TRUCKEE MEADOWS WATER AUTHORITY

STAFF REPORT

TO: Chairman and Board Members
FROM: Mark Foree, General Manager
FROM: John Erwin/Jeff Tissier
DATE: 17 September 2012
SUBJECT: **Presentation of preliminary analysis of TMWA's financial position in regard to the implementation of second phase of rate adjustment (scheduled to go into effect in February, 2013) approved by the Board in January, 2012**

RECOMMENDATIONS

Direct staff to schedule this item for further review at its December 2012 board meeting at which time the audited financial statements will be available as well as report on first quarter FY2013 financial performance; these reports will provide additional information related to future rate adjustments.

FINDINGS

At its January 18, 2012 meeting the Board approved and adopted such adjustments to be effective and implemented as follows:

i) Phase 1 Rates - commencing for the first billing cycle for February 2012;
ii) Phase 2 Rates - commencing for the first billing cycle for February 2013;
iii) Phase 3 Rates - commencing for the first billing cycle for February 2014.

Phase 1 was implemented by staff in February 2012. The Board anticipated in late 2012 and late 2013 a review of TMWA's finances to decide whether the Phase 2 or Phase 3 rates remain appropriate to achieve the intended effect based on the Authority's financial position at that time.

A review of FY2012 water sales and revenues determined the following:

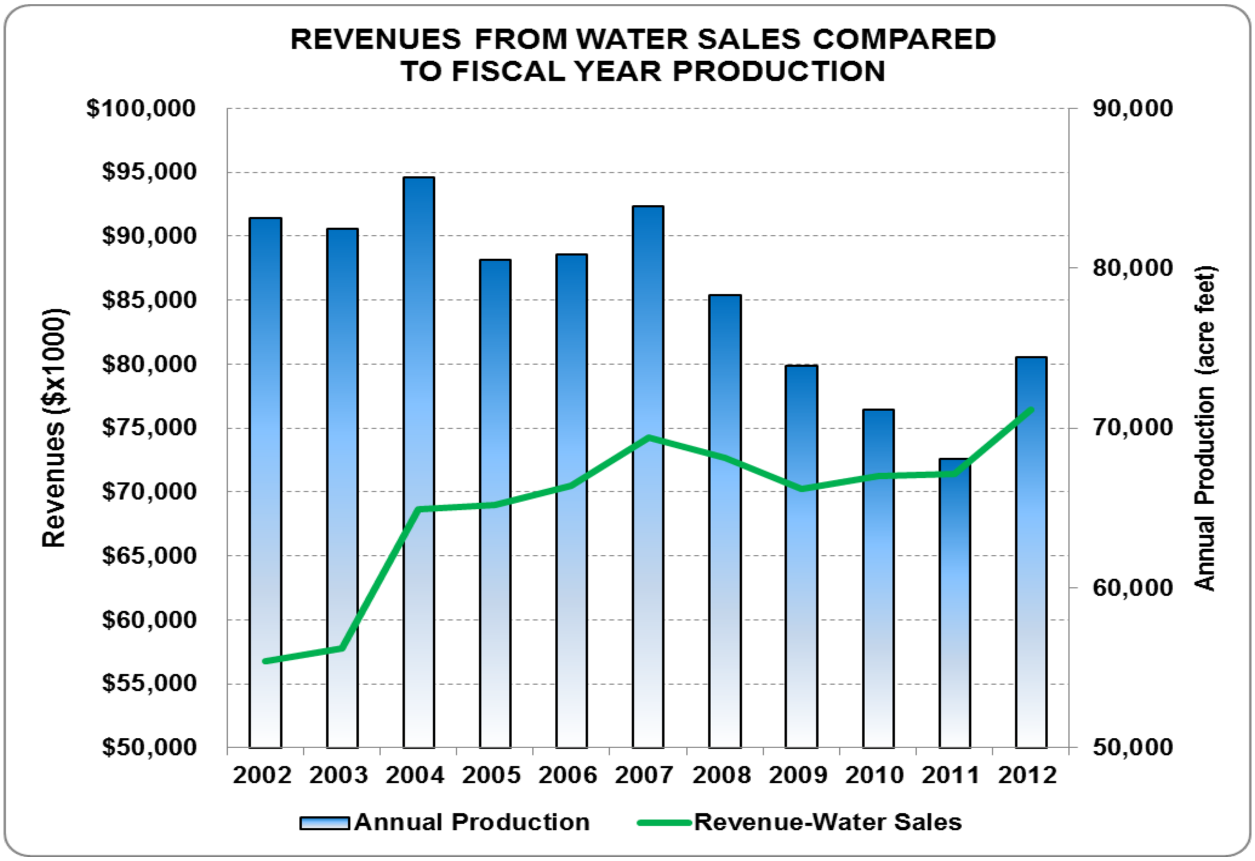
- FY2012 total water production was 9.4% greater than FY2011.
- Precipitation data for 1974 to 2012 indicates:
  - Spring 2012 is 9th driest spring with the 2nd fewest number of precipitation days
  - 2012 is warmer than 90% of the years in the time horizon
  - 2010 and 2011 represent typical precipitation patterns
- FY2012 revenues from all sources (water sales, hydroelectric generation, investment income, and other charges/rents) of $84.1 million exceeded FY2011 revenues of $78.6 million by $5.5 million.

- FY2012 hydroelectric generation sales were approximately $0.5 million over FY2011.
- Monthly customer rates, adjusted in February 2012, added approximately $0.85 million to FY2012 revenues.
- FY2012 earned, but unbilled, water sales revenues are approximately $1.2 million greater than FY 2011.
- The unexpectedly warm and dry condition during the winter and spring of 2011/2012 resulted in approximately $3.3 million in additional water sales revenue.[1]

DISCUSSION

Attached to this report is a memo—"2012 Weather Profile"—that analyzes and compares daily precipitation data for the years 1974-2012 and temperature data for the years 1973 to 2012. The purpose of the analysis was to compare Spring 2012 weather patterns with prior springs to determine whether Spring 2012 was an extreme event; the results indicate Spring 2012 was an extreme event.

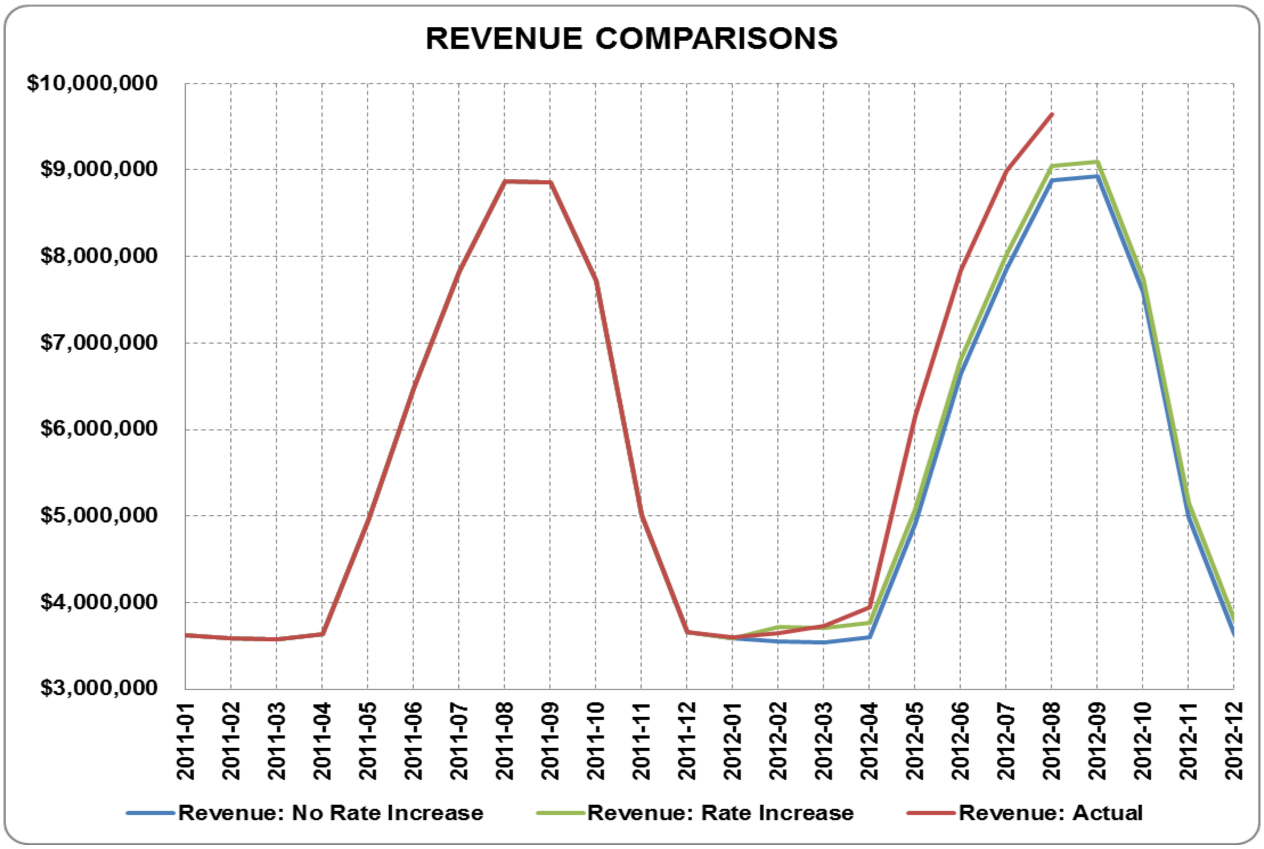
The following graphic compares fiscal year water production to revenues from water sales showing a 6,400 acre foot increase in water production FY2012 over FY2011.



[1] About $2.8 million of the $3.3 million is estimated from April to June 2012 billings, the balance of about $0.5 million is from the fall and winter of 2011 billings.

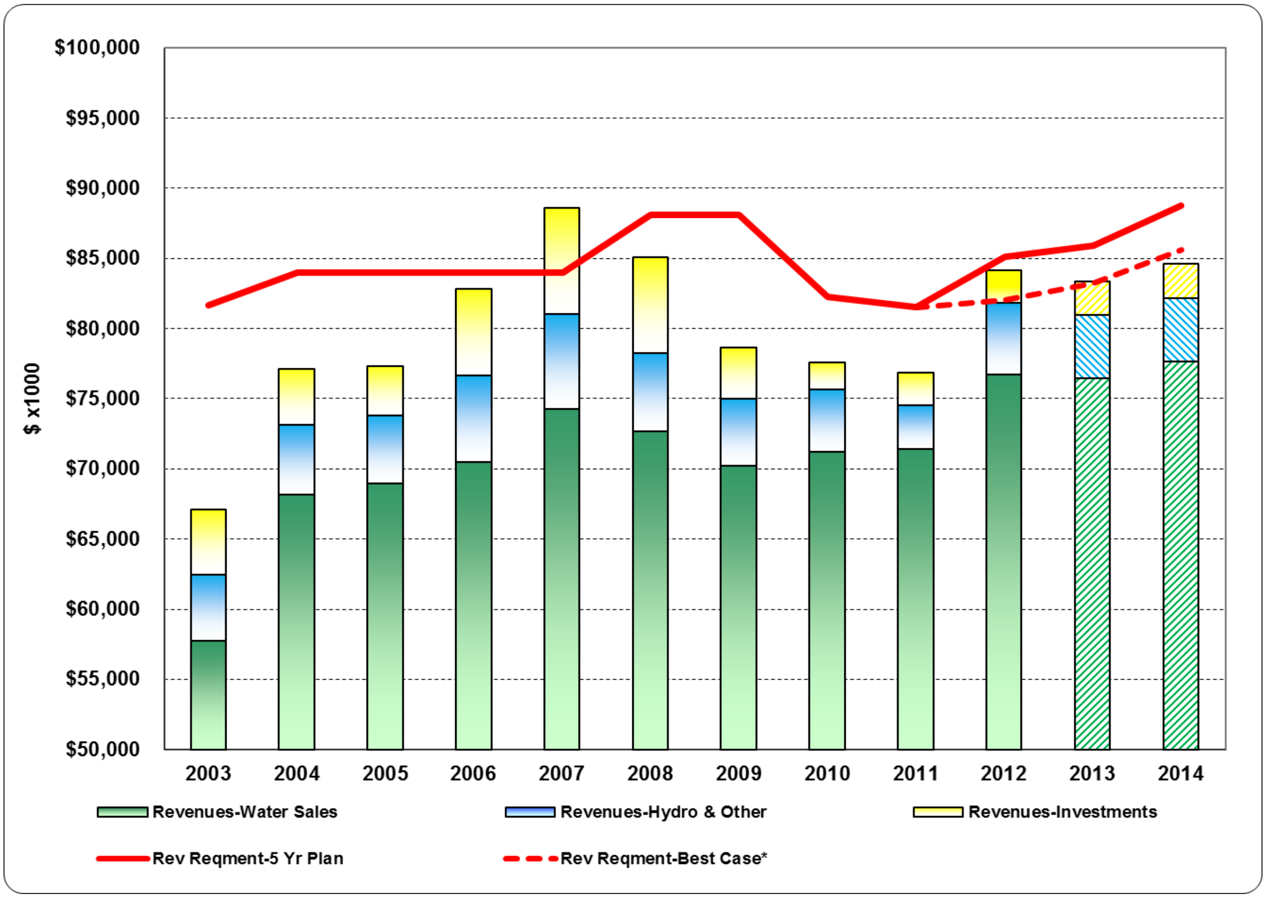
The effect on revenues is illustrated in the graphic by the green line. It is easily seen that water sales can vary significantly as a function of the weather. In fact FY2012 water production was 9.4 percent higher than FY2011 water production.

The following graphic further delineates the effect of weather on water sales by separating the various differences in revenues when comparing retail residential revenues: (a) without adjusting monthly customer charges (blue line); (b) adjusting monthly customer charges (green line); and (c) the estimated revenues from the change in volume of water sold between the spring months of 2011 to 2012 (red line).



The estimated revenues resulting from the difference in volume of water sold in the spring months (April through June) between 2011 and 2012 is approximately $2.8 million. When combined with additional water sales revenues (estimated to be $0.5 million) that occurred in the fall and winter, the combined effect of these warmer conditions produced approximately $3.3 million in additional revenues above the approximately $0.850 million from adjusting the monthly customer charges in February 2012.

This last graphic shows all revenue sources by fiscal year when compared to the annual revenue requirement (or cost to service). Due to the weather effects and extra hydroelectric generation (approximately $0.5 million during the fiscal year), TMWA almost made the total projected revenue requirement. Projected Phase 1 revenues from water sales were $74.015 million; actual FY2012 revenues were $76.5 million. Projected water sales revenues from Phase 2 rate adjustments are expected to be $76.3 million. Due to the fact that 2012 weather was an extreme event it is unlikely water sales revenues would be repeated similar to the Spring 2012 usage patterns.



Debt Retirement and Restructuring

With the February 2012 rate adjustments there continues to be a gap of approximately $5 million between estimated future revenues and expenses. Hence, the Board action that adopted the implementation of rate adjustments in 2012, 2013 and 2014. Despite overall reduction in operating costs of over $7.3 million (18%) in the past 3 years, TMWA has and will experience escalating costs of operations going forward (particularly electrical pumping costs), declining investment income (due to declining cash balances and lower rates of return on maturing investments stemming from the recession), potentially downward trends in customer usage patterns being experienced locally and nationally, and minimal-to-no expected growth in services in the near future. All these aforementioned conditions will continue to challenge TMWA's financial performance. These negative consequences can challenge debt management abilities. Debt management is a key area for managing future cost of service to produce water since TMWA has done as much as possible in controlling operating expenses. To preserve its ability to access low-cost capital, TMWA must continue to maintain or strengthen its senior lien debt coverage ratio in a manner satisfactory to the credit rating agencies and capital markets. TMWA has established certain financial metrics to be achieved consistent with credit rating and bond market expectations. Credit rating agencies are concerned about TMWA's responsibility to protect its creditors.

TMWA's unrestricted cash balance is not an element of its debt coverage ratios (DSC), only ongoing operating revenues and investment income count toward the coverage ratio since developer fee collections are virtually non-existent. Although unrestricted cash balances are not a part of the DSC calculations, these balances have been a key element in preserving TMWA's credit ratings since these balances currently demonstrate strong liquidity. A significant unexpected decline in unrestricted cash reserves can have serious ramifications in the future.

A build-up of unrestricted cash balances such as that experienced this past FY2012 enhances TMWA's ability in the future to improve its financial position and redeem outstanding commercial paper. All revenues generated in excess of expenses are part of the long-term plan to reap significant savings for TMWA anticipated in the planned debt restructuring scheduled to begin in 2015/2016.

Rate Revisions

The following table compares by class the cost to serve a customer class and the projected revenues from each rate adjustment phase to FY2011 and FY2012 actuals.

	Cost of Service	FY11 Actual Revenues	Projected Phase 1 Revenues	FY12 Actual Revenues	Delta	Projected Phase 2 Revenues	Projected Phase 3 Revenues
					d-c		
	----a----	----b----	----c----	----d----	----e----	----f----	----g----
Flat residential	$7,263	$6,560	$6,738	$6,007	($731)	$7,218	$7,569
Flat Multi-family	4,789	5,051	4,968	4,919	(49)	4,968	4,968
Meter residential	39,955	34,668	36,393	38,429	2,035	37,625	38,389
Metered Multi-family	3,310	2,969	3,027	3,187	160	3,090	3,129
Commercial	11,642	10,214	10,445	10,509	64	10,854	10,932
Irrigation	9,007	7,725	8,068	8,802	733	8,130	8,168
Private fire	1,375	1,282	1,338	1,362	24	1,351	1,373
Sun Valley GID	1,162	980	1,012	1,028	16	1,036	1,063
County Whlsl	2,100	1,958	2,027	2,445	418	2,060	2,090
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Totals	$80,602	$71,408	$74,015	$76,687	$2,672	$76,332	$77,680
	=====	=====	=====	=====	=====	=====	=====

The implementation of the scheduled Phase 2-3.4% and Phase 3-2.1% of rate adjustments in combination with active cost control activities by staff will continue to close the revenue-to-expense gap, particularly as the number of conversions from the flat to metered billing continues to erode revenues from that class of customers. Current average monthly bills for ¾ inch residential services are compared to monthly averages after Phase 2 and 3 rate adjustments are shown in the next table.

		Current Averages	Proposed Year 2	Proposed Year 3
3/4" Metered Rate Single Family Residence				
1	Average Monthly Bill	$41.64	$43.06	$43.94
2	Delta Prior Year Avg Monthly Bill		$1.42	$0.88
3	Percent Delta Prior Year Avg Monthly Bill		3.41%	2.04%
4	Average Daily Cost	$1.37	$1.41	$1.44
5	Delta Prior Year Avg Daily Cost	$0.05	$0.04	$0.03
3/4" Flat Rate Single Family Residence				
6	Average Monthly Bill	$94.10	$100.63	$105.06
7	Delta Prior Year Avg Monthly Bill		$6.53	$4.43
8	Percent Delta Prior Year Avg Monthly Bill		6.94%	4.40%
9	Average Daily Cost	$3.09	$3.31	$3.45
10	Delta Prior Year Avg Daily Cost	$0.25	$0.22	$0.14

SUMMARY

Staff's rate adjustment proposals were based on the projected costs summarized in TMWA's 2012-2016 Funding Plan; as of this writing that plan is still active. The proposed rate adjustments along with TMWA's continued diligence in reducing expenses are designed to collect sufficient revenues to cover projected expenses through FY2014 and maintain TMWA's financial integrity in preparation for significant debt buy-down and restructuring beginning in 2015 and extending through 2017.

TRUCKEE MEADOWS WATER
AUTHORITY
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Memorandum

1355 Capital Blvd. ● P.O. Box 30013 ● Reno, NV 89520-3013
P 775.834.8080 ● F 775.834.8003

TO: Directors and Managers

FROM: Shawn Stoddard

DATE: August 2, 2012

SUBJECT: 2012 Weather Profile

Findings

- As of June 30, 2012, total water production year-to-date was 9.39% greater than 2011.
- Using precipitation data for 1974 to 2012, this study finds:
  - Spring 2012 is 9th driest spring in this study with the 2nd fewest number of precipitation days.
  - 2010 and 2011 are a closer match a typical precipitation pattern.
- Using calculated growing degree days for 1943 to 2012, this study finds:
  - Spring 2012 is the 6th or 7th warmest spring using growing degree day data for 1943 to 2012.
  - 2010 and 2011 are a good match a typical precipitation pattern for projecting baseline irrigation water demand.
- Using daily temperature data, 2012 is warmer than 90% of the years studied.
- Comparing recent years with the statistics for all years 1943 to 2012, it can be seen that 2011 and 2010 most closely match the median and mean growing conditions.
- The extreme warm and dry spring is likely the primary cause of increased water demand.
- While a case is presented that uses weather to explain the increase in water demand, it might not explain the entire increase in demand. Water demand is also a function of the number and types of customers, community economic conditions, and local personal income (employment). Additional statistical analysis is required to quantify the effects of other variables on water demand.

Discussion

The demand for water is a factor of the number of water services, general economic conditions, employment / personal income, and the weather. The weather is a large component of the seasonal variation in water demand and unpredictable. As of June 30, 2012, total water production year-to-date, 74,461 acre feet, was 9.39% greater than 2011's 68,067 acre feet.

This study examines the recent weather conditions and compares the spring of 2012 with prior springs to answer the questions: 1) is the spring of 2012 an extreme event; and 2) is there a recent year's condition that could be used as a model of the general spring weather patterns?

To provide a direct comparison of the spring 2012, with prior years, all daily data is limited to January 1 to June 30 of each year.

Data

The National Climate Data Center (NCDC) publishes the Federal Climate Complex Global Surface Summary of the Day Data (GSOD). This data can be freely downloaded, contains over 9,000 worldwide stations, and the latest data is normally available 1-2 days after the date-time of the observations. The GSOD data is designed for use in climate studies and is well suited for this study. The Reno/Tahoe International Airport weather station is included in GSOD data and was downloaded for this study (Reno Data).

The Reno data contained 23,902 days of observation from 1943 to 2012. While there are gaps in the total data history, 66 years of temperature and 38 years of daily precipitation data was assembled and is sufficient. As spring weather conditions are the primary focus of this study, the data is filtered to include only daily weather observation from January 1 to June 30 of each year. The final dataset contains 11,956 days of data.

The following weather variables are used in this study: mean temperature (measured from 24 hourly temperatures), growing degree days (base 50 degrees), and daily precipitation (inches of water). The daily observations are used to compute statistics for each year and the summary statistics are directly compared.

Study Periods

This study reports statistics for each year of TMWA's existence, (2001 to 2012) and for all observed data. Comparisons are made between 2012 with recent years all observed years.

Precipitation

Precipitation has a direct effect on demand for water, via irrigation of landscape. During period of wet weather or frequent precipitation events, the irrigation need of the landscape is satisfied by soil moisture built up over the course of the winter or in the form of spring time rains. Daily precipitation is measured in hundredth of inches of water (.01). In this study two measures of precipitation are studied: total precipitation and number of days with measurable precipitation.

Review of Table 1, shows that 2012 had a total of 20 days with precipitation, second fewest days, with 2.62 inches of water, ninth driest period in this study. On average there are 37 days with precipitation with an average of 4.42 inches of water. Over the course of TMWA's history, the number of precipitation days average 33 days with average precipitation being 3.81 inches. Of special note, 2010 and 2011 could be considered average precipitation spring years when looking at both number of days and total precipitation.

Table 1: Precipitation Statistics 1974 to 2012, January 1 to June 30 of each year.

Recent Years	2012	2011	2010	2009	2008	2007
Total Days	20	36	35	44	29	24
Total Days Rank (1 = Fewest Days)	2	22	20	29	11	6
Total Precipitation	2.62	4.84	4.32	5.08	4.36	1.66
Total Precipitation Rank (1 = Driest)	9	24	21	27	22	2

Recent Years	2006	2005	2004	2003	2002	2001
Total Days	41	43	18	34	45	32
Total Days Rank (1 = Fewest Days)	25	28	1	17	30	14
Total Precipitation	7.03	5.04	4.18	2	3.39	1.28
Total Precipitation Rank (1 = Driest)	33	26	18	4	13	1

	Precipitation Days			Total Precipitation	
Statistics	All Years	2001 to 2012		All Years	2001 to 2012
Minimum Days (2004, 2004)	18	18	Years (2001, 2001)	1.28	1.28
10th Percentile	21	20		2	1.66
25th Percentile	28	26.5		2.93	2.31
Median	35	34.5		4.3	4.25
75th Percentile	44	42		5.17	4.94
90th Percentile	52	44		7.2	5.08
Maximum Days (1995, 2002)	69	45	Years (1995, 2006)	10.96	7.03
Mean Days	37	33	Mean Precipitation	4.42	3.81

Growing Degree Day (GDD) or Growing Degree Unit (GDU)

The GDU, sometimes called the growing degree day (GDD), is a commonly used measure of heat accumulation for agriculture, gardening, and pest management. Unless stressed by other environmental factors like moisture, the development and/or growth rate for many plants depends upon the daily air temperature. The development of many plants and insects depend on the accumulation of specific quantities of heat, and thus the plant's water requirement is also related to heat accumulation. This correlation between heat and plant development allows for a correlation between heat and irrigation requirements. While temperatures vary from year to year, GDD makes it possible to predict irrigation demands regardless of the differences in temperature.

Growing degrees (GDs) is defined as the number of temperature degrees above a certain threshold base temperature, which varies among plant species. The base temperature is that temperature below which plant growth is zero; if the base temperature is unknown then a base of 50 degrees is used. GDs are calculated each day as maximum temperature minus the minimum temperature divided by 2 (or the mean temperature), minus the base temperature. GDUs are accumulated by adding each day's GDs contribution as the season progresses. While GDUs can be used to estimate the growth-stages of crops, weeds or even life stages of insects, it can also be used a measure of growing season or opportunity for plant growth and need for nutrients and water. In this analysis GDUs are used to compare the various years demand for irrigation which is a primary component of seasonal water demand.

Table 2, shows the GDs statistics for each spring 1943 to 2012 with 4 missing years. It can be seen that 2012 was the 7th warmest spring by average GDD and the 6th warmest by total GDD, this places 2012 in the warmest 10% of springs studied. In the most recent 12 springs, 6 of those springs are in the warmest 10 springs and 5 of the last 12 springs are warmer than 90% of the springs since 1943.

Comparing recent years with the statistics for all years, it can be seen that 2011 and 2010 most closely match the median and mean growing conditions. This provides some explanation that the increase in water production in 2012 compared to 2011 is mostly a function of the warm and dry spring compared to a more normal spring such as 2011 or 2010.

Table 2: Growing Degree Days 1943 to 2012, January 1 to June 30 of each year.

Recent Years	2012	2011	2010	2009	2008	2007
Average Daily GDD	6.4	4.1	4.4	5.9	5.6	7.6
Average Daily GDD Rank	7	37	28	12	16	1
Total GDD	1160	735	805	1071	1013	1378
Total GDD Rank	6	37	28	12	16	1

Recent Years	2006	2005	2004	2003	2002	2001
Average Daily GDD	6.4	4.6	7	6	6	7.4
Average Daily GDD Rank	6	25	3	9	11	2
Total GDD	1158	825	1272	1086	1077	1332
Total GDD Rank	7	25	3	9	11	2

	Average GDD			Total GDD	
Statistics	All Years	2001 to 2012		All Years	2001 to 2012
Minimum Average GDD (1953, 2011)	1.65	4.06	Years (1953, 2011)	299	735
10th Percentile	6	4.45		522	805
25th Percentile	3.54	5.06		639	919
Median	4.16	5.98		758	1082
75th Percentile	5.53	6.7		1001	1216
90th Percentile	6.37	7.36		1158	1332
Maximum Average GDD (2007, 2007)	7.62	7.62	Years (2007, 2007)	1378	1378
Mean Days	4.44	5.94	Mean Total GDD	804	1076

Daily Temperature

Daily temperature is measured as the mean of temperature measurement taken hourly during the course of the day and thus a measure of how warm or cool a given day is. Table 3, provides a summary of daily temperature. 2012 is the 5th warmest spring and 2011 and 2010 springs are also shown to be more similar to overall average springs in the studied data.

Table 3: Average Daily Temperature 1943 to 2012, January 1 to June 30 of each year.

Recent Years	2012	2011	2010	2009	2008	2007
Average Daily Temperature	51.1	47.3	48.7	50.2	49	51.5
Average Daily Temperature Rank	5	29	19	9	15	4

Recent Years	2006	2005	2004	2003	2002	2001
Average Daily Temperature	50.1	47.6	52	50.7	49.5	50.4
Average Daily Temperature Rank	10	27	1	7	11	8

	Average Daily Temperature	
Statistics	All Years	2001 to 2012
Minimum Average Daily Temp.	40.4	47.3
10th Percentile	43.3	47.6
25th Percentile	45.5	48.8
Median	46.8	50.15
75th Percentile	48.9	50.9
90th Percentile	50.7	51.5
Maximum Average Daily Temp.	52	52
Mean Days	47	49.8

Conclusion

This study shows that Spring 2012 is an extreme event that was drier and warmer than 90% of the observed years. Extreme events cannot be predicted, and thus a large portion of the increased water demand experience during this spring could not have been predicted. The study shows that 2010 and 2011 are very close to both mean and median historic conditions