	73	67	81	81	315	315	315	315
2010	27	33	26	26	91	84	98	98	0	0	0	0	118	117	124	124
2011	28	28	24	26	190	190	196	194	0	0	0	0	218	218	220	220
Total	1355	1345	1600	1583	3399	3404	3857	3860	208	209	223	223	4962	4958	5680	5666
<div> <div>  <div> Drought Level 1  4,000 - 4,200 cfs </div> </div> <div>  <div> Drought Level 2  3,800 - 4,000 cfs  3,600 cfs (Nov - Jan) </div> </div> <div>  <div> Drought Level 3  3,800 cfs  3,100 cfs (Nov - Jan) </div> </div> </div>																

Table M-7 Annual Summary of Days Within Drought Levels  
Future Water Withdrawals with Climate Change Hydrology

Year	Drought Level 1				Drought Level 2				Drought Level 3				Total			
	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4
1939	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1940	19	19	53	58	0	0	6	11	0	0	0	0	19	19	59	69
1941	134	134	63	63	0	0	96	96	0	0	0	0	134	134	159	159
1942	48	48	1	1	0	0	48	48	0	0	0	0	48	48	49	49
1943	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1944	83	83	106	106	0	0	0	0	0	0	0	0	83	83	106	106
1945	97	97	147	108	0	0	0	28	0	0	0	0	97	97	147	136
1946	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2
1947	32	32	30	33	46	46	57	56	0	0	0	0	78	78	87	89
1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1949	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	95	95	33	34	0	0	70	70	0	0	0	0	95	95	103	104
1952	98	98	102	102	0	0	6	6	0	0	0	0	98	98	108	108
1953	91	93	92	94	0	0	36	36	0	0	0	0	91	93	128	130
1954	27	27	26	25	105	105	113	113	0	0	0	0	132	132	139	138
1955	73	73	47	48	240	240	255	255	0	0	0	0	313	313	302	303
1956	55	52	29	28	221	220	226	229	0	0	0	0	276	272	255	257
1957	79	79	87	35	63	61	59	113	0	0	0	0	142	140	146	148
1958	1	1	3	3	0	0	0	0	0	0	0	0	1	1	3	3
1959	15	15	33	33	0	0	0	0	0	0	0	0	15	15	33	33
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	97	99	112	112	0	0	0	0	0	0	0	0	97	99	112	112
1963	19	19	24	25	0	0	0	0	0	0	0	0	19	19	24	25
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	6	6	20	23	0	0	0	0	0	0	0	0	6	6	20	23
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	2	2	14	13	0	0	0	0	0	0	0	0	2	2	14	13
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	40	41	33	33	79	78	90	97	0	0	0	0	119	119	123	130
1971	1	1	1	1	25	33	32	37	0	0	0	0	26	34	33	38
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Year	Drought Level 1				Drought Level 2				Drought Level 3				Total			
	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4	NAA / A1	A2	A3	A4
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	79	79	102	102	0	0	0	0	0	0	0	0	79	79	102	102
1979	20	20	19	19	0	0	0	0	0	0	0	0	20	20	19	19
1980	9	9	35	35	0	0	0	0	0	0	0	0	9	9	35	35
1981	134	134	149	148	186	186	181	182	0	0	0	0	320	320	330	330
1982	39	38	69	69	33	33	33	33	0	0	0	0	72	71	102	102
1983	26	27	68	69	0	0	0	0	0	0	0	0	26	27	68	69
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	34	36	54	67	50	50	52	63	0	0	0	0	84	86	106	130
1986	107	99	111	113	236	205	188	187	0	38	56	58	343	342	355	358
1987	31	31	28	37	120	119	127	122	0	0	0	0	151	150	155	159
1988	0	0	0	0	345	318	308	302	21	48	58	64	366	366	366	366
1989	10	2	1	4	122	125	122	121	64	60	63	64	196	187	186	189
1990	43	61	41	51	0	0	64	65	0	0	0	0	43	61	105	116
1991	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	31	29	31	27	84	86	91	94	0	0	0	0	115	115	122	121
1994	1	1	1	1	60	60	60	60	0	0	0	0	61	61	61	61
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	7	7	0	0	0	0	0	0	0	0	0	0	7	7
1997	30	30	43	43	0	0	0	0	0	0	0	0	30	30	43	43
1998	102	104	110	110	0	0	0	0	0	0	0	0	102	104	110	110
1999	58	56	52	54	119	121	136	136	0	0	0	0	177	177	188	190
2000	48	48	48	46	270	270	271	272	0	0	0	0	318	318	319	318
2001	0	0	0	0	365	365	365	365	0	0	0	0	365	365	365	365
2002	0	0	0	0	239	237	194	188	126	128	171	177	365	365	365	365
2003	1	1	1	1	63	64	63	63	0	0	0	0	64	65	64	64
2004	22	20	25	24	0	0	0	0	0	0	0	0	22	20	25	24
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	47	46	27	26	151	151	150	151	0	0	0	0	198	197	177	177
2007	47	47	41	53	199	195	191	184	41	45	55	56	287	287	287	293
2008	0	0	0	0	108	103	99	97	258	263	267	269	366	366	366	366
2009	1	1	1	1	151	232	199	112	185	85	136	224	337	318	336	337
2010	24	24	24	25	100	100	107	106	0	0	0	0	124	124	131	131
2011	26	25	20	22	202	203	208	210	0	0	0	0	228	228	228	232
Total	2082	2082	2166	2135	3982	4006	4303	4308	695	667	806	912	6759	6755	7275	7355
<div><div></div><div><div>Drought Level 1</div><div>4,000 - 4,200 cfs</div></div></div> <div><div></div><div><div>Drought Level 2</div><div>3,800 - 4,000 cfs</div><div>3,600 cfs (Nov - Jan)</div></div></div> <div><div></div><div><div>Drought Level 3</div><div>3,800 cfs</div><div>3,100 cfs (Nov - Jan)</div></div></div>																