Update and Calibration of the Utah Lake Water Quality Salinity Model (LKSIM2000)

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Executive Summary

The water in Utah Lake is used for many in-lake purposes as well as being the source of the Jordan River. The quality of the water needs to be maintained to support in-lake and downstream uses. High concentrations of salts in Utah Lake are of major concern. High salt concentrations occur naturally, but are increased by human activity in the basin. As water in the basin surrounding Utah Lake is developed, according to the Central Utah Project Completion Act (CUPCA), concentrations of total dissolved solids (TDS) and other pollutants will change. In order to understand how development of the watershed and various water management strategies will affect the quality of the water in Utah Lake, the Utah Lake Water Quality Salinity Model (LKSIM2000) was developed. The goal of the model is to simulate conservative salt concentrations to within 50 mg/l of actual values. The calibrated model is then used to project future salinity for various water use scenarios, thus allowing project managers to consider the issue of salinity in their planning.

This report covers work done in 1998 and again in 2001 to update the hydrologic database and recalibrate the LKSIM2000 model for the 50-year period from 1950-1999. The hydrologic data used as inputs for the model were updated according to the pattern that was established in the 1992 update of the model (Van Blankenstein, 1992). These inputs were reviewed and improved. The model was then calibrated to produce the best simulation.

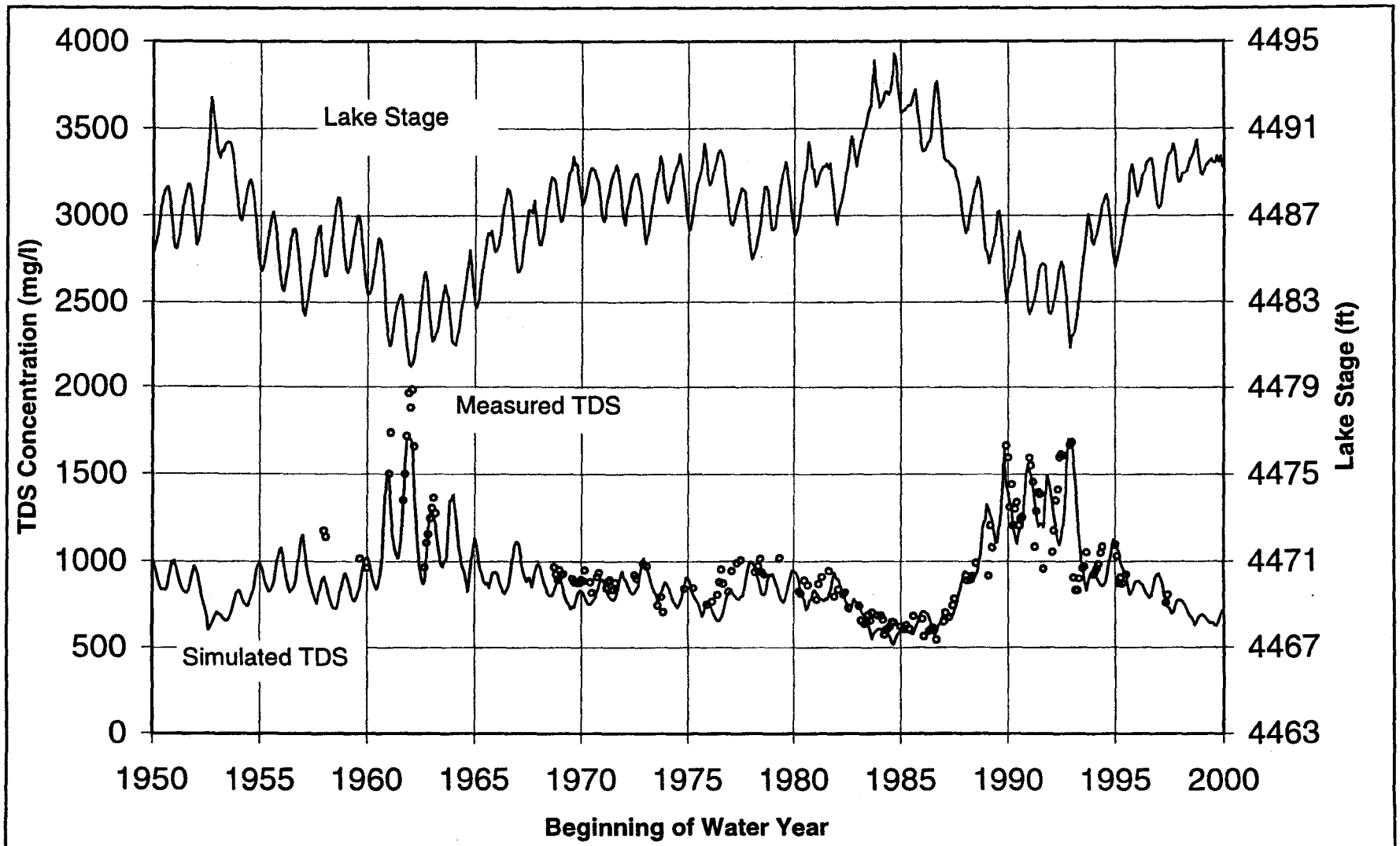
The hydrologic data were updated through the water year 2000. Several changes had to be made to update these inputs. First, indices were updated so that correlation equations based on those indices could be used to determine surface inflows. The Groundwater Index could not be updated, and the Average Valley Precipitation Index was updated with precipitation values from

Santaquin rather than Elberta. The correlation equations that were based on these two indices were changed. The correlation equation for each tributary with its corresponding index was used to update flows through 2000. These changes and updated surface inflows are presented here.

Precipitation was updated using the Theissen Polygon methods. Since the station at Elberta was discontinued, polygons had to be redrawn on Goshen Bay in order to find weighted areas based on the Santaquin, Payson and Orem stations. These weighted areas, and the weighted areas calculated previously for the Main Lake and Provo Bay, were used to update the precipitation inflow through 2000. Evaporation was updated using the CRLE version of Morton's Model. Corrected Salt Lake City air temperature and dew point temperature were used , along with the percent total sunshine in Salt Lake City, to simulate and update evaporation through 2000. These results are presented here as well.

The LKSIM2000 model was used to successfully simulate salt concentrations for the water years 1950 through 1999. Plots of simulated TDS were used to help calibrate the model. The plotted results were interpreted and the model adjusted until simulated results matched measured salinity as well as possible. Plots representing the calibrated simulation are presented in APPENDIX F (the TDS plot is also given on the following page). Calibration work resulted in what is felt to be an improved simulated match to the historical measured quality. The 50 year average TDS concentration was found to be 900 mg/l, which is lower than the 1034 mg/l result when the model was last updated in 1992.

It is hoped that this report will provide a background for those who will continue to use the LKSIM2000 model to improve simulations of Utah Lake TDS.. As water quality is better understood through improved modeling and research, steps are taken to ensure that lake quality is maintained, and that valuable water resources will continue to be developed in Central Utah.



Total Dissolved Solids and Water Levels in Utah Lake

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Introduction

Utah Lake sits in Utah Valley at the base of the Wasatch Range in central Utah. The lake is a remnant of Lake Bonneville, a massive body of water that once covered the Northeast corner of the Great Basin to a depth of nearly 300 feet during long periods of wetness. The long term climatological cycle has now produced a period of relative dryness. Utah Lake now fills the valley floor as a reminder of the forces that shaped the surrounding landscape. The drainage area of the lake is about 2,700 square miles. The lake has a surface area of about 95,000 acres. This surface area is larger than any other freshwater lake west of the Great Lakes. It is a very shallow lake, with an average depth of 9 feet and a maximum depth of 14 feet when at the compromise stage (4489.34 ft) (Merritt et.al., 1995, p1). Water flows north from Utah Lake, through the Salt Lake Valley via the Jordan River and into the Great Salt Lake, some 45 miles to the north.

The Issue of Water Quality

Utah lake is the natural recipient of many "pollutants" that originate in its drainage basin. The lake shares Utah Valley with a rapidly growing metropolitan area. The public commonly views the lake as polluted and blames the problem on industry, development and wastewater discharges. However, studies have shown that the quality of the water in the lake is largely determined by nature.

Utah Lake dominates the landscape of Utah County and provides many valuable resources. Besides storing large volumes of water, the lake also provides a home for wildlife and

a place for recreation. It is a major factor affecting development in the valley. Many people have a stake in the way that Utah Lake's waters are managed. Of primary concern is the salinity of the water in Utah Lake. The water quality parameter of primary focus herein is the total dissolved solids (TDS), also referred to as salinity. The water has historically been used downstream in the Salt Lake Valley for irrigation. The downstream water's potential as a possible source of drinking water is becoming more important as well. The salinity of Utah Lake is occasionally too high for sensitive-crop irrigation and always too high for drinking water without blending with low TDS waters.

The LKSIM2000 model, developed at Brigham Young University, simulates the concentration of conservative (soluble) ions in Utah Lake. The main goal of the model is to simulate TDS concentrations to within 50 mg/l of historical and future salt concentrations (Van Blankenstein, 1992, p1). A main use of the model is to simulate various future management/ development alternatives, including those of the Central Utah Project Completion Act (CUPCA). Those who are managing the development of water in the Utah Lake watershed use LKSIM2000 to project the effects of various future development scenarios on the water quality of the lake.

Project Purpose

This project involved updating the hydrologic data base and recalibrating the LKSIM2000 model for the period of 1950 - 1999. The LKSIM2000 model uses a water balance and salt balance approach to generate monthly, yearly and total simulation results. The model has calibrated well for the 1950 through 1999 period. This project report documents the updating of the LKSIM2000 model. The following objectives were considered as part of this project:

1. Update surface inflows, precipitation and evaporation data to be used as input for the model through the water year 1999.
2. Review input data and make any necessary improvements.
3. Provide graphical representation of the output in order to more easily calibrate the model.

This report summarizes what was done to accomplish these three goals.

Surface Tributary Inflows

Water enters Utah Lake through more than 70 tributaries. Most of those tributaries are surface flows. Table 1 lists these inflows, and Figure 1 shows their respective locations. Gaging stations on the Provo River at Provo and at Deer Creek, on the American Fork River above the power plant site, and on the Spanish Fork River at Castilla continually measure flow. Discharges from the wastewater treatment plants in Utah Valley and Geneva Steel are also continually measured. Surface flows into Utah Lake through other tributaries have only been measured periodically for other studies. Unmeasured flows were estimated by correlating the measured flows in each tributary to an index based on continually measured meteorologic and hydrologic data, such as precipitation or surface flow at another point in the watershed. In order to update inflows through 1999, it was necessary first to review and update the indices that were used the last time the lake water quality was modeled in 1991. These indices were then used to update surface inflows using correlation equations.

Correlation Indices

In order to be consistent with what was done before, it was our intention to use the same indices that were used the last time the model was updated. The following indices were used before to estimate surface inflows (Van Blankenstein, 1992, p6):

- Lehi Precipitation Index
- Provo Precipitation Index
- Average Valley Precipitation Index
  (Average of Lehi, Provo and Elberta Stations)
- Lehi Groundwater Well Index
- Santaquin Precipitation Index
- American Fork River above power plant Apr-Jul Runoff
- Spanish Fork River at Lakeshore Water Year Runoff

Table 1 - Descriptions and Code Numbers For Utah Lake Surface Tributary Inflows.

TRIBUTARY	ID #
Drain 6900 N. and Saratoga Rd.	UT 1
Dry Creek (Lehi)	UT 3
Drain, .7 mi. E. of 9950 W. 7350 N.	UT 4
Drain, near 8730 W. and 7350 N.	UT 5
Drain, near 8350 W. and 7350 N.	UT 6
Drain, near 8000 W. and 7350 N.	UT 7
Minnie Creek	UT 8
Mill Pond (Spring Creek)	UT 9
Drain, 1.25 mi S. of 6500 W. and 7750 N.	UT 10
American Fork WWTP	UT 11
Drain, on 6150 W. and 1.1 mi. S. of 7750 N.	UT 12
American Fork River (Apr.-Jul.)	UT 13-1
American Fork River (Oct.-Mar., Aug.-Sep.)	UT 13-2
Drain, 0.1 mi. W. of 6400 N. and 5750 W.	UT 14
Drain, 0.1 mi. E. of 6400 N. and 5750 W.	UT 15
Drain, near 6400 N. and 5750 W.	UT 16
Drain, near 6400 N. and 4850 W.	UT 17
Geneva Cannery Drain, 4250 W. and 5600 N.	UT 18
Drain 0.15 mi. N. of Geneva Channel on U-114	UT 19
Geneva Steel effluent	UT 20
Drain, .2 mi. S. of Geneva Channel on W. Geneva Rd.	UT 21
Drain, .5 mi. S. of Geneva Channel on W. Geneva Rd.	UT 22
Drain, .9 mi. S. of Geneva Channel on W. Geneva Rd.	UT 23
Drain, 1.3 mi. S. of Geneva Channel on W. Geneva Rd.	UT 24
Drain, 4000 N. and W. Geneva Rd.	UT 25
Orem City WWTP	UT 26
Powell Slough	UT 27
Drain, on N. Boat Harbor Dr.	UT 28
Provo River at USGS Gaging Station	UT 29
Little Dry Creek	UT 31
Drain, near 1150 S. and 1600 W.	UT 32
Flowing well near 1150 S. and 1600 W.	UT 33
Big Dry Creek	UT 34
11th West Ditch, near 1560 S. and 1100 W.	UT 35
5th West Ditch, near 1560 S. and 500 W.	UT 36
University Ditch, near 1420 S. and University Ave.	UT 37
Mill Race	UT 38
Provo WWTP	UT 39
Drain, 0.4 mi SE of Provo WWTP	UT 40
Rat Farm Drain, 0.5 mi SE of Provo WWTP	UT 41
Steel Mill Drain, near Kuhni plant	UT 42
Spring Creek	UT 43
Hobble Creek	UT 44
Packard Drain	UT 45
Drain, .35 mi W. of I-15 on 3900 S.	UT 46
Dry Creek, 0.85 mi W. of I-15 on 4000 S.	UT 47
Spanish Fork River, near Lakeshore, USGS Gaging Station	UT 48
Drain, 0.8 mi. N. of 5200 S. and 3200 W.	UT 49
Drain, 5200 S. and 4000 W.	UT 50
Benjamin Slough	UT 51
White Lake overflow to Goshen Bay	UT 52
Jordan River and canals outflow from lake	UT 53
Lehi WWTP	UT 70
Timpanogos WWTP	UT 71
Pleasant Grove WWTP	UT 72
Springville WWTP	UT 73
Spanish Fork WWTP	UT 74
Salem WWTP	UT 75
Payson WWTP	UT 76

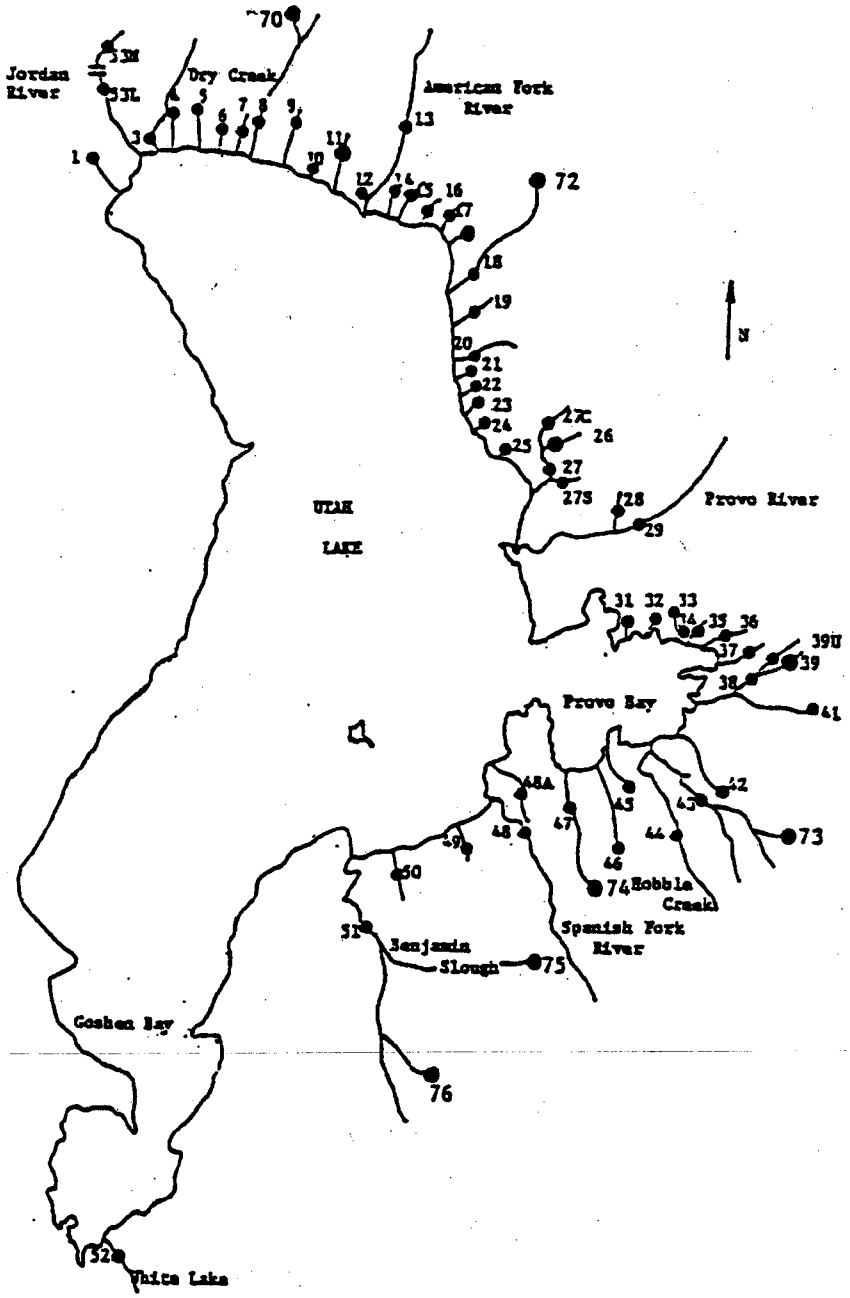


Figure 1 - Sampling Sites and Numbers for Utah Lake Surface Tributaries

As data were collected to update the indices it was found that the Elberta Station had been closed since 1991. The precipitation measured at this station had been used to determine the Average Valley Precipitation Index. For this reason, the Average Valley Precipitation Index was changed to estimate the flows after 1991. Instead of using the precipitation at the Elberta Station to update the index, the precipitation at Santaquin was used. The precipitation at the Santaquin Station is slightly greater, on average, than the precipitation at the Elberta Station. However, after reviewing the different correlations and indices, it was decided that the change to the overall water budget would not be significant.

The readings from the Lehi Groundwater Well, which were the basis for the Groundwater Index, were much lower during the 1990's than in previous years. Apparently, additional well drilling and pumping in the Lehi area had lowered the water table significantly and so well readings from recent years could not be used for correlations of the Lehi Groundwater Well Index. For this reason the Lehi Groundwater Index was not used for updating surface inflows after 1991.

Previously, the flow in the Spanish Fork River at Lakeshore was used as an index for one of the correlations. The gaging station at Lakeshore was discontinued recently as well. For this reason, the flow in the Spanish Fork River was not used as an index for estimating flows after 1991.

These changes were made and the following indices were used in the correlation equations to estimate surface inflows after 1991:

- Lehi Precipitation Index
- Provo Precipitation Index

- Average Valley Precipitation Index
  (Average of Lehi, Provo and Santaquin Stations)
- Santaquin Precipitation Index
- American Fork River above power plant Apr-Jul Runoff

The first four indices listed are based on monthly precipitation data. The Lehi, Provo and Santaquin Precipitation Indices were calculated as the sum of monthly precipitation totals at each station during the given water year. A maximum monthly precipitation total of two inches was used to calculate the indices. Any monthly total in excess of two inches was reduced to two inches before summing the totals to find the index. The Average Valley Index was calculated as the average of the Lehi, Provo and Santaquin Indices.

When the model was last updated, it was noted that the Provo Weather Station had changed locations three times since 1950. A double mass analysis was done to find correction factors which account for the effects of changing the location of the station. The factor determined for the period of 1977 to 1990 was 0.722 (Van Blankenstein, 1992, p8). Each monthly precipitation total recorded at the station during this period was reduced by multiplying by this factor to account for the moving of the station to its present location at B.Y.U. The monthly precipitation totals recorded at the Provo station from 1991-1999 were also multiplied by this correction factor to get a corrected total for each month. These corrected values were then summed, as discussed before, to find the Provo Precipitation Index.

The total flow in the American Fork River at the gaging station above the power plant in American Fork Canyon from April through July was used as the final index. These indices were each updated as data became available and then were ready to be used to estimate surface inflows using the correlation equations. (See Appendix A)

Analysis of Surface Tributary Inflows

With the indices calculated, the next step in determining surface tributary inflows was to update equations correlating measured flows recorded for each tributary to one of the indices. When the model was updated last in 2000, a linear regression analysis was done to determine which index correlated most closely with the measured flows for each tributary. An equation was determined for the best fit line. The variables in each equation were the yearly discharge of the tributary into Utah Lake and the yearly value for the index used in that correlation. The indices were then used in each equation to determine runoff values for each tributary through 1999.

Because these correlations were carefully determined previously, it was our intention to use the same correlation equations to update surface inflows. However, because we were not able to update the Lehi Groundwater Index and because we changed the Average Valley Precipitation Index, we had to do the regression analyses again for the runoffs which would have been estimated based on these indices. The new indices were used to develop new correlations, and in many cases the new correlations seem to be better. These new correlation equations and those which were not changed were used with the updated indices to update surface inflows through 1999. These changes and the correlations for each surface tributary are discussed below.

UT 1 - Drain. Flows were measured from 1954-1959 and 1964-1965 by the Bureau of Reclamation. Flows were also measured by researchers from BYU in 1971, 1978, and 1979. This drain flows into Utah Lake southwest of Lehi. The correlation for this drain, based on the Lehi Precipitation Index, was not changed. (Van Blankenstein, 1992, p14, and Appendix B)

UT 3 - Dry Creek (Lehi). Dry Creek is a stream that runs into Utah Lake southwest of Lehi. As the name of the creek indicates, the flow is usually diverted for irrigation before it reaches the lake. During spring snow - melt runoff , however, some of the flow does reach the lake. The flow in this stream was again correlated with the April - July flow in the American Fork River. (Van Blankenstein, 1992, p15, and Appendix B)

UT 4 - Drain. This drain is also located southwest of Lehi. The correlation for this drain, based on Lehi Precipitation Index, was not changed. (Van Blankenstein, 1992, p15, and Appendix B)

UT 5 - Drain. This drain also flows into the lake southwest of Lehi. The correlation, based on the Lehi Precipitation Index, was not changed. (Van Blankenstein, 1992, p15, and Appendix B)

UT 6 - Drain. The flow in this drain enters the lake south of Lehi. The measured flows in this drain are more uniform, ranging from 1000 to 1500 acre-ft per year. The correlation for this drain, based on the Lehi Precipitation Index, was not changed. (Van Blankenstein, 1992, p15, and Appendix B)

UT 7 - Drain. This drain is also located south of Lehi. The correlation for this drain, based on the Lehi Precipitation Index from the previous year, was not changed. (Van Blankenstein, 1992, p16, and Appendix B)

UT 8 - Minnie Creek. This stream drains the area around the old Lehi Sugar Factory and west of

the Lehi Mill Pond. The Lehi WWTP discharged into this creek from 1956, until August 1979, when the sewage was diverted to the Timpanogos WWTP. The effluent from the treatment plant was not included in the reported flow. The correlation for this flow, based on the Lehi Precipitation Index, was not changed. (Van Blankenstein, 1992, p16, and Appendix B)

UT 9 - Mill Pond (Spring Creek). The outflow from Mill Pond, also known as Spring Creek, enters Utah Lake south of Lehi. It drains a large area between Lehi and American Fork with measured flows varying between 5,000 and 15,000 acre-ft per year. The flow was correlated with the previous year's Lehi Groundwater Well Index through the 1991 water year. Because this index could not be used for more recent years, flows after the 1991 water year were correlated with the previous year's Provo Precipitation Index. (See Appendix B, Figure B:9)

UT 10 - Drain. This flow drains the area around the old American Fork WWTP. The flow was measured during four years when the effluents from this treatment plant were discharged into this drain. However, the effluent was not included when the flow from this tributary was reported. The correlation, based on the Lehi Precipitation Index, was not changed. (Van Blankenstein, 1992, p17, and Appendix B)

UT 11 - American Fork Wastewater Treatment Plant. This plant discharged effluent from 1953 until 1979 when the sewage was diverted to the Timpanogas WWTP. The measured flow data were taken from the Utah Board of Health records and from American Fork City records. Data were missing for some years, but flow was estimated based on population increase and

additional sewer connections. (See Appendix C, Table C:11)

UT 12 - Drain. The flow in this drain, located south of American Fork City, was correlated with the Lehi Groundwater Well Index through the water year 1991. However, because the groundwater index could not be used to update surface inflows, the flow after water year 1991 was correlated with the Average Valley Precipitation Index from the previous year. (See Appendix B, Figure B:12)

UT 13 - American Fork River. The American Fork River flows into Utah lake near the American Fork boat harbor. A large part of the flow in this river is diverted upstream, before it reaches the lake. Larger flows enter the lake during the runoff season. In order to best estimate the flow in this channel the flow is divided into two parts: UT 13-1 represents the flow during the April-July high runoff season, and UT 13-2 represents the flow from October-March and August -September. The April-July runoff was correlated with the April- July flow in the American Fork River in the canyon above the power plant. A linear correlation would have produced zero or negative flows for years of less than average runoff. Consequently an exponential correlation was used. The flow during the remainder of the water year was correlated with the Lehi Precipitation Index of the previous year. Neither of these correlations were changed for this project. (Van Blankenstein, 1992, p18, and Appendix B)

UT 14 - Drain. This drain enters Utah Lake south of American Fork. The flow in the drain had previously been correlated with the Average Valley Precipitation Index. Because that index was

changed, the correlation changed. Flows after 1991 were correlated with the updated Average Valley Precipitation Index. (See Appendix B, Figure B:14)

UT 15 - Drain. This drain enters Utah Lake southeast of American Fork. The correlation, based on the Lehi Precipitation Index for the previous year, was not changed. (Van Blankenstein, 1992, p19, and Appendix B)

UT 16 - Drain. This drain is located southeast of American Fork as well. Before 1992 the flow was correlated with the Average Valley Precipitation Index from the previous year. Because that index was changed, flows from 1992 through 1999 were correlated with the Lehi Precipitation Index from the previous year. (See Appendix B, Figure B:16)

UT 17 - Olefson's Slough. This drain is also located southeast of American Fork. The correlation, based on the Lehi Precipitation Index, was not changed. (Van Blankenstein, 1992, p19, and Appendix B)

UT 18 - Geneva Cannery Drain. This channel drains a large area south and east of Pleasant Grove. The flows measured in this drain ranged from 8000 to 22,000 acre-feet. This drain also carried effluent from the Pleasant Grove WWTP from 1956, until 1979, when sewage was diverted to the Timpanogos wastewater facility. The effluent was deducted from flows measured during this period. The correlation, based on the previous year's Provo precipitation index, was not changed. (Van Blankenstein, 1992, p19, and Appendix B)

UT 19 - Drain. This is a very small drain located north of the Geneva Steel plant. Flow in this drain, which is typically less than 5 acre-feet per year, was previously correlated with the previous year groundwater index. Because this index could not be updated, flows after 1991 were correlated with the Provo Precipitation Index. (See Appendix B, Figure B:19)

UT 20 - Geneva Steel Effluent. Flow in this tributary accounts for discharge from the Geneva Steel plant. Since 1947, flows have been reported by the Geneva Works office and we have obtained those records. (See Appendix C, Table C:20)

UT 21 - Drain. This drain is located just south of the Geneva Steel plant. It is one of many very small drains in that area. The correlation, based on the Provo Precipitation Index was not changed. (Van Blankenstein, 1992, p21, and Appendix B)

UT 22 - Drain. This drain is also located just south of the Geneva Steel plant. Flows are very small in this drain. The correlation was based on the previous years groundwater index. For estimating flows after 1991, the Provo Precipitation Index was used. (See Appendix B, Figure B:22)

UT 23 - Drain. This drain is located near the previous two drains, just south of the Geneva Steel plant. Flows were estimated to be fairly constant, as before, at 80 acre-ft per year. (Van Blankenstein, 1992, p21, and Appendix B)

UT 24 - Drain. This is another of several small drains just south of Geneva Steel. Flows, which have been very small, were correlated with the groundwater index up through 1991. For estimating flows after 1991, the Provo Precipitation Index was used. (See Appendix B, Figure B:24)

UT 25 - Drain. This drain is also located south of Geneva Steel. Measured flows have ranged from 400 to 1000 acre-ft per year. These flows were correlated with the groundwater index through 1991. For estimating flows after 1991, the previous year's Provo Precipitation Index was used. (See Appendix B, Figure B:25)

UT 26 - Orem Wastewater Treatment Plant. The Orem WWTP was finished in 1958. Sewage flows were recorded beginning in 1956. Flows before that were estimated based on lengths of sewage pipe, and population served by the system. Records of wastewater discharge since 1958 were obtained from Orem City files. (See Appendix C, Table C:26)

UT 27 - Powell Slough. The drainage into Utah Lake through the Powell Slough area is not well defined and is now very difficult to measure. The effluent from the Orem WWTP and the drainage from the treatment plant site both run into Powell Slough. Three other major drains and several smaller drains also empty into Powell Slough. Because Powell Slough is not defined into a single channel, it is difficult to define a single point where it empties into Utah Lake. Measured flows range from 13,000 to 17,000 acre-ft per year. The flows were previously correlated with the Average Valley Precipitation Index. Because that index was changed, measured flows were

correlated with the new Average Valley Precipitation Index, which was updated to account for the closing of the Elberta Station as discussed before. (See Appendix B, Figure B:27)

UT 28 - Drain. This drain is located north of the Provo Boat Harbor. Measured flows have ranged from 400 to 1200 acre-ft per year. The measured flows are correlated with the previous year's Lehi Precipitation Index. (Van Blankenstein, 1992, p22, and Appendix B)

UT 29 - Provo River. A gaging station on the river, located on the west side of Provo, measures flow before it reaches Utah Lake. Flows have been recorded continuously by the USGS since 1937. We have those records. (Van Blankenstein, 1992, p23, and Appendix B).

UT 31 - Little Dry Creek. This tributary is located southwest of Provo. Flows were measured from 1954-1959 and 1964-1965 by the Bureau of Reclamation. Flows were also measured by researchers from BYU in 1971, 1978, and 1979. These flows range from 600 to 3200 acre-ft per year. These measured flows were correlated with the previous year's Average Valley Precipitation Index through 1991. However, because that correlation was changed, flows after 1991 were correlated with the updated Average Valley Precipitation Index from the previous year. (See Appendix B, Figure B:31)

UT 32 - Drain. This drain is located southwest of Provo. The correlation for this drain, which was based on the Provo Precipitation Index, was not changed. The original correlation was very flat and so a new one was developed which gives a better representation of flow from this drain.

(Van Blankenstein, 1992, p24, and Appendix B)

UT 33 - Flowing Well. The well is located southwest of Provo. Flows ranging from 75 - 400 acre-ft per year have been measure from this well. The correlation, which was based on the previous year's Lehi Precipitation Index, was not changed. (Van Blankenstein, 1992, p25, and Appendix B)

UT 34 - Big Dry Creek. Big Dry Creek is located southwest of Provo as well. Measured flows were recorded by the Bureau of Reclamation for the water years 1954-1964 and 1964-1965. Flows were also measured by BYU and the Eyring Research Institute for 1971, 1972, 1978 and 1979. These measured flows were previously correlated with the goundwater index. Because this index could not be updated, flows after 1991 were determined using a correlation based on the Santaquin Precipitation Index. (See Appendix B, Figure B:34)

UT 35 - 11th West Ditch. This drain is located south of Provo near 1100 West Street. Measured flows varied between zero and 2200 acre-feet annually. Flows were correlated with the groundwater index through 1991. Because the index could not be updated, flows after 1991 were estimated using a correlation based on the Average Valley Precipitation Index.(See Appendix B, Figure B:35)

UT 36 - 5th West Ditch. This ditch is used as a drainage channel and is located at the south end of 500 West Street in Provo. Measured flows were correlated with the previous year's average

valley precipitation index through 1991. Because that index was changed, the correlation was updated. Flows after 1991 were determined using a correlation based on the previous year's Lehi precipitation index. (See Appendix B, Figure B:36)

UT 37 - University Ditch. This ditch is also used for drainage and is located at the south end of University Ave. in Provo. Measured flows, which vary from 700-1500 acre-ft annually, were also correlated with the previous year's Average Valley Precipitation Index through 1991. Flows after 1991 were determined using a correlation based on the previous year's Lehi Precipitation Index. (See Appendix B, Figure B:37)

UT 38 - Mill Race. Mill Race drains the area adjacent to the Provo Wastewater Treatment Plant. Measured flows have ranged from 4000-17,000 acre-ft per year. The correlation for this tributary, based on the previous year's Provo Precipitation Index, has not been changed. (Van Blankenstein, 1992, p26, and Appendix B)

UT 39 - Provo Wastewater Treatment Plant. The Provo Wastewater Treatment Plant was constructed in 1956. However, components of the Provo sewer system have been in place since before 1950. Sewer flows were estimated according to trends in development for the seven years when data were missing. Wastewater discharge flows since 1956 were obtained from Provo City files. (See Appendix C, Table C:39)

UT 40 - Drain. This drain is located south of the Provo WWTP. It was rerouted in 1977, and the

flows after 1977 are included with the flow in UT 41. Measured flows ranged from 900-3000 acre-ft annually. The correlation, based on the Provo Precipitation Index, was not changed. (Van Blankenstein, 1992, p27, and Appendix B)

UT 41 - Rat Farm Drain. This large drain is located southeast of the Provo Wastewater Treatment Plant. Measured flows have ranged from 12,000 to 22,000 acre-ft per year. The Bureau of Reclamation provided flow measurements for the water years 1938-1940, 1955-1961, and 1964-1965. The correlation, based on the Provo Precipitation Index, was not changed. (Van Blankenstein, 1992, p27, and Appendix B)

UT 42 - Steel Mill Drain. This tributary drains part of the old Ironton property and the Pacific Cast Iron Pipe property. Flows were recorded by the Bureau of Reclamation for the water years 1938-1940, 1954-1961, and 1964-1965. Flow was also recorded by BYU and the Eyring Research Institute for 1971, 1972, 1978 and 1979. The correlation, based on the Provo Precipitation Index from the previous year, was not changed. (Van Blankenstein, 1992, p27, and Appendix B)

UT 43 - Spring Creek. This tributary is located on the west side of Springville and carries effluent from the Springville Wastewater Treatment Plant to Utah Lake. The effluent was subtracted from the flow before the correlation was developed. Flows in this stream were measured by the Bureau of Reclamation for the water years 1938-1940, 1954-1961, and 1964-1965. Flow was recorded by BYU and the Eyring Research Institute for the water years 1971,

1972, 1978 and 1979. Flows ranged form 4500 to 10,000 acre-ft per year. The correlation developed previously was based on two indices, the groundwater index and the Provo Precipitation Index. Because the groundwater index could not be updated, flows after 1991 were estimated using a correlation based only on the Provo Precipitation Index. (See Appendix B, Figure B:43)

UT 44 - Hobble Creek. Hobble Creek originates in Hobble Creek Canyon, in the mountains above Springville. Flow is heavily influenced by spring snow - melt runoff and varies greatly from year to year. A USGS gaging station once measured flow continuously in Hobble Creek Canyon. Flows measured closer to the lake have ranged from 2600 to 50,000 acre-ft per year. Previously, flows were correlated with the water year runoff in the Spanish Fork River at Lakeshore. However, because the gaging station at Lakeshore was closed, this index could not be used to update flows in Hobble Creek. An updated correlation, based on the Santaquin Precipitation Index was used to determine flows after 1991. (See Appendix B, Figure B:44)

UT 45 - Packard Drain. This is a large drain located west of Springville. Measured flows were supplied by the Bureau of Reclamation, and by BYU and the Eyring Research Institute. The correlation for this drain, based on the Santaquin Precipitation Index, was not changed. (Van Blankenstein, 1992, p29, and Appendix B)

UT 46 - Drain. This drain is also located west of Springville. Measured flow is fairly constant ranging form 2200 to 2300 acre-ft per year. The correlation for this drain, also based on the

Santaquin Precipitation Index, was not changed. (Van Blankenstein, 1992, p29, and Appendix B)

UT 47 - Dry Creek. This stream carries effluent to Utah Lake from the Spanish Fork WWTP. Sewage flows were deducted before developing any correlation. Flows were recorded during the water years 1930, 1961, 1965, and 1966, by the Bureau of Reclamation. Other measured flows were recorded by BYU and the Eyring Research Institute. The correlation for this drain was also based on two different indices, the groundwater index and the Santaquin Precipitation Index. Because the groundwater index could not be used to update the flow more recently, an updated correlation was developed based on the previous year's Provo Precipitation Index. (See Appendix B, Figure B:47)

UT 48 - Spanish Fork River at Lakeshore. The Spanish Fork River is a major tributary to Utah Lake and originates in Spanish Fork Canyon, in the Wasatch Range. A USGS Gaging Station recorded flow data at Lakeshore where the river runs into Utah Lake beginning in 1904. Between 1925 and 1938 the measurement was discontinued. From 1939 through 1988 flow was measured continually, but in 1988 the station was again discontinued.

When the model was updated through 1991 and again through 2000, a method was developed to find the flow at Lakeshore for each month after the station was discontinued in 1988. For the months of January - May and October - December, when irrigation diversions have little effect on the flow, a correlation equation was developed relating the flow at Lakeshore to the flow at Castilla for each month of the year. The flows in Castilla were continually measured and could be used in these equations to estimate missing flow data.

For the months of June - September, when irrigation diversions draw most of the flow away from the river, a more complex relationship was developed to estimate the missing flows. The historical ratio of the flow in the Provo River below Deer Creek Dam to the flow in the Provo River at Provo, or ratio A, was determined for each month of record since 1950. The historical ratio of the flow in the Spanish Fork River at Castilla to the flow in the Spanish Fork River at Lakeshore, or ratio B, was also determined for each month. Linear equations were then developed to correlate the historical ratio of flows in the Provo River (ratio A) with the historical ratio of flows in the Spanish Fork River (ratio B) for each month in the form B=f(A). These correlations were used to determine the ratio of flows in the Spanish Fork River, or B, during each of the summer months after the station was discontinued. Continuously measured monthly flows at Castilla were then divided by B to find the flow at Lakeshore.

Previously this method was used to determine only three years of data. The determined flows were mostly small, and so this method was carefully reviewed while updating the flows through 1999. Another method was developed for comparison, which returned larger flows.. However, after talking to several people who are familiar with the water flows in the lower Spanish Fork River and considering the amount of flow diverted for irrigation, we decided that the method discussed above would give better results. This method was then used to update flows at Lakeshore for each month from 1991 through 1999. (See Appendix C, Table C:48)

UT 49 - Drain. This tributary drains a small area west of the Spanish Fork River. Measured flows have ranged from 300 to 650 acre-ft annually. The flows were previously correlated with the groundwater index. However, because this index could not be updated, flows after 1991 were

determined using a correlation based on the previous year's Average Valley Precipitation Index. (See Appendix B, Figure B:49)

UT 50 - Drain. This drain is slightly larger than UT 49 and is located between the Spanish Fork River and Benjamin Slough. The flows measured in this drain were correlated with the previous year's Average Valley Precipitation Index. This index was updated and changed, and flows after 1991 were determined using the Average Valley Precipitation Index for the same year. (See Appendix B, Figure B:50)

UT 51 - Benjamin Slough. - Benjamin Slough is a large tributary which drains the eastern slope of West Mountain and the areas of Payson, Salem and Benjamin. It also carries effluent from the Salem and Payson wastewater facilities to Utah Lake. Flows for this tributary range from 18,000 to 41,000 acre-ft per year. Wastewater discharges were subtracted from measured flows before establishing a correlation. The correlation, based on the Santaquin Precipitation Index, was not changed. (Van Blankenstein, 1992, p31, and Appendix B)

UT 52 - White Lake. - The inflow from the flat area at the southeast end of the lake is called the White Lake overflow to Goshen Bay. Water accumulating at the south end of the lake over the years has mostly evaporated, leaving behind soil that is high in soluble salts. Measured flows were correlated with the groundwater index. However, because this index was not updated, flows after 1991 were correlated with the previous year's Santaquin Precipitation Index. (See Appendix B, Figure B:52)

UT 53 - Outflows - This flow is the surface outflow from the lake through the Jordan River, Utah and Salt Lake Canal, and East Jordan Canal. A USGS gaging station in the Jordan River Narrows continuously records flow. In addition to this combined flow, water bypasses this station through the Utah Lake Distributing Canal. Monthly flows are recorded and are included in the Jordan River Commissioners' annual reports. These flows are used to calibrate the outflows produced by the model. (See Appendix C, Table C:53)

UT 70 - Lehi Wastewater Treatment Plant. The Lehi Wastewater Treatment facility discharged into Utah Lake through Minnie Creek continuously from 1956 to 1979. Sewage was diverted to the newly completed Timpanogos Wastewater Treatment Plant in 1979. Flow was recorded continuously while the treatment plant was in service. (See Appendix C, Table C:70)

UT 71 - Timpanogos Wastewater Treatment Plant. - The Timpanogos Wastewater Treatment Plant was put into service in August of 1979 and includes sewage previously treated at Lehi, American Fork, and Pleasant Grove. Flows have been continuously recorded at the plant since it opened. (See Appendix C, Table C:71)

UT 72 - Pleasant Grove Wastewater Treatment Plant. - Sewers were first constructed in Pleasant Grove in 1956, and wastewater from the treatment plant was discharged into Utah Lake through the Geneva Cannery Drain until 1979. After 1979, sewage was diverted to the Timpanogos Wastewater Treatment Plant. Flows were recorded continuously until that time. (See Appendix C, Table C:72)

UT 73 - Springville Wastewater Treatment Plant. This plant was completed in 1956 and started discharging wastewater into Utah Lake through Spring Creek. Flows from sewer lines constructed before 1956 were estimated with city personnel based on the population served by the system. (See Appendix C, Table C:73)

UT 74 - Spanish Fork Wastewater Treatment Plant. This plant was built around 1960. Water is discharged into the lake through Dry Creek. Flow records have been kept at the plant since its completion. Sewer lines were first constructed in 1936. Discharge from the system previous to 1960 was estimated based on the population served by the system after consultation with city personnel. (See Appendix C, Table C:74)

UT 75 - Salem Wastewater Treatment Plant. A sewer system was finished in Salem in 1964. The treatment plant discharges effluent into Beer Creek, which flows into Benjamin Slough and then into Utah Lake. Recorded flows from the treatment plant were used when available. Other flows were estimated based on the population served by the system. (See Appendix C, Table C:75)

UT 76 - Payson Wastewater Treatment Plant. Sewers and a settling tank were first put in place in Payson in 1941. The treatment plant was completed in 1968. Effluent is discharged into Benjamin Slough through local drainage channels. Measured flows were obtained when available. Other flows were estimated based on the population served by the system. (See Appendix C, Table C:76)

Precipitation Inflow

The next step in the project was to update the inflow to Utah Lake due to precipitation over the lake. Because the lake is large and precipitation is variable over the surface of the lake, the Thiessen Polygon method was used to determine precipitation inflow. This method involves dividing the surface area of the lake into smaller areas, or polygons, according to the location of selected precipitation stations.

The Thiessen Polygon method assumes that precipitation varies over the surface of the lake. Precipitation gage readings from around the lake are selected. The location of each gage, or station, is determined on a map and a line segment is drawn from each station to all adjacent stations. The area of influence of each gage is determined by drawing perpendicular bisectors through each connecting line and then forming polygons with these bisectors as they intersect one another. The lake surface area bounded by each polygon is determined as a percentage of the total surface area of the lake. Each of these percentages is multiplied by the precipitation gage reading closest to that area to get the weighted precipitation for each gage. The sum of the weighted precipitation values is equal to the average depth of precipitation over the lake. This can be multiplied by the total surface area of the lake to find the volume of water coming into the lake through precipitation.

The LKSIM2000 model divides the lake into three sections. The Thiessen Polygon method was used to analyze precipitation inflow over each section separately. Goshen Bay is the southern section of the lake on the west side of West Mountain. Provo Bay is the shallow section of the lake lying between the south side of Provo and Lakeshore. The Main Lake includes the rest

of the lake. Each of these sections was drawn on a 1:2000 scale contour map of Utah Lake. Gages were then selected around each section so that the Thiessen Polygon method could be used. Polygons were drawn accordingly and areas were measured with a planimeter for lake stages from 4484 feet to 4490 feet. Percentages were then calculated based on planimeter units because of the difficulty in calibrating the planimeter to find the area in sq. inches or sq. feet.

The lake level at the end of each month, and the surface area of each section of the lake corresponding to that stage were recorded from the Utah Lake stage records. The measured precipitation for each month at each station was then multiplied by the percentage corresponding to that station and lake stage to find the weighted precipitation (see Appendix D).

In the analysis of precipitation inflow for the years previous to 1992, precipitation gage readings at the Elberta, Payson and Orem Treatment Plant stations were used to determined the precipitation over Goshen Bay (Van Blankenstein, 1992, p36). The Provo and Orem Treatment Plant stations were used for Provo Bay, and the Lehi, Orem Treatment Plant, and Payson stations were used for the main lake.

Because the Elberta Station was closed in 1992, that station could not be used to find the precipitation over Goshen Bay during the succeeding years. The Santaquin Station was used as a replacement because it is the closest existing station to the Elberta Station. We were concerned about this however, because the Elberta Station was our only station representative of the west side of Utah Lake. The Santaquin Station has historically recorded higher precipitation than the Elberta Station. New areas were drawn on Goshen Bay according to the location change and the precipitation was calculated. We used the Santaquin Station to analyze and compare the results back to 1988 and found the difference in the resulting precipitation over Goshen Bay to be small.

The precipitation was not consistently greater using the Santaquin Station in place of the Elberta Station. The precipitation inflow is also a relatively small fraction of the total inflow in the water budget, so the change was not significant. Santaquin, Payson, and Orem Treatment Plant stations were then used to find the precipitation inflow over Goshen Bay since 1991 (see Figure 2 and Tables 2-7). The areas and percentages for the other sections of the lake were used as calculated for the previous report. (Van Blankenstein, 1992)

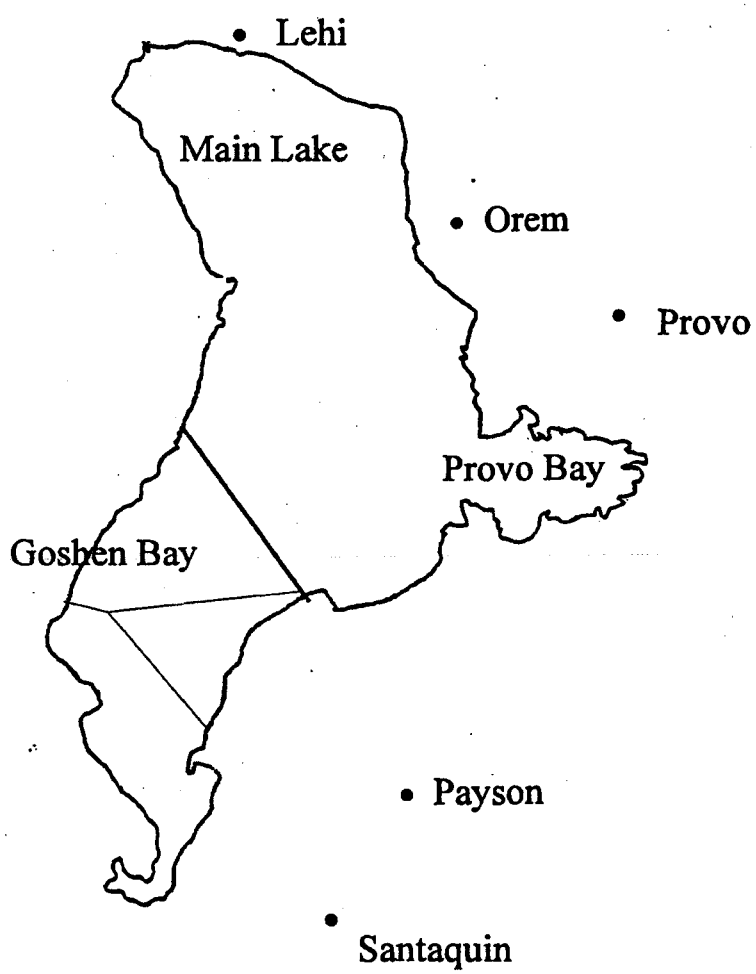


Figure 2 - Polygons for precipitation inflow calculation of Goshen Bay

Table 2 - Weighted Areas for Main Lake Polygons

Main Lake Area Percentages					
	Lake Elevation (ft)				
STATION	4492	4490	4488	4486	4484
Orem T.P.	71.4	72.7	73.8	73.8	74.3
Payson	7.4	6.0	4.9	4.7	4.3
Lehi	21.2	21.3	21.3	21.5	21.4
Total	100	100	100	100	100

Table 3 - Weighted Areas for Provo Bay Polygons

Provo Bay Area Percentages					
	Lake Elevation (ft)				
STATION	4492	4490	4488	4486	4484
Orem T.P.	3.1	3.8	4.5	3.6	0.3
Provo BYU	96.9	96.2	95.5	96.4	99.7
Total	100	100	100	100	100

Table 4 - Weighted Areas for Goshen Bay Polygons

Goshen Bay Area Percentages					
	Lake Elevation (ft)				
STATION	4492	4490	4488	4486	4484
Orem T.P.	39.1	40.5	43.8	46.3	49.6
Payson	14.6	15.0	16.6	16.9	18.1
Santaquin	46.3	44.5	39.6	36.8	32.3
Total	100	100	100	100	100

Table 5 - Main Lake Precipitation

Precipitation Inflows - Main Lake (Acre-ft)													
WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1991	10740	8043	4975	6391	4374	5919	12200	14268	4528	1076	6377	13429	92319
1992	5807	7879	1780	1917	7313	2572	1250	5603	3084	3527	1599	4738	47069
1993	10533	6226	6814	9437	6634	11089	2517	12641	6031	3429	2816	5473	83641
1994	10229	1597	1116	2101	6158	4065	13385	4933	10	868	5226	4103	53791
1995	13105	4283	5130	6461	1233	6741	7044	22946	5678	4279	2491	2105	81494
1996	2008	2565	5871	12648	10170	7984	4517	5142	999	1631	140	7885	61560
1997	8050	9871	5577	12693	5482	926	7193	7644	4401	2847	3714	8180	76578
1998	6128	6521	5348	9836	13363	7960	6648	8114	14780	4955	2575	2544	88773
1999	5369	3864	4047	8709	5457	1854	22510	11354	7399	5748	2355	1035	79701

Table 6 - Provo Bay Precipitation

Precipitation Inflows - Provo Bay (Acre-ft)													
WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1991	55	61	101	128	115	339	502	522	240	42	121	80	2306
1992	55	127	54	103	387	288	83	267	88	34	2	1	1491
1993	5	3	19	220	341	529	226	1139	715	452	377	307	4333
1994	842	249	482	390	956	584	1274	590	35	36	378	167	5984
1995	837	692	482	1075	404	1104	871	2668	1390	563	317	290	10693
1996	299	383	1339	1708	1477	1496	1102	997	312	292	34	799	10237
1997	1080	1231	1093	2374	966	317	1112	1263	522	313	437	1391	12099
1998	923	944	867	1709	1820	1169	1359	1176	2582	385	482	654	14071
1999	818	776	442	1439	770	341	2672	2175	983	445	608	89	11558

Table 7 - Goshen Bay Precipitation

Precipitation Inflows - Goshen Bay (Acre-ft)													
WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1991	3065	2693	1871	2040	1122	1828	4219	4074	1100	169	1747	3725	27653
1992	2803	3803	959	797	2687	1763	276	2641	1231	1561	367	1141	20028
1993	3299	6521	2729	4829	3367	4464	1854	6346	3156	1148	1028	2214	40954
1994	3722	1248	1224	963	4170	1646	5685	2565	30	301	2725	1790	26070
1995	6648	3695	2177	3689	1644	3732	4756	11403	3423	1487	634	1576	44865
1996	565	1452	2710	6005	6540	5964	3342	3048	342	406	163	3225	33761
1997	4104	4183	3192	6971	3531	804	5122	4110	1748	2048	1787	3957	41556
1998	3463	3207	2281	5366	6410	5030	3691	3422	7169	2553	934	1340	44867
1999	3351	2797	2364	3803	2915	1068	9669	6405	3536	2801	1135	547	40391

Evaporation

As was mentioned before, Utah Lake is a large, shallow lake in a semi-arid setting. These conditions are favorable for large evaporations. Evaporation is a very large part of the water budget in Utah Lake. There is considerable interest in finding a way to reduce the loss of water through evaporation from the surface of Utah Lake. Because some of the other components in the water budget are hard to measure or estimate, like groundwater inflow, it is important to accurately determine evaporation in order to model the quality of the lake accurately.

Several different methods have been examined for estimating evaporation. A model was developed by F.I. Morton, a scientist with the National Hydrology Research Institute in Canada, which has been used to estimate the evaporation (Morton, 1986). This model is particularly useful for estimating evaporation of shallow lakes in semi-arid regions. A study of evaporation models in 1980 concluded that Morton's model would best simulate evaporation from Utah Lake.

Morton developed several different versions of this evaporation model. The model uses monthly values of air temperature, humidity (or dew point temperature), and percent possible sunshine (or solar radiation) to simulate evaporation. Different versions of this model have been developed to simulate different conditions. The CRAE (complimentary relationship areal evapotransporation) version permits areal evapotranspiration to be estimated from its effects on air temperature and humidity. The CRWE (complimentary relationship wet-surface evaporation) version provides estimates of wet-surface evaporation corresponding to a shallow lake with little change is seasonal subsurface heat storage. The CRLE (complimentary relationship lake

evaporation) version takes into account the seasonal change in heat storage caused by the change in energy consumed by evaporation. The model routes the solar and waterborne heat input (rather than lake-size wet surface evaporation) through a hypothetical heat reservoir (Marsh, 1995, p4).

Morton's model has also proven useful because the input variables needed in the model are readily available. A study completed in 1995 examined the use of variables from different sources in Morton's model (Marsh, 1995). Air temperature, percent sunshine and dew point temperature are continually measured at the Salt Lake City Airport. These variables were also measured at the Palmyra station near the south shore of Utah Lake, and at Santaquin. Using these data, a study was also done to find correction factors which would adjust the Salt Lake City recorded air temperature, percent sunshine and dew point temperature to more closely represent conditions at Utah Lake (Mingfeng Gu, 1993). The study concluded that using the Palmyra air and dew point temperatures with uncorrected percent sunshine data at the Salt Lake City Airport with the CRLE version of the model produced the best simulations of evaporation.

We used the CRLE version of Morton's model with corrected air and dew point temperatures and uncorrected percent sunshine from the Salt Lake City Airport, to simulate and update monthly evaporation values. The CRLE version was used because it takes into account the effects of heat storage on monthly evaporation. Heat storage is an important factor, particularly in deep lakes, but also in shallow lakes, like Utah Lake. The corrected air and dew point temperatures from Salt Lake City were used instead of the actual and dew point temperatures at Palmyra because they were more readily available. Data suggests that the correction factors listed in Table 1 of Mingfeng Gu's report adequately adjust Salt Lake City Airport data to represent conditions at Utah Lake (Mingfeng Gu, 1993, p60). This method

produced simulated monthly evaporation values which fit well into the water budget used as input for the LKSIM2000 model. Plots of simulated monthly evaporation and air and dew point temperature are given in Appendix E.

Calibration and Results

Having established surface flow, evaporation, precipitation and change in lake stage, the water budget was complete to the point that the LKSIM2000 model could be used. The model uses these input parameters, as well as water quality inputs to balance the salts going into and out of the lake. The process of calibrating the model involves adjusting some of the less measurable inputs, until the results reflect the water quality that has been measured. Then the water quality can be modeled into the future based on flows resulting from planned projects and growth.

Calibration was done by Dr. Lavere B. Merritt, developer of the LKSIM2000 model. In order to more easily calibrate the model, results from trial simulations are organized into files that can easily be transferred to a spreadsheet for plotting and analysis. Files include simulated concentrations of Ca, HCO_3, Cl, Mg, K, SO_4, Na, and TDS. The model simulates the quality in each of the three sections of the lake (Goshen Bay, Provo Bay, Main Lake) separately. The quality of water in the main lake is of primary interest, because surface water discharges from this section of the lake through the Jordan River.

A spreadsheet file was created with measured water quality values. Water quality data for Utah Lake and the Jordan River were obtained from the Utah State Division of Water Quality. Water quality data from the State were reviewed and analyzed to include only representative data points. Those data points included mostly measurements taken in the main section of the lake, or near the outlet in the Jordan River. Extreme data, such as those taken in the winter when mixing was low, were omitted. These measured concentrations were then plotted as points against time. The simulated monthly values from the model output were opened in spreadsheet format and

pasted into the spreadsheet file next to the measured values. Major ion concentrations and TDS concentrations were added to each respective plot of measured concentrations. Lake levels were also added to each plot.

Periodically, simulations were plotted and reviewed as Dr. Merritt refined the calibration. The goal was to match the simulated concentrations with the measured values, as seen on each plot. Some inputs were then modified slightly and a new simulation was run on the model. This process was repeated until it was felt that the simulation matched as closely as possible with the measured values. The overall arithmetic monthly average TDS concentration of the final simulation for the water years 1950-1999 is 900 mg/l. This result compares to an average TDS concentration of 1034 mg/l for the earlier update of the model from 1950 through 1991. The change represents an improvement in the calibration of the LKSIM2000 model. The plots of the major ion and TDS concentrations can be seen in Appendix F.

Concluding Remarks

The hydrologic database needed to model the salinity of Utah Lake was updated and the LKISM2000 model was successfully calibrated. This work resulted in an improved simulation of TDS concentrations in Utah Lake for the water years 1950-1999. It is hoped that this report will be used by those who will continue to use the LKSIM2000 model to study the water quality of Utah Lake. By using these tools, those who manage the water in the Utah Lake Drainage Basin will be able to reduce the concentrations of TDS in the lake and preserve the valuable resources it provides.

References

Maidment, David and Quenzer, Ann, *Total Loads and Water Quality in Corpus Christi Bay System*, http://www.ce.utexas.edu/prof/maidment/visual/ccbnep98/sld001.htm, University of Texas, 1998.

Marsh, Dean D., *Utah Lake Evaporation Study: Application of Local Climatological Data*, Brigham Young University, 1995.

Merrit, LaVere B., Miller, A. Woodruff, and Oldroyd, Jared W., LKSIM2000 Users *Manual*, Brigham Young University, 1995.

Mingfeng Gu, Frank, *Utah Lake Evaporation Study: Application of the Computer Modeling*, Brigham Young University, 1993.

Morton, F.I., *Practical Estimates of Lake Evaporation*, Journal of Climate and Applied Meteorology, v25, p371-387, 1986.

Van Blankenstein, Ian, *Utah Lake Tributary Correlations and Precipitation Determinations for the Utah Lake Water Quality Salinity Model*, Brigham Young University, 1992.

APPENDIX A - Correlation Indices

Table A:1 - Lehi, Provo, Average Valley, and Santaquin Precipitation Indices.

PRECIPITATION INDICES (inches)				
WATER YEAR	LEHI	PROVO	AVERAGE VALLEY	SANTAQUIN
1950	7.8	11.8	11.7	15.4
1951	12.7	12.6	13.4	14.8
1952	12.6	15.7	15.5	18.1
1953	7.8	8.3	9.6	12.8
1954	6.6	10.3	11.1	16.4
1955	9.2	11.1	12.5	17.1
1956	6.4	7.0	8.9	13.2
1957	10.0	12.3	12.6	15.6
1958	8.5	11.5	12.1	16.2
1959	8.9	12.8	12.7	16.4
1960	6.7	8.5	9.2	12.5
1961	9.2	11.2	12.0	15.5
1962	12.3	14.7	14.8	17.5
1963	10.3	10.4	11.5	13.7
1964	13.3	12.0	13.7	15.7
1965	13.2	12.1	14.8	19.0
1966	8.5	8.5	10.5	14.4
1967	13.7	12.2	14.8	18.6
1968	12.9	15.1	15.5	18.4
1969	10.3	12.6	13.3	16.9
1970	10.1	16.6	14.8	17.8
1971	11.3	14.8	14.3	16.9
1972	7.7	9.5	9.8	12.2
1973	14.0	16.9	16.3	18.1
1974	5.4	8.2	8.3	11.3

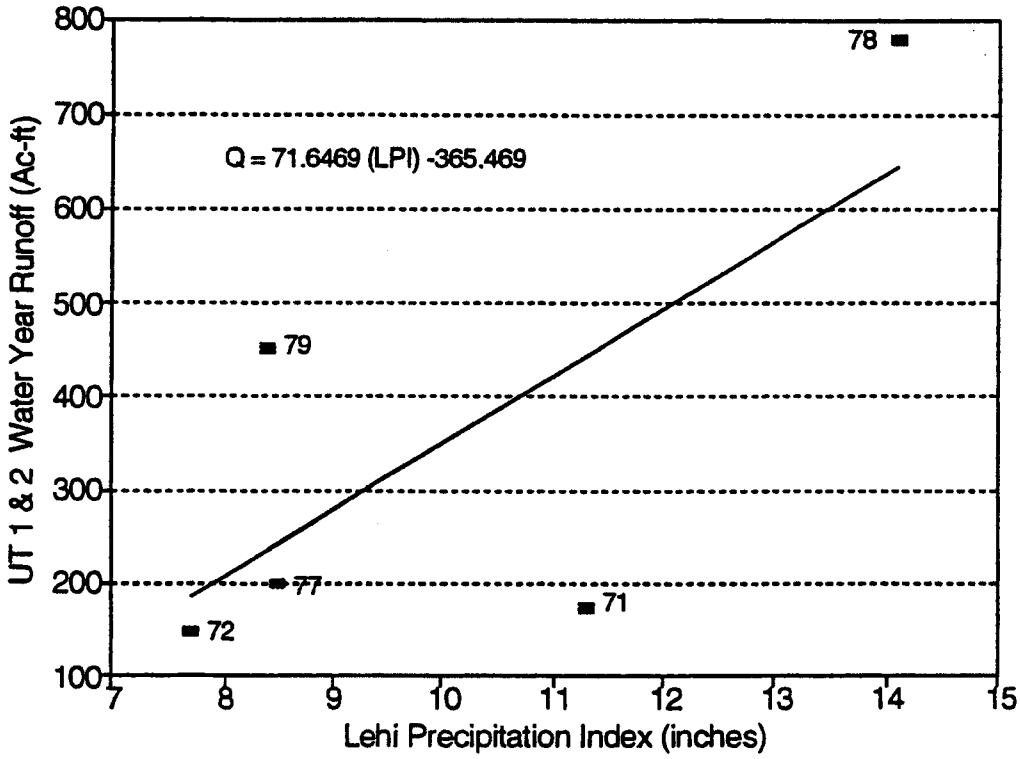
PRECIPITATION INDICES (inches)				
WATER YEAR	LEHI	PROVO	AVERAGE VALLEY	SANTAQUIN
1975	13.0	13.8	13.5	13.8
1976	10.2	11.6	11.6	13.0
1977	8.5	9.4	9.0	9.1
1978	14.1	13.6	13.3	12.1
1979	8.4	10.5	9.7	10.3
1980	10.7	12.5	12.8	15.1
1981	9.9	12.0	12.2	14.8
1982	12.6	14.4	13.9	14.8
1983	16.9	19.9	19.3	21.1
1984	15.3	18.0	17.1	18.1
1985	12.7	15.2	15.2	17.8
1986	13.6	19.0	16.3	16.4
1987	9.2	10.9	10.5	11.3
1988	10.1	9.3	11.4	14.9
1989	8.9	12.8	11.2	11.8
1990	7.6	10.7	10.8	14.2
1991	13.7	14.0	14.8	16.6
1992	10.7	11.5	11.4	11.9
1993	15.6	17.3	17.4	19.3
1994	11.1	10.6	11.8	13.8
1995	16.1	16.5	17.0	18.5
1996	9.4	13.2	12.0	13.4
1997	15.1	15.0	16.6	19.8
1998	17.1	16.0	17.2	18.6
1999	13.2	15.3	15.2	17.2

Table A:2 - Index-American Fork River Above Power Plant (Apr - Jul runoff)

American Fork River Above Power Plant (Apr-Jul Runoff)			
Water Year	Volume 1000 Ac-ft	Water Year	Volume 1000 Ac-ft
1950	37.7	1975	47.0
1951	35.1	1976	21.6
1952	51.0	1977	8.1
1953	27.9	1978	47.7
1954	19.5	1979	27.5
1955	23.8	1980	48.9
1956	28.7	1981	18.7
1957	29.1	1982	51.8
1958	38.4	1983	58.7
1959	16.6	1984	52.7
1960	21.5	1985	33.8
1961	7.5	1986	59.3
1962	34.1	1987	14.6
1963	22.0	1988	11.9
1964	29.3	1989	13.8
1965	36.6	1990	14.5
1966	24.2	1991	18.6
1967	39.6	1992	11.2
1968	33.0	1993	50.6
1969	56.3	1994	19.1
1970	24.3	1995	33.3
1971	29.0	1996	34.3
1972	26.5	1997	44.1
1973	37.5	1998	46.0
1974	26.3	1999	30.0

APPENDIX B - Updated Surface Tributary Correlations

UT 1 & 2 -- Drain 6900 N. and Saratoga Road



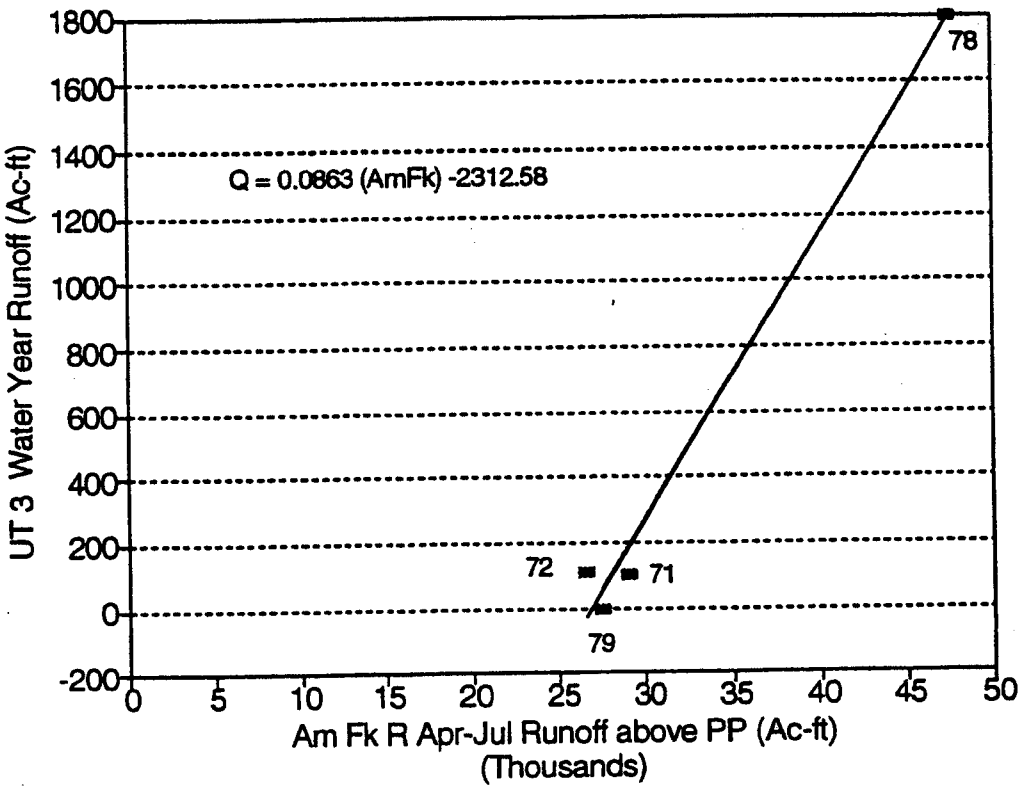
Year	Flow	LPI
1971	175	11.3
1972	150	7.7
1977	200	8.5
1978	778	14.1
1979	452	8.4

Regression Output:

Constant	-365.469
Std Err of Y Est	215.9448
R Squared	0.51206
No. of Observations	5
Degrees of Freedom	3
X Coefficient(s)	71.64685
Std Err of Coef.	40.37938

Figure B:1 -- Correlation for Drains UT 1 & 2

UT 3 -- Dry Creek (Lehi)



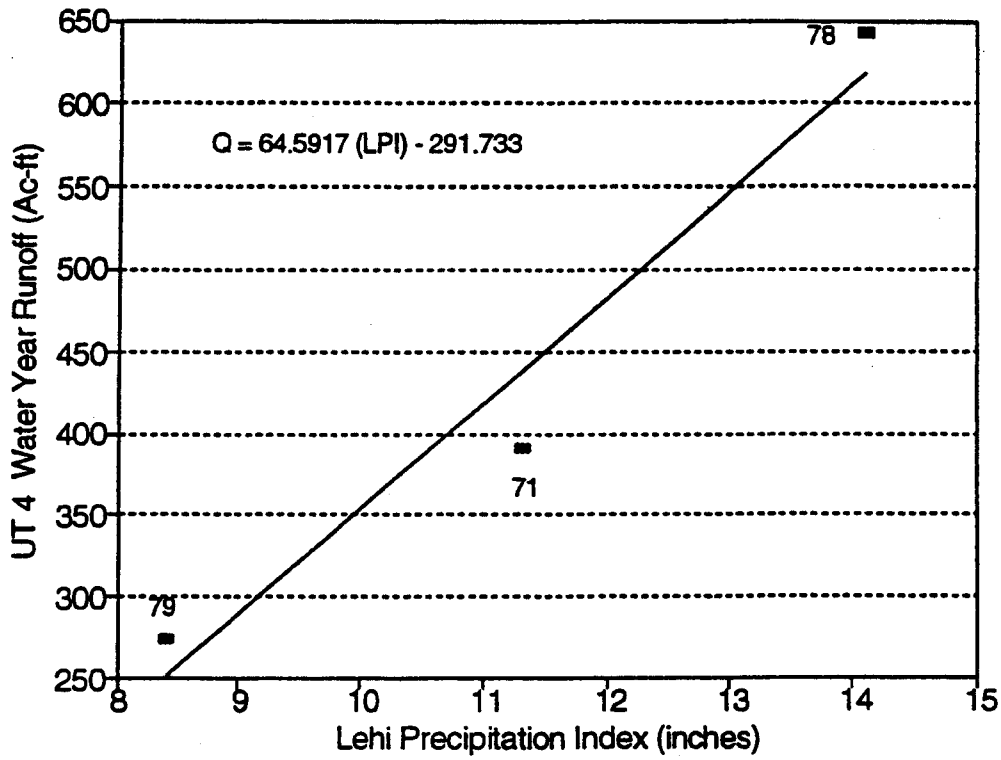
Year	Flow	AF Riv
1971	103	29000
1972	109	26500
1978	1800	47500
1979	0	27500

Regression Output:

Constant	-2312.58
Std Err of Y Est	121.6011
R Squared	0.986859
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	0.086301
Std Err of Coef.	0.007042

Figure B:3 – Correlation for UT 3, Dry Creek (Lehi)

UT 4 -- Drain, 0.7 mi. E. of 9550 W. and 7350 N.



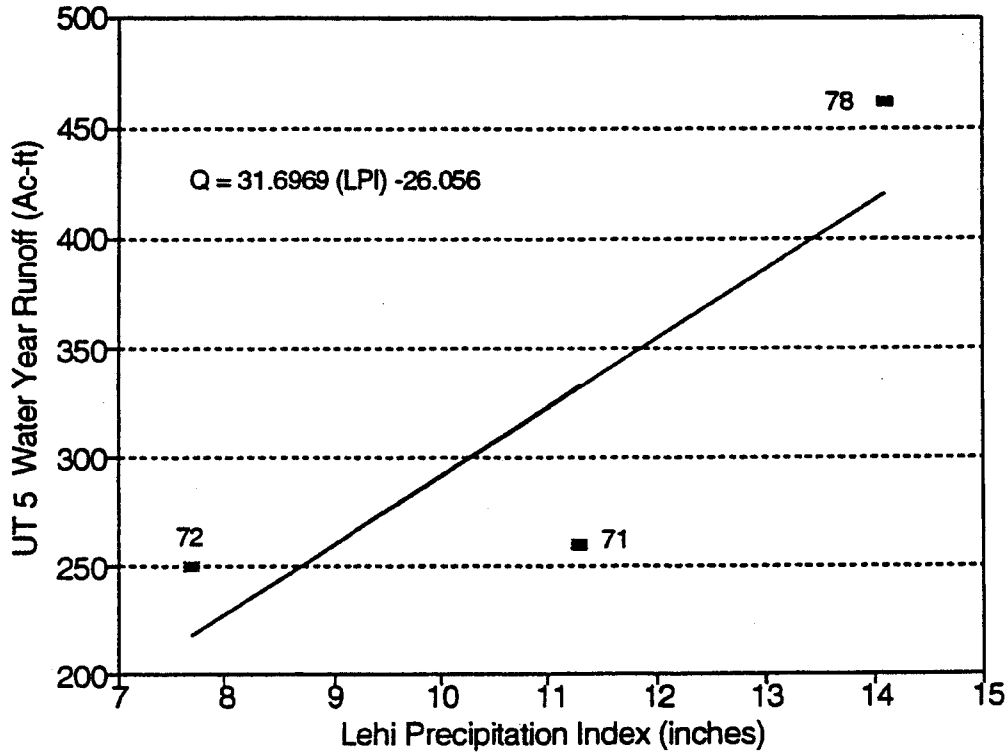
Year	Flow	LPI
1971	391	11.3
1978	643	14.1
1979	274	8.4

Regression Output:

Constant	-291.733
Std Err of Y Est	57.75343
R Squared	0.9531
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	64.59171
Std Err of Coef.	14.32833

Figure B:4 -- Correlation for Drain UT 4

UT 5 -- Drain, near 8730 W. and 7350 N.



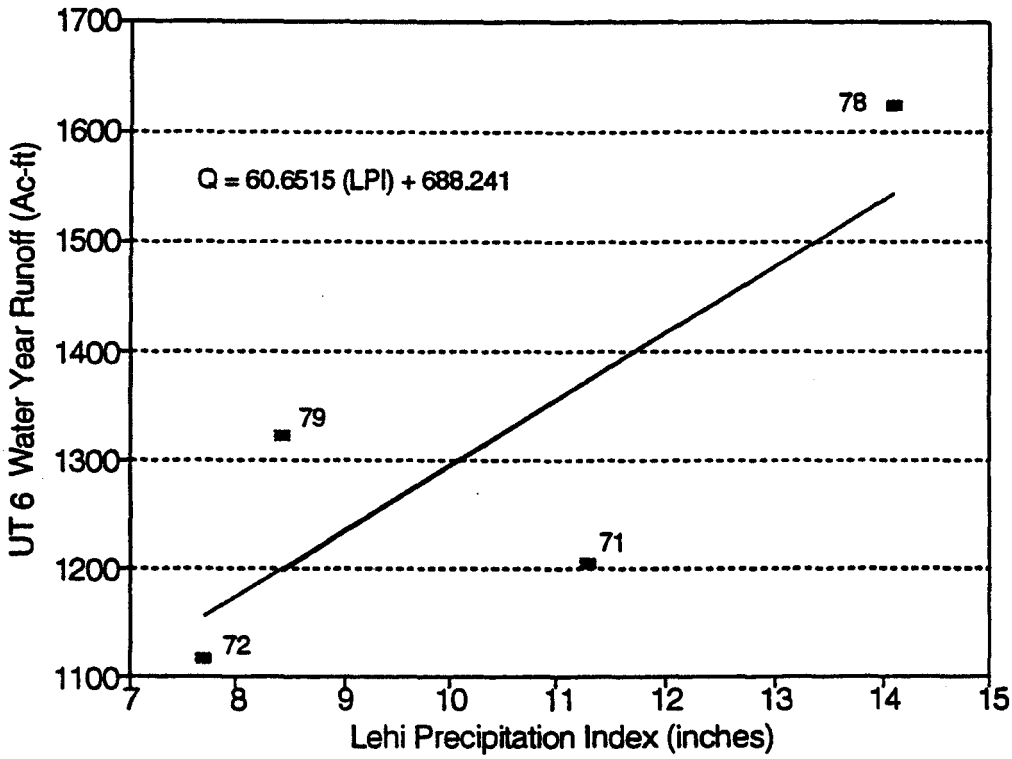
Year	Flow	LPI
1971	259	11.3
1972	250	7.7
1978	462	14.1

Regression Output:

Constant	-26.0557
Std Err of Y Est	89.78524
R Squared	0.719552
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	31.69689
Std Err of Coef.	19.78846

Figure B:5 -- Correlation for Drain UT 5

UT 6 -- Drain, near 8350 W. and 7350 N.



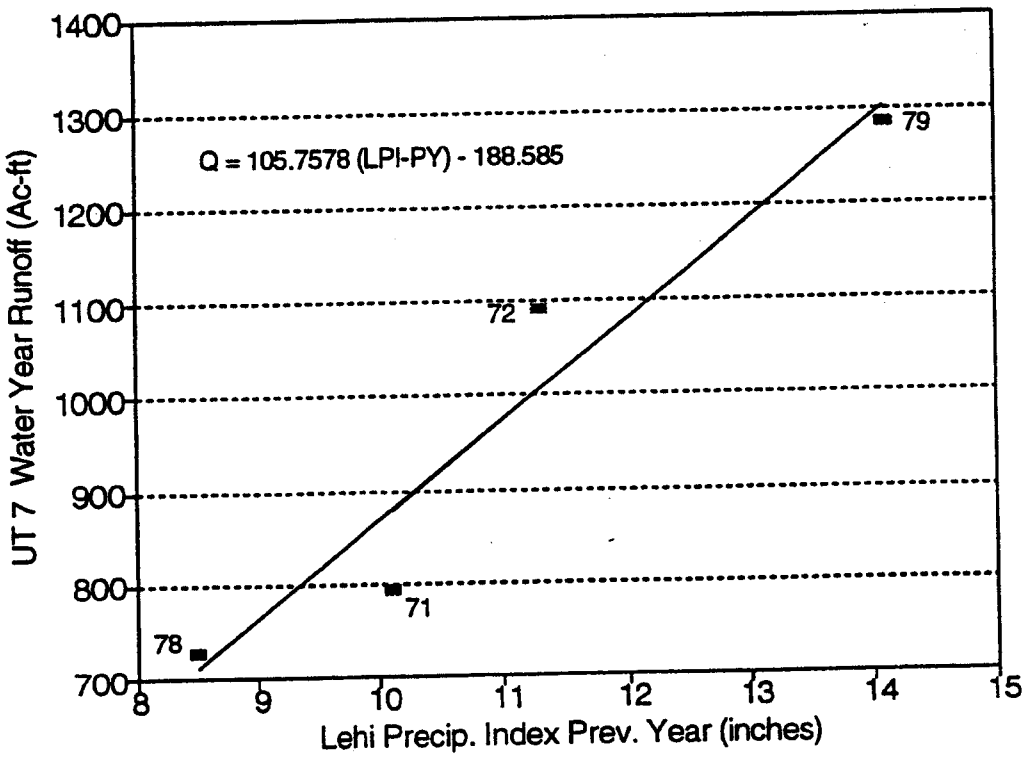
Year	Flow	LPI
1971	1206	11.3
1972	1117	7.7
1978	1624	14.1
1979	1323	8.4

Regression Output:

Constant	688.2409
Std Err of Y Est	160.8463
R Squared	0.647058
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	60.65148
Std Err of Coef.	31.67426

Figure B:6 -- Correlation for Drain UT 6

UT 7 -- Drain, near 8000 W. and 7350 N.



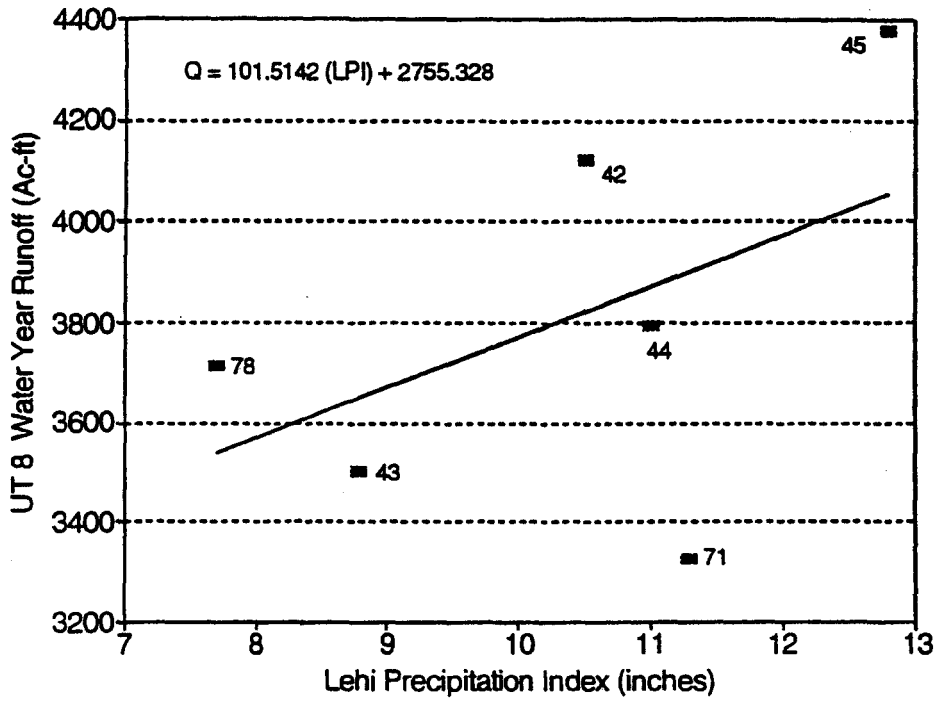
Year	Flow	LPI Prev Yr
1971	795	10.1
1972	1092	11.3
1978	728	8.5
1979	1284	14.1

Regression Output:

Constant	-188.585
Std Err of Y Est	86.95725
R Squared	0.925347
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	105.7578
Std Err of Coef.	21.2407

Figure B:7 -- Correlation for Drain UT 7

UT 8 -- Minnie Creek

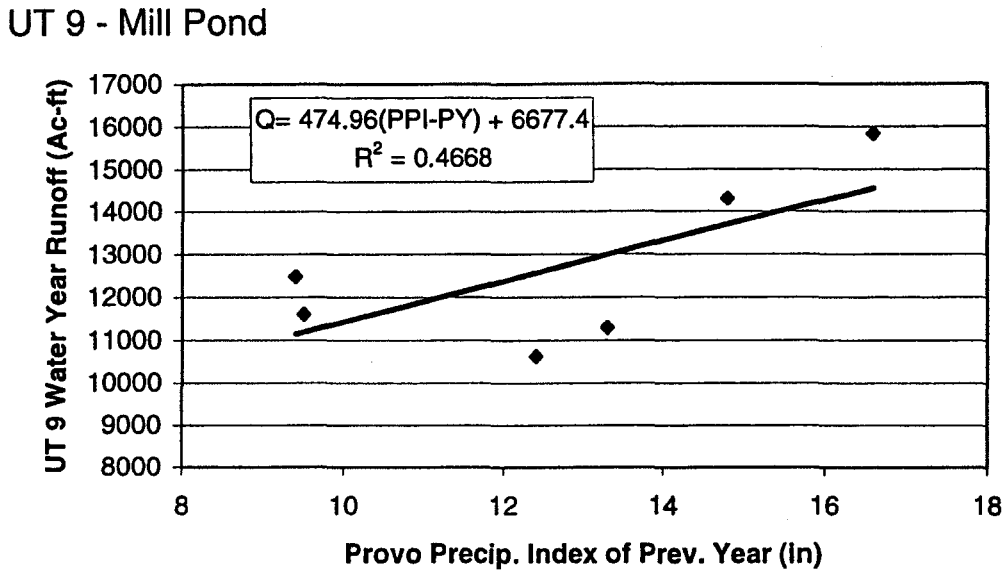


Year	Flow	LPI
1942	4122	10.5
1943	3500	8.8
1944	3792	11.0
1945	4381	12.8
1971	3325	11.3
1978	3716	7.7

Regression Output:

Constant	2755.328
Std Err of Y Est	384.3519
R Squared	0.226335
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	101.5142
Std Err of Coef.	93.84211

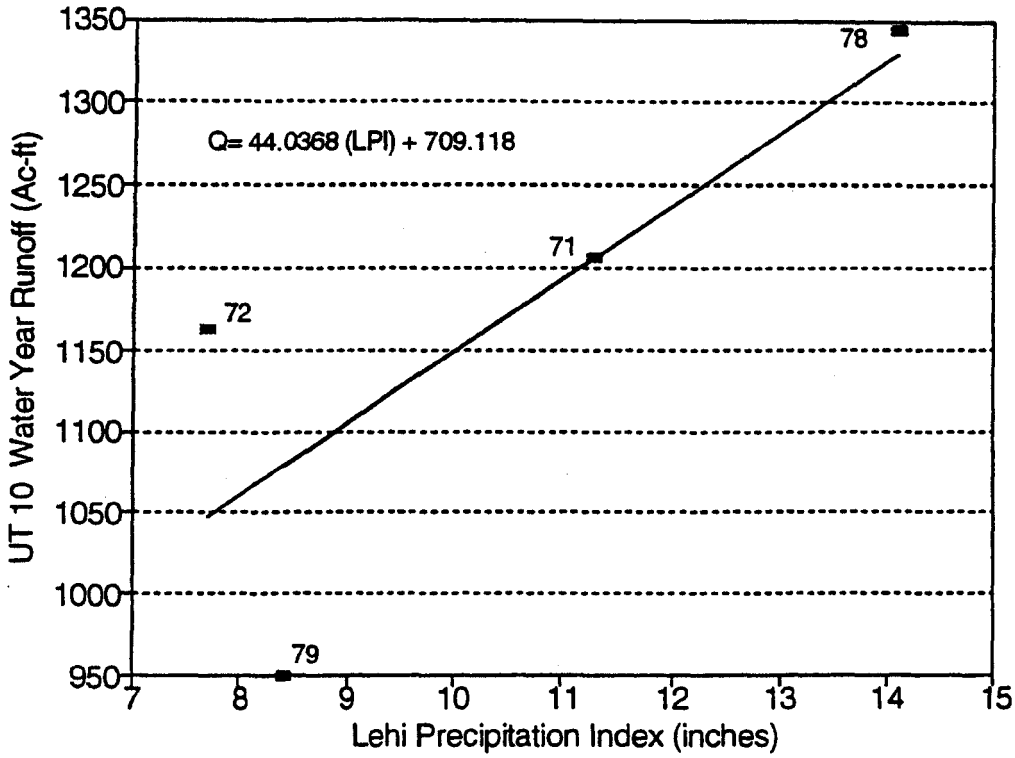
Figure B-8 -- Correlation for UT 8, Minnie Creek



Year	Flow	PPI-PY
1943	10632	12.4
1944	11606	9.5
1945	11291	13.3
1971	15833	16.6
1972	14309	14.8
1978	12490	9.4

Figure B:9 - Correlation for UT 9

UT 10 -- Drain, 1.25 mi S. of 6500 W. and 7750 N.



Year	Flow	LPI
1971	1207	11.3
1972	1163	7.7
1978	1344	14.1
1979	950	8.4

Regression Output:

Constant	709.1178
Std Err of Y Est	122.5189
R Squared	0.624869
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	44.03684
Std Err of Coef.	24.12673

Figure B:10-- Correlation for Drain UT 10

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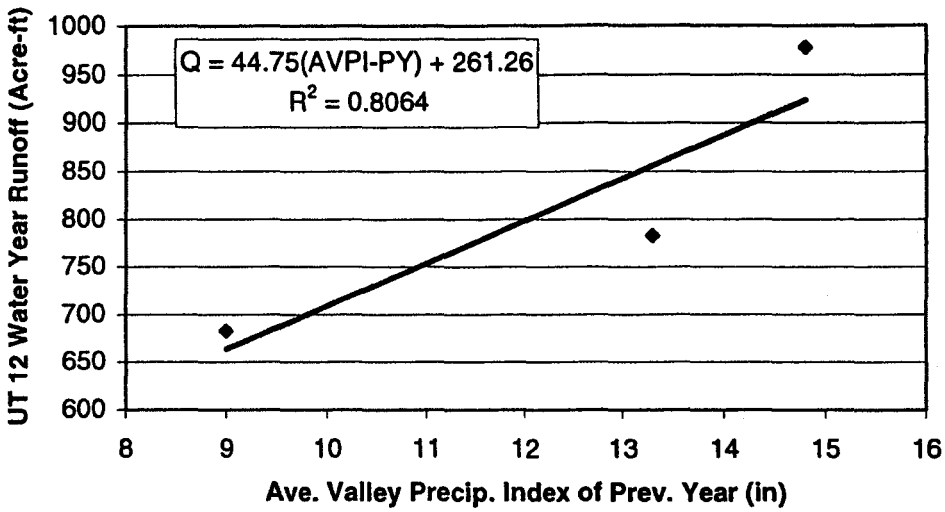
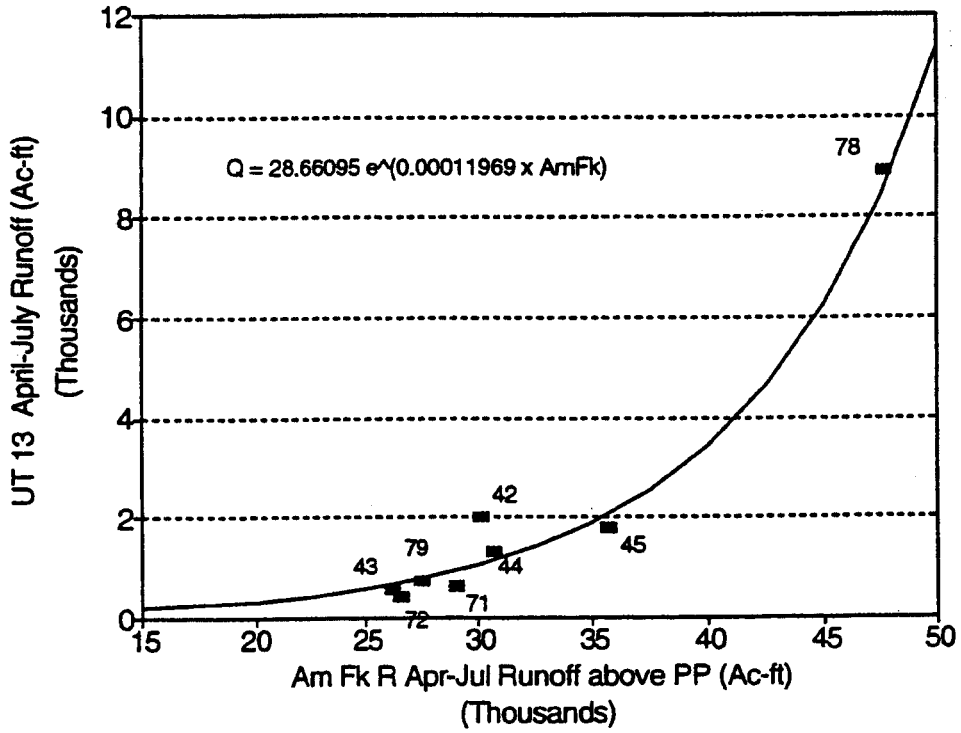
UT 12 - Drain, on 6150 W and 1.1 mi. S of 7750 N



Year	Flow	AVPI-PY
1971	978	14.8
1978	683	9
1979	783	13.3

Figure B:12 - Correlation for UT 12

UT 13-1 -- American Fork River (Apr-Jul)

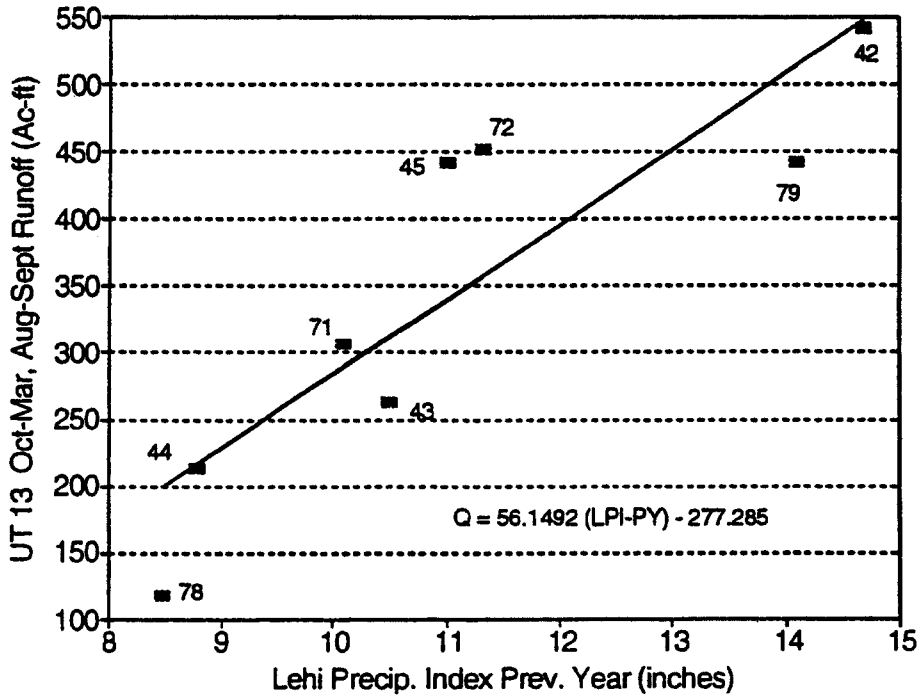


Year	Flow	AFRiv
1942	2035	30100
1943	602	26200
1944	1345	30700
1945	1806	35700
1971	638	29000
1972	421	26500
1978	8887	47700
1979	748	27500

The best fit line was found to be an exponential curve for the given data. The equation was found using a calculator program for fitting data points to a curve.

Figure B:13-1-Correlation for UT 13, American Fork River (Apr-Jul)

UT 13-2 -- American Fork River (Oct-Mar, Aug-Sept)

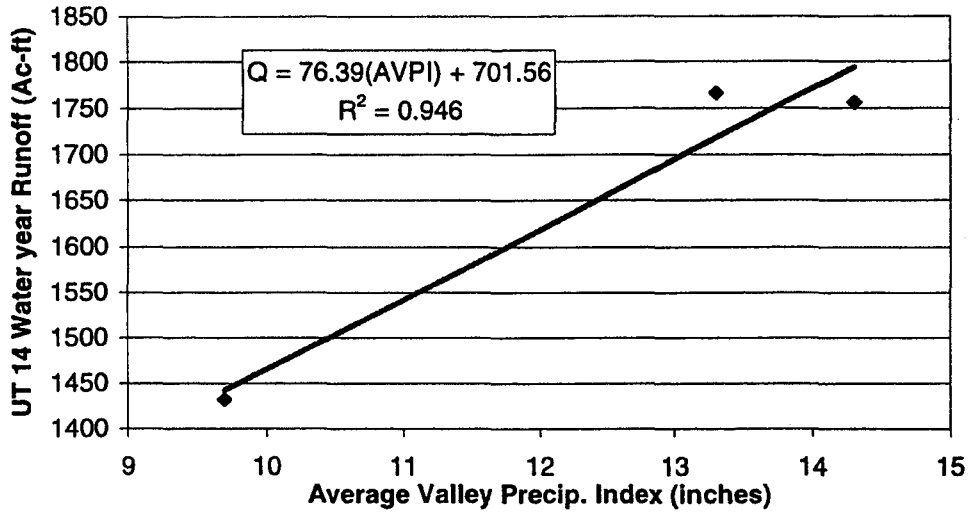


Year	Flow	LPI Prev Yr
1942	541	14.7
1943	264	10.5
1944	214	8.8
1945	442	11
1971	307	10.1
1972	452	11.3
1978	117	8.5
1979	442	14.1

Regression Output:		
Constant		-277.285
Std Err of Y Est		75.42516
R Squared		0.765867
No. of Observations		8
Degrees of Freedom		6
X Coefficient(s)	56.14923	
Std Err of Coef.	12.67426	

Figure B:13-2 - Correlation for UT 13, American Fork River (Oct-Mar, Aug-Sep)

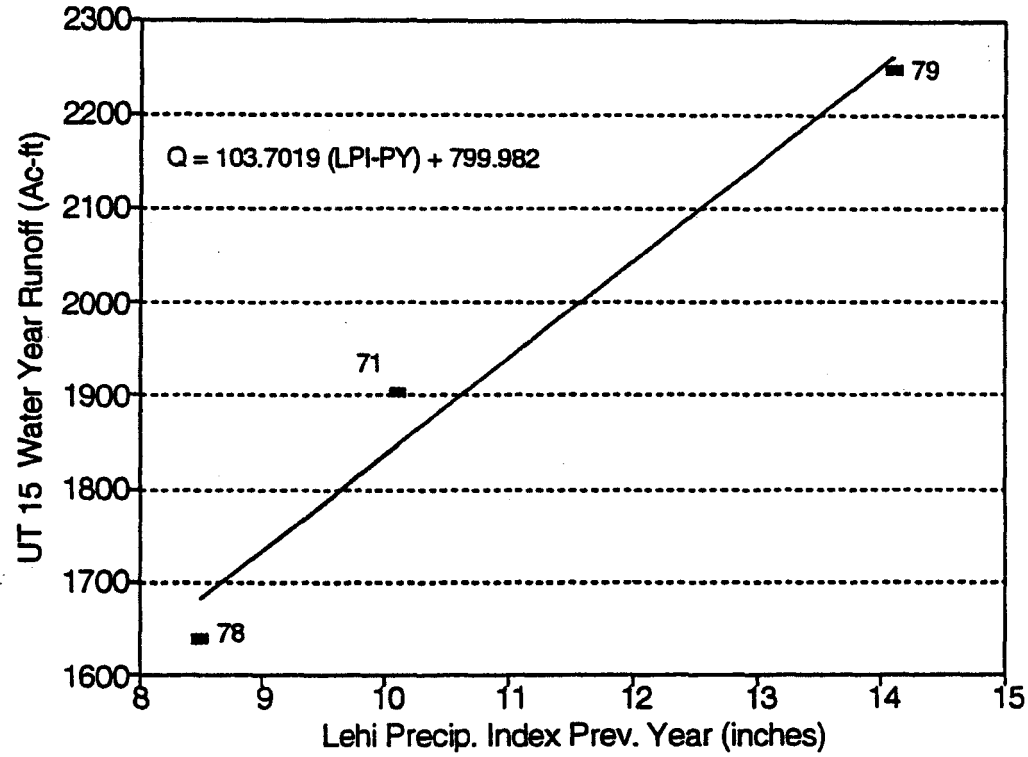
UT 14 - Drain, 0.1 mi W. of 6400 N. and 5750 W.



Year	Flow	AVPI
1971	1756	14.3
1978	1766	13.3
1979	1432	9.7

Figure B:14 - Correlation for UT 14

UT 15 -- Drain, 0.1 mi E. of 6400 N. and 5750 W.



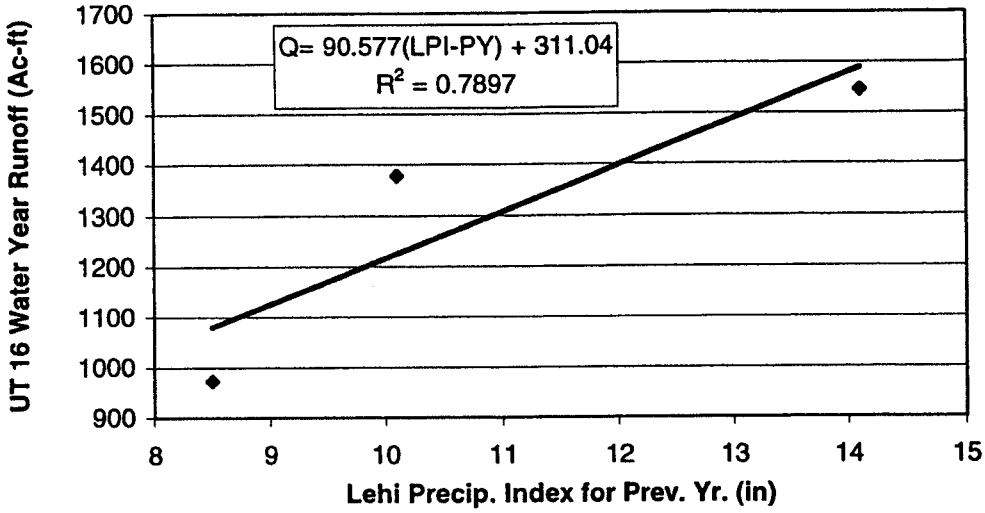
Year	Flow	LPI Prev Yr
1971	1904	10.1
1978	1641	8.5
1979	2246	14.1

Regression Output:

Constant	799.9824
Std Err of Y Est	71.44668
R Squared	0.972265
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	103.7019
Std Err of Coef.	17.51481

Figure B:15 – Correlation for Drain UT 15

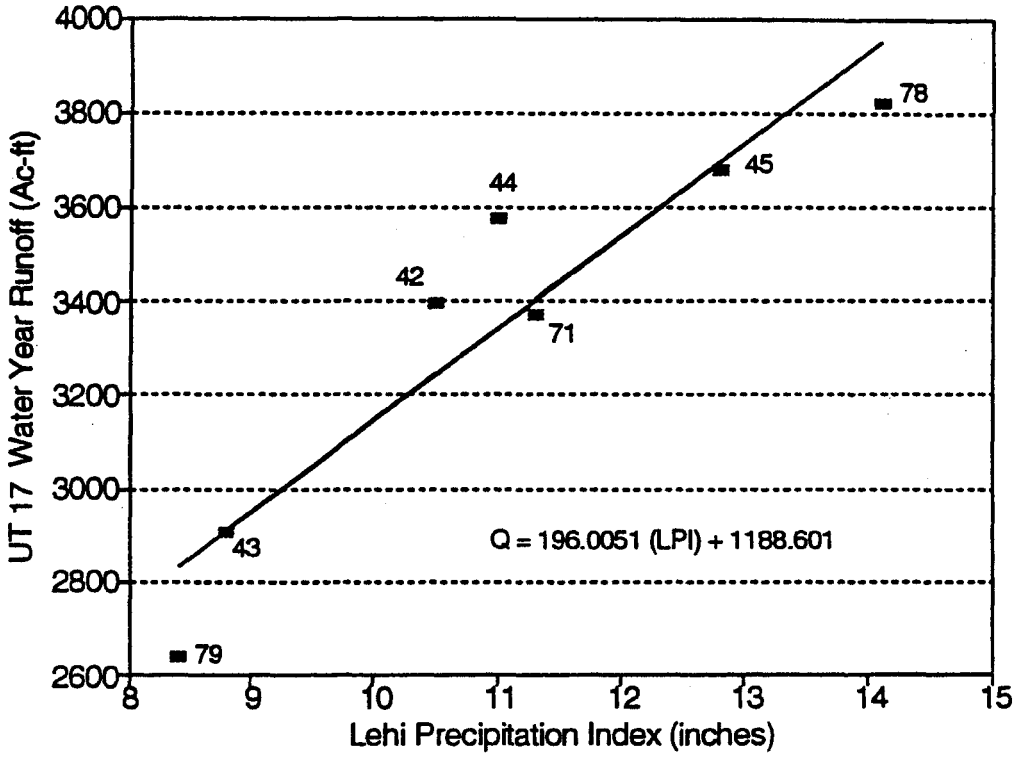
UT 16 - Drain, near 6400 N. and 5300 W.



Year	Flow	LPI - PY
1971	1377	10.1
1978	973	8.5
1979	1545	14.1

Figure B:16 - Correlation for UT 16

UT 17 -- Olefson's Slough, 6400 N. and 4850 W.



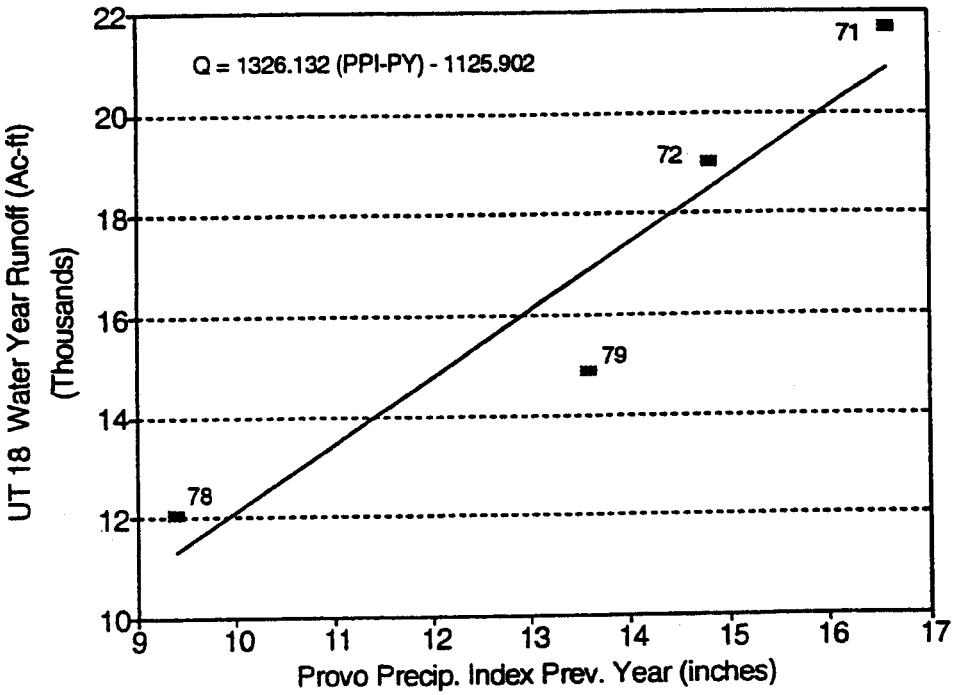
Year	Flow	LPI
1942	3395	10.5
1943	2906	8.8
1944	3579	11.0
1945	3679	12.8
1971	3373	11.3
1978	3821	14.1
1979	2640	8.4

Regression Output:

Constant		1188.601
Std Err of Y Est		163.4147
R Squared		0.877035
No. of Observations		7
Degrees of Freedom		5
X Coefficient(s)	196.0051	
Std Err of Coef.	32.82202	

Figure B:17 -- Correlation for UT 17, Olefson's Slough

UT 18 -- Geneva Cannery Drain

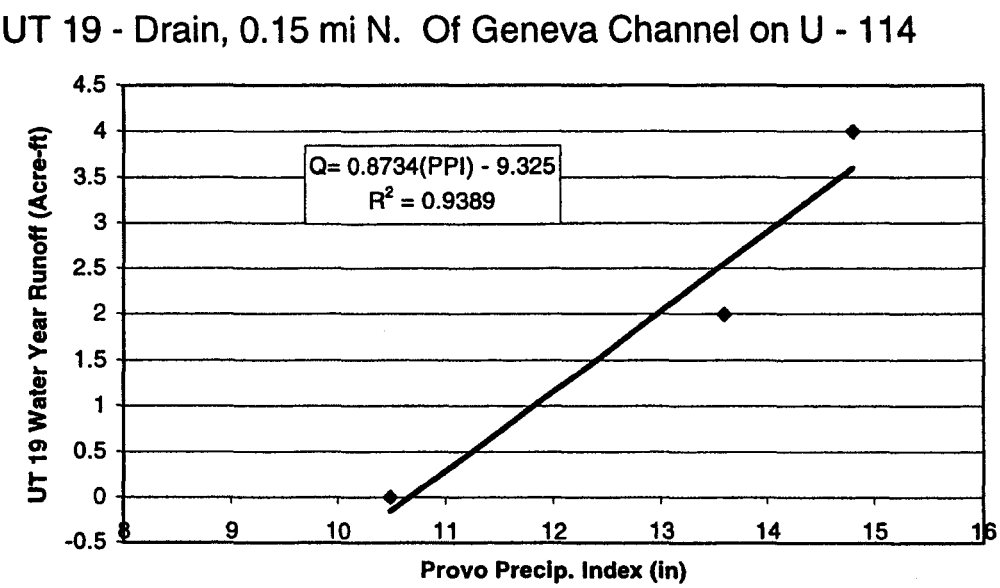


Year	Flow	PPI Prev Yr
1971	21705	16.6
1972	19000	14.8
1978	12066	9.4
1979	14867	13.6

Regression Output:

Constant	-1125.9
Std Err of Y Est	1675.717
R Squared	0.897887
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	1326.132
Std Err of Coef.	316.2293

Figure B-18 -- Correlation for UT 18, Geneva Cannery Drain

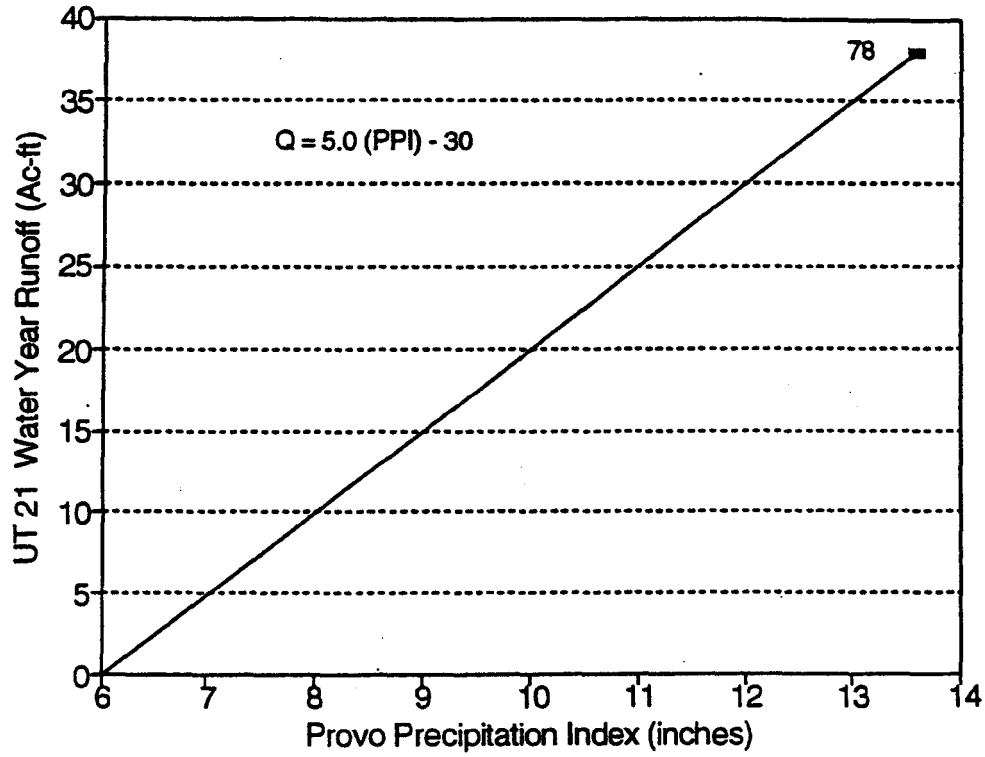


Year	Flow	PPI
1971	4	14.8
1978	2	13.6
1979	0	10.5

Figure B:19 - Correlation for UT 19

UT20 Geneva Outfall in Measured Flow Section C, page 89

UT 21 -- Drain, 0.2 mi S of Geneva Channel, W Gen Rd



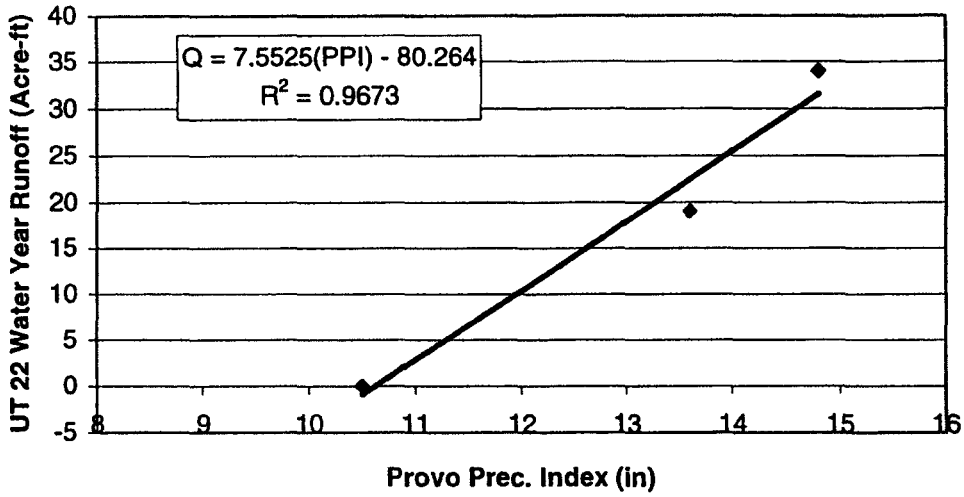
Year	Flow	PPI
1978	38	13.6
	0	6.0

Regression Output:

Constant	-30
Std Err of Y Est	5.52E-14
R Squared	1
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	5
Std Err of Coef.	8.89E-15

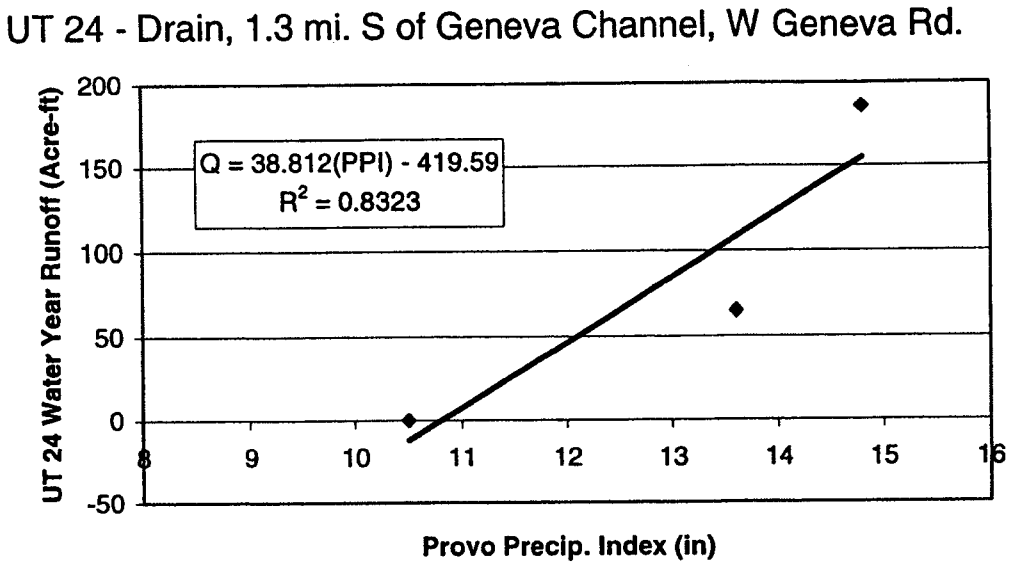
Figure B-21 -- Correlation for Drain UT 21

UT 22 - Drain, 0.5 mi. S of Geneva Channel, W Gen. Rd.



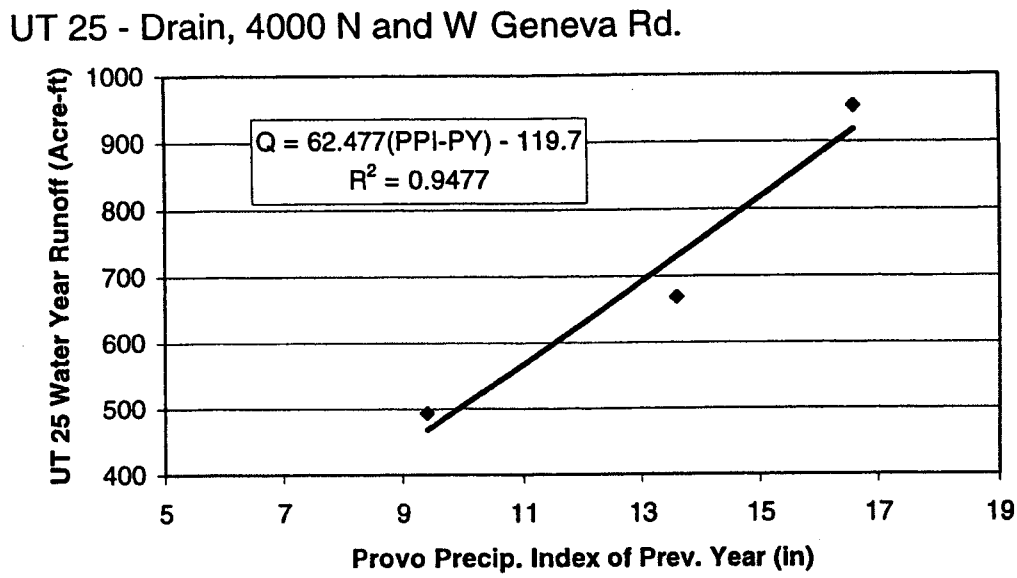
Year	Flow	PPI
1971	34	14.8
1978	19	13.6
1979	0	10.5

Figure B:22 - Correlation for UT 22



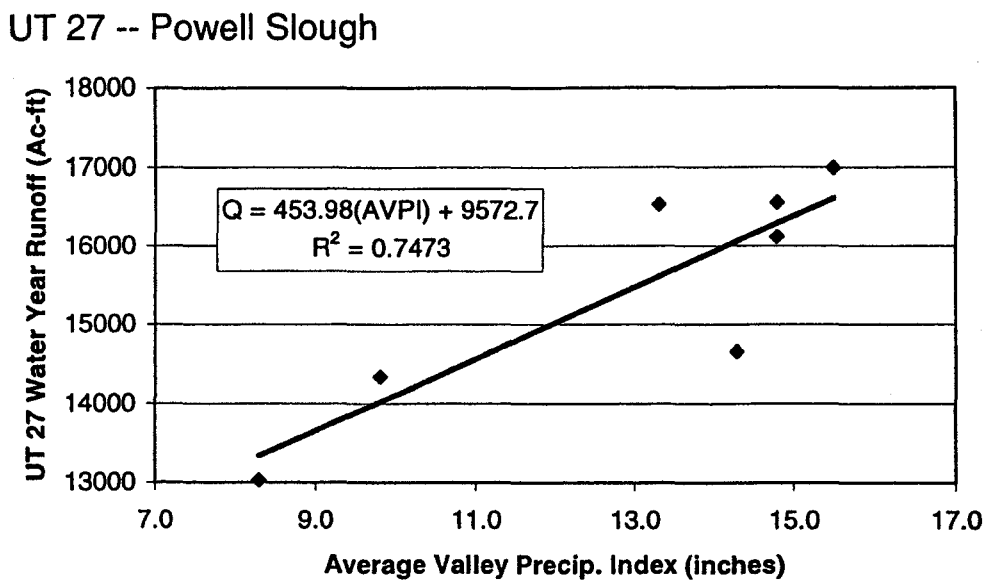
Year	Flow	PPI
1971	186	14.8
1978	65	13.6
1979	0	10.5

Figure B:24 - Correlation for UT 24



Year	Flow	PPI-PY
1971	953	16.6
1978	493	9.4
1979	669	13.6

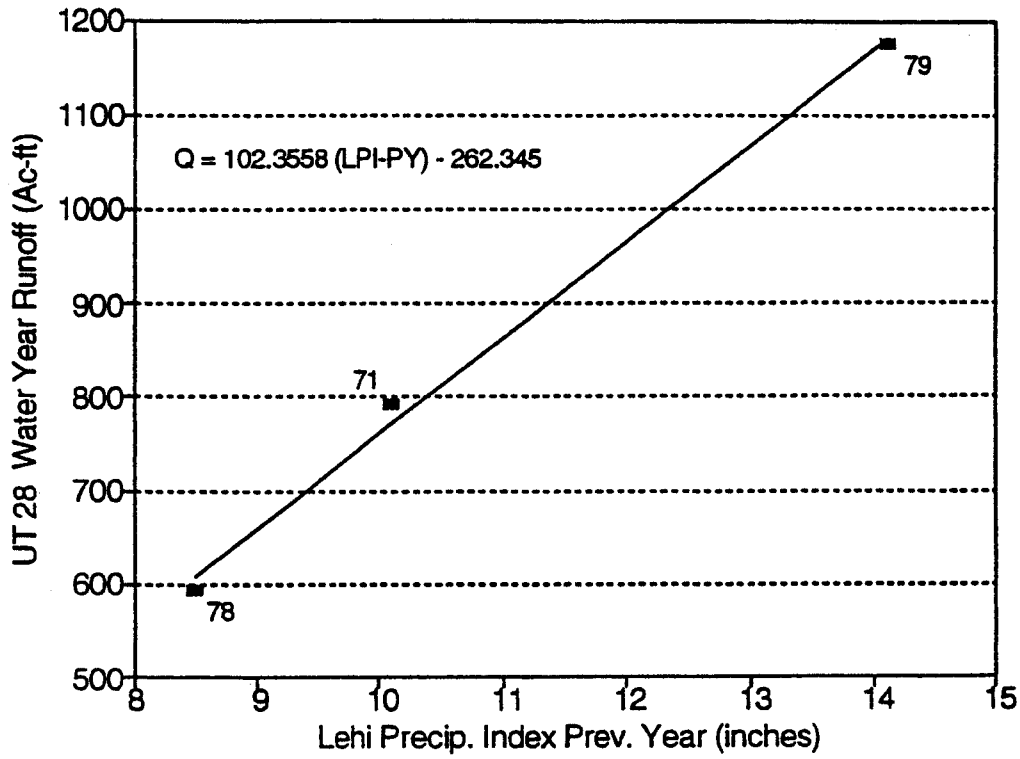
Figure B:25 - Correlation for UT 25



Year	Flow	AVPI
1967	16119	14.8
1968	16992	15.5
1969	16530	13.3
1970	16557	14.8
1971	14659	14.3
1972	14340	9.8
1974	13033	8.3

Figure B:27 - Correlation for UT 27

UT 28 -- Drain, on N. Boat Harbor Drive



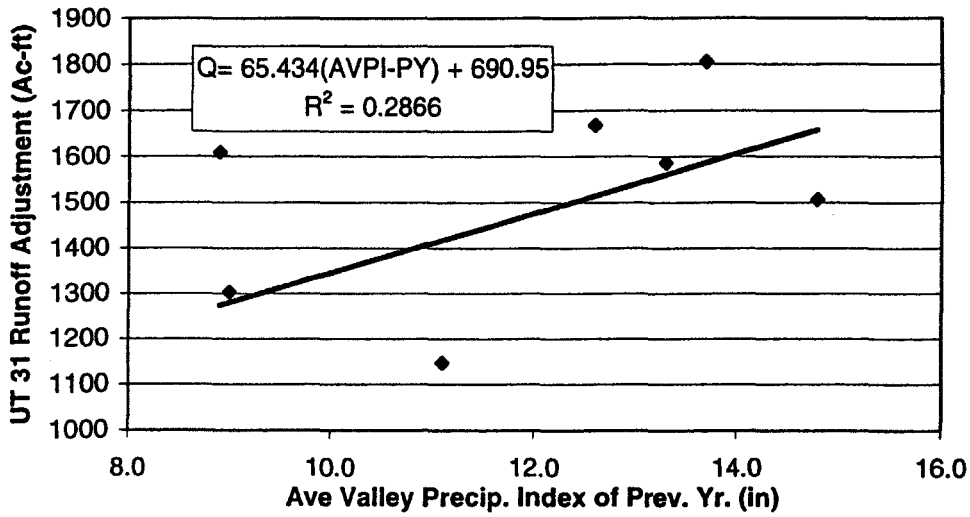
Year	Flow	LPI Prev Yr
1971	792	10.1
1978	593	8.5
1979	1175	14.1

Regression Output:

Constant	-262.345
Std Err of Y Est	25.92914
R Squared	0.996158
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	102.3558
Std Err of Coef.	6.356404

Figure B:28- Correlation for Drain UT 28

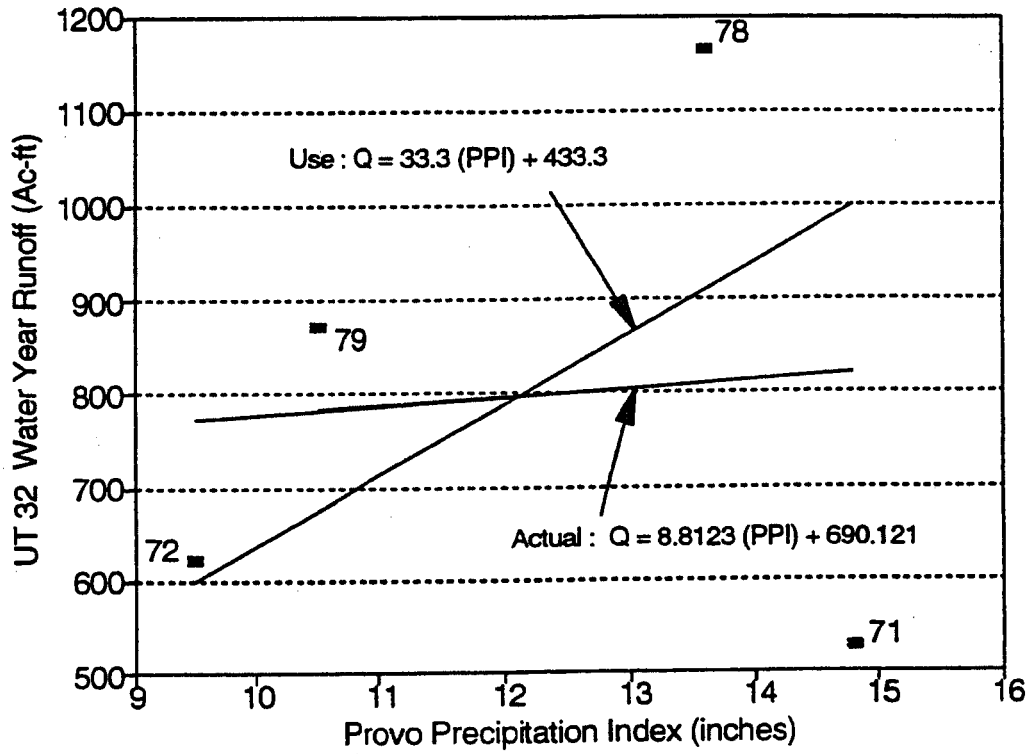
UT 31 - Little Dry Creek



Year	Flow	AVPI - PY
1954	987	9.6
1955	1146	11.1
1957	1610	8.9
1958	1669	12.6
1965	1805	13.7
1971	1507	14.8
1978	1302	9.0
1979	1587	13.3

Figure B:31 - Correlation for UT 31

UT 32 -- Drain, near 1150 S. and 1600 W. (Provo)



Year	Flow	PPI
1971	530	14.8
1972	622	9.5
1978	1164	13.6
1979	871	10.5
	1000	17
	600	5

Actual Regression Output

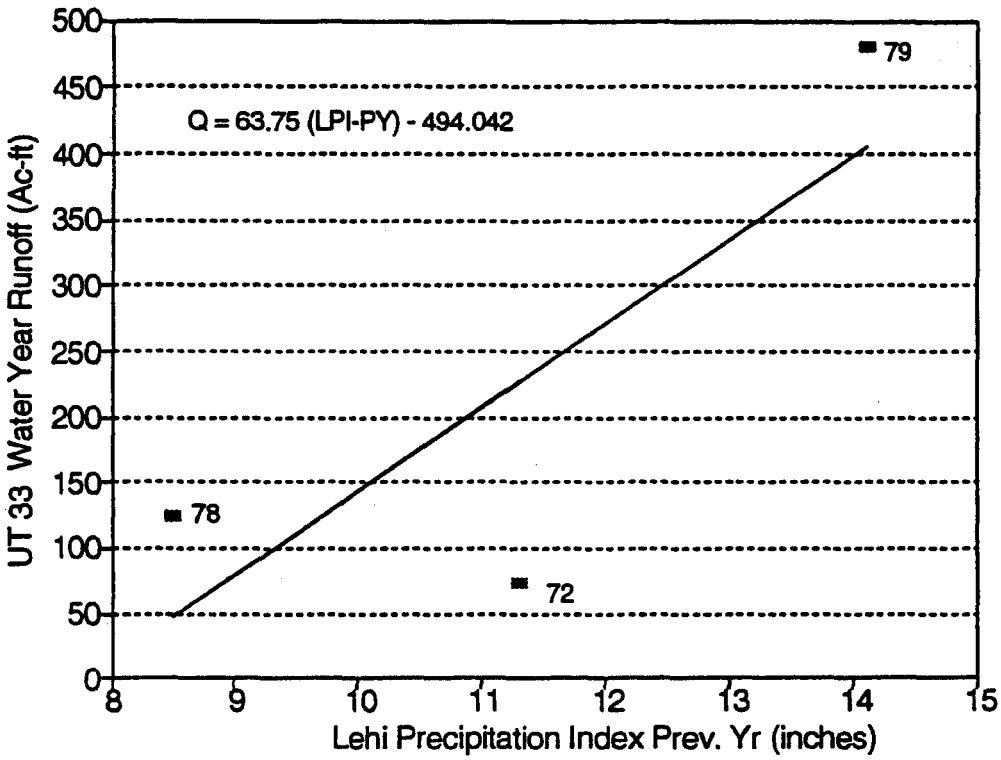
Constant	690.1212
Std Err of Y Est	346.8531
R Squared	0.00605
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	8.812301
Std Err of Coef.	79.86835

Regression Output used for Correlatio

Constant	433.3333
Std Err of Y Est	3.73E-13
R Squared	1
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	33.33333

Figure B:32-- Correlation for Drain UT 32

UT 33 -- Flowing Well near 1150 S. and 1600 W. (Provo)

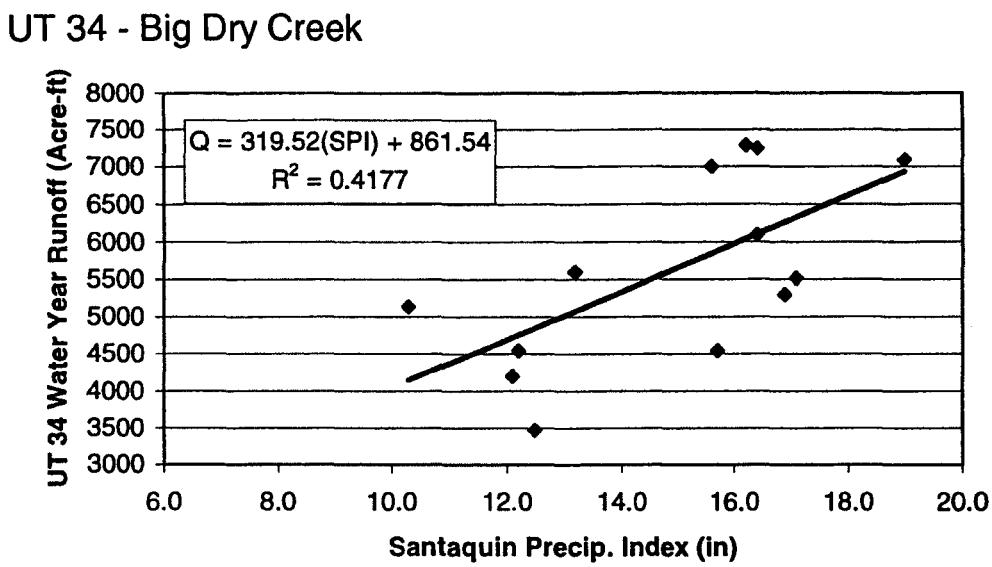


Year	Flow	LPI Prev Yr
1972	74	11.3
1978	124	8.5
1979	481	14.1

Regression Output:

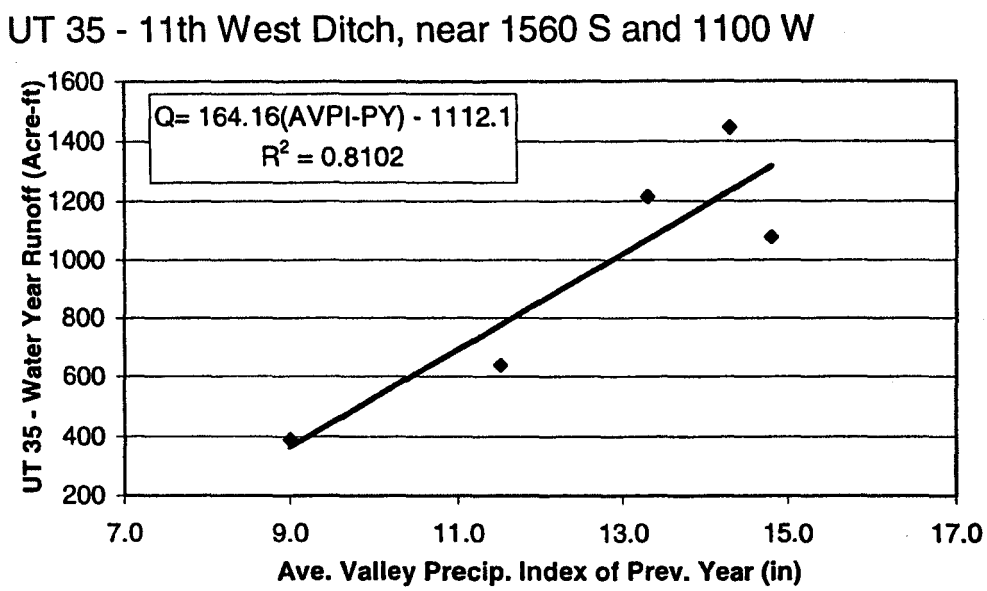
Constant	-494.042
Std Err of Y Est	186.5695
R Squared	0.646735
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	63.75
Std Err of Coef.	47.11591

Figure B:33 -- Correlation for UT 33, Flowing Well



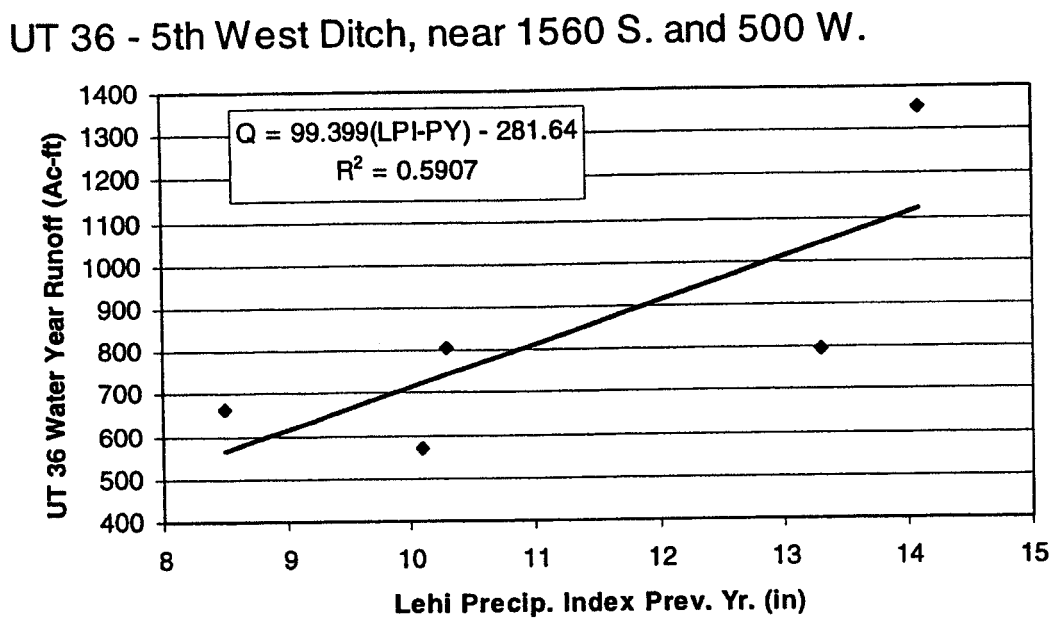
Year	Flow	SPI
1954	7251	16.4
1955	5520	17.1
1956	5598	13.2
1957	7002	15.6
1958	7292	16.2
1959	6093	16.4
1960	3472	12.5
1964	4547	15.7
1965	7097	19.0
1971	5298	16.9
1972	4548	12.2
1978	4201	12.1
1979	5141	10.3

Figure B:34 - Correlation for UT 34



Year	Flow	AVPI-PY
1964	639	11.5
1971	1078	14.8
1972	1446	14.3
1978	388	9.0
1979	1214	13.3

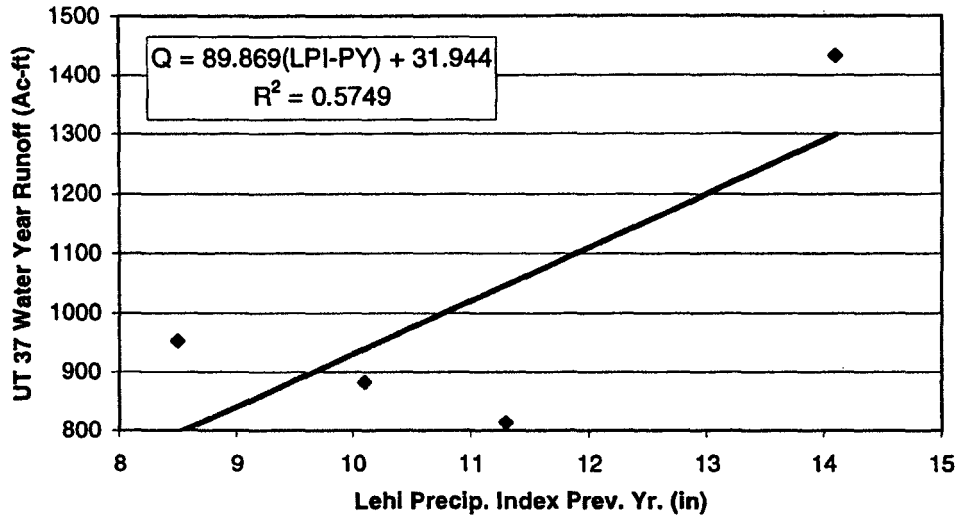
Figure B:35 - Correlation for UT 35



Year	Flow	LPI - PY
1964	808	10.3
1965	796	13.3
1971	569	10.1
1978	663	8.5
1979	1352	14.1

Figure B:36 - Correlation for UT 36

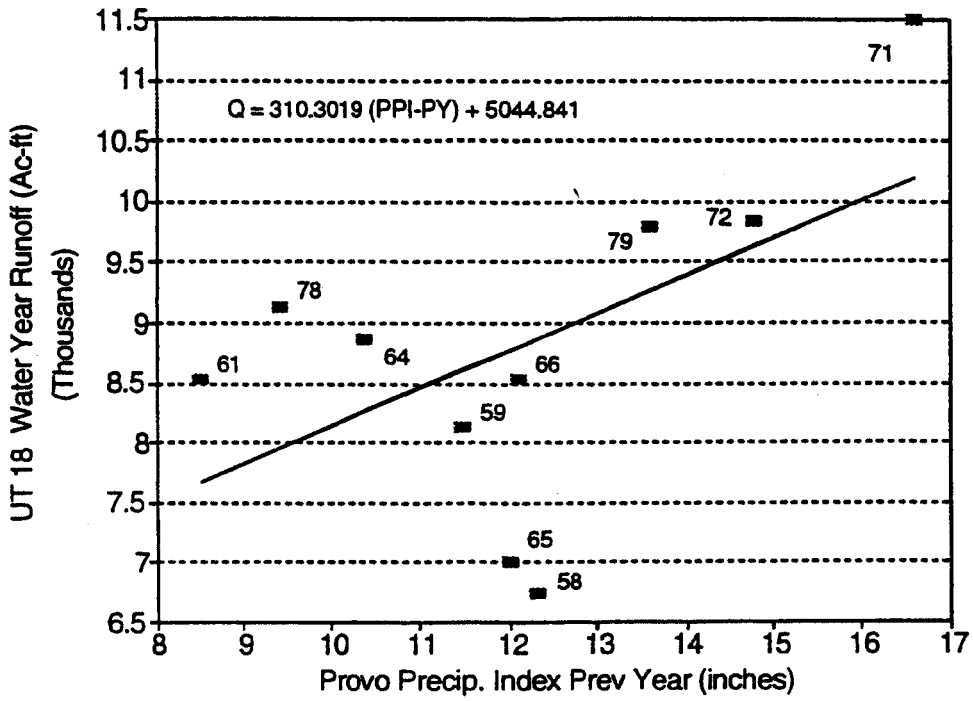
UT 37 - University Ditch, near 1420 S. and Univ. Ave.



Year	Flow	LPI - PY
1971	883	10.1
1972	814	11.3
1978	953	8.5
1979	1432	14.1

Figure B:37 - Correlation for UT 37

UT 38 -- Mill Race



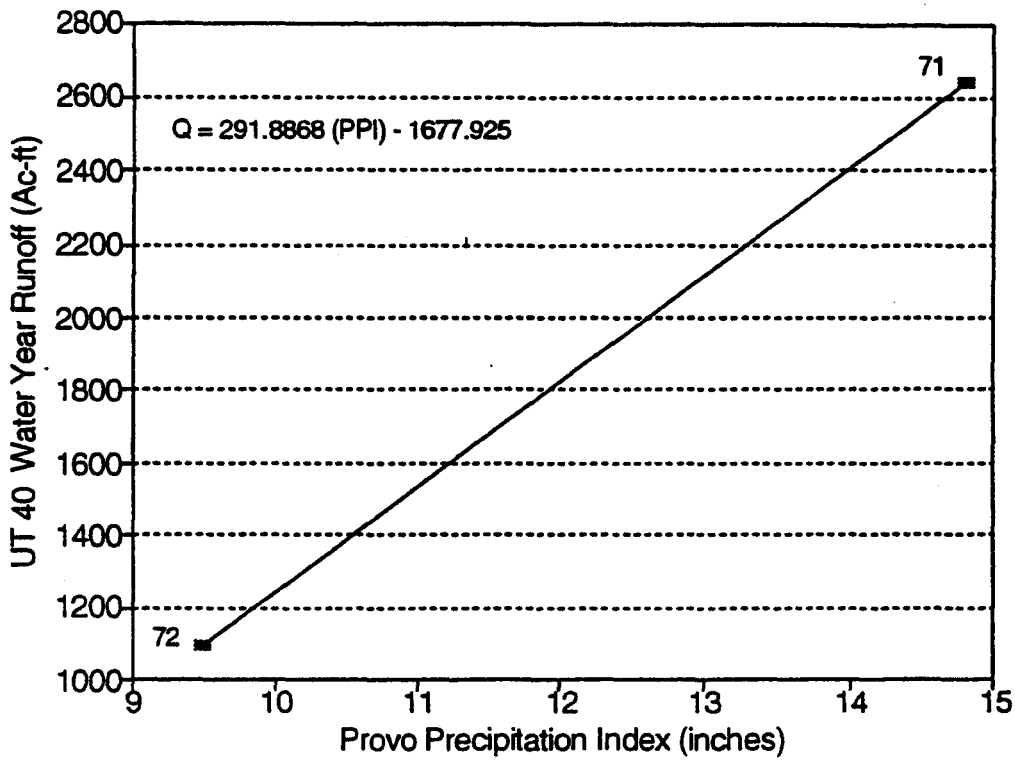
Year	Flow	PPI Prev Yr
1958	6749	12.3
1959	8143	11.5
1961	8519	8.5
1964	8870	10.4
1965	7011	12.0
1966	8528	12.1
1971	11483	16.6
1972	9833	14.8
1978	9121	9.4
1979	9800	13.6

Regression Output:

Constant		5044.841
Std Err of Y Est		1236.393
R Squared		0.295744
No. of Observations		10
Degrees of Freedom		8
X Coefficient(s)	310.3019	
Std Err of Coef.	169.2958	

Figure B:38 -- Correlation for UT 38, Mill Race

UT 40 -- Drain, 0.4 mi SE of Provo WWTP



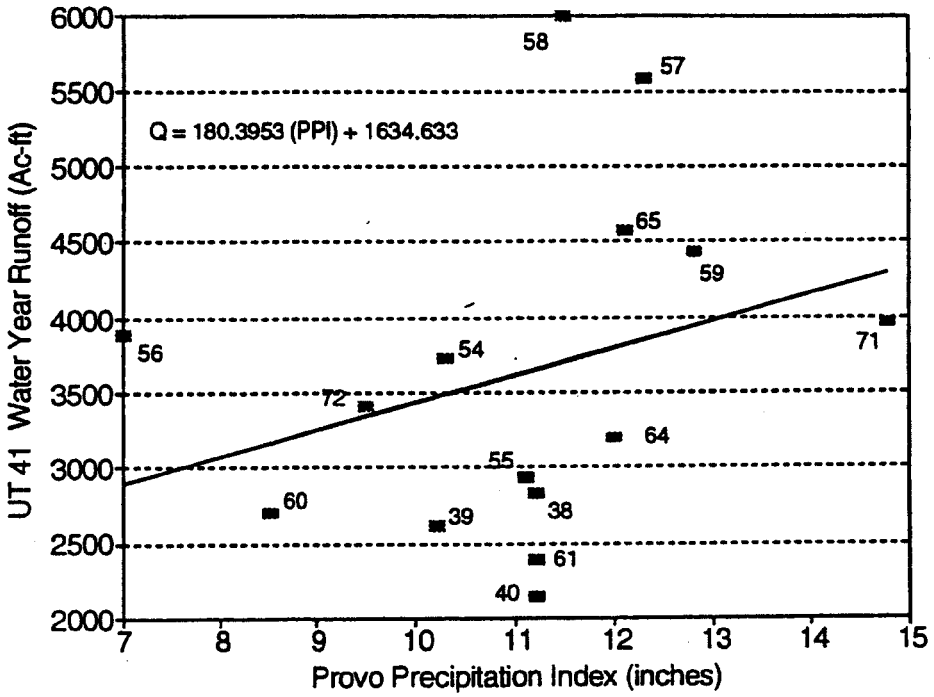
Year	Flow	PPI
1971	2642	14.8
1972	1095	9.5

Regression Output:

Constant	-1677.92
Std Err of Y Est	7.28E-12
R Squared	1
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	291.8868
Std Err of Coef.	1.68E-12

Figure B:40 -- Correlation for Drain UT 40

UT 41 -- Rat Farm Drain, 0.5 mi SE of Provo WWTP



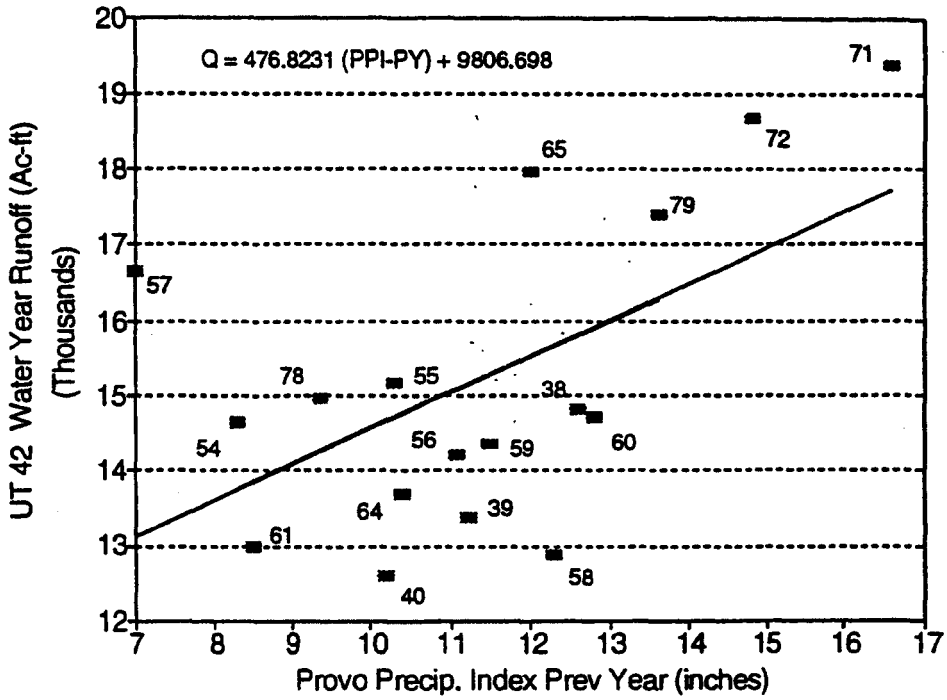
Year	Flow	PPI
1938	2830	11.2
1939	2617	10.2
1940	2135	11.2
1954	3728	10.3
1955	2943	11.1
1956	3897	7.0
1957	5583	12.3
1958	5988	11.5
1959	4435	12.8
1960	2701	8.5
1961	2389	11.2
1964	3197	12.0
1965	4584	12.1
1971	3962	14.8
1972	3422	9.5

Regression Output:

Constant		1634.633
Std Err of Y Est		1129.429
R Squared		0.08536
No. of Observations		15
Degrees of Freedom		13
X Coefficient(s)	180.3953	
Std Err of Coef.	163.776	

Figure B:41 – Correlation for UT 41, Rat Farm Drain

UT 42 -- Steel Mill Drain, near Kuhni plant



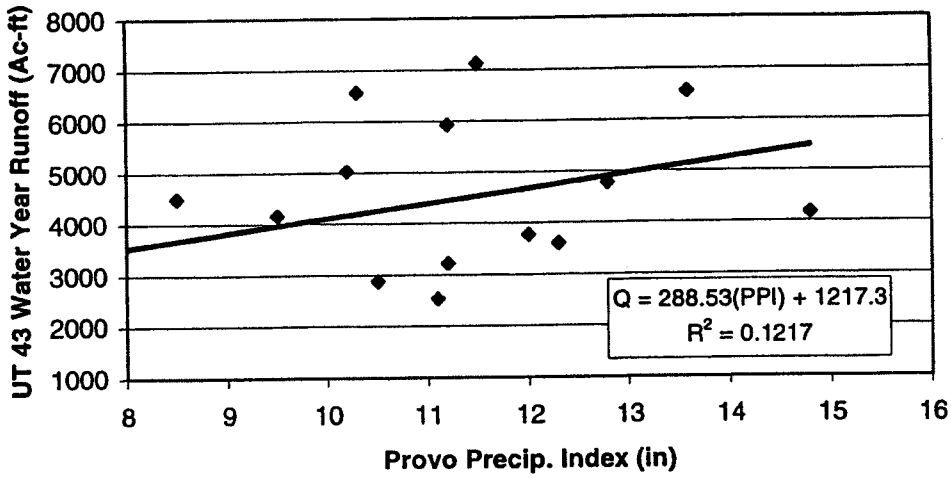
Year	Flow	PPI Prev Yr
1938	14835	12.6
1939	13368	11.2
1940	12597	10.2
1954	14639	8.3
1955	15168	10.3
1956	14216	11.1
1957	16677	7.0
1958	12867	12.3
1959	14354	11.5
1960	14710	12.8
1961	12970	8.5
1964	13704	10.4
1965	17971	12.0
1971	19409	16.6
1972	18687	14.8
1978	14984	9.4
1979	17394	13.6

Regression Output:

Constant		9806.698
Std Err of Y Est		1799.746
R Squared		0.303447
No. of Observations		17
Degrees of Freedom		15
X Coefficient(s)	476.8231	
Std Err of Coef.	186.5294	

Figure B:42 -- Correlation for UT 42, Steel Mill Drain near Kuhni Plant

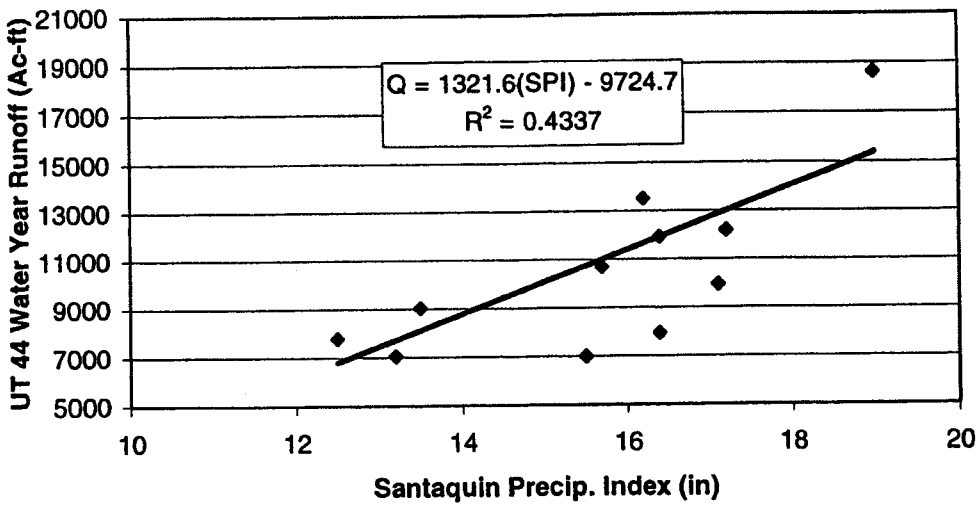
UT 43 - Spring Creek



Year	Flow	PPI
1939	5028	10.2
1940	5930	11.2
1954	6564	10.3
1955	2534	11.1
1956	1504	7
1957	3597	12.3
1958	7123	11.5
1959	4785	12.8
1960	4505	8.5
1961	3214	11.2
1964	3760	12
1971	4166	14.8
1972	4162	9.5
1978	6551	13.6
1979	2876	10.5

Figure B:43 - Correlation for UT 43

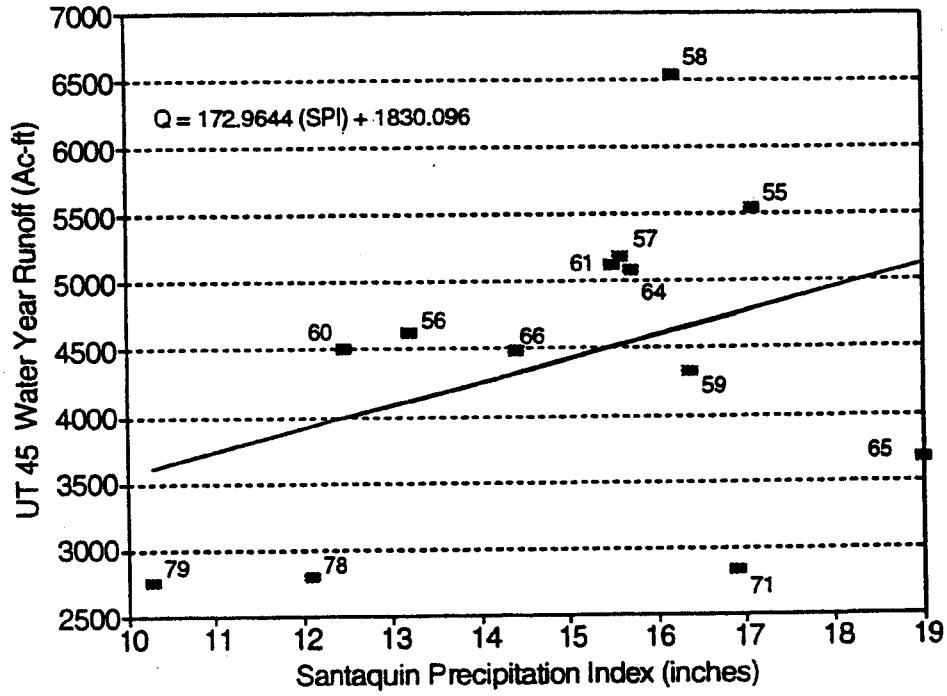
UT 44 - Hobble Creek



Year	Flow	SPI
1939	12192	17.2
1940	9040	13.5
1954	11930	16.4
1955	9958	17.1
1956	7061	13.2
1957	16426	15.6
1958	13509	16.2
1959	7949	16.4
1960	7800	12.5
1961	7000	15.5
1964	10700	15.7
1965	18600	19

Figure B:44 - Correlation for UT 44

UT 45 -- Packard Drain



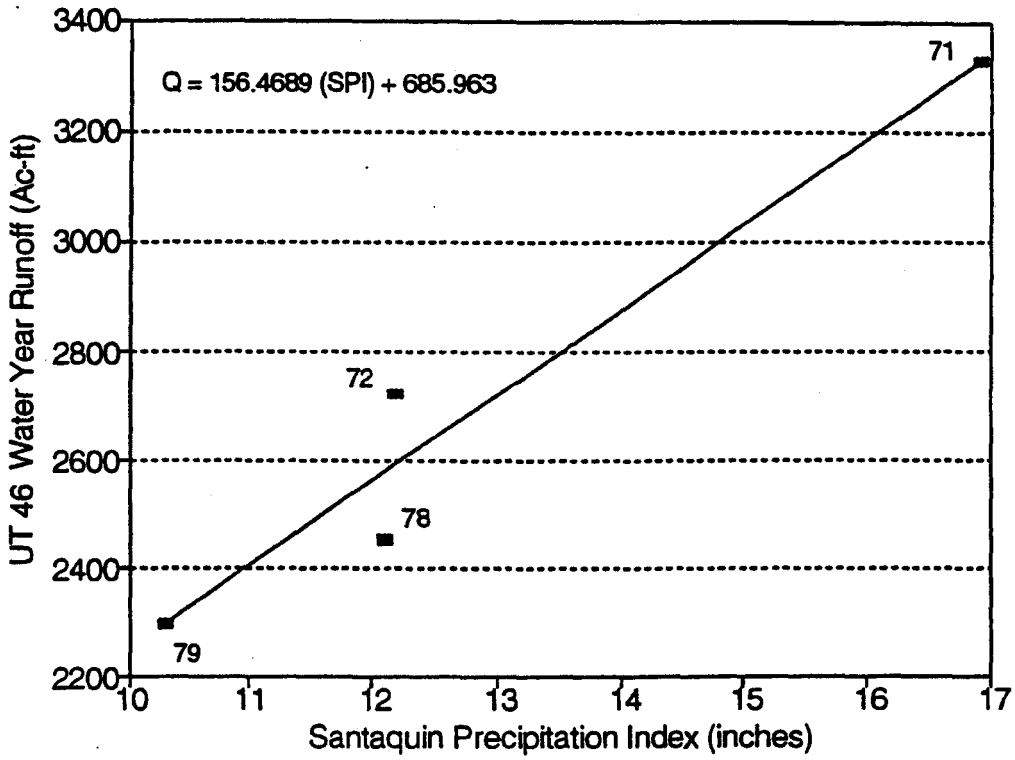
Year	Flow	SPI
1955	5549	17.1
1956	4629	13.2
1957	5178	15.6
1958	6536	16.2
1959	4336	16.4
1960	4520	12.5
1961	5120	15.5
1964	5074	15.7
1965	3684	19.0
1966	4487	14.4
1971	2828	16.9
1978	2798	12.1
1979	2763	10.3

Regression Output:

Constant	1830.096
Std Err of Y Est	1116.074
R Squared	0.130714
No. of Observations	13
Degrees of Freedom	11
X Coefficient(s)	172.9644
Std Err of Coef.	134.487

Figure B:45 -- Correlation for UT 45, Packard Drain

UT 46 -- Drain, 0.35 mi W. of I-15 on 3900 S.



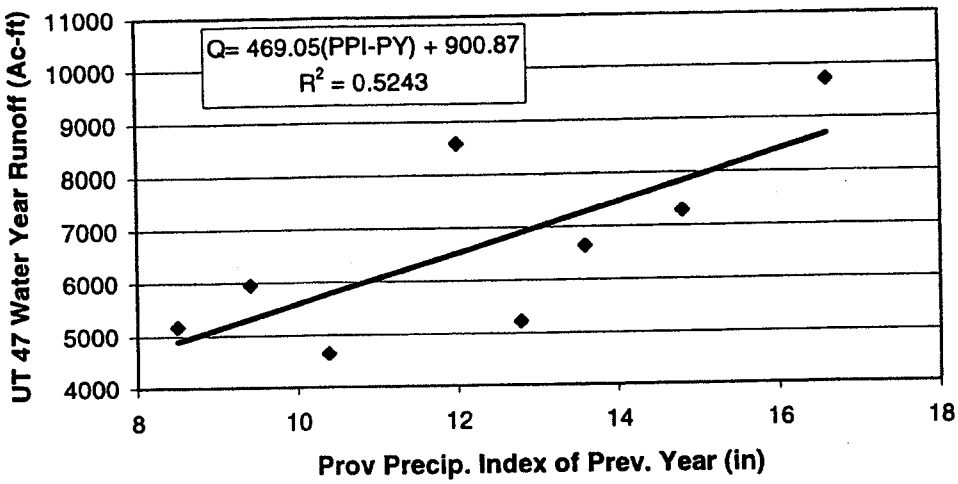
Year	Flow	SPI
1971	3327	16.9
1972	2724	12.2
1978	2455	12.1
1979	2296	10.3

Regression Output:

Constant	685.9634
Std Err of Y Est	126.7264
R Squared	0.947938
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	156.4689
Std Err of Coef.	25.92876

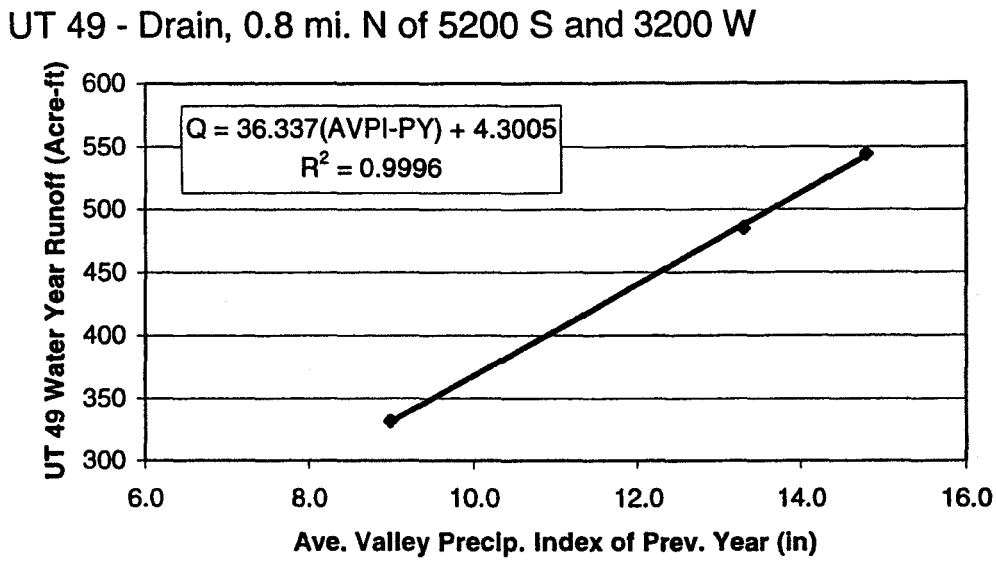
Figure B:46 -- Correlation for Drain UT 46

UT 47 - Dry Creek, 0.85 mi W of I-15 on 400 S



Year	Flow	PPI-PY
1960	5225	12.8
1961	5171	8.5
1964	4640	10.4
1965	8584	12
1971	9723	16.6
1972	7286	14.8
1978	5952	9.4
1979	6640	13.6

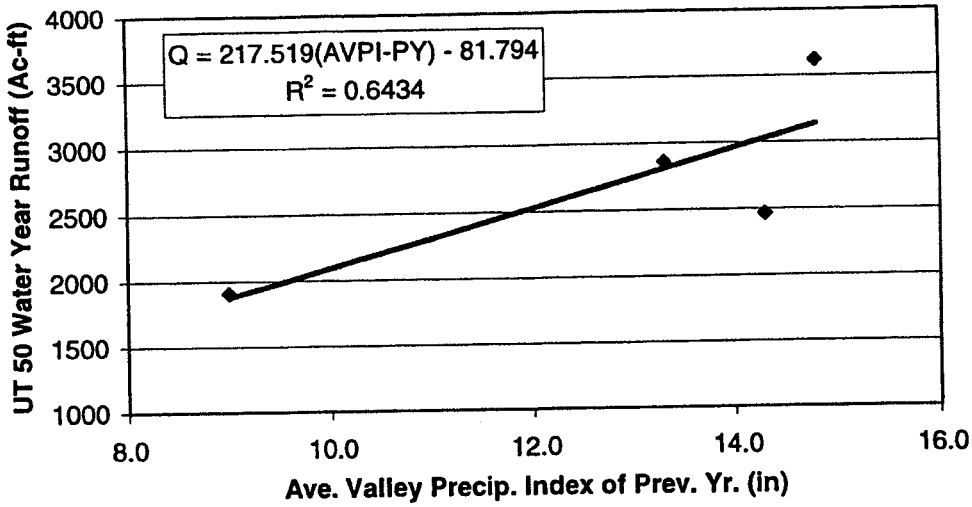
Figure B:47 - Correlation of UT 47



Year	Flow	AVPI-PY
1971	544	14.8
1978	332	9.0
1979	485	13.3

Figure B:49 - Correlation of UT 49

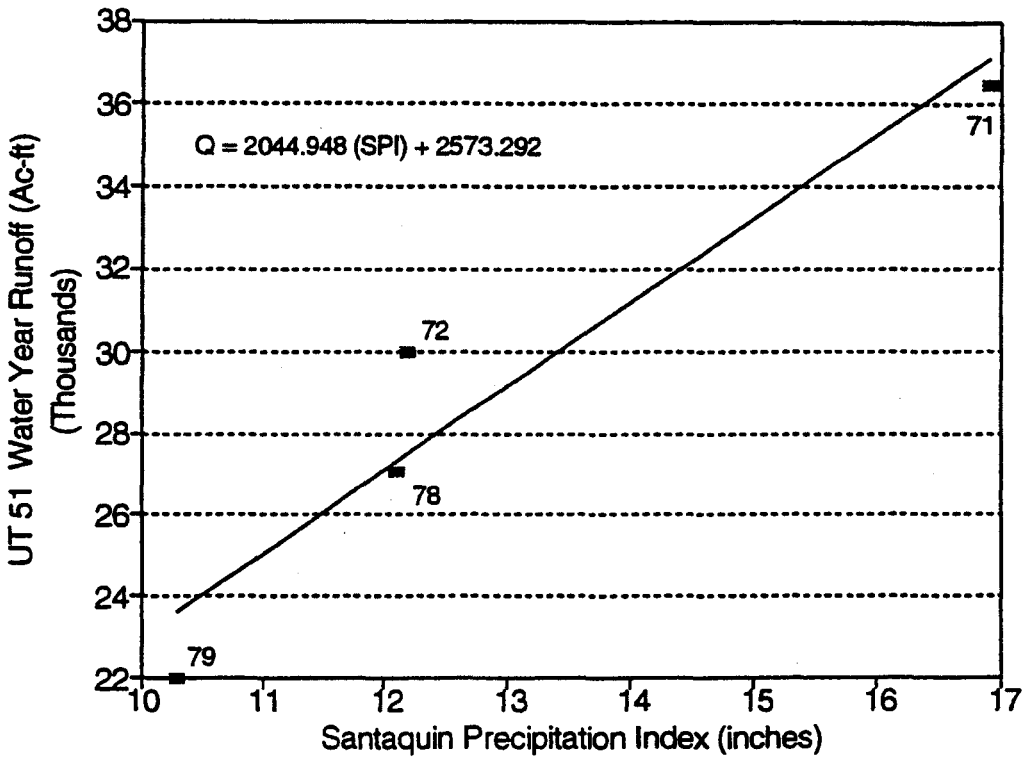
UT 50 - Drain, 5200 S. and 4000 W.



Year	Flow	AVPI - PY
1971	3614	14.8
1972	2465	14.3
1978	1911	9.0
1979	2863	13.3

Figure B:50 - Correlation for UT 50

UT 51 -- Benjamin Slough

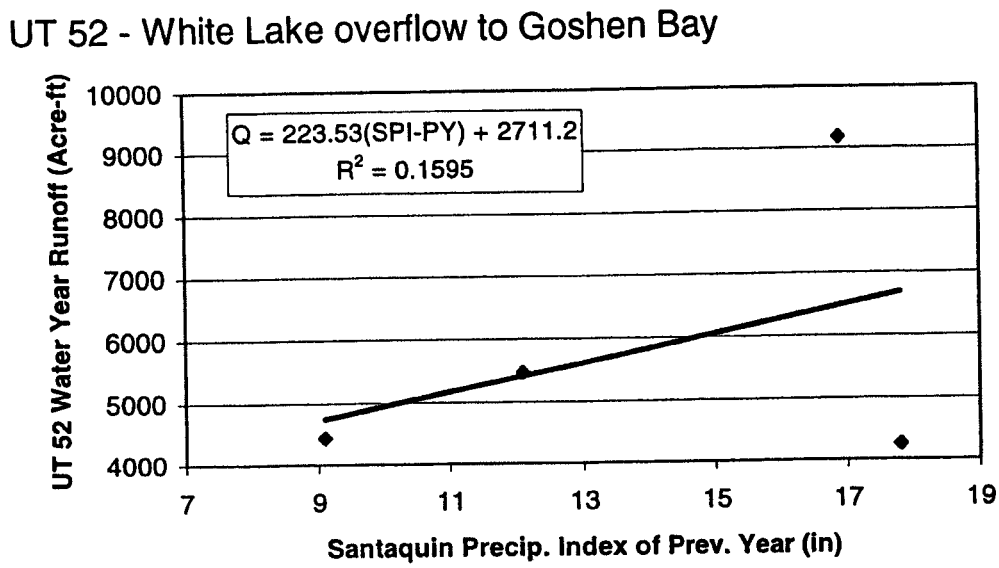


Year	Flow	SPI
1971	36469	16.9
1972	30027	12.2
1978	27107	12.1
1979	22005	10.3

Regression Output:

Constant	2573.292
Std Err of Y Est	2170.563
R Squared	0.913803
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	2044.948
Std Err of Coef.	444.1064

Figure 6:51 -- Correlation for UT 51, Benjamin Slough



Year	Flow	SPI-PY
1971	4256	17.8
1972	9184	16.9
1978	4433	9.1
1979	5467	12.1

Figure B:52 - Correlation for UT 52

APPENDIX C - Measured and Estimated Surface Inflow

Table C:11 - Measured Flows UT11 American Fork WWTP

UT11 Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	40.8	34.2	31.5	29.8	29.3	31.5	34.8	53.0	73.4	77.8	64.0	51.9	552.0
1954	61.3	51.3	47.2	44.7	43.9	47.2	52.2	79.5	110.1	116.7	96.0	77.8	828.0
1955	71.5	59.9	55.1	52.2	51.2	55.1	60.9	92.7	128.5	136.2	112.1	90.8	966.0
1956	73.4	61.5	56.5	53.6	52.6	56.5	62.5	95.2	131.9	139.9	115.1	93.2	992.0
1957	75.3	63.1	58.0	55.0	54.0	58.0	64.1	97.7	135.4	143.5	118.1	95.7	1018.0
1958	77.3	64.7	59.5	56.4	55.3	59.5	65.8	100.2	138.9	147.2	121.1	98.1	1044.0
1959	79.2	66.3	61.0	57.8	56.7	61.0	67.4	102.7	142.3	150.9	124.1	100.6	1070.0
1960	81.0	67.9	62.4	59.1	58.0	62.4	69.0	105.1	145.6	154.4	127.0	102.9	1095.0
1961	83.0	69.5	63.9	60.5	59.4	63.9	70.6	107.6	149.1	158.1	130.0	105.4	1121.0
1962	84.9	71.1	65.4	61.9	60.8	65.4	72.3	110.1	152.6	161.7	133.1	107.8	1147.0
1963	86.8	72.7	66.9	63.3	62.2	66.9	73.9	112.6	156.0	165.4	136.1	110.3	1173.0
1964	88.7	74.3	68.3	64.7	63.5	68.3	75.5	115.1	159.5	169.1	139.1	112.7	1199.0
1965	90.7	76.0	69.8	66.2	64.9	69.8	77.2	117.6	162.9	172.7	142.1	115.2	1225.0
1966	92.6	77.6	71.3	67.6	66.3	71.3	78.8	120.1	166.4	176.4	145.1	117.6	1251.0
1967	94.5	79.2	72.8	69.0	67.7	72.8	80.5	122.6	169.8	180.1	148.1	120.0	1277.0
1968	96.3	80.7	74.2	70.3	69.0	74.2	82.0	125.0	173.2	183.6	151.0	122.4	1302.0
1969	98.3	82.3	75.7	71.7	70.4	75.7	83.7	127.5	176.6	187.2	154.0	124.8	1328.0
1970	93.6	78.4	72.1	68.3	67.0	72.1	79.7	121.4	168.2	178.4	146.7	118.9	1265.0
1971	102.1	85.6	78.7	74.5	73.1	78.7	86.9	132.5	183.5	194.6	160.1	129.7	1380.0
1972	87.6	73.4	67.5	63.9	62.8	67.5	74.6	113.7	157.5	166.9	137.3	111.3	1184.0
1973	135.1	113.2	104.1	98.6	96.8	104.1	115.0	175.3	242.9	257.5	211.8	171.6	1826.0
1974	131.0	109.7	100.9	95.6	93.8	100.9	111.5	169.9	235.4	249.6	205.3	166.4	1770.0
1975	140.7	117.9	108.4	102.7	100.8	108.4	119.8	182.6	253.0	268.2	220.6	178.8	1902.0
1976	150.6	126.2	116.0	109.9	107.9	116.0	128.2	195.4	270.7	286.9	236.1	191.3	2035.0
1977	137.0	114.8	105.5	100.0	98.1	105.5	116.6	177.7	246.2	261.0	214.7	174.0	1851.0
1978	170.1	142.5	131.0	124.1	121.8	131.0	144.8	220.7	305.8	324.2	266.7	216.1	2299.0
1979	150.0	125.7	115.5	109.5	107.4	115.5	127.7	194.6	269.6	285.8	235.1	190.5	2027.0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	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
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	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
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
Averages:	39.30	32.90	30.30	28.70	28.20	30.30	33.50	51.00	70.70	74.90	61.60	49.90	524.00
Distribution of annual total flow by month													
	0.074	0.062	0.057	0.054	0.053	0.057	0.063	0.096	0.133	0.141	0.116	0.094	

Table C:20 - Measured Flows UT20 Geneva Steel Effluent

UT 20 Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	1997	2154.6	2364.8	2732.7	3021.7	2522.5	2180.9	1891.9	1760.5	1813	1891.9	1944.4	26276
1951	2204.8	2378.9	2611	3017.2	3336.3	2785.1	2407.9	2088.8	1943.7	2001.8	2088.8	2146.8	29011
1952	2563.2	2765.5	3035.3	3507.5	3878.5	3237.7	2799.3	2428.3	2259.6	2327.1	2428.3	2495.7	33726
1953	2655.3	2864.9	3144.4	3633.6	4017.9	3354.1	2899.9	2515.5	2340.9	2410.7	2515.5	2585.4	34938
1954	2581.6	2785.5	3057.2	3532.8	3906.4	3261	2819.4	2445.8	2275.9	2343.9	2445.8	2513.7	33969
1955	2174.8	2346.5	2575.4	2976.1	3290.8	2747.1	2375.1	2060.4	1917.3	1974.5	2060.4	2117.6	28616
1956	1821.6	1965.5	2157.2	2492.8	2756.4	2301	1989.4	1725.8	1605.9	1653.9	1725.8	1773.7	23969
1957	1970.2	2125.7	2333.1	2696	2981.2	2488.6	2151.6	1866.5	1736.8	1788.7	1866.5	1918.3	25923
1958	1929.2	2081.5	2284.6	2639.9	2919.2	2436.9	2106.9	1827.7	1700.7	1751.5	1827.7	1878.4	25384
1959	2429.6	2621.4	2877.1	3324.7	3676.3	3068.9	2653.3	2301.7	2141.9	2205.8	2301.7	2365.6	31968
1960	1830.7	1975.2	2167.9	2505.2	2770.1	2312.5	1999.3	1734.3	1613.9	1662.1	1734.3	1782.5	24088
1961	1378.7	1487.6	1632.7	1886.7	2086.2	1741.5	1505.7	1306.2	1215.4	1251.7	1306.2	1342.4	18141
1962	1425.2	1537.7	1687.7	1950.2	2156.5	1800.2	1556.4	1350.1	1256.4	1293.9	1350.1	1387.7	18752
1963	1604.8	1731.5	1900.4	2196.1	2428.3	2027.1	1752.6	1520.4	1414.8	1457	1520.4	1562.6	21116
1964	2952.2	3185.3	3496.1	4039.9	4467.2	3729.1	3224.1	2796.8	2602.6	2680.3	2796.8	2874.5	38845
1965	2744.1	2960.8	3249.6	3755.1	4152.3	3466.3	2996.9	2599.7	2419.2	2491.4	2599.7	2671.9	36107
1966	2616.1	2822.6	3098	3579.9	3958.5	3304.5	2857	2478.4	2306.3	2375.1	2478.4	2547.2	34422
1967	1718.4	1854	2034.9	2351.4	2600.2	2170.6	1876.6	1627.9	1514.9	1560.1	1627.9	1673.1	22610
1968	1901.9	2052.1	2252.3	2602.6	2877.9	2402.4	2077.1	1801.8	1676.7	1726.7	1801.8	1851.9	25025
1969	1867.2	2014.6	2211.1	2555.1	2825.3	2358.5	2039.1	1768.9	1646.1	1695.2	1768.9	1818	24568
1970	1747.7	1885.7	2069.6	2391.6	2644.5	2207.6	1908.7	1655.7	1540.7	1586.7	1655.7	1701.7	22996
1971	1847.6	1993.4	2187.9	2528.2	2795.7	2333.8	2017.7	1750.3	1628.8	1677.4	1750.3	1798.9	24310
1972	1903.1	2053.4	2253.7	2604.3	2879.7	2403.9	2078.4	1803	1677.8	1727.8	1803	1853	25041
1973	2253.4	2431.3	2668.5	3083.6	3409.8	2846.4	2461	2134.8	1986.6	2045.9	2134.8	2194.1	29650
1974	2355.2	2541.2	2789.1	3223	3563.9	2975	2572.2	2231.3	2076.3	2138.3	2231.3	2293.3	30990
1975	2171.6	2343	2571.6	2971.6	3285.9	2743	2371.6	2057.3	1914.4	1971.5	2057.3	2114.4	28573
1976	2307.5	2307.5	2592.3	2649.3	2250.5	2506.9	2335.9	2392.9	2279	2136.5	2250.5	2478.4	28487
1977	1864.1	1864.1	2094.2	2140.2	1818	2025.1	1887.1	1933.1	1841	1726	1818	2002.1	23013
1978	1996.5	1996.5	2243	2292.3	1947.2	2169	2021.1	2070.4	1971.8	1848.6	1947.2	2144.4	24648
1979	2127.6	2127.6	2390.2	2442.7	2075	2311.4	2153.8	2206.3	2101.3	1970	2075	2285.1	26266
1980	2236.2	2236.2	2512.2	2567.5	2181	2429.4	2263.8	2319	2208.6	2070.5	2181	2401.8	27607
1981	1881.7	1881.7	2114	2160.5	1835.3	2044.3	1904.9	1951.4	1858.5	1742.3	1835.3	2021.1	23231
1982	2169.3	2169.3	2437.2	2490.7	2115.8	2356.8	2196.1	2249.7	2142.6	2008.7	2115.8	2330	26782
1983	1968.5	1968.5	2211.6	2260.2	1919.9	2138.7	1992.9	2041.5	1944.2	1822.7	1919.9	2114.4	24303
1984	1538.9	1538.9	1728.9	1766.9	1500.9	1671.9	1557.9	1595.9	1519.9	1424.9	1500.9	1652.9	18999
1985	1427.2	1427.2	1603.4	1638.7	1392	1550.6	1444.8	1480.1	1409.6	1321.5	1392	1532.9	17620
1986	1156.3	1156.3	1299	1327.6	1127.7	1256.2	1170.6	1199.1	1142	1070.6	1127.7	1241.9	14275
1987	940.1	940.1	1056.1	1079.4	916.9	1021.3	951.7	974.9	928.5	870.5	916.9	1009.7	11606
1988	788.6	788.6	886	905.4	769.1	856.8	798.4	817.8	778.9	730.2	769.1	847	9736
1989	1092	1092	1226.9	1253.8	1065.1	1186.4	1105.5	1132.5	1078.6	1011.2	1065.1	1172.9	13482
1990	833.3	833.3	936.2	956.8	812.8	905.3	843.6	864.2	823	771.6	812.8	895.1	10288
1991	599.2	599.2	673.2	688	584.4	651	606.6	621.4	591.8	554.9	584.4	643.6	7398
1992	689.5	689.5	774.6	791.6	672.4	749.1	698	715	681	638.4	672.4	740.5	8512
1993	670.4	670.4	753.2	769.8	653.9	728.4	678.7	695.3	662.2	620.8	653.9	720.1	8277
1994	798.3	798.3	896.9	916.6	778.6	867.3	808.2	827.9	788.5	739.2	778.6	857.5	9856
1995	737.5	737.5	828.6	846.8	719.3	801.2	746.6	764.8	728.4	682.9	719.3	792.1	9105
1996	875.8	875.8	983.9	1005.5	854.1	951.5	886.6	908.2	865	810.9	854.1	940.6	10812
1997	789.4	789.4	886.9	906.4	769.9	857.6	799.2	818.7	779.7	731	769.9	847.9	9746
1998	793.8	793.8	891.8	911.4	774.2	862.4	803.6	823.2	784	735	774.2	852.6	9800
1999	759.2	890.3	1060.8	1016.1	1004.6	1004.7	1129.7	1181.7	948.9	787.8	956.2	1232.9	11972.4
Averages:	1474.1	1555.8	1719	1920.5	1994.5	1784.5	1574.9	1435.9	1346.1	1346.2	1408.8	1479.4	19040
Distribution of annual total flow by month													
	0.076	0.082	0.09	0.104	0.115	0.096	0.083	0.072	0.067	0.069	0.072	0.074	

Table C:26 - Measured Flows UT 26 Orem WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	49.7	43.2	43.7	40.5	38.3	41	40	45.9	47	47	51.8	51.8	540
1951	55.2	48	48.6	45	42.6	45.6	44.4	51	52.2	52.2	57.6	57.6	600
1952	60.7	52.8	53.5	49.5	46.9	50.2	48.8	56.1	57.4	57.4	63.4	63.4	660
1953	66.2	57.6	58.3	54	51.1	54.7	53.3	61.2	62.6	62.6	69.1	69.1	720
1954	71.8	62.4	63.2	58.5	55.4	59.3	57.7	66.3	67.9	67.9	74.9	74.9	780
1955	77.3	67.2	68	63	59.6	63.8	62.2	71.4	73.1	73.1	80.6	80.6	840
1956	82.8	72	72.9	67.5	63.9	68.4	66.6	76.5	78.3	78.3	86.4	86.4	900
1957	101.2	88	89.1	82.5	78.1	83.6	81.4	93.5	95.7	95.7	105.6	105.6	1100
1958	128.8	112	113.4	105	99.4	106.4	103.6	119	121.8	121.8	134.4	134.4	1400
1959	165.6	144	145.8	135	127.8	136.8	133.2	153	156.6	156.6	172.8	172.8	1800
1960	174.8	152	153.9	142.5	134.9	144.4	140.6	161.5	165.3	165.3	182.4	182.4	1900
1961	184	160	162	150	142	152	148	170	174	174	192	192	2000
1962	193.2	168	170.1	157.5	149.1	159.6	155.4	178.5	182.7	182.7	201.6	201.6	2100
1963	202.4	176	178.2	165	156.2	167.2	162.8	187	191.4	191.4	211.2	211.2	2200
1964	211.6	184	186.3	172.5	163.3	174.8	170.2	195.5	200.1	200.1	220.8	220.8	2300
1965	220.8	192	194.4	180	170.4	182.4	177.6	204	208.8	208.8	230.4	230.4	2400
1966	239.2	208	210.6	195	184.6	197.6	192.4	221	226.2	226.2	249.6	249.6	2600
1967	260.8	226.8	229.6	212.6	201.3	215.5	209.8	241	246.6	246.6	272.2	272.2	2835
1968	224.5	195.2	197.6	183	173.2	185.4	180.6	207.4	212.3	212.3	234.2	234.2	2440
1969	260	226.1	228.9	212	200.6	214.8	209.1	240.2	245.9	245.9	271.3	271.3	2826
1970	280.4	243.8	246.9	228.6	216.4	231.6	225.6	259.1	265.2	265.2	292.6	292.6	3048
1971	299.1	260.1	263.3	243.8	230.8	247.1	240.6	276.3	282.8	282.8	312.1	312.1	3251
1972	320.4	278.6	282.1	261.2	247.3	264.7	257.7	296.1	303	303	334.4	334.4	3483
1973	380.7	331	335.2	310.4	293.8	314.5	306.2	351.7	360	360	397.2	397.2	4138
1974	392.7	341.4	345.7	320.1	303	324.4	315.8	362.8	371.3	371.3	409.7	409.7	4268
1975	356.4	309.9	313.8	290.6	275.1	294.4	286.7	329.3	337	337	371.9	371.9	3874
1976	397.3	345.5	349.8	323.9	306.6	328.2	319.6	367.1	375.8	375.8	414.6	414.6	4319
1977	527.8	459	464.7	430.3	407.3	436	424.5	487.6	499.1	499.1	550.8	550.8	5731
1978	481.6	418.8	424	392.6	371.7	397.9	387.4	445	455.4	455.4	502.6	502.6	5235
1979	567.1	493.1	499.3	462.3	437.6	468.5	456.1	523.9	536.3	536.3	591.7	591.7	6164
1980	595.2	517.6	524.1	485.3	459.4	491.7	478.8	550	562.9	562.9	621.1	621.1	6470
1981	561.2	488	494.1	457.5	433.1	463.6	451.4	518.5	530.7	530.7	585.6	585.6	6100
1982	587.7	511	517.4	479.1	453.5	485.5	472.7	543	555.8	555.8	613.2	613.2	6388
1983	664.2	577.6	584.8	541.5	512.6	548.7	534.3	613.7	628.1	628.1	693.1	693.1	7220
1984	895.4	778.6	788.4	730	691	739.7	720.2	827.3	846.8	846.8	934.4	934.4	9733
1985	732.4	636.9	644.8	597.1	565.2	605	589.1	676.7	692.6	692.6	764.3	764.3	7961
1986	754.9	656.4	664.6	615.4	582.6	623.6	607.2	697.4	713.8	713.8	787.7	787.7	8205
1987	780.5	678.7	687.2	636.3	602.4	644.8	627.8	721.1	738.1	738.1	814.5	814.5	8484
1988	842	732.2	741.3	686.4	649.8	695.6	677.2	777.9	796.2	796.2	878.6	878.6	9152
1989	830.5	722.2	731.2	677	640.9	686.1	668	767.3	785.4	785.4	866.6	866.6	9027
1990	856.2	744.5	753.8	698	660.7	707.3	688.6	791	809.6	809.6	893.4	893.4	9306
1991	864.9	752.1	761.5	705.1	667.5	714.5	695.7	799.1	817.9	817.9	902.5	902.5	9401
1992	880.3	765.4	775	717.6	679.3	727.2	708	813.3	832.4	832.4	918.5	918.5	9568
1993	824.5	717	725.9	672.2	636.3	681.1	663.2	761.8	779.7	779.7	860.4	860.4	8962
1994	873.7	759.8	769.3	712.3	674.3	721.8	702.8	807.2	826.2	826.2	911.7	911.7	9497
1995	867.1	754	763.4	706.9	669.2	716.3	697.5	801.1	820	820	904.8	904.8	9425
1996	903.3	785.4	795.3	736.4	697.1	746.2	726.5	834.5	854.2	854.2	942.5	942.5	9818
1997	954.5	830	840.4	778.1	736.6	788.5	767.8	881.9	902.6	902.6	996	996	10375
1998	1012	880	891	825	781	836	814	935	957	957	1056	1056	11000
1999	1032	898	909	842	797	853	830	954	976	976	1077	1077	11222
Averages:	325.7	283.3	286.8	265.6	251.4	269.1	262	301	308	308	339.9	339.9	3541
Distribution of annual total flow by month													
	0.092	0.08	0.081	0.075	0.071	0.076	0.074	0.085	0.087	0.087	0.096	0.096	

Table C:29 - Measured Flows UT 29 Provo River

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	13850	16810	16640	18800	16360	19000	14700	19460	28700.1	350	80'	1340	166090
1951	7050	12800	19070	19450	19470	19550	15060	15150	12210	240	120	960	141130
1952	14460	19150	21130	21820	19470	20350	52570.1	85820.2	31960.1	1180	890	2700	291501
1953	7030	15890	19900	19670	23430.1	18900	14820	2420	2100	230	320	360	125070
1954	4780	13590	23520.1	21260	12160	9110	4210	710	390	230	150	180	90290
1955	920	7490	11960	11800	8330	7260	5830	680	900	150	90	380	55790
1956	2070	10600	14470	17110	18220	21280	10710	8440	19080	300	190	360	122830
1957	3870	15800	16540	12520	11890	18300	16370	20460	37580.1	7790	510	1430	163060
1958	8180	13910	19120	17830	15790	21030	27400.1	14520	14390	330	400	1040	153940
1959	4160	9930	16490	15950	12680	16800	9940	740	290	150	260	1440	88830
1960	10400	9730	10520	10780	9100	6970	2910	220	210	120	70	90	61120
1961	670	5330	17570	8360	5620	2520	1440	140	6240	3220	240	130	51480
1962	1920	6980	18350	11680	14060	27930.1	28470.1	37050.1	33310.1	2130	420	360	182660
1963	3430	1520	9100	12120	17160	19650	11810	12670	26620.1	270	190	910	115450
1964	3850	8800	12450	16080	8180	6650	18350	20460	53120.1	4120	180	380	152620
1965	1890	8440	9840	14150	23390.1	34100.1	28200.1	14710	58310.1	24000.1	2500	9980	229510
1966	16790	17160	19190	19240	16470	14350	16720	12540	2060	390	230	460	135600
1967	4010	10730	19730	21120	15270	19510	20680	5250	56390.1	13600	780	2100	189170
1968	6840	14220	21190	16860	9700	22990	23960.1	13520	27320.1	1210	1580	3030	162420
1969	9030	13840	22420	26460.1	20750	22270	34270.1	13160	22350	3650	1420	1730	191350
1970	11270	18290	22920	19450	20710	13540	9590	5290	18060	1250	630	1220	142220
1971	9500	20700	23350.1	19280	17170	13310	18800	11690	19500	850	880	1120	156150
1972	15420	20230	20210	16520	16310	20580	16850	16720	29440.1	1840	730	2020	176870
1973	11400	13850	14090	16290	16000	17130	20680	41880.1	19470	900	1360	5770	178820
1974	15640	14670	12540	14180	20840	21200	22120	20620	18270	620	720	260	161680
1975	5000	11500	22010	19910	13680	10200	23510.1	20980	62440.1	14340	1310	2230	207110
1976	10350	22160	23250	20280	17110	24340.1	15640	7340	2340	480	420	910	144620
1977	7110	10280	7190	7590	6360	6280	3540	510	140	90	240	470	49800
1978	2320	9440	8070	7650	7780	14540	16000	8890	27960.1	2490	2400	5680	113220
1979	10340	14730	16940	17250	15430	17320	17700	6160	2360	960	2570	2530	124290
1980	5610	9600	5630	8050	8350	15990	40090.1	55570.1	18730	3890	1090	3520	176120
1981	12790	20070	19140	8890	4840	10250	5480	15210	8720	685	1010	1370	108455
1982	7330	6130	10690	9970	14800	21720	34830.1	44130.1	30810.1	6610	2370	9570	198960
1983	24210.1	34800.1	35280.1	21110	17420	25710.1	32170.1	52600.1	93500.2	10360	12940	12390	372491
1984	31500.1	16440	34610.1	31550.1	20740	31380.1	37680.1	71350.2	57030.1	5170	3940	11250	352641
1985	27200.1	25820.1	25580.1	26610.1	21400	18920	38370.1	42780.1	12410	4290	2250	5320	250951
1986	11040	11500	12830	15180	45450.1	77300.2	80010.2	67240.1	46130.1	10440	6930	16520	400571
1987	24760.1	25730.1	23470	10670	10550	11490	7690	18940	2750	1740	2880	3300	143970
1988	3750	5890	6000	4430	4280	4450	3690	15260	4150	640	730	1130	54400
1989	1980	2630	2580	1520	1970	3590	7740	1800	1580	1090	843	2730	30053
1990	2740	5470	3600	3410	2470	4960	2930	1950	23590.1	1030	586	867	53603
1991	1850	2980	3580	3650	4750	5750	5660	8090	24570.1	1340	1390	5770	69380
1992	7440	4470	4760	3850	3510	4510	1500	1230	1320	376	626	682	34274
1993	1810	3250	2420	3030	2870	5350	19110	47030.1	59610.1	8870	3980	5800	163130
1994	10640	6770	6490	5340	3580	4970	4830	3660	2320	930	1100	2070	52700
1995	4760	3800	4670	5110	5320	10190	7200	19260	32170.1	10910	1780	5180	110350
1996	12110	8830	7870	6750	12350	15250	16900	24040.1	7040	1510	1770	3460	117880
1997	7020	7600	16650	38690.1	42000.1	37710.1	24520.1	30290.1	8830	3810	2690	11500	231310
1998	13260	6440	6680	16310	20190	22010	26060.1	30410.1	42860.1	7110	4410	9780	205520
1999	22900	19090	22210	18060	16000	18320	13340	31350	32180	2720	2410	7250	205830
Averages:	7763.3	11347.6	14866.6	14773.2	14219.2	17170.5	17622.5	18446.3	18698.4	2532.5	1132.4	2528.4	141101

Table C:39 - Measured Flows UT 39 Provo WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	656	544	528	536	504	552	552	720	816	896	896	800	8000
1951	680.6	564.4	547.8	556.1	522.9	572.7	572.7	747	846.6	929.6	929.6	830	8300
1952	713.4	591.6	574.2	582.9	548.1	600.3	600.3	783	887.4	974.4	974.4	870	8700
1953	738	612	594	603	567	621	621	810	918	1008	1008	900	9000
1954	762.6	632.4	613.8	623.1	585.9	641.7	641.7	837	948.6	1041.6	1041.6	930	9300
1955	795.4	659.6	640.2	649.9	611.1	669.3	669.3	873	989.4	1086.4	1086.4	970	9700
1956	820	680	660	670	630	690	690	900	1020	1120	1120	1000	10000
1957	894.6	741.9	720.1	731	687.3	752.8	752.8	981.9	1112.8	1221.9	1221.9	1091	10910
1958	942.3	781.5	758.5	770	724	792.9	792.9	1034.3	1172.2	1287.1	1287.1	1149.2	11492
1959	897.2	744	722.1	733	689.3	754.9	754.9	984.7	1116	1225.4	1225.4	1094.1	10941
1960	841.4	697.7	677.2	687.5	646.4	708	708	923.5	1046.6	1149.2	1149.2	1026.1	10261
1961	717.7	595.1	577.6	586.4	551.4	603.9	603.9	787.7	892.7	980.2	980.2	875.2	8752
1962	855.2	709.2	688.3	698.7	657	719.6	719.6	938.6	1063.8	1168.1	1168.1	1042.9	10429
1963	806.6	668.9	649.2	659.1	619.7	678.8	678.8	885.3	1003.4	1101.7	1101.7	983.7	9837
1964	892.8	740.4	718.6	729.5	685.9	751.3	751.3	979.9	1110.6	1219.5	1219.5	1088.8	10888
1965	974	807.7	783.9	795.8	748.3	819.6	819.6	1069	1211.6	1330.3	1330.3	1187.8	11878
1966	971	805.3	781.6	793.4	746	817.1	817.1	1065.8	1207.9	1326.3	1326.3	1184.2	11842
1967	941.9	781.1	758.1	769.6	723.7	792.6	792.6	1033.8	1171.7	1286.5	1286.5	1148.7	11487
1968	967.9	802.7	779.1	790.9	743.7	814.5	814.5	1062.4	1204	1322.1	1322.1	1180.4	11804
1969	1093.1	906.4	879.8	893.1	839.8	919.8	919.8	1199.7	1359.7	1493	1493	1333	13330
1970	1118.6	927.7	900.4	914	859.4	941.3	941.3	1227.8	1391.5	1527.9	1527.9	1364.2	13642
1971	1091.1	904.8	878.2	891.5	838.3	918.1	918.1	1197.5	1357.2	1490.3	1490.3	1330.6	13306
1972	1202.9	997.6	968.2	982.9	924.2	1012.2	1012.2	1320.3	1496.3	1643	1643	1467	14670
1973	1233.4	1022.9	992.8	1007.8	947.6	1037.9	1037.9	1353.8	1534.3	1684.7	1684.7	1504.2	15042
1974	1209	1002.6	973.1	987.9	928.9	1017.3	1017.3	1327	1503.9	1651.3	1651.3	1474.4	14744
1975	1177.6	976.6	947.8	962.2	904.7	990.9	990.9	1292.5	1464.8	1608.4	1608.4	1436.1	14361
1976	1234.2	1023.5	993.4	1008.4	948.2	1038.5	1038.5	1354.6	1535.2	1685.7	1685.7	1505.1	15051
1977	1018.5	844.6	819.8	832.2	782.5	857.1	857.1	1117.9	1266.9	1391.2	1391.2	1242.1	1242[illegible]
1978	1211.6	1004.8	975.2	990	930.9	1019.5	1019.5	1329.8	1507.2	1654.9	1654.9	1477.6	147[illegible]
1979	1415	1173.4	1138.9	1156.2	1087.1	1190.7	1190.7	1553	1760.1	1932.7	1932.7	1725.6	17[illegible]
1980	1500.1	1244	1207.4	1225.7	1152.5	1262.3	1262.3	1646.5	1866	2048.9	2048.9	1829.4	18294
1981	1373.7	1139.1	1105.6	1122.4	1055.4	1155.9	1155.9	1507.7	1708.7	1876.2	1876.2	1675.2	16752
1982	1456.3	1207.7	1172.2	1189.9	1118.9	1225.4	1225.4	1598.4	1811.5	1989.1	1989.1	1776	17760
1983	1576	1307	1268.5	1287.7	1210.9	1326.2	1326.2	1729.8	1960.4	2152.6	2152.6	1922	19220
1984	1501	1244.7	1208.1	1226.4	1153.2	1263	1263	1647.5	1867.1	2050.2	2050.2	1830.5	18305
1985	1458.5	1209.5	1173.9	1191.7	1120.5	1227.2	1227.2	1600.7	1814.2	1992	1992	1778.6	17786
1986	1527.2	1266.4	1229.2	1247.8	1173.3	1285.1	1285.1	1676.2	1899.7	2085.9	2085.9	1862.4	18624
1987	1387.8	1150.8	1117	1133.9	1066.2	1167.8	1167.8	1523.2	1726.3	1895.5	1895.5	1692.4	16924
1988	1342.6	1113.4	1080.6	1097	1031.5	1129.7	1129.7	1473.6	1670	1833.8	1833.8	1637.3	16373
1989	1398	1159.3	1125.2	1142.3	1074.1	1176.4	1176.4	1534.4	1739	1909.5	1909.5	1704.9	17049
1990	1303.5	1080.9	1049.1	1065	1001.5	1096.8	1096.8	1430.6	1621.4	1780.4	1780.4	1589.6	15896
1991	1368.3	1134.7	1101.3	1118	1051.3	1151.4	1151.4	1501.8	1702.1	1868.9	1868.9	1668.7	16687
1992	1335.6	1107.6	1075	1091.3	1026.1	1123.9	1123.9	1465.9	1661.4	1824.3	1824.3	1628.8	16288
1993	1461.7	1212.2	1176.5	1194.3	1123	1230	1230	1604.3	1818.3	1996.5	1996.5	1782.6	17826
1994	1337.2	1108.9	1076.3	1092.6	1027.3	1125.2	1125.2	1467.6	1663.3	1826.4	1826.4	1630.7	16307
1995	1314.9	1090.4	1058.3	1074.3	1010.2	1106.4	1106.4	1443.2	1635.6	1795.9	1795.9	1603.5	16035
1996	1406.5	1166.4	1132.1	1149.3	1080.6	1183.6	1183.6	1543.8	1749.6	1921.1	1921.1	1715.3	17153
1997	1637.9	1358.2	1318.3	1338.3	1258.4	1378.2	1378.2	1797.7	2037.4	2237.1	2237.1	1997.4	19974
1998	1748.2	1449.8	1407.1	1428.4	1343.2	1471.1	1471.1	1918.8	2174.6	2387.8	2387.8	2132	21320
1999	1660	1377	1336	1356	1275	1397	1397	1822	2065	2268	2268	2025	20246
Averages:	937.9	777.8	754.9	766.3	720.6	789.2	789.2	1029.4	1166.6	1281	1281	1143.8	11438
Distribution of annual total flow by month													
	0.082	0.068	0.066	0.067	0.063	0.069	0.069	0.09	0.102	0.112	0.112	0.1	

Table C:48 - Measured and Calculated Flows UT 48 Spanish Fork River at Lakeshore

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	3080	4630	4430	5470	6230	8020	11900	9040	80	60	0	20	52960
1951	610	4500	5670	5590	6260	6930	7220	3470	100	110	80	30	40570
1952	2820	4060	4330	5220	5840	8840	64760	93300	16610	100	260	2380	208520
1953	2820	7140	9220	8610	6390	9030	9540	2530	30	180	430	150	56070
1954	1620	4630	5290	5740	5710	6960	6130	10	0	20	0	180	36290
1955	920	3380	3550	3380	3720	7570	8820	2100	0	20	170	60	33690
1956	960	3340	5310	6020	5180	8490	4920	190	30	30	30	20	34520
1957	840	3190	4560	4710	6850	6580	9420	17660	7570	50	20	50	61500
1958	2560	5080	5640	5440	6470	9010	15520	15030	130	20	20	70	64990
1959	580	3210	5890	5740	5780	6360	1580	20	20	50	10	370	29610
1960	890	980	3250	4340	4050	6580	4490	40	80	50	100	960	25810
1961	1270	3040	3480	3710	3540	4080	960	280	70	20	110	30	20590
1962	580	2860	2760	3400	7340	7380	21570	4120	1270	50	40	30	51400
1963	560	1490	3420	3930	4610	890	780	540	100	10	150	170	16650
1964	70	3070	3710	3610	3050	4080	8130	12150	20	150	90	40	38170
1965	180	2160	3730	3960	4800	5950	11690	5530	1180	500	480	2050	42210
1966	2270	4250	5360	5460	4880	9350	3600	280	90	50	70	140	35800
1967	2200	3740	4360	4770	4540	7750	6160	1830	6200	390	380	480	42800
1968	2880	4030	3870	3030	5860	7350	10940	12810	3480	1020	860	690	56820
1969	3320	5410	5880	6950	6020	10300	34170	14980	2850	1560	370	250	92060
1970	4800	5600	6310	7260	6790	7750	5680	3880	2720	350	680	2170	53990
1971	4130	5320	5810	6810	6810	9970	13860	10760	1910	590	540	1700	68210
1972	5340	6220	6490	7270	7060	10320	6930	800	730	110	150	760	52180
1973	4950	6320	6450	6550	5730	7300	17090	40150	3480	290	620	2030	100960
1974	3770	6090	6730	7150	6530	11540	16940	9500	680	1180	410	200	70720
1975	3930	5630	5380	6110	5910	7840	8990	31890	30410	1860	340	1560	109850
1976	5260	6810	6720	6890	7860	11320	10520	3780	300	210	460	1220	61350
1977	3500	3970	4630	4670	4550	4660	700	470	250	270	420	170	28260
1978	2410	2720	3130	4200	4370	11090	20530	24530	910	60	290	1700	75940
1979	2300	5040	6320	7940	6440	8770	15340	10360	790	180	334	561	64375
1980	3140	5260	5640	6710	8540	10180	21880	37050	8150	2070	1290	3020	112930
1981	4690	6880	7170	6680	5980	6760	4730	3060	345	186	258	1060	47799
1982	5410	5810	5860	6300	6960	14170	34050	50770	7240	2450	1060	4710	144790
1983	10920	8320	8800	8380	8560	19130	22460	70250	65820	5430	3980	1550	233601
1984	40080	29310	12960	10300	9840	17770	55480	111400	38370	6130	7090	6570	345301
1985	17420	16020	13120	12030	5740	10990	26830	29750	12220	6040	3820	5680	159660
1986	9450	9800	8760	8290	20680	23300	46510	50280	3490	4220	7360	4860	197000
1987	9670	8880	7840	7910	7800	9620	4550	1110	598	1440	1340	1740	62498
1988	4260	5550	4310	4550	5460	6620	4250	1110	598	1440	1340	1740	41228
1989	2280	4070	6430	10590	10830	13050	16260	5340	180	310	410	380	70130
1990	1940	9400	11370	11660	11200	13990	4960	3360	190	330	440	220	69060
1991	1000	4030	9930	9390	10650	8880	3060	300	240	380	580	470	48910
1992	230	3940	8840	10040	10360	11050	14370	2170	190	160	400	570	62320
1993	110	6460	9870	11290	11740	18110	20960	28930	250	500	660	490	109370
1994	300	6720	10600	5850	6220	8310	3100	1710	220	320	450	450	44250
1995	1770	4810	5520	5200	6160	12360	10820	31260	420	500	650	590	80060
1996	870	4190	4900	7170	8390	12810	19370	20290	250	320	570	430	79560
1997	3480	6300	6740	8960	7990	17730	23510	32450	250	430	580	730	109150
1998	2810	6720	7630	8110	7970	14700	22210	34560	330	700	750	840	107330
1999	6064	9754	9056	9590	10037	10089	8316	9824	285	422	619	739	74795
Averages:	3287	5124	5680	5976	6389	9165	13234	13907	3445	661	636	867	68369

Table C:48 - Measured and Calculated Flows UT 48 Spanish Fork River at Lakeshore

1958	2560	5080	5640	5440	6470	9010	15520	15030	130	20	20	70	64990
1959	580	3210	5890	5740	5780	6360	1580	20	20	50	10	370	29610
1960	890	980	3250	4340	4050	6580	4490	40	80	50	100	960	25810
1961	1270	3040	3480	3710	3540	4080	960	280	70	20	110	30	20590
1962	580	2860	2760	3400	7340	7380	21570	4120	1270	50	40	30	51400
1963	560	1490	3420	3930	4610	890	780	540	100	10	150	170	16650
1964	70	3070	3710	3610	3050	4080	8130	12150	20	150	90	40	38170
1965	180	2160	3730	3960	4800	5950	11690	5530	1180	500	480	2050	42210
1966	2270	4250	5360	5460	4880	9350	3600	280	90	50	70	140	35800
1967	2200	3740	4360	4770	4540	7750	6160	1830	6200	390	380	480	42800
1968	2880	4030	3870	3030	5860	7350	10940	12810	3480	1020	860	690	56820
1969	3320	5410	5880	6950	6020	10300	34170.1	14980	2850	1560	370	250	92060
1970	4800	5600	6310	7260	6790	7750	5680	3880	2720	350	680	2170	53990
1971	4130	5320	5810	6810	6810	9970	13860	10760	1910	590	540	1700	68210
1972	5340	6220	6490	7270	7060	10320	6930	800	730	110	150	760	52180
1973	4950	6320	6450	6550	5730	7300	17090	40150.1	3480	290	620	2030	100960
1974	3770	6090	6730	7150	6530	11540	16940	9500	680	1180	410	200	70720
1975	3930	5630	5380	6110	5910	7840	8990	31890.1	30410.1	1860	340	1560	109850
1976	5260	6810	6720	6890	7860	11320	10520	3780	300	210	460	1220	61350
1977	3500	3970	4630	4670	4550	4660	700	470	250	270	420	170	28260
1978	2410	2720	3130	4200	4370	11090	20530	24530.1	910	60	290	1700	75940
1979	2300	5040	6320	7940	6440	8770	15340	10360	790	180	334	561	64375
1980	3140	5260	5640	6710	8540	10180	21880	37050.1	8150	2070	1290	3020	112930
1981	4690	6880	7170	6680	5980	6760	4730	3060	345	186	258	1060	47799
1982	5410	5810	5860	6300	6960	14170	34050.1	50770.1	7240	2450	1060	4710	144790
1983	10920	8320	8800	8380	8560	19130	22460	70250.1	65820.1	5430	3980	1550	233601
1984	40080.1	29310.1	12960	10300	9840	17770	55480.1	111400.2	38370.1	6130	7090	6570	[illegible]
1985	17420	16020	13120	12030	5740	10990	26830.1	29750.1	12220	6040	3820	5680	[illegible]
1986	9450	9800	8760	8290	20680	23300.1	46510.1	50280.1	3490	4220	7360	4860	[illegible]
1987	9670	8880	7840	7910	7800	9620	4550	1110	598	1440	1340	1740	62498
1988	4260	5550	4310	4550	5460	6620	4250	1110	598	1440	1340	1740	41228
1989	2280	4070	6430	10590	10830	13050	16260	5340	180	310	410	380	70130
1990	1940	9400	11370	11660	11200	13990	4960	3360	190	330	440	220	69060
1991	1000	4030	9930	9390	10650	8880	3060	300	240	380	580	470	48910
1992	230	3940	8840	10040	10360	11050	14370	2170	190	160	400	570	62320
1993	110	6460	9870	11290	11740	18110	20960	28930.1	250	500	660	490	109370
1994	300	6720	10600	5850	6220	8310	3100	1710	220	320	450	450	44250
1995	1770	4810	5520	5200	6160	12360	10820	31260.1	420	500	650	590	80060
1996	870	4190	4900	7170	8390	12810	19370	20290	250	320	570	430	79560
1997	3480	6300	6740	8960	7990	17730	23510.1	32450.1	250	430	580	730	109150
1998	2810	6720	7630	8110	7970	14700	22210	34560.1	330	700	750	840	107330
1999	6064	9754	9056	9590	10037	10089	8316	9824	285	422	619	739	74795
erages:	3287	5123.5	5679.7	5975.8	6388.7	9164.8	13234.4	13906.6	3444.8	660.8	636.4	866.7	68369

Table C:53 - Measured Outflows UT 53 Jordan River

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	14500	7900	3400	1100	6800	12600	16700	29400.1	46000.1	52200.1	52700.1	39500.1	282801
1951	17300	6500	6100	1000	2600	5800	16000	32300.1	45500.1	50800.1	40800.1	44800.1	269501
1952	12200	7000	6200	14000	19900	27600.1	35100.1	74000.2	81300.2	65200.1	53500.1	42600.1	438601
1953	37200.1	34600.1	40000.1	44100.1	41700.1	48300.1	44500.1	45100.1	45400.1	51800.1	49800.1	45300.1	527801
1954	19500	7800	11500	11300	14700	23230.1	24300.1	42600.1	44700.1	53700.1	49800.1	41000.1	344131
1955	13000	1700	1600	400	400	500	1500	29800.1	36800.1	51100.1	47700.1	39100.1	223600
1956	11800	800	600	400	100	100	5800	35000.1	43500.1	52200.1	50500.1	41100.1	241901
1957	12700	600	500	0	0	0	0	17500	33500.1	49100.1	48200.1	39100.1	201200
1958	12200	1300	1200	1900	4500	4100	3600	38200.1	46700.1	54800.1	59700.1	43200.1	271401
1959	18000	9500	3300	1100	1000	300	9200	39700.1	46100.1	52000.1	47400.1	32800.1	260401
1960	9600	5000	1400	300	100	300	5100	39800.1	44300.1	51000.1	37700.1	26300.1	220900
1961	6100	1100	1100	0	0	0	0	33500.1	33100.1	23600.1	14900	5600	119000
1962	700	500	200	100	500	400	800	27100.1	36300.1	45400.1	46400.1	35600.1	194000
1963	6700	4100	1200	400	100	0	0	29900.1	28100.1	47800.1	40900.1	20700	179900
1964	11000	900	1300	1300	400	100	0	18200	20600	47500.1	44500.1	33900.1	179700
1965	10400	500	600	1500	1300	800	5800	30000.1	38200.1	42900.1	41500.1	17400	190900
1966	9300	1200	1300	3400	11800	8800	8500	41800.1	46900.1	49200.1	48800.1	36600.1	267601
1967	13700	3100	1200	1400	2100	4900	3800	38400.1	27000.1	47600.1	51600.1	38500.1	233301
1968	10500	1100	1100	1300	1500	9500	22500	34300.1	38300.1	50900.1	42300.1	39100.1	252401
1969	18100	9000	12000	19800	25300.1	31100.1	35200.1	42600.1	34900.1	48500.1	50100.1	41700.1	368301
1970	20400	16000	20500	26700.1	29600.1	34300.1	29300.1	39100.1	39400.1	45300.1	50700.1	33400.1	384701
1971	14900	8900	16900	23100.1	25900.1	31300.1	30000.1	38200.1	40000.1	47900.1	51400.1	36800.1	365301
1972	12900	10300	15200	23800.1	25800.1	29300.1	25200.1	44800.1	44000.1	51000.1	52000.1	35500.1	369801
1973	13400	5300	1800	6800	19700	26800.1	29800.1	39300.1	44600.1	47100.1	50800.1	33000.1	318401
1974	17700	18000	23500.1	30500.1	32200.1	40800.1	41100.1	44200.1	45200.1	50600.1	51500.1	44000.1	439301
1975	19700	3100	1400	1200	15500	28200.1	30700.1	30500.1	44400.1	45300.1	48500.1	39700.1	308201
1976	25100.1	29100.1	38400.1	41800.1	45400.1	45400.1	40700.1	41700.1	42000.1	42100.1	49500.1	36300.1	477501
1977	11900	1100	1100	1000	1100	1200	10500	24600.1	35800.1	40300.1	37500.1	29000.1	195100
1978	700	600	600	800	1000	2000	8000	22500	22100	43500.1	42700.1	25700.1	170200
1979	7300	1300	1300	1150	20960	33350.1	33000.1	38641.1	40224.1	46206.1	45623.1	39108.1	308163
1980	14542	870	818	1244	13698	26860.1	29004.1	42545.1	43436.1	39235.1	38891.1	24928.1	276072
1981	21334	23111	31186.1	32953.1	31271.1	34885.1	32005.1	30146.1	33542.1	48527.1	46389.1	32553.1	397903
1982	13160	8577	14519	17226	22342	32698.1	34332.1	48363.1	53255.1	46008.1	41601.1	26426.1	358508
1983	39701.1	46413.1	53976.1	62787.1	58328.1	74087.2	78534.2	95368.2	125204.3	122960.3	102390.2	84611.2	944361
1984	79837.2	79023.2	87293.2	97293.2	90317.2	96246.2	100225.2	137244.3	171494.4	141493.3	112625.2	83136.2	1276229
1985	75959.2	78595.2	80906.2	80479.2	73987.2	83570.2	88937.2	94514.2	86491.2	71454.2	58284.1	44535.1	917713
1986	43678.1	46586.1	59478.1	61940.1	66198.1	35548.1	129846.3	149667.3	129292.3	115622.3	96714.2	67628.1	1002199
1987	69147.1	70028.1	73420.2	71544.1	63473.1	69826.1	44588.1	38979.1	37833.1	39882.1	40971.1	32924.1	652616
1988	14190	1831	1500	1565	1636	1324	9769	32672.1	41960.1	45886.1	43850.1	33834.1	230018
1989	12784	1402	972	1019	1004	1466	13597	38901.1	42005.1	51100.1	47485.1	27571.1	239307
1990	5566	1002	1089	1152	893	561	10141	40742.1	33794.1	47775.1	45162.1	31488.1	219365
1991	3608	543	617	682	916	827	1369	22772	26624.1	46821.1	44474.1	27254.1	176507
1992	14814	1242	962	710	561	623	18030	41692.1	44352.1	42966.1	25956.1	5042	196950
1993	1583	1045	18	161	1154	2358	1379	18722	24652.1	32813.1	37053.1	22655	143593
1994	9669	1636	3531	0	0	121	5411	24702.1	34014.1	43645.1	38761.1	30426.1	191916
1995	1962	0	0	1142	1014	988	1424	6384	55436.1	55586.1	35483.1	26920.1	186339
1996	8644	0	0	0	31918.1	49692.1	46915.1	56922.1	55297.1	34747.1	34603.1	21544	340283
1997	9667	1365	15537	42198.1	46709.1	55212.1	57302.1	67479.1	68713.1	58485.1	28229.1	20323	471220
1998	8658	44029.1	44458.1	46758.1	45733.1	53018.1	54309.1	66674.1	67169.1	70413.1	55045.1	38000.1	594265
1999	17700	42900	47600	51000	48300	52500	48900	59800	62800	46500	36000	25100	539100
Averages:	15097.2	9108.7	10236	11576.9	13311.8	15905.7	20214.8	40368.6	44689.8	50299	45368	33868.3	310045

Table C:70 - Measured Flows UT 70 Lehi WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0	0	0	0	0	0
1956	16.8	15.4	15.8	14.4	14	16.2	17.2	18.8	21.2	18.6	16.4	15.2	200
1957	35.3	32.3	33.2	30.2	29.4	34	36.1	39.5	44.5	39.1	34.4	31.9	420
1958	37.8	34.7	35.6	32.4	31.5	36.5	38.7	42.3	47.7	41.9	36.9	34.2	450
1959	40.3	37	37.9	34.6	33.6	38.9	41.3	45.1	50.9	44.6	39.4	36.5	480
1960	42.8	39.3	40.3	36.7	35.7	41.3	43.9	47.9	54.1	47.4	41.8	38.8	510
1961	43.1	39.5	40.5	36.9	35.9	41.6	44.1	48.2	54.4	47.7	42.1	39	513
1962	43.3	39.7	40.8	37.2	36.1	41.8	44.4	48.5	54.7	48	42.3	39.2	516
1963	43.6	40	41	37.4	36.3	42	44.6	48.8	55	48.3	42.6	39.4	519
1964	43.8	40.1	41.2	37.5	36.5	42.2	44.8	49	55.2	48.5	42.7	39.6	521
1965	44	40.3	41.4	37.7	36.7	42.4	45.1	49.3	55.5	48.7	43	39.8	524
1966	44.3	40.6	41.6	37.9	36.9	42.7	45.3	49.5	55.9	49	43.2	40.1	527
1967	44.5	40.8	41.9	38.2	37.1	42.9	45.6	49.8	56.2	49.3	43.5	40.3	530
1968	44.8	41	42.1	38.4	37.3	43.2	45.8	50.1	56.5	49.6	43.7	40.5	533
1969	45	41.3	42.3	38.6	37.5	43.4	46.1	50.4	56.8	49.8	44	40.7	536
1970	45.4	41.6	42.7	38.9	37.8	43.7	46.4	50.8	57.2	50.2	44.3	41	540
1971	47.4	43.4	44.6	40.6	39.5	45.7	48.5	53	59.8	52.5	46.2	42.9	564
1972	49.4	45.3	46.5	42.3	41.2	47.6	50.6	55.3	62.3	54.7	48.2	44.7	588
1973	51.4	47.1	48.3	44.1	42.8	49.6	52.6	57.5	64.9	56.9	50.2	46.5	612
1974	53.4	49	50.2	45.8	44.5	51.5	54.7	59.8	67.4	59.1	52.2	48.3	636
1975	55.4	50.8	52.1	47.5	46.2	53.5	56.8	62	70	61.4	54.1	50.2	660
1976	56.3	51.6	52.9	48.2	46.9	54.3	57.6	63	71	62.3	54.9	50.9	670
1977	48.7	44.7	45.8	41.8	40.6	47	49.9	54.5	61.5	53.9	47.6	44.1	580
1978	57.1	52.4	53.7	49	47.6	55.1	58.5	63.9	72.1	63.2	55.8	51.7	680
1979	58.8	53.9	55.3	50.4	49	56.7	60.2	65.8	74.2	65.1	57.4	53.2	700
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	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
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	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
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
Averages:	16.1	14.7	15.1	13.8	13.4	15.5	16.5	18	20.3	17.8	15.7	14.5	189
Distribution of annual total flow by month													
	0.084	0.077	0.079	0.072	0.07	0.081	0.086	0.094	0.106	0.093	0.082	0.076	

Table C:71 - Measured Flows UT 71 Timpanogos WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	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
1960	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
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	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
1966	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
1968	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
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	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
1974	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
1976	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
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	672.5	600.3	528	461.3	294.6	316.8	294.6	277.9	222.3	839.3	528	522.5	5558
1981	568	507	445.9	389.6	248.8	267.6	248.8	234.7	187.8	708.8	445.9	441.2	4694
1982	715.2	638.4	561.5	490.6	313.3	336.9	313.3	295.6	236.4	892.6	561.5	555.6	5911
1983	776	692.6	609.2	532.3	339.9	365.5	339.9	320.7	256.5	968.4	609.2	602.8	6413
1984	808	721.2	634.4	554.3	353.9	380.6	353.9	333.9	267.1	1008.4	634.4	627.7	6678
1985	728.5	650.3	572	499.7	319.1	343.2	319.1	301.1	240.8	909.2	572	566	6021
1986	765.1	682.9	600.7	524.8	335.1	360.4	335.1	316.2	252.9	954.8	600.7	594.4	6323
1987	627.7	560.3	492.9	430.6	275	295.7	275	259.4	207.5	783.4	492.9	487.7	5188
1988	572	510.5	449.1	392.3	250.5	269.4	250.5	236.4	189.1	713.8	449.1	444.3	4727
1989	502.8	448.7	394.7	344.9	220.2	236.8	220.2	207.8	166.2	627.4	394.7	390.6	4155
1990	499.4	445.7	392.1	342.5	218.7	235.2	218.7	206.4	165.1	623.2	392.1	387.9	4127
1991	595.1	531.1	467.2	408.2	260.7	280.3	260.7	245.9	196.7	742.6	467.2	462.3	4918
1992	621.3	554.6	487.8	426.2	272.2	292.7	272.2	256.8	205.4	775.4	487.8	482.7	5135
1993	791.9	706.9	621.8	543.2	346.9	373.1	346.9	327.3	261.8	988.3	621.8	615.2	6545
1994	755.9	674.7	593.5	518.5	331.1	356.1	331.1	312.4	249.9	943.3	593.5	587.2	6247
1995	862.5	769.8	677.2	591.6	377.8	406.3	377.8	356.4	285.1	1076.3	677.2	670	7128
1996	961	857.7	754.5	659.2	420.9	452.7	420.9	397.1	317.7	1199.2	754.5	746.5	7942
1997	1005.6	897.6	789.5	689.8	440.5	473.7	440.5	415.6	332.4	1255	789.5	781.2	8311
1998	1113.2	993.6	874	763.6	487.6	524.4	487.6	460	368	1389.2	874	864.8	9200
1999	1157	1033	908	794	507	545	507	478	382	1444	908	899	9562
Averages:	202.1	180.3	158.6	138.6	88.5	95.2	88.5	83.5	66.8	252.2	158.6	157	1670
Distribution of annual total flow by month													
	0.121	0.108	0.095	0.083	0.053	0.057	0.053	0.05	0.04	0.151	0.095	0.094	

Table C:72 - Measured Flows UT 72 Pleasant Grove WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0	0	0	0	0	0
1956	17.6	17	17.4	14.4	13	16	15.2	16.8	17.6	18.4	18.4	18.2	200
1957	35.2	34	34.8	28.8	26	32	30.4	33.6	35.2	36.8	36.8	36.4	400
1958	44	42.5	43.5	36	32.5	40	38	42	44	46	46	45.5	500
1959	61.6	59.5	60.9	50.4	45.5	56	53.2	58.8	61.6	64.4	64.4	63.7	700
1960	71.3	68.9	70.5	58.3	52.7	64.8	61.6	68	71.3	74.5	74.5	73.7	810
1961	74.6	72.1	73.8	61.1	55.1	67.8	64.4	71.2	74.6	78	78	77.2	848
1962	78	75.3	77.1	63.8	57.6	70.9	67.3	74.4	78	81.5	81.5	80.6	886
1963	81.3	78.5	80.4	66.5	60.1	73.9	70.2	77.6	81.3	85	85	84.1	924
1964	84.7	81.8	83.7	69.3	62.5	77	73.1	80.8	84.7	88.5	88.5	87.5	962
1965	88	85	87	72	65	80	76	84	88	92	92	91	1000
1966	91.3	88.2	90.3	74.7	67.5	83	78.9	87.2	91.3	95.5	95.5	94.5	1038
1967	94.7	91.5	93.6	77.5	69.9	86.1	81.8	90.4	94.7	99	99	97.9	1076
1968	98	94.7	96.9	80.2	72.4	89.1	84.7	93.6	98	102.5	102.5	101.4	1114
1969	101.4	97.9	100.2	82.9	74.9	92.2	87.6	96.8	101.4	106	106	104.8	1152
1970	104.7	101.2	103.5	85.7	77.4	95.2	90.4	100	104.7	109.5	109.5	108.3	1190
1971	110.4	106.6	109.1	90.3	81.5	100.3	95.3	105.3	110.4	115.4	115.4	114.1	1254
1972	116	112	114.7	94.9	85.7	105.4	100.2	110.7	116	121.3	121.3	119.9	1318
1973	121.5	117.4	120.1	99.4	89.8	110.5	105	116	121.5	127.1	127.1	125.7	1381
1974	127.2	122.8	125.7	104	93.9	115.6	109.8	121.4	127.2	132.9	132.9	131.5	1445
1975	132.8	128.3	131.3	108.6	98.1	120.7	114.7	126.8	132.8	138.8	138.8	137.3	1509
1976	138.4	133.7	136.9	113.3	102.2	125.8	119.5	132.1	138.4	144.7	144.7	143.1	1573
1977	144	139.1	142.3	117.8	106.3	130.9	124.3	137.4	144	150.5	150.5	148.9	1636
1978	149.6	144.5	147.9	122.4	110.5	136	129.2	142.8	149.6	156.4	156.4	154.7	1700
1979	155.8	150.5	154	127.4	115.1	141.6	134.5	148.7	155.8	162.8	162.8	161.1	1770
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	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
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	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
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
Averages:	34.1	33	33.8	27.9	25.2	31	29.5	32.6	34.1	35.7	35.7	35.3	382
Distribution of annual total flow by month													
	0.088	0.085	0.087	0.072	0.065	0.08	0.076	0.084	0.088	0.092	0.092	0.091	

Table C:73 - Measured Flows UT 73 Springville WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	142.4	112	97.6	84.8	112	139.2	131.2	137.6	155.2	171.2	164.8	152	1600
1951	146.9	115.5	100.7	87.5	115.5	143.6	135.3	141.9	160.1	176.6	170	156.8	1650
1952	151.3	119	103.7	90.1	119	147.9	139.4	146.2	164.9	181.9	175.1	161.5	1700
1953	155.8	122.5	106.8	92.8	122.5	152.3	143.5	150.5	169.8	187.3	180.3	166.3	1750
1954	160.2	126	109.8	95.4	126	156.6	147.6	154.8	174.6	192.6	185.4	171	1800
1955	164.7	129.5	112.9	98.1	129.5	161	151.7	159.1	179.5	198	190.6	175.8	1850
1956	169.1	133	115.9	100.7	133	165.3	155.8	163.4	184.3	203.3	195.7	180.5	1900
1957	180.2	141.8	123.5	107.3	141.8	176.2	166.1	174.2	196.4	216.7	208.6	192.4	2025
1958	200.3	157.5	137.3	119.3	157.5	195.8	184.5	193.5	218.3	240.8	231.8	213.8	2250
1959	211.4	166.3	144.9	125.9	166.3	206.6	194.8	204.3	230.4	254.1	244.6	225.6	2375
1960	213.6	168	146.4	127.2	168	208.8	196.8	206.4	232.8	256.8	247.2	228	2400
1961	216	169.9	148	128.6	169.9	211.1	199	208.7	235.4	259.7	250	230.6	2427
1962	218.4	171.8	149.7	130.1	171.8	213.5	201.2	211	238	262.6	252.8	233.1	2454
1963	220.8	173.7	151.3	131.5	173.7	215.8	203.4	213.4	240.7	265.5	255.5	235.7	2481
1964	223.2	175.6	153	132.9	175.6	218.2	205.7	215.7	243.3	268.4	258.3	238.3	2508
1965	225.6	177.5	154.6	134.4	177.5	220.5	207.9	218	245.9	271.2	261.1	240.8	2535
1966	228	179.3	156.3	135.8	179.3	222.9	210.1	220.3	248.5	274.1	263.9	243.4	2562
1967	230.4	181.2	157.9	137.2	181.2	225.2	212.3	222.7	251.1	277	266.7	246	2589
1968	232.8	183.1	159.6	138.6	183.1	227.6	214.5	225	253.8	279.9	269.4	248.5	2616
1969	235.2	185	161.2	140.1	185	229.9	216.7	227.3	256.4	282.8	272.2	251.1	2643
1970	237.6	186.9	162.9	141.5	186.9	232.3	218.9	229.6	259	285.7	275	253.7	2670
1971	250	196.6	171.3	148.9	196.6	244.4	230.3	241.6	272.5	300.6	289.3	266.9	2809
1972	262.4	206.4	179.8	156.2	206.4	256.5	241.7	253.5	286	315.4	303.6	280.1	2948
1973	274.7	216	188.2	163.6	216	268.5	253.1	265.4	299.3	330.2	317.9	293.2	3086
1974	287	225.8	196.7	170.9	225.8	280.6	264.5	277.4	312.8	345.1	332.2	306.4	3225
1975	299.4	235.5	205.2	178.3	235.5	292.7	275.8	289.3	326.3	359.9	346.5	319.6	3364
1976	311.8	245.2	213.7	185.7	245.2	304.8	287.2	301.3	339.8	374.8	360.8	332.8	3503
1977	324	254.9	222.1	193	254.9	316.8	298.6	313.1	353.2	389.6	375	345.9	3641
1978	336.4	264.6	230.6	200.3	264.6	328.9	310	325.1	366.7	404.5	389.3	359.1	3780
1979	349.8	275.1	239.7	208.3	275.1	341.9	322.3	338	381.2	420.5	404.8	373.4	3930
1980	264.1	207.7	181	157.3	207.7	258.1	243.3	255.2	287.8	317.5	305.6	281.9	2967
1981	302.2	237.7	207.2	180	237.7	295.5	278.5	292.1	329.4	363.4	349.8	322.6	3396
1982	300.2	236.1	205.8	178.8	236.1	293.5	276.6	290.1	327.2	360.9	347.4	320.4	3373
1983	363.4	285.8	249.1	216.4	285.8	355.2	334.8	351.1	396.1	436.9	420.5	387.9	4083
1984	402.3	316.4	275.7	239.6	316.4	393.2	370.6	388.7	438.4	483.6	465.6	429.4	4520
1985	434.1	341.5	297.6	258.5	341.5	424.4	400	419.5	473.2	521.9	502.4	463.4	4878
1986	358.2	281.8	245.5	213.3	281.8	350.2	330.1	346.2	390.4	430.7	414.6	382.4	4025
1987	315.7	248.3	216.4	188	248.3	308.6	290.9	305	344.1	379.5	365.3	337	3547
1988	300.9	236.7	206.2	179.2	236.7	294.1	277.2	290.8	328	361.8	348.2	321.2	3381
1989	290.9	228.8	199.4	173.3	228.8	284.4	268.1	281.1	317.1	349.8	336.7	310.6	3269
1990	289.5	227.7	198.4	172.4	227.7	283	266.7	279.8	315.5	348.1	335.1	309	3253
1991	291.5	229.3	199.8	173.6	229.3	284.9	268.6	281.7	317.7	350.4	337.3	311.1	3275
1992	268.3	211.1	183.9	159.8	211.1	262.3	247.2	259.3	292.5	322.6	310.5	286.4	3015
1993	276.3	217.4	189.4	164.6	217.4	270.1	254.6	267	301.2	332.2	319.8	295	3105
1994	302.9	238.2	207.6	180.4	238.2	296.1	279	292.7	330.1	364.1	350.5	323.3	3403
1995	344.4	270.9	236.1	205.1	270.9	336.7	317.3	332.8	375.4	414.1	398.6	367.7	3870
1996	383	301.2	262.5	228.1	301.2	374.4	352.8	370.1	417.4	460.4	443.2	408.8	4303
1997	384.2	302.2	263.3	228.8	302.2	375.6	354	371.3	418.7	461.9	444.7	410.1	4317
1998	436.1	343	298.9	259.7	343	426.3	401.8	421.4	475.3	524.3	504.7	465.5	4900
1999	462	363	317	275	363	451	425	446	503	555	534	493	5189
Averages:	209.5	164.8	143.6	124.8	164.8	204.8	193.1	202.5	228.4	251.9	242.5	223.7	2354
Distribution of annual total flow by month													
	0.089	0.07	0.061	0.053	0.07	0.087	0.082	0.086	0.097	0.107	0.103	0.095	

Table C:74 - Measured Flows UT 74 Spanish Fork WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	116.5	112.6	117.8	93.4	83.2	110.1	97.3	105	105	111.4	113.9	113.9	1280
1951	119.2	115.3	120.5	95.6	85.2	112.7	99.6	107.4	107.4	114	116.6	116.6	1310
1952	121.9	117.9	123.3	97.8	87.1	115.2	101.8	109.9	109.9	116.6	119.3	119.3	1340
1953	124.7	120.6	126	100	89.1	117.8	104.1	112.3	112.3	119.2	121.9	121.9	1370
1954	127.4	123.2	128.8	102.2	91	120.4	106.4	114.8	114.8	121.8	124.6	124.6	1400
1955	130.1	125.8	131.6	104.4	93	123	108.7	117.3	117.3	124.4	127.3	127.3	1430
1956	132.9	128.5	134.3	106.6	94.9	125.6	111	119.7	119.7	127	129.9	129.9	1460
1957	135.6	131.1	137.1	108.8	96.9	128.1	113.2	122.2	122.2	129.6	132.6	132.6	1490
1958	138.3	133.8	139.8	111	98.8	130.7	115.5	124.6	124.6	132.2	135.3	135.3	1520
1959	141.1	136.4	142.6	113.2	100.8	133.3	117.8	127.1	127.1	134.9	138	138	1550
1960	143.8	139	145.4	115.3	102.7	135.9	120.1	129.6	129.6	137.5	140.6	140.6	1580
1961	149.8	144.8	151.4	120.2	107	141.6	125.1	135	135	143.2	146.5	146.5	1646
1962	155.9	150.7	157.6	125	111.3	147.3	130.2	140.5	140.5	149	152.5	152.5	1713
1963	162.1	156.7	163.9	130	115.8	153.2	135.4	146	146	154.9	158.5	158.5	1781
1964	168.2	162.6	170	134.9	120.1	158.9	140.4	151.5	151.5	160.8	164.5	164.5	1848
1965	174.3	168.5	176.2	139.8	124.5	164.7	145.5	157	157	166.6	170.4	170.4	1915
1966	180.5	174.5	182.4	144.8	128.9	170.5	150.7	162.6	162.6	172.5	176.5	176.5	1983
1967	186.6	180.4	188.6	149.7	133.3	176.3	155.8	168.1	168.1	178.4	182.5	182.5	2050
1968	192.6	186.3	194.8	154.5	137.6	182.1	160.9	173.6	173.6	184.2	188.4	188.4	2117
1969	198.8	192.3	201	159.5	142	187.9	166.1	179.2	179.2	190.1	194.5	194.5	2185
1970	204.9	198.2	207.2	164.4	146.4	193.7	171.2	184.7	184.7	195.9	200.4	200.4	2252
1971	211.1	204.2	213.4	169.4	150.8	199.5	176.3	190.2	190.2	201.8	206.5	206.5	2320
1972	217.2	210.1	219.6	174.3	155.2	205.3	181.4	195.7	195.7	207.7	212.4	212.4	2387
1973	223.3	216	225.8	179.1	159.5	211	186.5	201.2	201.2	213.5	218.4	218.4	2454
1974	229.5	221.9	232	184.1	163.9	216.9	191.7	206.8	206.8	219.4	224.5	224.5	2522
1975	235.6	227.8	238.2	189	168.3	222.7	196.8	212.3	212.3	225.2	230.4	230.4	2589
1976	241.7	233.7	244.4	193.9	172.6	228.4	201.9	217.8	217.8	231.1	236.4	236.4	2656
1977	247.9	239.7	250.6	198.9	177.1	234.3	207	223.4	223.4	237	242.4	242.4	2724
1978	254	245.6	256.8	203.7	181.4	240	212.1	228.9	228.9	242.8	248.4	248.4	2791
1979	303.7	293.7	307	243.6	216.9	287	253.6	273.6	273.6	290.3	297	297	3337
1980	273.4	264.4	276.4	219.3	195.3	258.3	228.3	246.3	246.3	261.3	267.4	267.4	3004
1981	250.3	242.1	253.1	200.8	178.8	236.6	209.1	225.6	225.6	239.3	244.8	244.8	2751
1982	265.4	256.6	268.3	212.9	189.5	250.8	221.6	239.1	239.1	253.7	259.5	259.5	2916
1983	287.2	277.7	290.4	230.4	205.1	271.4	239.9	258.8	258.8	274.6	280.9	280.9	3156
1984	273.5	264.5	276.6	219.4	195.4	258.5	228.5	246.5	246.5	261.5	267.5	267.5	3006
1985	265.7	257	268.6	213.2	189.8	251.1	221.9	239.4	239.4	254	259.9	259.9	2920
1986	278.3	269.1	281.3	223.2	198.8	263	232.4	250.8	250.8	266	272.2	272.2	3058
1987	252.9	244.6	255.7	202.9	180.6	239	211.2	227.9	227.9	241.8	247.3	247.3	2779
1988	211.9	205	214.3	170	151.4	200.3	177	191	191	202.6	207.3	207.3	2329
1989	216.6	209.4	219	173.7	154.7	204.7	180.9	195.2	195.2	207.1	211.8	211.8	2380
1990	229	221.5	231.6	183.7	163.6	216.5	191.3	206.4	206.4	219	224	224	2517
1991	222.7	215.3	225.1	178.6	159.1	210.4	186	200.7	200.7	212.9	217.8	217.8	2447
1992	251.2	242.9	253.9	201.5	179.4	237.4	209.8	226.3	226.3	240.1	245.6	245.6	2760
1993	268.9	260	271.9	215.7	192.1	254.1	224.6	242.3	242.3	257.1	263	263	2955
1994	244.6	236.5	247.3	196.2	174.7	231.2	204.3	220.4	220.4	233.9	239.2	239.2	2688
1995	258.3	249.8	261.2	207.2	184.5	244.2	215.8	232.8	232.8	247	252.7	252.7	2839
1996	308	297.9	311.4	247.1	220	291.1	257.3	277.6	277.6	294.5	301.3	301.3	3385
1997	322	311.3	325.5	258.3	230	304.3	268.9	290.1	290.1	307.8	314.9	314.9	3538
1998	348.5	337	352.4	279.6	249	329.4	291.1	314.1	314.1	333.2	340.9	340.9	3830
1999	377	364	381	302	269	356	314	339	339	360	368	368	4138
Averages:	169.5	163.9	171.3	136	121.1	160.2	141.5	152.7	152.7	162	165.8	165.8	1862
Distribution of annual total flow by month													
	0.091	0.088	0.092	0.073	0.065	0.086	0.076	0.082	0.082	0.087	0.089	0.089	

Table C:75 - Measured Flows UT 75 Salem WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	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
1960	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
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	45.2	41.3	43	41.3	39.7	47.3	49	41.3	49	43.5	50.6	52.8	544
1965	45.4	41.6	43.2	41.6	39.9	47.6	49.2	41.6	49.2	43.8	50.9	53.1	547
1966	45.6	41.7	43.4	41.7	40.1	47.8	49.4	41.7	49.4	43.9	51.1	53.3	549
1967	45.8	42	43.6	42	40.3	48	49.7	42	49.7	44.2	51.3	53.5	552
1968	46.1	42.2	43.8	42.2	40.5	48.3	50	42.2	50	44.4	51.6	53.8	555
1969	46.2	42.3	44	42.3	40.7	48.5	50.1	42.3	50.1	44.6	51.8	54	557
1970	46.5	42.6	44.2	42.6	40.9	48.7	50.4	42.6	50.4	44.8	52.1	54.3	560
1971	47.6	43.6	45.3	43.6	41.9	49.9	51.7	43.6	51.7	45.9	53.4	55.7	574
1972	48.9	44.8	46.5	44.8	43	51.2	53	44.8	53	47.1	54.8	57.1	589
1973	41.7	38.2	39.7	38.2	36.7	43.8	45.3	38.2	45.3	40.2	46.8	48.8	503
1974	42.9	39.3	40.8	39.3	37.7	45	46.5	39.3	46.5	41.4	48.1	50.1	517
1975	44.2	40.4	42	40.4	38.8	46.3	47.9	40.4	47.9	42.6	49.5	51.6	532
1976	45.3	41.5	43.1	41.5	39.9	47.5	49.1	41.5	49.1	43.7	50.8	53	546
1977	46.5	42.6	44.2	42.6	40.9	48.7	50.4	42.6	50.4	44.8	52.1	54.3	560
1978	47.7	43.7	45.4	43.7	42	50	51.8	43.7	51.8	46	53.5	55.8	575
1979	48.9	44.8	46.5	44.8	43	51.2	53	44.8	53	47.1	54.8	57.1	589
1980	53.1	48.6	50.6	48.6	46.7	55.7	57.6	48.6	57.6	51.2	59.5	62.1	640
1981	74.4	68.1	70.8	68.1	65.4	78	80.6	68.1	80.6	71.7	83.3	86.9	896
1982	92	84.3	87.6	84.3	81	96.5	99.8	84.3	99.8	88.7	103.1	107.6	1109
1983	148.3	135.8	141.2	135.8	130.5	155.5	160.8	135.8	160.8	143	166.2	173.3	1787
1984	66.3	60.7	63.1	60.7	58.3	69.5	71.9	60.7	71.9	63.9	74.3	77.5	799
1985	67.2	61.6	64	61.6	59.1	70.5	72.9	61.6	72.9	64.8	75.3	78.6	810
1986	76.4	70	72.8	70	67.2	80.1	82.9	70	82.9	73.7	85.7	89.3	921
1987	62	56.8	59	56.8	54.5	65	67.2	56.8	67.2	59.8	69.5	72.5	747
1988	57.7	52.8	54.9	52.8	50.7	60.5	62.6	52.8	62.6	55.6	64.6	67.4	695
1989	57.7	52.8	54.9	52.8	50.7	60.5	62.6	52.8	62.6	55.6	64.6	67.4	695
1990	57.7	52.8	54.9	52.8	50.7	60.5	62.6	52.8	62.6	55.6	64.6	67.4	695
1991	57.7	52.8	54.9	52.8	50.7	60.5	62.6	52.8	62.6	55.6	64.6	67.4	695
1992	60.6	55.5	57.7	55.5	53.3	63.5	65.7	55.5	65.7	58.4	67.9	70.8	730
1993	60.6	55.5	57.7	55.5	53.3	63.5	65.7	55.5	65.7	58.4	67.9	70.8	730
1994	57.3	52.4	54.5	52.4	50.4	60	62.1	52.4	62.1	55.2	64.2	66.9	690
1995	64.7	59.3	61.6	59.3	56.9	67.9	70.2	59.3	70.2	62.4	72.5	75.7	780
1996	69.7	63.8	66.4	63.8	61.3	73.1	75.6	63.8	75.6	67.2	78.1	81.5	840
1997	73.9	67.6	70.3	67.6	65	77.4	80.1	67.6	80.1	71.2	82.8	86.3	890
1998	78.9	72.2	75.1	72.2	69.4	82.7	85.5	72.2	85.5	76	88.4	92.2	950
1999	75	68	71	68	66	78	81	68	81	72	84	87	900
Averages:	30	27.5	28.6	27.5	26.4	31.5	32.5	27.5	32.5	28.9	33.6	35.1	362
Distribution of annual total flow by month													
	0.083	0.076	0.079	0.076	0.073	0.087	0.09	0.076	0.09	0.08	0.093	0.097	

Table C:76 - Measured Flows UT 76 Payson WWTP

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
1950	50.2	43.4	40.5	36	32	34.8	38.3	43.4	53.1	67.9	71.4	60	571
1951	50.5	43.6	40.8	36.2	32.1	35	38.5	43.6	53.4	68.3	71.8	60.3	574
1952	50.9	43.9	41	36.4	32.4	35.3	38.7	43.9	53.8	68.8	72.3	60.7	578
1953	51.1	44.2	41.3	36.6	32.5	35.4	38.9	44.2	54	69.1	72.6	61	581
1954	51.5	44.5	41.5	36.9	32.8	35.7	39.2	44.5	54.4	69.6	73.1	61.4	585
1955	51.7	44.7	41.7	37	32.9	35.9	39.4	44.7	54.7	70	73.5	61.7	588
1956	52	44.9	42	37.2	33.1	36.1	39.6	44.9	55	70.3	73.9	62.1	591
1957	52.4	45.2	42.2	37.5	33.3	36.3	39.9	45.2	55.3	70.8	74.4	62.5	595
1958	52.6	45.4	42.5	37.7	33.5	36.5	40.1	45.4	55.6	71.2	74.8	62.8	598
1959	53	45.8	42.7	37.9	33.7	36.7	40.3	45.8	56	71.6	75.3	63.2	602
1960	53.2	46	43	38.1	33.9	36.9	40.5	46	56.3	72	75.6	63.5	605
1961	53.5	46.2	43.2	38.3	34	37.1	40.7	46.2	56.5	72.4	76	63.8	608
1962	53.9	46.5	43.5	38.6	34.3	37.3	41	46.5	56.9	72.8	76.5	64.3	612
1963	54.1	46.7	43.7	38.7	34.4	37.5	41.2	46.7	57.2	73.2	76.9	64.6	615
1964	54.5	47	43.9	39	34.7	37.8	41.5	47	57.6	73.7	77.4	65	619
1965	54.7	47.3	44.2	39.2	34.8	37.9	41.7	47.3	57.8	74	77.8	65.3	622
1966	55	47.5	44.4	39.4	35	38.1	41.9	47.5	58.1	74.4	78.1	65.6	625
1967	55.4	47.8	44.7	39.6	35.2	38.4	42.1	47.8	58.5	74.9	78.6	66	629
1968	55.6	48	44.9	39.8	35.4	38.6	42.3	48	58.8	75.2	79	66.4	632
1969	56	48.3	45.2	40.1	35.6	38.8	42.6	48.3	59.1	75.7	79.5	66.8	636
1970	56.2	48.6	45.4	40.3	35.8	39	42.8	48.6	59.4	76	79.9	67.1	639
1971	59.9	51.8	48.4	42.9	38.1	41.5	45.6	51.8	63.3	81	85.1	71.5	681
1972	63.6	54.9	51.3	45.5	40.5	44.1	48.4	54.9	67.2	86	90.4	75.9	723
1973	67.2	58.1	54.2	48.1	42.8	46.6	51.2	58.1	71.1	90.9	95.5	80.2	764
1974	70.9	61.3	57.2	50.8	45.1	49.2	54	61.3	75	95.9	100.8	84.6	806
1975	74.6	64.4	60.2	53.4	47.5	51.7	56.8	64.4	78.9	100.9	106	89	848
1976	78.3	67.6	63.2	56.1	49.8	54.3	59.6	67.6	82.8	105.9	111.3	93.5	890
1977	81.9	70.8	66.1	58.7	52.1	56.8	62.4	70.8	86.6	110.8	116.4	97.8	931
1978	85.6	73.9	69.1	61.3	54.5	59.4	65.2	73.9	90.5	115.8	121.6	102.2	973
1979	89.3	77.1	72.1	63.9	56.8	61.9	68	77.1	94.4	120.8	126.9	106.6	1015
1980	92.8	80.1	74.8	66.4	59	64.3	70.6	80.1	98	125.4	131.8	110.7	1054
1981	85	73.4	68.6	60.9	54.1	58.9	64.7	73.4	89.8	115	120.8	101.4	966
1982	90.1	77.8	72.7	64.5	57.3	62.5	68.6	77.8	95.2	121.9	128	107.5	1024
1983	97.5	84.2	78.7	69.8	62	67.6	74.2	84.2	103	131.9	138.5	116.3	1108
1984	92.8	80.2	74.9	66.5	59.1	64.4	70.7	80.2	98.1	125.5	131.9	110.8	1055
1985	90.2	77.9	72.8	64.6	57.4	62.5	68.7	77.9	95.3	122	128.1	107.6	1025
1986	94.4	81.5	76.2	67.6	60.1	65.5	71.9	81.5	99.8	127.7	134.1	112.7	1073
1987	85.8	74.1	69.2	61.4	54.6	59.5	65.3	74.1	90.7	116	121.9	102.4	975
1988	83.1	71.7	67	59.5	52.9	57.6	63.2	71.7	87.8	112.3	118	99.1	944
1989	83.5	72.1	67.4	59.8	53.1	57.9	63.6	72.1	88.3	112.9	118.6	99.6	949
1990	79.4	68.6	64	56.8	50.5	55	60.4	68.6	83.9	107.3	112.8	94.7	902
1991	119.4	103.1	96.3	85.5	76	82.8	90.9	103.1	126.2	161.5	169.6	142.5	1357
1992	92.4	79.8	74.6	66.2	58.8	64.1	70.4	79.8	97.7	125	131.3	110.3	1050
1993	92.4	79.8	74.6	66.2	58.8	64.1	70.4	79.8	97.7	125	131.3	110.3	1050
1994	88	76	71	63	56	61	67	76	93	119	125	105	1000
1995	93.3	80.6	75.3	66.8	59.4	64.7	71	80.6	98.6	126.1	132.5	111.3	1060
1996	98.6	85.1	79.5	70.6	62.7	68.3	75	85.1	104.2	133.3	140	117.6	1120
1997	93.3	80.6	75.3	66.8	59.4	64.7	71	80.6	98.6	126.1	132.5	111.3	1060
1998	105.6	91.2	85.2	75.6	67.2	73.2	80.4	91.2	111.6	142.8	150	126	1200
1999	117	101	95	84	75	51	59	101	124	159	167	140	1334
Averages:	57.6	49.7	46.5	41.2	36.6	39.9	43.8	49.7	60.9	77.9	81.8	68.7	654
Distribution of annual total flow by month													
	0.088	0.076	0.071	0.063	0.056	0.061	0.067	0.076	0.093	0.119	0.125	0.105	

APPENDIX D - Precipitation Inflow Calculations

Table D:1 - Provo Bay Precipitation

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1980 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
GENEVA ACTUAL	2.21	0.97	0.20	3.53	3.41	1.17	0.36	2.21	0.08	0.21	0.67	1.14
GENEVA WEIGHTED	2.21	0.97	0.20	3.53	3.41	1.17	0.36	2.21	0.08	0.21	0.67	1.14
PROVO BYU ACTUAL	-	-	-	-	-	-	-	-	-	-	-	-
PROVO BYU WEIGHTED	-	-	-	-	-	-	-	-	-	-	-	-
LAKE ELEVATION (ft)	4486.14	4486.37	4486.74	4487.29	4488.04	4488.63	4489.13	4489.91	4490.78	4489.66	4488.91	4488.41
AREA (Acres))	4510	4699	5055	5973	6063	6486	6824	7320	7853	7165	6678	6331
WEIGHTED PRECIP (in)	2.21	0.97	0.20	3.53	3.41	1.17	0.36	2.21	0.08	0.21	0.67	1.14
VOLUME (Ac-ft)	831	380	84	1757	1723	632	205	1348	52	125	373	601

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1981 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
GENEVA ACTUAL	6.38	1.35	1.37	0.80	0.29	1.85	0.49	3.76	0.36	0.10	0.17	0.89
GENEVA WEIGHTED	0.28	0.06	0.06	0.03	0.01	0.07	0.02	0.15	0.01	0.00	0.01	0.04
PROVO BYU ACTUAL	2.41	1.41	0.76	1.22	0.66	3.61	1.12	4.17	0.50	0.63	0.56	1.82
PROVO BYU WEIGHTED	2.30	1.35	0.73	1.17	0.63	3.46	1.07	4.00	0.48	0.60	0.54	1.75
LAKE ELEVATION (ft)	4488.36	4488.65	4488.97	4489.21	4489.28	4489.30	4489.32	4489.25	4489.14	4488.36	4487.44	4486.81
AREA (Acres))	6295	6500	6718	6877	6923	6936	6949	6903	6831	6295	5602	[illegible]
WEIGHTED PRECIP (in)	2.58	1.41	0.79	1.20	0.64	3.53	1.09	4.15	0.49	0.60	0.55	[illegible]
VOLUME (Ac-ft)	1353	764	442	688	369	2040	631	2387	279	315	257	[illegible]

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1982 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
*GENEVA ACTUAL	3.49	0.24	1.65	1.34	0.79	2.00	0.52	1.50	0.48	1.56	0.39	5.75
*GENEVA WEIGHTED	0.14	0.01	0.07	0.06	0.03	0.08	0.02	0.06	0.02	0.06	0.02	0.23
PROVO BYU ACTUAL	5.05	0.84	2.48	2.26	1.41	3.01	1.21	1.91	0.62	0.70	0.22	6.53
PROVO BYU WEIGHTED	4.85	0.80	2.37	2.16	1.35	2.89	1.16	1.84	0.60	0.67	0.21	6.27
LAKE ELEVATION (ft)	4486.94	4487.29	4487.60	4488.17	4488.56	4489.09	4489.47	4490.28	4490.66	4490.18	4489.63	4489.32
AREA (Acres))	5193	5482	5728	6158	6437	6796	7045	7548	7780	7486	7146	6949
WEIGHTED PRECIP (in)	4.99	0.81	2.44	2.22	1.38	2.97	1.18	1.90	0.62	0.73	0.23	6.50
VOLUME (Ac-ft)	2159	370	1165	1139	740	1683	693	1195	402	455	137	3764

*Changed to Orem Treatment Plant in August 1982

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1983 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.94	1.57	1.02	1.38	2.63	1.74	1.38	1.84	0.88	1.12	2.28	1.33
OREM TP WEIGHTED	0.07	0.06	0.04	0.05	0.09	0.06	0.04	0.05	0.02	0.03	0.06	0.04
PROVO BYU ACTUAL	2.82	1.80	2.31	2.22	3.93	3.41	1.95	4.04	0.97	2.11	4.38	2.37
ROVO BYU WEIGHTED	2.71	1.73	2.23	2.14	3.80	3.30	1.89	3.92	0.95	2.06	4.26	2.30
LAKE ELEVATION (ft)	4489.84	4490.29	4490.70	4490.93	4491.16	4491.58	4491.79	4492.40	4493.93	4493.59	4492.77	4492.19
AREA (Acres))	7277	7554	7805	7944	8083	8335	8460	8821	9707	9512	9038	8697
EIGHTED PRECIP (in)	2.78	1.79	2.27	2.19	3.89	3.36	1.93	3.97	0.97	2.09	4.32	2.34
VOLUME (Ac-ft)	1686	1127	1476	1450	2620	2334	1361	2918	785	1657	3254	1696

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1984 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	0.59	2.24	3.35	0.46	0.56	0.38	1.66	0.33	2.43	0.90	1.77	1.39
OREM TP WEIGHTED	0.02	0.07	0.10	0.01	0.02	0.01	0.03	0.01	0.05	0.02	0.03	0.04
PROVO BYU ACTUAL	1.39	4.20	6.00	1.05	1.53	1.98	3.77	0.91	4.01	2.80	2.55	1.71
PROVO BYU WEIGHTED	1.35	4.07	5.83	1.02	1.49	1.92	3.67	0.89	3.92	2.73	2.48	1.66
ELEVATION (ft)	4492.06	4492.17	4492.48	4492.79	4492.60	4492.60	4492.89	4493.85	4494.54	4493.65	4492.64	4491.86
EA (Acres))	8620	8685	8868	9049	8938	8938	9107	9661	10059	9547	8962	8502
HTED PRECIP (in)	1.37	4.14	5.93	1.03	1.51	1.93	3.70	0.90	3.97	2.75	2.51	1.70
VOLUME (Ac-ft)	984	2996	4382	777	1125	1438	2808	725	3328	2188	1875	1204

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1985 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.49	1.04	0.74	0.84	0.79	1.60	0.27	1.89	1.76	1.20	0.08	0.80
OREM TP WEIGHTED	0.05	0.03	0.02	0.03	0.02	0.05	0.01	0.05	0.05	0.04	0.00	0.03
PROVO BYU ACTUAL	3.26	1.90	1.48	2.07	1.59	2.99	0.43	2.56	1.94	1.58	0.07	1.87
PROVO BYU WEIGHTED	3.16	1.84	1.43	2.01	1.54	2.90	0.42	2.49	1.88	1.53	0.07	1.80
LAKE ELEVATION (ft)	4491.75	4491.85	4491.89	4492.00	4492.06	4492.15	4492.40	4492.73	4492.29	4491.50	4490.77	4490.15
AREA (Acres))	8437	8496	8520	8585	8620	8674	8821	9014	8756	8287	7847	7468
WEIGHTED PRECIP (in)	3.21	1.87	1.45	2.04	1.56	2.95	0.43	2.54	1.93	1.57	0.07	1.83
VOLUME (Ac-ft)	2257	1324	1030	1459	1121	2132	316	1908	1408	1084	46	1139

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1986 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.76	1.97	0.90	0.87	2.79	2.53	2.82	1.29	0.68	0.76	1.02	1.89
OREM TP WEIGHTED	0.07	0.07	0.03	0.03	0.10	0.08	0.08	0.03	0.02	0.02	0.04	0.07
PROVO BYU ACTUAL	2.39	3.52	2.45	1.39	3.28	3.35	4.10	2.09	0.30	2.07	1.71	2.86
PROVO BYU WEIGHTED	2.30	3.39	2.36	1.34	3.16	3.24	3.99	2.03	0.29	2.00	1.65	2.75
LAKE ELEVATION (ft)	4489.97	4490.08	4490.26	4490.35	4490.63	4491.76	4492.73	4493.13	4492.84	4491.72	4490.71	4489.84
AREA (Acres))	7357	7424	7535	7591	7762	8443	9014	9247	9078	8419	7811	7277
WEIGHTED PRECIP (in)	2.37	3.46	2.39	1.37	3.26	3.32	4.07	2.06	0.31	2.02	1.69	2.82
VOLUME (Ac-ft)	1453	2141	1501	867	2109	2336	3057	1587	235	1417	1100	1710

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1987 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	0.62	0.69	0.15	0.70	1.02	0.88	0.05	1.63	0.15	1.08	1.87	0.20
OREM TP WEIGHTED	0.02	0.03	0.01	0.03	0.04	0.04	0.00	0.07	0.01	0.05	0.07	0.01
PROVO BYU ACTUAL	1.01	1.60	0.40	1.82	2.23	1.76	0.46	2.06	0.24	1.70	1.75	0.10
PROVO BYU WEIGHTED	0.97	1.54	0.38	1.75	2.14	1.69	0.44	1.97	0.23	1.63	1.68	0.[illegible]
LAKE ELEVATION (ft)	4489.61	4489.53	4489.45	4489.39	4489.27	4489.18	4488.95	4488.62	4488.23	4487.45	4486.83	44[illegible]
AREA (Acres))	7134	7083	7032	6994	6916	6857	6704	6479	6202	5610	5099	471[illegible]
WEIGHTED PRECIP (in)	0.99	1.57	0.39	1.78	2.18	1.73	0.44	2.04	0.24	1.68	1.75	0.11
VOLUME (Ac-ft)	589	927	229	1037	1256	989	246	1101	124	785	744	43

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1988 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.53	1.25	0.62	1.02	0.00	0.35	1.19	0.99	0.04	0.82	0.66	0.69
OREM TP WEIGHTED	0.06	0.05	0.03	0.04	0.00	0.02	0.05	0.04	0.00	0.03	0.02	0.02
PROVO BYU ACTUAL	1.44	1.92	1.83	1.49	0.21	0.84	1.70	1.38	0.36	0.41	0.63	0.68
PROVO BYU WEIGHTED	1.39	1.85	1.76	1.43	0.20	0.80	1.63	1.32	0.34	0.39	0.61	0.66
LAKE ELEVATION (ft)	4486.16	4486.64	4487.06	4487.59	4488.01	4488.47	4488.76	4488.66	4488.13	4486.99	4485.93	4485.32
AREA (Acres))	4498	4934	5293	5721	6040	6374	6575	6507	6129	5235	4235	3323
WEIGHTED PRECIP (in)	1.45	1.90	1.79	1.47	0.20	0.82	1.68	1.36	0.34	0.42	0.63	0.68
VOLUME (Ac-ft)	544	781	790	702	101	436	921	737	174	183	222	188

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1989 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	0.64	0.98	0.77	0.25	1.17	1.15	1.44	0.48	0.26	0.54	0.90	1.55
OREM TP WEIGHTED	0.01	0.02	0.02	0.01	0.04	0.05	0.06	0.04	0.01	0.01	0.00	0.00
PROVO BYU ACTUAL	0.69	2.67	1.53	0.81	2.62	2.14	1.45	0.72	1.08	0.53	1.62	1.88
ROVO BYU WEIGHTED	0.68	2.62	1.49	0.79	2.52	2.05	1.39	0.69	1.04	0.52	1.62	1.88
LAKE ELEVATION (ft)	4484.75	4484.93	4485.27	4485.55	4486.20	4486.90	4487.25	4486.80	4486.05	4484.80	4483.60	4483.55
AREA (Acres))	2558	2790	3252	3655	4536	5159	5450	5073	4394	2021	1267	1219
VEIGHTED PRECIP (in)	0.69	2.64	1.51	0.80	2.56	2.10	1.45	0.73	1.05	0.53	1.62	1.88
VOLUME (Ac-ft)	147	614	409	244	968	903	659	309	384	89	171	191

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1990 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	0.80	0.96	0.08	0.89	0.79	1.01	0.64	0.90	1.11	0.31	0.73	0.64
OREM TP WEIGHTED	0.00	0.00	0.00	0.02	0.02	0.04	0.02	0.03	0.03	0.00	0.00	0.00
PROVO BYU ACTUAL	1.19	1.23	0.15	1.52	1.94	1.95	1.55	1.35	2.05	0.42	0.59	0.93
PROVO BYU WEIGHTED	1.19	1.23	0.15	1.49	1.89	1.88	1.49	1.31	2.00	0.42	0.59	0.93
LAKE ELEVATION (ft)	4483.60	4484.05	4484.45	4485.02	4485.48	4486.06	4486.25	4485.72	4485.31	4484.45	4483.40	4482.61
AREA (Acres))	1267	1732	2189	2909	3553	4403	4582	3910	3308	2189	1077	424
GHTED PRECIP (in)	1.19	1.23	0.15	1.51	1.91	1.92	1.51	1.34	2.03	0.42	0.59	0.93
VOLUME (Ac-ft)	126	178	27	366	566	704	577	437	560	77	53	33

PROVO BAY
UTAH LAKE PRECIPITATION DATA (inches)

1991 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.74	1.07	0.60	0.95	0.40	0.70	1.21	1.73	0.66	1.17	2.54	1.21
OREM TP WEIGHTED	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.01	0.00	0.00	0.00
PROVO BYU ACTUAL	1.77	1.41	1.58	1.33	0.90	1.82	2.42	2.44	1.06	0.30	1.98	2.43
PROVO BYU WEIGHTED	1.77	1.41	1.58	1.33	0.90	1.80	2.39	2.40	1.04	0.30	1.98	2.43
LAKE ELEVATION (ft)	4482.52	4482.72	4483.05	4483.48	4483.87	4484.49	4484.70	4484.76	4484.88	4483.99	4483.01	4482.57
AREA (Acres))	359	505	769	1152	1540	2236	2494	2570	2725	1667	735	395
WEIGHTED PRECIP (in)	1.77	1.41	1.58	1.33	0.90	1.81	2.41	2.43	1.05	0.30	1.98	2.43
VOLUME (Ac-ft)	53	59	101	128	116	337	501	520	238	42	121	80

Table D:1 - Provo Bay Precipitation

PROVO BAY MONTHLY PRECIPITATION DATA (inches) 1992 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.21	1.64	0.34	0.37	1.44	0.45	0.14	1.20	0.75	0.98	0.30	1.06
Orem Weighted	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Provo Actual	1.83	2.63	0.68	0.87	2.35	1.39	0.39	1.62	0.89	1.13	1.28	0.89
Provo Weighted	1.83	2.62	0.68	0.87	2.34	1.39	0.39	1.62	0.89	1.13	1.28	0.89
Lake Elevation	4482.52	4482.82	4483.27	483.76	4484.27	4484.70	4484.75	4484.27	4483.52	4482.53	4481.40	4481.16
Area (acres)	359	582	959	1427	1978	2494	2558	1978	1190	366	18	16
Weighted Precip. (in)	1.83	2.63	0.68	0.87	2.35	1.39	0.39	1.62	0.89	1.13	1.28	0.89
Volume (Ac-ft)	55	127	54	103	387	288	83	267	88	34	2	1

PROVO BAY MONTHLY PRECIPITATION DATA (inches) 1993 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.36	1.15	1.60	1.84	1.45	2.54	0.48	2.45	1.31	0.79	0.62	1.09
Orem Weighted	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.09	0.05	0.03	0.02	0.04
Provo Actual	3.04	2.06	1.97	4.60	3.21	2.87	0.87	3.15	1.70	1.09	1.03	0.94
Provo Weighted	3.03	2.05	1.96	4.59	3.20	2.86	0.84	3.04	1.64	1.05	0.99	0.91
Lake Elevation	4481.46	4481.70	4482.15	4482.81	4483.61	4484.47	4485.21	4486.03	4486.82	4486.74	4486.12	4485.71
Area (acres)	18	20	113	575	1277	2212	3168	4375	5091	5021	4460	3895
Weighted Precip. (in)	3.04	2.06	1.97	4.59	3.21	2.87	0.86	3.12	1.69	1.08	1.02	0.95
Volume (Ac-ft)	5	3	19	220	341	529	226	1139	715	452	377	307

PROVO BAY MONTHLY PRECIPITATION DATA (inches) 1994 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.14	0.34	0.10	0.40	1.11	0.79	2.83	0.98	0.00	0.18	1.02	0.73
Orem Weighted	0.08	0.01	0.00	0.01	0.05	0.04	0.13	0.04	0.00	0.01	0.04	0.00
Provo Actual	2.54	0.68	1.24	0.93	2.13	1.23	2.55	1.21	0.08	0.09	1.28	0.74
Provo Weighted	2.45	0.66	1.19	0.90	2.03	1.17	2.44	1.16	0.08	0.09	1.23	0.74
Lake Elevation	4485.78	4486.14	4486.52	4486.89	4487.32	4487.68	4487.91	4487.82	4487.24	4486.34	4485.49	4484.87
Area (acres)	4002	4479	4828	5142	5506	5790	5966	5898	5442	4665	3567	2712
Weighted Precip. (in)	2.53	0.67	1.20	0.91	2.08	1.21	2.56	1.20	0.08	0.09	1.27	0.74
Volume (Ac-ft)	842	249	482	390	956	584	1274	590	35	36	378	167

PROVO BAY MONTHLY PRECIPITATION DATA (inches) 1995 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.97	0.78	1.02	1.16	0.25	1.13	1.25	4.81	1.08	0.65	0.48	0.33
Orem Weighted	0.01	0.03	0.04	0.04	0.01	0.05	0.06	0.22	0.04	0.02	0.02	0.01
Provo Actual	3.87	2.74	1.61	3.01	1.02	2.57	1.89	5.11	2.48	1.00	0.59	0.58
Provo Weighted	3.86	2.64	1.55	2.90	0.98	2.45	1.80	4.88	2.39	0.96	0.56	0.55
Lake Elevation	4484.78	4485.17	4485.54	4486.04	4486.59	4487.03	4487.46	4488.34	4489.20	4489.17	4488.66	4488.12
Area (acres)	2596	3113	3641	4384	4890	5286	5618	6281	6870	6851	6507	6122
Weighted Precip. (in)	3.87	2.67	1.59	2.94	0.99	2.51	1.86	5.10	2.43	0.99	0.59	0.57
Volume (Ac-ft)	837	692	482	1075	404	1104	871	2668	1390	563	317	290

Table D:1 Cont.

PROVO BAY MONTHLY PRECIPITATION DATA (inches)
1996 Water Year

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	0.45	0.48	1.03	2.93	2.11	1.53	0.66	0.94	0.19	0.25	0.02	1.90
Orem Weighted	0.02	0.02	0.05	0.13	0.08	0.06	0.02	0.04	0.01	0.01	0.00	0.09
Provo Actual	0.60	0.75	2.54	3.06	2.59	2.59	1.91	1.71	0.55	0.55	0.07	1.70
Provo Weighted	0.57	0.72	2.43	2.92	2.49	2.49	1.84	1.65	0.53	0.53	0.07	1.62
Lake Elevation	4488.01	4488.27	4488.65	4488.96	4489.23	4489.46	4489.55	4489.59	4489.37	4488.71	4487.91	4487.45
Area (acres)	6040	6231	6500	6711	6890	7039	7096	7121	6981	6541	5966	5610
Weighted Precip. (in)	0.59	0.74	2.47	3.05	2.57	2.55	1.86	1.68	0.54	0.54	0.07	1.71
Volume (Ac-ft)	299	383	1339	1708	1477	1496	1102	997	312	292	34	799

PROVO BAY MONTHLY PRECIPITATION DATA (inches)
1997 Water Year

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.70	1.83	0.98	2.94	1.18	0.14	1.31	1.35	0.62	0.37	0.72	1.49
Orem Weighted	0.08	0.08	0.04	0.13	0.04	0.01	0.05	0.05	0.02	0.01	0.03	0.07
Provo Actual	2.36	2.55	2.14	4.32	1.66	0.54	1.84	2.06	0.85	0.54	0.80	2.64
Provo Weighted	2.25	2.44	2.04	4.13	1.60	0.52	1.77	1.98	0.82	0.52	0.76	2.52
Lake Elevation	4487.39	4487.78	4488.34	4488.93	4489.49	4489.79	4489.93	4490.13	4490.11	4489.45	4488.77	4488.58
Area (acres)	5563	5867	6281	6691	7058	7246	7332	7455	7443	7032	6582	6451
Weighted Precip. (in)	2.33	2.52	2.09	4.26	1.64	0.52	1.82	2.03	0.84	0.53	0.80	2.59
Volume (Ac-ft)	1080	1231	1093	2374	966	317	1112	1263	522	313	437	1391

PROVO BAY MONTHLY PRECIPITATION DATA (inches)
1998 Water Year

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.05	1.41	0.83	1.89	2.51	1.62	1.26	1.27	2.85	0.98	0.37	0.37
Orem Weighted	0.05	0.06	0.04	0.07	0.09	0.06	0.05	0.05	0.11	0.04	0.01	0.02
Provo Actual	1.71	1.70	1.58	3.05	3.15	1.98	2.29	1.93	4.13	0.61	0.85	1.21
Provo Weighted	1.63	1.62	1.51	2.93	3.03	1.91	2.20	1.86	3.97	0.59	0.82	1.16
Lake Elevation	4488.78	4488.97	4488.99	4489.13	4489.38	4489.61	4489.79	4490.05	4490.35	4490.06	4489.32	4488.94
Area (acres)	6589	6718	6731	6824	6987	7134	7246	7406	7591	7412	6949	6698
Weighted Precip. (in)	1.68	1.69	1.55	3.01	3.13	1.97	2.25	1.91	4.08	0.62	0.83	1.17
Volume (Ac-ft)	923	944	867	1709	1820	1169	1359	1176	2582	385	482	654

PROVO BAY MONTHLY PRECIPITATION DATA (inches)
1999 Water Year

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	0.87	0.72	0.78	1.74	1.07	0.29	4.66	2.33	1.58	0.92	0.52	0.27
Orem Weighted	0.04	0.03	0.03	0.07	0.04	0.01	0.19	0.09	0.06	0.04	0.02	0.01
Provo Actual	1.48	1.38	0.76	2.48	1.31	0.59	4.56	3.72	1.66	0.78	1.17	0.17
Provo Weighted	1.42	1.32	0.73	2.38	1.26	0.57	4.38	3.57	1.59	0.75	1.12	0.16
Lake Elevation	4489.01	4489.22	4489.36	4489.47	4489.57	4489.53	4489.44	4489.59	4489.59	4489.09	4488.49	4488.1
Area (acres)	6745	6883	6974	7045	7109	7083	7026	7121	7121	6798	6388	6107
Weighted Precip. (in)	1.46	1.35	0.76	2.45	1.30	0.58	4.56	3.66	1.66	0.79	1.14	0.17
Volume (Ac-ft)	818	776	442	1439	770	341	2672	2175	983	445	608	89

Table D:2 - Main Lake Precipitation

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1980 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
GENEVA ACTUAL	2.21	0.97	0.20	3.53	3.41	1.17	0.36	2.21	0.08	0.21	0.67	1.14
GENEVA WEIGHTED	1.63	0.72	0.15	2.61	2.51	0.86	0.26	1.61	0.06	0.15	0.49	0.84
PAYSON ACTUAL	2.20	1.33	0.91	3.94	2.12	3.35	0.78	2.90	0.04	0.08	0.56	1.11
PAYSON WEIGHTED	0.12	0.07	0.05	0.22	0.12	0.20	0.05	0.19	0.00	0.01	0.03	0.07
LEHI ACTUAL	1.55	0.95	0.12	2.23	0.60	0.78	0.45	2.23	0.01	0.69	0.75	0.83
LEHI WEIGHTED	0.32	0.20	0.02	0.46	0.12	0.16	0.09	0.46	0.00	0.14	0.15	0.17
LAKE ELEVATION (ft)	4486.14	4486.37	4486.74	4487.29	4488.04	4488.63	4489.13	4489.91	4490.78	4489.66	4488.91	4488.41
AREA (Acres))	58476	58643	58927	59391	60087	60676	61199	62052	62972	61777	60966	60452
WEIGHTED PRECIP (in)	2.07	0.99	0.22	3.29	2.75	1.22	0.40	2.26	0.06	0.30	0.67	1.08
VOLUME (Ac-ft)	10087	4838	1080	16283	13770	6169	2040	11686	315	1544	3404	5441

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1981 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
GENEVA ACTUAL	6.38	1.35	1.37	0.80	0.29	1.85	0.49	3.76	0.36	0.10	0.17	0.89
GENEVA WEIGHTED	4.69	0.99	1.00	0.58	0.21	1.35	0.36	2.75	0.26	0.07	0.13	0.66
PAYSON ACTUAL	1.92	1.95	0.97	0.72	0.45	3.34	1.58	3.95	0.31	1.23	0.62	1.79
PAYSON WEIGHTED	0.10	0.10	0.05	0.04	0.03	0.19	0.09	0.22	0.02	0.06	0.03	0.09
LEHI ACTUAL	1.01	1.41	0.43	0.85	0.68	1.28	0.49	3.77	0.27	0.41	0.13	0.95
LEHI WEIGHTED	0.22	0.30	0.09	0.18	0.14	0.27	0.10	0.80	0.06	0.09	0.03	[illegible]
LAKE ELEVATION (ft)	4488.36	4488.65	4488.97	4489.21	4489.28	4489.3	4489.32	4489.25	4489.14	4488.36	4487.44	44[illegible]
AREA (Acres))	60402	60696	61029	61284	61359	61381	61403	61327	61210	60402	59524	58983
WEIGHTED PRECIP (in)	5.01	1.39	1.14	0.80	0.38	1.81	0.55	3.77	0.34	0.22	0.19	0.95
VOLUME (Ac-ft)	25218	7031	5798	4086	1943	9258	2814	19267	1734	1107	942	4669

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1982 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
*GENEVA ACTUAL	3.49	0.24	1.65	1.34	0.79	2.00	0.52	1.50	0.48	1.56	0.39	5.75
*GENEVA WEIGHTED	2.57	0.18	1.22	0.99	0.58	1.46	0.38	1.09	0.35	1.13	0.28	4.20
PAYSON ACTUAL	7.30	1.09	2.41	2.45	1.24	3.00	1.94	2.37	0.51	0.75	0.49	9.33
PAYSON WEIGHTED	0.35	0.05	0.12	0.12	0.06	0.16	0.11	0.15	0.03	0.05	0.03	0.52
LEHI ACTUAL	3.45	0.80	1.91	0.85	0.37	1.57	0.41	1.04	0.36	1.00	0.25	5.63
LEHI WEIGHTED	0.74	0.17	0.41	0.18	0.08	0.33	0.09	0.22	0.08	0.21	0.05	1.20
LAKE ELEVATION (ft)	4486.94	4487.29	4487.6	4488.17	4488.56	4489.09	4489.47	4490.28	4490.66	4490.18	4489.63	4489.32
AREA (Acres))	59091	59391	59670	60214	60604	61156	61565	62445	62843	62340	61744	61403
WEIGHTED PRECIP (in)	3.66	0.40	1.75	1.29	0.72	1.95	0.58	1.46	0.46	1.39	0.36	5.92
VOLUME (Ac-ft)	18023	1980	8702	6473	3636	9938	2976	7597	2409	7221	1852	30292

Changed to Orem Treatment Plant in August 1982

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1983 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.94	1.57	1.02	1.38	2.63	1.74	1.38	1.84	0.88	1.12	2.28	1.33
OREM TP WEIGHTED	1.41	1.14	0.74	1.00	1.89	1.25	0.99	1.31	0.62	0.79	1.62	0.95
PAYSON ACTUAL	3.45	1.54	1.25	2.22	3.90	3.55	1.85	3.20	1.05	1.39	2.60	2.40
PAYSON WEIGHTED	0.20	0.09	0.08	0.14	0.26	0.24	0.13	0.23	0.09	0.11	0.20	0.17
LEHI ACTUAL	1.88	1.24	0.81	1.18	2.25	2.55	0.94	1.54	0.93	1.00	2.96	1.42
LEHI WEIGHTED	0.40	0.26	0.17	0.25	0.48	0.54	0.20	0.33	0.20	0.21	0.63	0.30
LAKE ELEVATION (ft)	4489.84	4490.29	4490.70	4490.93	4491.16	4491.58	4491.79	4492.40	4493.93	4493.59	4492.77	4492.19
AREA (Acres))	61976	62455	62886	63136	63390	63864	64105	64821	66711	66393	65267	64572
WEIGHTED PRECIP (in)	2.01	1.49	0.99	1.39	2.63	2.03	1.32	1.87	0.91	1.11	2.45	1.42
VOLUME (Ac-ft)	10381	7755	5188	7313	13893	10804	7052	10101	5059	6141	13325	7641

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1984 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	0.59	2.24	3.35	0.46	0.56	0.38	1.66	0.33	2.43	0.90	1.77	1.39
OREM TP WEIGHTED	0.42	1.60	2.39	0.33	0.40	0.27	1.18	0.23	1.71	0.64	1.26	1.00
PAYSON ACTUAL	1.20	4.42	4.96	0.73	1.58	1.86	3.43	0.97	3.09	1.41	2.38	1.30
PAYSON WEIGHTED	0.09	0.32	0.36	0.05	0.12	0.14	0.26	0.08	0.26	0.11	0.18	0.09
CTUAL	1.19	3.79	3.14	0.64	0.52	1.05	2.53	0.50	2.10	0.58	1.76	1.10
IGHTED	0.25	0.81	0.67	0.14	0.11	0.22	0.54	0.11	0.45	0.12	0.37	0.23
AKE ELEVATION (ft)	4492.06	4492.17	4492.48	4492.79	4492.60	4492.60	4492.89	4493.85	4494.54	4493.65	4492.64	4491.86
AREA (Acres))	64419	64549	64917	65292	65061	65061	65413	66609	67400	66320	65100	64186
WEIGHTED PRECIP (in)	0.76	2.73	3.42	0.52	0.63	0.63	1.98	0.42	2.42	0.87	1.81	1.32
VOLUME (Ac-ft)	4080	14685	18501	2829	3416	3416	10793	2331	13592	4808	9819	7060

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1985 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.49	1.04	0.74	0.84	0.79	1.60	0.27	1.89	1.76	1.20	0.08	0.80
OREM TP WEIGHTED	1.07	0.75	0.53	0.60	0.57	1.14	0.19	1.34	1.26	0.86	0.06	0.58
PAYSON ACTUAL	3.93	1.10	1.29	2.19	1.68	2.31	0.63	1.80	1.36	1.82	0.21	0.93
PAYSON WEIGHTED	0.27	0.08	0.09	0.16	0.07	0.17	0.05	0.13	0.10	0.12	0.01	0.06
LEHI ACTUAL	1.79	1.34	0.69	0.95	0.58	1.05	0.42	2.82	1.20	1.40	0.15	1.16
LEHI WEIGHTED	0.38	0.28	0.15	0.20	0.12	0.22	0.09	0.60	0.25	0.30	0.03	0.25
LAKE ELEVATION (ft)	4491.75	4491.85	4491.89	4492.00	4492.06	4492.15	4492.40	4492.73	4492.29	4491.50	4490.77	4490.15
AREA (Acres))	64059	64175	64221	64349	64419	64525	64821	65219	64690	63773	62962	62308
WEIGHTED PRECIP (in)	1.72	1.11	0.77	0.96	0.76	1.53	0.33	2.07	1.61	1.28	0.10	0.89
VOLUME (Ac-ft)	9182	5936	4121	5148	4080	8227	1783	11250	8679	6802	525	4621

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1986 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.76	1.97	0.90	0.87	2.79	2.53	2.82	1.29	0.68	0.76	1.02	1.89
OREM TP WEIGHTED	1.28	1.43	0.65	0.63	2.02	1.81	2.01	0.92	0.48	0.54	0.74	1.37
PAYSON ACTUAL	2.39	3.44	2.16	0.77	1.90	2.55	3.93	2.24	0.65	1.03	0.44	2.77
PAYSON WEIGHTED	0.11	0.21	0.13	0.05	0.12	0.18	0.29	0.17	0.05	0.07	0.03	0.16
LEHI ACTUAL	1.35	1.19	0.50	1.58	3.12	1.78	3.01	1.08	0.00	0.55	0.90	1.73
LEHI WEIGHTED	0.29	0.25	0.11	0.34	0.66	0.38	0.64	0.23	0.00	0.12	0.19	0.37
LAKE ELEVATION (ft)	4489.97	4490.08	4490.26	4490.35	4490.63	4491.76	4492.73	4493.13	4492.84	4491.72	4490.71	4489.84
AREA (Acres))	62117	62234	62424	62517	62810	64071	65219	65708	65353	64025	62896	61976
WEIGHTED PRECIP (in)	1.68	1.89	0.89	1.02	2.80	2.37	2.94	1.32	0.53	0.73	0.96	1.90
VOLUME (Ac-ft)	8696	9802	4630	5314	14656	12654	15979	7228	2886	3895	5032	9813

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1987 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	0.62	0.69	0.15	0.70	1.02	0.88	0.05	1.63	0.15	1.08	1.87	0.20
OREM TP WEIGHTED	0.45	0.50	0.11	0.51	0.75	0.64	0.04	1.20	0.11	0.80	1.38	0.15
PAYSON ACTUAL	1.19	1.41	0.32	1.00	1.58	1.85	0.43	2.40	0.22	1.20	1.76	0.07
PAYSON WEIGHTED	0.07	0.08	0.02	0.06	0.09	0.10	0.02	0.13	0.01	0.06	0.08	0.00
LEHI ACTUAL	0.61	0.30	0.33	1.11	0.92	0.88	0.09	1.70	0.56	1.01	1.58	0.11
LEHI WEIGHTED	0.13	0.06	0.07	0.24	0.20	0.19	0.02	0.36	0.12	0.22	0.34	0.02
LAKE ELEVATION (ft)	4489.61	4489.53	4489.45	4489.39	4489.27	4489.18	4488.95	4488.62	4488.23	4487.45	4486.83	44[illegible]
AREA (Acres))	61722	61632	61544	61478	61349	61252	61008	60666	60273	59533	59000	58[illegible]
WEIGHTED PRECIP (in)	0.65	0.64	0.20	0.81	1.04	0.93	0.08	1.69	0.24	1.08	1.80	0.1[illegible]
VOLUME (Ac-ft)	3343	3287	1026	4150	5317	4747	407	8544	1205	5358	8850	831

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1988 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.53	1.25	0.62	1.02	0.00	0.35	1.19	0.99	0.04	0.82	0.66	0.69
OREM TP WEIGHTED	1.13	0.92	0.46	0.75	0.00	0.26	0.87	0.73	0.03	0.60	0.49	0.51
PAYSON ACTUAL	1.36	1.96	1.55	1.81	0.35	1.15	1.52	1.10	0.22	0.60	0.31	0.78
PAYSON WEIGHTED	0.06	0.09	0.07	0.09	0.02	0.06	0.08	0.06	0.01	0.03	0.01	0.04
LEHI ACTUAL	1.57	2.25	0.71	1.14	0.12	0.57	1.16	1.12	0.06	0.35	0.66	0.60
LEHI WEIGHTED	0.34	0.48	0.15	0.24	0.03	0.12	0.25	0.24	0.01	0.08	0.14	0.13
LAKE ELEVATION (ft)	4486.16	4486.64	4487.06	4487.59	4488.01	4488.47	4488.76	4488.66	4488.13	4486.99	4485.93	4485.32
AREA (Acres))	58491	58846	59192	59661	60058	60513	60810	60707	60174	59133	58323	57856
WEIGHTED PRECIP (in)	1.53	1.49	0.68	1.08	0.05	0.44	1.20	1.03	0.05	0.71	0.64	0.68
VOLUME (Ac-ft)	7458	7307	3354	5369	250	2219	6081	5211	251	3499	3111	3279

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1989 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	0.64	0.98	0.77	0.25	1.17	1.15	1.44	0.48	0.26	0.54	0.90	1.55
OREM TP WEIGHTED	0.47	0.73	0.57	0.18	0.86	0.85	1.06	0.35	0.19	0.40	0.67	1.15
PAYSON ACTUAL	0.55	2.33	1.34	0.70	2.68	1.32	0.43	0.49	0.25	0.59	1.08	1.23
PAYSON WEIGHTED	0.03	0.10	0.06	0.03	0.13	0.06	0.02	0.02	0.01	0.03	0.05	0.05
LEHI ACTUAL	0.49	1.35	0.43	0.07	0.49	1.24	1.08	0.59	0.42	0.80	1.06	0.85
LEHI WEIGHTED	0.11	0.29	0.09	0.02	0.11	0.27	0.23	0.13	0.09	0.17	0.23	0.18
LAKE ELEVATION (ft)	4484.75	4484.93	4485.27	4485.55	4486.20	4486.90	4487.25	4486.80	4486.05	4484.80	4483.60	4483.55
AREA (Acres))	57344	57513	57813	58041	58520	59057	59356	58975	58411	57392	56113	56054
WEIGHTED PRECIP (in)	0.61	1.12	0.72	0.23	1.10	1.18	1.31	0.50	0.29	0.60	0.95	1.38
VOLUME (Ac-ft)	2915	5368	3469	1112	5364	5807	6480	2457	1412	2870	4442	6446

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1990 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	0.80	0.96	0.08	0.89	0.79	1.01	0.64	0.90	1.11	0.31	0.73	0.64
OREM TP WEIGHTED	0.60	0.71	0.06	0.66	0.58	0.74	0.47	0.66	0.82	0.23	0.54	0.48
PAYSON ACTUAL	0.92	1.11	0.24	1.16	2.04	2.02	1.27	1.05	1.68	0.63	0.18	0.77
PAYSON WEIGHTED	0.04	0.05	0.01	0.05	0.09	0.09	0.06	0.05	0.08	0.03	0.01	0.03
EHI ACTUAL	0.00	0.50	0.10	0.37	0.28	0.83	1.18	0.65	0.74	0.35	1.23	1.34
LEHI WEIGHTED	0.00	0.11	0.02	0.08	0.06	0.18	0.25	0.14	0.16	0.08	0.26	0.29
E ELEVATION (ft)	4483.60	4484.05	4484.45	4485.02	4485.48	4486.06	4486.25	4485.72	4485.31	4484.45	4483.40	4482.61
REA (Acres))	56113	56623	57047	57595	57988	58418	58556	58168	57847	57047	55875	54893
GHTED PRECIP (in)	0.64	0.87	0.09	0.79	0.73	1.01	0.78	0.85	1.06	0.34	0.81	0.80
VOLUME (Ac-ft)	2993	4105	428	3792	3528	4917	3806	4120	5110	1616	3772	3660

MAIN LAKE
UTAH LAKE PRECIPITATION DATA (inches)

1991 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
OREM TP ACTUAL	1.74	1.07	0.60	0.95	0.40	0.70	1.21	1.73	0.66	0.09	1.17	2.54
OREM TP WEIGHTED	1.30	0.80	0.45	0.71	0.30	0.52	0.90	1.28	0.49	0.07	0.87	1.90
PAYSON ACTUAL	1.82	1.37	1.38	1.29	1.04	1.25	2.90	2.73	0.64	0.16	0.54	1.30
PAYSON WEIGHTED	0.07	0.06	0.06	0.05	0.04	0.06	0.13	0.12	0.03	0.01	0.02	0.05
EHI ACTUAL	1.26	1.70	0.15	0.49	0.85	0.85	1.86	2.41	0.83	0.43	1.30	2.28
EHI WEIGHTED	0.27	0.36	0.03	0.10	0.18	0.18	0.40	0.52	0.18	0.09	0.28	0.49
LAKE ELEVATION (ft)	4482.52	4482.72	4483.05	4483.48	4483.87	4484.49	4484.70	4484.76	4484.88	4483.99	4483.01	4482.57
AREA (Acres))	54777	55034	55449	55971	56423	57088	57296	57354	57467	56557	55399	54842
WEIGHTED PRECIP (in)	1.64	1.22	0.54	0.86	0.52	0.76	1.43	1.92	0.70	0.17	1.17	2.44
VOLUME (Ac-ft)	7486	5595	2495	4011	2445	3616	6828	9177	3352	801	5401	11151

Table D:2 - Main Lake Precipitation

MAIN LAKE MONTHLY PRECIPITATION DATA (inches) 1992 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.21	1.64	0.34	0.37	1.44	0.45	0.14	1.20	0.75	0.98	0.30	1.06
Orem Weighted	0.90	1.22	0.25	0.27	1.07	0.33	0.10	0.89	0.56	0.73	0.22	0.79
Payson Actual	1.90	2.36	0.75	0.62	1.77	1.21	0.23	1.63	0.81	1.03	0.22	0.70
Payson Weighted	0.08	0.10	0.03	0.03	0.08	0.05	0.01	0.07	0.04	0.04	0.01	0.03
Lehi Actual	1.36	1.84	0.46	0.50	1.92	0.71	0.69	1.08	0.32	0.00	0.60	1.22
Lehi Weighted	0.29	0.39	0.10	0.11	0.41	0.15	0.15	0.23	0.07	0.00	0.13	0.26
Lake Elevation	4482.52	4482.82	4483.27	483.76	4484.27	4484.70	4484.75	4484.27	44[illegible]	4482.53	4481.40	4481.16
Area (acres)	54777	55161	55718	56298	56359	57296	57344	56359	56019	54790	53191	52715
Weighted Precip. (in)	1.27	1.71	0.38	0.41	1.56	0.54	0.26	1.19	0.66	0.77	0.36	1.08
Volume (Ac-ft)	5807	7879	1780	1917	7313	2572	1250	5603	3084	3527	1599	4738

MAIN LAKE MONTHLY PRECIPITATION DATA (inches) 1993 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.36	1.15	1.60	1.84	1.45	2.54	0.48	2.45	1.31	0.79	0.62	1.09
Orem Weighted	1.75	0.85	1.19	1.37	1.08	1.89	0.35	1.81	0.97	0.58	0.46	0.80
Payson Actual	1.84	1.80	1.50	3.85	2.32	2.13	1.21	4.36	1.37	0.44	0.46	1.24
Payson Weighted	0.08	0.08	0.07	0.17	0.10	0.09	0.06	0.20	0.06	0.02	0.02	0.06
Lehi Actual	2.52	2.15	1.18	2.43	1.19	1.65	0.52	2.72	0.91	0.44	0.46	1.24
Lehi Weighted	0.54	0.46	0.25	0.52	0.25	0.35	0.11	0.59	0.20	0.09	0.10	0.27
Lake Elevation	4481.46	4481.70	4482.15	4482.81	4483.61	4484.47	4485.21	4486.03	4486.82	4486.74	4486.12	4485.71
Area (acres)	53296	53672	54304	55149	55584	57067	57762	58396	58992	58927	58462	58160
Weighted Precip. (in)	2.37	1.39	1.51	2.05	1.43	2.33	0.52	2.60	1.23	0.70	0.58	1.13
Volume (Ac-ft)	10533	6226	6814	9437	6634	11089	2517	12641	6031	3429	2816	5473

MAIN LAKE MONTHLY PRECIPITATION DATA (inches) 1994 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.14	0.34	0.10	0.40	1.11	0.79	2.83	0.98	0.00	0.18	1.02	0.73
Orem Weighted	1.58	0.25	0.07	0.30	0.82	0.58	2.09	0.72	0.00	0.13	0.75	0.54
Payson Actual	1.47	0.86	0.90	0.56	2.45	0.81	2.92	1.42	0.04	0.27	1.50	0.91
Payson Weighted	0.07	0.04	0.04	0.03	0.12	0.04	0.14	0.07	0.00	0.01	0.07	0.04
Lehi Actual	2.14	0.17	0.52	0.49	1.43	0.91	2.10	0.92	0.00	0.15	1.20	1.28
Lehi Weighted	0.46	0.04	0.11	0.11	0.31	0.19	0.45	0.20	0.00	0.03	0.26	0.27
Lake Elevation	4485.78	4486.14	4486.52	4486.89	4487.32	4487.68	4487.91	4487.82	4487.24	4486.34	4485.49	4484.87
Area (acres)	58212	58476	58752	59049	59417	59744	59962	59876	59347	58621	57996	57550
Weighted Precip. (in)	2.11	0.33	0.23	0.43	1.24	0.82	2.68	0.99	0.00	0.18	1.08	0.86
Volume (Ac-ft)	10229	1597	1116	2101	6158	4065	13385	4933	10	868	5226	4103

MAIN LAKE MONTHLY PRECIPITATION DATA (inches) 1995 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.97	0.78	1.02	1.16	0.25	1.13	1.25	4.81	1.08	0.65	0.48	0.33
Orem Weighted	2.21	0.58	0.75	0.86	0.18	0.83	0.92	3.55	0.79	0.47	0.35	0.24
Payson Actual	3.36	3.04	0.97	2.30	1.11	2.23	2.32	4.89	1.47	1.09	0.21	0.99
Payson Weighted	0.15	0.14	0.05	0.11	0.05	0.11	0.11	0.24	0.09	0.07	0.01	0.05
Lehi Actual	1.82	0.80	1.22	1.69	0.07	1.99	1.80	3.62	1.12	1.41	0.60	0.60
Lehi Weighted	0.39	0.17	0.26	0.36	0.02	0.42	0.38	0.77	0.24	0.30	0.13	0.13
Lake Elevation	4484.78	4485.17	4485.54	4486.04	4486.59	4487.03	4487.46	4488.34	4489.20	4489.17	4488.66	4488.12
Area (acres)	57373	57727	58034	58403	58807	59166	59542	60382	61274	61242	60707	60165
Weighted Precip. (in)	2.74	0.89	1.06	1.33	0.25	1.37	1.42	4.56	1.11	0.84	0.49	0.42
Volume (Ac-ft)	13105	4283	5130	6461	1233	6741	7044	22946	5678	4279	2491	2105

Table D:2 Continued

MAIN LAKE MONTHLY PRECIPITATION DATA (Inches) 1996 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	0.45	0.48	1.03	2.93	2.11	1.53	0.66	0.94	0.19	0.25	0.02	1.90
Orem Weighted	0.33	0.35	0.76	2.16	1.53	1.11	0.48	0.68	0.14	0.18	0.01	1.40
Payson Actual	0.28	0.71	1.74	3.43	3.14	2.29	1.97	1.87	0.24	0.11	0.27	1.35
Payson Weighted	0.01	0.03	0.09	0.17	0.19	0.14	0.12	0.11	0.01	0.01	0.01	0.07
Lehi Actual	0.26	0.57	1.48	0.74	1.26	1.44	1.32	0.96	0.20	0.62	0.00	0.57
Lehi Weighted	0.06	0.12	0.32	0.16	0.27	0.31	0.28	0.20	0.04	0.13	0.00	0.12
Lake Elevation	4488.01	4488.27	4488.65	4488.96	4489.23	4489.46	4489.55	4489.59	4489.37	4488.71	4487.91	4487.45
Area (acres)	60058	60312	60696	61019	61306	61554	61654	61699	61457	60758	59962	59533
Weighted Precip. (in)	0.40	0.51	1.16	2.49	1.99	1.56	0.88	1.00	0.20	0.32	0.03	1.59
Volume (Ac-ft)	2008	2565	5871	12648	10170	7984	4517	5142	999	1631	140	7885

MAIN LAKE MONTHLY PRECIPITATION DATA (Inches) 1997 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.70	1.83	0.98	2.94	1.18	0.14	1.31	1.35	0.62	0.37	0.72	1.49
Orem Weighted	1.25	1.35	0.72	2.17	0.86	0.10	0.95	0.98	0.45	0.27	0.53	1.10
Payson Actual	2.46	2.27	1.25	3.05	1.27	0.62	2.58	1.62	0.80	0.58	0.85	1.95
Payson Weighted	0.12	0.11	0.06	0.15	0.08	0.04	0.15	0.10	0.05	0.03	0.04	0.10
Lehi Actual	1.17	2.43	1.52	0.84	0.63	0.19	1.33	1.85	1.64	1.18	0.75	1.99
Lehi Weighted	0.25	0.52	0.32	0.18	0.13	0.04	0.28	0.39	0.35	0.25	0.16	0.42
Lake Elevation	4487.39	4487.78	4488.34	4488.93	4489.49	4489.79	4489.93	4490.13	4490.11	4489.45	4488.77	4488.58
Area (acres)	59479	59838	60382	60987	61587	61921	62074	62287	62266	61544	60820	60625
Weighted Precip. (in)	1.62	1.98	1.11	2.50	1.07	0.18	1.39	1.47	0.85	0.56	0.73	1.62
Volume (Ac-ft)	8050	9871	5577	12693	5482	926	7193	7644	4401	2847	3714	8180

MAIN LAKE MONTHLY PRECIPITATION DATA (Inches) 1998 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.05	1.41	0.83	1.89	2.51	1.62	1.26	1.27	2.85	0.98	0.37	0.37
Orem Weighted	0.77	1.04	0.61	1.37	1.82	1.18	0.92	0.92	2.07	0.71	0.27	0.27
Payson Actual	2.25	1.50	1.08	2.89	2.7	1.87	1.59	2.18	2.03	0.86	0.46	0.99
Payson Weighted	0.11	0.07	0.05	0.17	0.16	0.11	0.10	0.13	0.12	0.05	0.03	0.05
Lehi Actual	1.52	0.79	1.81	1.79	2.92	1.21	1.30	2.40	3.02	0.90	0.97	0.84
Lehi Weighted	0.32	0.17	0.39	0.38	0.62	0.26	0.28	0.51	0.64	0.19	0.21	0.18
Lake Elevation	4488.78	4488.97	4488.99	4489.13	4489.38	4489.61	4489.79	4490.05	4490.35	4490.06	4489.32	4488.94
Area (acres)	60831	61029	61050	61199	61467	61722	61921	62202	62517	62213	61403	60998
Weighted Precip. (in)	1.21	1.28	1.05	1.93	2.61	1.55	1.29	1.57	2.84	0.96	0.50	0.50
Volume (Ac-ft)	6128	6521	5348	9836	13363	7960	6648	8114	14780	4955	2575	2544

MAIN LAKE MONTHLY PRECIPITATION DATA (Inches) 1999 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	0.87	0.72	0.78	1.74	1.07	0.29	4.66	2.33	1.58	0.92	0.52	0.27
Orem Weighted	0.64	0.53	0.57	1.27	0.78	0.21	3.40	1.70	1.15	0.67	0.38	0.20
Payson Actual	1.44	1.37	0.89	1.22	1.11	0.56	4.63	2.73	1.61	1.29	0.44	0.15
Payson Weighted	0.08	0.08	0.05	0.07	0.06	0.03	0.26	0.16	0.09	0.07	0.02	0.01
Lehi Actual	1.59	0.72	0.80	1.68	1.02	0.55	3.40	1.65	0.91	1.80	0.29	0.00
Lehi Weighted	0.34	0.15	0.17	0.36	0.22	0.12	0.72	0.35	0.19	0.04	0.06	0.00
Lake Elevation	4489.01	4489.22	4489.36	4489.47	4489.57	4489.53	4489.44	4489.59	4489.59	4489.09	4488.49	4488.1
Area (acres)	61072	61295	61446	61565	61677	61632	61533	61699	61699	61156	60533	60145
Weighted Precip. (in)	1.05	0.76	0.79	1.70	1.06	0.36	4.39	2.21	1.44	1.13	0.47	0.21
Volume (Ac-ft)	5369	3864	4047	8709	5457	1854	22510	11354	7399	5748	2355	1035

Table D:3 - Goshen Bay Precipitation

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1980 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	1.77	0.67	0.15	2.47	0.87	1.59	0.37	1.98	0.05	0.26	0.33	0.84
ELBERTA WEIGHTED	0.54	0.21	0.05	0.80	0.30	0.56	0.14	0.77	0.02	0.10	0.12	0.29
GENEVA ACTUAL	2.21	0.97	0.20	3.53	3.41	1.17	0.36	2.21	0.08	0.21	0.67	1.14
GENEVA WEIGHTED	0.46	0.20	0.04	0.71	0.67	0.22	0.07	0.40	0.01	0.04	0.13	0.22
PAYSON ACTUAL	2.20	1.33	0.91	3.94	2.12	3.35	0.78	2.90	0.04	0.08	0.56	1.11
PAYSON WEIGHTED	1.07	0.64	0.44	1.86	0.98	1.52	0.35	1.25	0.02	0.03	0.25	0.48
LAKE ELEVATION (ft)	4486.14	4486.37	4486.74	4487.29	4488.04	4488.63	4489.13	4489.91	4490.78	4489.66	4488.91	4488.41
AREA (Acres))	23769	23936	24221	24678	25371	25976	26531	27477	28120	27163	26281	25744
WEIGHTED PRECIP (in)	2.07	1.05	0.53	3.37	1.95	2.30	0.56	2.42	0.05	0.17	0.50	0.99
VOLUME (Ac-ft)	4100	2094	1070	6930	4123	4979	1238	5541	117	385	1095	2124

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1981 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	1.48	0.85	0.39	0.21	0.26	1.57	0.92	2.64	1.00	0.42	0.96	0.78
ELBERTA WEIGHTED	0.24	0.14	0.07	0.04	0.05	0.30	0.18	0.50	0.19	0.07	0.13	0.09
GENEVA ACTUAL	6.38	1.35	1.37	0.80	0.29	1.85	0.49	3.76	0.36	0.10	0.17	0.89
GENEVA WEIGHTED	1.23	0.26	0.26	0.15	0.05	0.34	0.09	0.70	0.07	0.02	0.03	0.18
PAYSON ACTUAL	1.92	1.95	0.97	0.72	0.45	3.34	1.58	3.95	0.31	1.23	0.62	1.7[illegible]
PAYSON WEIGHTED	1.24	1.25	0.61	0.45	0.28	2.08	0.98	2.47	0.19	0.80	0.41	[illegible]
LAKE ELEVATION (ft)	4488.36	4488.65	4488.97	4489.21	4489.28	4489.30	4489.32	4489.25	4489.14	4488.36	4487.44	44[illegible]
AREA (Acres))	25693	25997	26349	26623	26705	26728	26752	26670	26542	25693	24810	24276
WEIGHTED PRECIP (in)	2.71	1.65	0.94	0.64	0.38	2.72	1.25	3.67	0.45	0.89	0.57	1.48
VOLUME (Ac-ft)	5802	3575	2064	1420	846	6058	2787	8157	995	1906	1178	2994

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1982 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	2.83	0.54	1.09	1.12	0.33	1.12	0.41	1.66	0.57	3.67	0.38	5.30
ELBERTA WEIGHTED	0.35	0.07	0.15	0.17	0.06	0.21	0.08	0.37	0.13	0.80	0.08	1.02
*GENEVA ACTUAL	3.79	0.24	1.65	1.34	0.79	2.00	0.52	1.50	0.48	1.56	0.39	5.75
*GENEVA WEIGHTED	0.70	0.05	0.33	0.26	0.15	0.37	0.10	0.27	0.08	0.28	0.07	1.07
PAYSON ACTUAL	7.30	1.09	2.41	2.45	1.24	3.00	1.94	2.37	0.51	0.75	0.49	9.33
PAYSON WEIGHTED	4.92	0.73	1.60	1.60	0.80	1.89	1.20	1.42	0.30	0.45	0.30	5.81
LAKE ELEVATION (ft)	4486.74	4487.29	4487.60	4488.17	4488.56	4489.09	4489.47	4490.28	4490.66	4490.18	4489.63	4489.32
AREA (Acres))	24382	24678	24954	25500	25901	26485	26931	27775	28035	27709	27126	26752
WEIGHTED PRECIP (in)	5.97	0.85	2.08	2.03	1.01	2.47	1.38	2.06	0.51	1.53	0.45	7.90
VOLUME (Ac-ft)	12130	1748	4325	4314	2180	5451	3097	4768	1191	3533	1017	17612

* Changed to Orem Treatment Plant in August 1982

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1983 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	1.46	0.73	0.67	1.24	2.00	2.30	1.32	1.67	0.89	0.82	2.11	1.76
ELBERTA WEIGHTED	0.30	0.16	0.16	0.30	0.50	0.61	0.36	0.49	0.30	0.27	0.64	0.50
OREM TP ACTUAL	1.94	1.57	1.02	1.38	2.63	1.74	1.38	1.84	0.88	1.12	2.28	1.33
OREM TP WEIGHTED	0.35	0.28	0.18	0.24	0.45	0.29	0.23	0.30	0.13	0.17	0.36	0.22
PAYSON ACTUAL	3.45	1.54	1.25	2.22	3.90	3.55	1.85	3.20	1.05	1.39	2.60	2.40
PAYSON WEIGHTED	2.11	0.92	0.74	1.30	2.25	2.01	1.04	1.75	0.54	0.72	1.40	1.33
LAKE ELEVATION (ft)	4489.84	4490.29	4490.70	4490.93	4491.16	4491.58	4491.79	4492.40	4493.93	4493.59	4492.77	4492.19
AREA (Acres))	27338	27782	28063	28229	28399	28725	28895	29417	30916	30558	29754	29232
WEIGHTED PRECIP (in)	2.76	1.36	1.08	1.84	3.20	2.91	1.63	2.54	0.97	1.16	2.40	2.05
VOLUME (Ac-ft)	6288	3149	2526	4328	7573	6966	3925	6227	2499	2954	5951	4994

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1984 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	0.57	2.69	1.97	0.61	0.61	0.91	1.80	0.45	2.12	1.19	1.26	1.17
ELBERTA WEIGHTED	0.16	0.76	0.58	0.19	0.18	0.27	0.55	0.15	0.76	0.39	0.38	0.32
OREM TP ACTUAL	0.59	2.24	3.35	0.46	0.56	0.38	1.66	0.33	2.43	0.90	1.77	1.39
OREM TP WEIGHTED	0.10	0.37	0.54	0.07	0.09	0.06	0.26	0.05	0.35	0.14	0.28	0.23
PAYSON ACTUAL	1.20	4.42	4.96	0.73	1.58	1.86	3.43	0.97	3.09	1.41	2.38	1.30
PAYSON WEIGHTED	0.67	2.44	2.71	0.39	0.86	1.01	1.84	0.50	1.53	0.73	1.29	0.73
E ELEVATION (ft)	4492.06	4492.17	4492.48	4492.79	4492.60	4492.60	4492.89	4493.85	4494.54	4493.65	4492.64	4491.86
REA (Acres))	29121	29215	29488	29772	29597	29597	29866	30830	31506	30620	29634	28953
GHTED PRECIP (in)	0.93	3.57	3.83	0.65	1.13	1.34	2.65	0.70	2.64	1.26	1.95	1.28
VOLUME (Ac-ft)	2257	8691	9412	1613	2787	3305	6595	1798	6931	3215	4816	3088

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1985 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	2.28	0.38	0.75	1.07	0.64	1.20	0.48	1.46	0.57	1.67	0.17	0.75
ELBERTA WEIGHTED	0.62	0.10	0.21	0.30	0.18	0.34	0.14	0.44	0.16	0.44	0.04	0.16
OREM TP ACTUAL	1.49	1.04	0.74	0.84	0.79	1.60	0.27	1.89	1.76	1.20	0.08	0.80
OREM TP WEIGHTED	0.25	0.17	0.12	0.14	0.13	0.26	0.04	0.30	0.29	0.20	0.01	0.14
PAYSON ACTUAL	3.93	1.10	1.29	2.19	1.68	2.31	0.63	1.80	1.36	1.82	0.21	0.93
PAYSON WEIGHTED	2.21	0.62	0.72	1.22	0.93	1.28	0.34	0.97	0.75	1.04	0.12	0.56
LAKE ELEVATION (ft)	4491.75	4491.85	4491.89	4492.00	4492.06	4492.15	4492.40	4492.73	4492.29	4491.50	4490.77	4490.15
AREA (Acres))	28862	28945	28978	29070	29121	29198	29417	29717	29320	28662	28113	27690
WEIGHTED PRECIP (in)	3.08	0.89	1.05	1.66	1.24	1.88	0.52	1.71	1.20	1.68	0.17	0.86
VOLUME (Ac-ft)	7408	2147	2536	4021	3009	4574	1275	4235	2932	4013	398	1984

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (Inches)

1986 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	1.35	1.95	0.51	0.19	1.03	1.39	2.72	0.65	0.68	0.83	1.14	2.11
ELBERTA WEIGHTED	0.29	0.42	0.11	0.04	0.24	0.38	0.82	0.20	0.21	0.22	0.27	0.44
OREM TP ACTUAL	1.76	1.97	0.90	0.87	2.79	2.53	2.82	1.29	0.68	0.76	1.02	1.89
OREM TP WEIGHTED	0.32	0.35	0.16	0.15	0.49	0.42	0.45	0.20	0.11	0.13	0.18	0.34
PAYSON ACTUAL	1.92	3.44	2.16	0.77	1.90	2.55	3.93	2.24	0.65	1.03	0.44	2.77
PAYSON WEIGHTED	1.17	2.08	1.30	0.46	1.12	1.44	2.12	1.19	0.35	0.58	0.26	1.69
LAKE ELEVATION (ft)	4489.97	4490.08	4490.26	4490.35	4490.63	4491.76	4492.73	4493.13	4492.84	4491.72	4490.71	4489.84
AREA (Acres))	27554	27644	27762	27822	28014	28871	29717	30097	29819	28838	28070	27338
WEIGHTED PRECIP (in)	1.78	2.85	1.57	0.65	1.85	2.24	3.39	1.59	0.67	0.93	0.71	2.47
VOLUME (Ac-ft)	4087	6565	3632	1507	4319	5389	8395	3988	1665	2235	1661	5627

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (Inches)

1987 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	1.09	0.37	0.07	0.68	1.02	1.13	0.22	1.06	0.75	1.73	2.05	0.11
ELBERTA WEIGHTED	0.22	0.07	0.01	0.13	0.19	0.21	0.04	0.18	0.12	0.24	0.25	0.01
OREM TP ACTUAL	0.62	0.69	0.15	0.70	1.02	0.88	0.05	1.63	0.15	1.08	1.87	0.20
OREM TP WEIGHTED	0.11	0.13	0.03	0.13	0.19	0.16	0.01	0.31	0.03	0.21	0.38	0.04
PAYSON ACTUAL	1.19	1.41	0.32	1.00	1.58	1.85	0.43	2.40	0.22	1.20	1.76	0.07
PAYSON WEIGHTED	0.73	0.87	0.20	0.62	0.99	1.16	0.27	1.54	0.14	0.80	1.19	0.05
LAKE ELEVATION (ft)	4489.61	4489.53	4489.45	4489.39	4489.27	4489.18	4488.95	4488.62	4488.23	4487.45	4486.83	44
AREA (Acres))	27101	27004	26907	26835	26693	26588	26326	25965	26651	24819	24293	23
WEIGHTED PRECIP (in)	1.06	1.07	0.24	0.88	1.37	1.53	0.32	2.03	0.29	1.25	1.82	0.10
VOLUME (Ac-ft)	2394	2408	538	1968	3047	3390	702	4397	644	2585	3684	200

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (Inches)

1988 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	1.52	0.63	0.82	1.65	0.16	1.19	1.29	0.58	0.09	0.08	0.32	0.47
ELBERTA WEIGHTED	0.16	0.07	0.10	0.23	0.02	0.20	0.17	0.10	0.01	0.01	0.03	0.04
OREM TP ACTUAL	1.53	1.25	0.62	1.02	0.00	0.35	1.19	0.99	0.04	0.82	0.66	0.69
OREM TP WEIGHTED	0.32	0.25	0.12	0.20	0.00	0.07	0.23	0.19	0.01	0.17	0.14	0.15
PAYSON ACTUAL	1.36	1.96	1.55	1.81	0.35	1.15	1.52	1.10	0.22	0.60	0.31	0.78
PAYSON WEIGHTED	0.94	1.33	1.04	1.20	0.23	0.74	0.97	0.70	0.14	0.40	0.21	0.55
LAKE ELEVATION (ft)	4486.16	4486.64	4487.06	4487.59	4488.01	4488.47	4488.76	4488.66	4488.13	4486.99	4485.93	4485.32
AREA (Acres))	23783	24142	24482	24945	25342	25807	26116	26008	25480	24423	23613	23094
WEIGHTED PRECIP (in)	1.42	1.65	1.26	1.63	0.25	1.01	1.37	0.99	0.16	0.58	0.38	0.74
VOLUME (Ac-ft)	2814	3320	2571	3388	528	2172	2982	2146	340	1180	748	1424

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1989 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	0.69	1.15	0.46	0.28	1.79	1.06	0.51	0.55	0.26	0.47	0.91	0.93
ELBERTA WEIGHTED	0.05	0.09	0.04	0.03	0.19	0.13	0.07	0.07	0.03	0.04	0.05	0.05
OREM TP ACTUAL	0.64	0.98	0.77	0.25	1.17	1.15	1.44	0.48	0.26	0.54	0.90	1.55
OREM TP WEIGHTED	0.14	0.21	0.16	0.05	0.24	0.23	0.29	0.10	0.05	0.12	0.20	0.35
PAYSON ACTUAL	0.55	2.33	1.34	0.70	2.68	1.32	0.43	0.49	0.25	0.59	1.08	1.23
PAYSON WEIGHTED	0.39	1.65	0.94	0.49	1.84	0.89	0.29	0.33	0.17	0.42	0.78	0.89
LAKE ELEVATION (ft)	4484.75	4484.93	4485.27	4485.55	4486.20	4486.90	4487.25	4486.80	4486.05	4484.80	4483.60	4483.55
AREA (Acres))	22561	22735	23050	23296	23812	24349	24643	24268	23720	22610	21307	21246
WEIGHTED PRECIP (in)	0.58	1.95	1.14	0.57	2.27	1.25	0.65	0.50	0.25	0.58	1.03	1.29
VOLUME (Ac-ft)	1090	3694	2190	1107	4504	2536	1335	1011	494	1093	1829	2284

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1990 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	0.51	0.77	0.17	0.61	2.09	0.98	0.72	0.46	0.79	0.74	0.18	1.05
ELBERTA WEIGHTED	0.03	0.05	0.01	0.05	0.19	0.10	0.08	0.04	0.07	0.05	0.01	0.03
OREM TP ACTUAL	0.80	0.96	0.08	0.89	0.79	1.01	0.64	0.90	1.11	0.31	0.73	0.64
OREM TP WEIGHTED	0.18	0.21	0.02	0.19	0.17	0.21	0.13	0.19	0.24	0.07	0.16	0.15
PAYSON ACTUAL	0.92	1.11	0.24	1.16	2.04	2.02	1.27	1.05	1.68	0.63	0.18	0.77
PAYSON WEIGHTED	0.67	0.80	0.17	0.82	1.42	1.39	0.87	0.73	1.18	0.45	0.13	0.57
E ELEVATION (ft)	4483.60	4484.05	4484.45	4485.02	4485.48	4486.06	4486.25	4485.72	4485.31	4484.45	4483.40	4482.61
AREA (Acres))	21307	21830	22259	22820	23235	23712	23848	23440	23086	22259	21060	19974
IGHTED PRECIP (in)	0.88	1.06	0.20	1.06	1.78	1.70	1.08	0.96	1.49	0.57	0.30	0.75
VOLUME (Ac-ft)	1563	1928	371	2016	3447	3359	2146	1875	2867	1057	527	1248

GOSHEN BAY
UTAH LAKE PRECIPITATION DATA (inches)

1991 WATER YEAR

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ELBERTA ACTUAL	1.22	0.66	0.57	0.49	0.33	0.84	1.35	3.01	0.41	0.42	0.78	1.14
ELBERTA WEIGHTED	0.04	0.02	0.02	0.02	0.02	0.06	0.10	0.23	0.03	0.03	0.03	0.03
OREM TP ACTUAL	1.74	1.07	0.60	0.95	0.40	0.70	1.21	1.73	0.66	0.09	1.17	2.54
OREM TP WEIGHTED	0.40	0.24	0.14	0.21	0.09	0.15	0.26	0.37	0.14	0.02	0.26	0.58
PAYSON ACTUAL	1.82	1.37	1.38	1.29	1.04	1.25	2.90	2.73	0.64	0.16	0.54	1.30
PAYSON WEIGHTED	1.35	1.01	1.01	0.94	0.75	0.89	2.06	1.93	0.45	0.12	0.40	0.96
LAKE ELEVATION (ft)	4482.52	4482.72	4483.05	4483.48	4483.87	4484.49	4484.70	4484.76	4484.88	4483.99	4483.01	4482.57
AREA (Acres))	19837	20136	20601	21160	21626	22300	22512	22571	22687	21763	20546	19913
WEIGHTED PRECIP (in)	1.79	1.27	1.17	1.17	0.86	1.10	2.42	2.53	0.62	0.17	0.69	1.57
VOLUME (Ac-ft)	2959	2131	2009	2063	1550	2044	4540	4759	1172	308	1181	2605

Table D:3 - Goshen Bay Precipitation

GOSHEN BAY MONTHLY PRECIPITATION DATA (inches) 1992 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.21	1.64	0.34	0.37	1.44	0.45	0.14	1.20	0.75	0.98	0.30	1.06
Orem Weighted	0.60	0.81	0.17	0.18	0.71	0.22	0.07	0.60	0.37	0.49	0.15	0.53
Payson Actual	1.90	2.36	0.75	0.62	1.77	1.21	0.23	1.63	0.81	1.03	0.22	0.70
Payson Weighted	0.34	0.43	0.14	0.11	0.32	0.22	0.04	0.30	0.15	0.19	0.04	0.13
Santaquin Actual	2.18	2.93	0.73	0.45	1.32	1.54	0.11	1.69	0.55	0.84	0.19	0.47
Santaquin Weighted	0.70	0.95	0.24	0.15	0.43	0.50	0.04	0.55	0.18	0.27	0.06	0.15
Lake Elevation	4482.52	4482.82	4483.27	483.76	4484.27	4484.70	4484.75	4484.27	4483.52	4482.53	4481.40	4481.16
Area (acres)	20408	20867	21295	21695	22070	22512	22561	22070	21209	19853	17604	17021
Weighted Precip. (in)	1.65	2.19	0.54	0.44	1.46	0.94	0.15	1.44	0.70	0.94	0.25	0.80
Volume (Ac-ft)	2803	3803	959	797	2687	1763	276	2641	1231	1561	367	1141

GOSHEN BAY MONTHLY PRECIPITATION DATA (inches) 1993 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.36	1.15	1.60	1.84	1.45	2.54	0.48	2.45	1.31	0.79	0.62	1.09
Orem Weighted	1.17	0.57	0.79	0.91	0.72	1.26	0.22	1.13	0.61	0.37	0.29	0.50
Payson Actual	1.84	1.80	1.50	3.85	2.32	2.13	1.21	4.36	1.37	0.44	0.46	1.24
Payson Weighted	0.33	0.33	0.27	0.70	0.42	0.39	0.20	0.74	0.23	0.07	0.08	0.21
Santaquin Actual	2.25	2.24	1.97	3.87	2.34	2.35	1.47	3.65	1.96	0.35	0.42	1.14
Santaquin Weighted	0.73	0.72	0.64	1.25	0.76	0.76	0.54	1.34	0.72	0.13	0.15	0.42
Lake Elevation	4481.46	4481.70	4482.15	4482.81	4483.61	4484.47	4485.21	4486.03	4486.82	4486.74	4486.12	4485.71
Area (acres)	17747	48310	19246	20266	21319	22279	22995	23691	24285	24221	23754	23432
Weighted Precip. (in)	2.23	1.62	1.70	2.86	1.89	2.40	0.97	3.21	1.56	0.57	0.52	1.13
Volume (Ac-ft)	3299	6521	2729	4829	3367	4464	1854	6346	3156	1148	1028	2214

GOSHEN BAY MONTHLY PRECIPITATION DATA (inches) 1994 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.14	0.34	0.10	0.40	1.11	0.79	2.83	0.98	0.00	0.18	1.02	0.73
Orem Weighted	0.99	0.16	0.05	0.19	0.49	0.35	1.24	0.43	0.00	0.08	0.47	0.36
Payson Actual	1.47	0.86	0.90	0.56	2.45	0.81	2.92	1.42	0.04	0.27	1.50	0.91
Payson Weighted	0.25	0.15	0.15	0.09	0.41	0.13	0.48	0.24	0.01	0.05	0.25	0.16
Santaquin Actual	1.80	0.89	1.12	0.53	2.86	0.78	2.47	1.41	0.02	0.06	1.85	1.29
Santaquin Weighted	0.66	0.33	0.41	0.20	1.13	0.31	0.98	0.56	0.01	0.02	0.68	0.42
Lake Elevation	4485.78	4486.14	4486.52	4486.89	4487.32	4487.68	4487.91	4487.82	4487.24	4486.34	4485.49	4484.87
Area (acres)	23490	23769	24049	24341	24704	25028	25245	25159	24635	23914	23244	22773
Weighted Precip. (in)	1.90	0.63	0.61	0.47	2.03	0.79	2.70	1.22	0.01	0.15	1.41	0.94
Volume (Ac-ft)	3722	1248	1224	963	4170	1646	5685	2565	30	301	2725	1790

GOSHEN BAY MONTHLY PRECIPITATION DATA (inches) 1995 Water Year												
STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	2.97	0.78	1.02	1.16	0.25	1.13	1.25	4.81	1.08	0.65	0.48	0.33
Orem Weighted	1.47	0.36	0.47	0.54	0.12	0.49	0.55	2.11	0.44	0.26	0.21	0.14
Payson Actual	3.36	3.04	0.97	2.30	1.11	2.23	2.32	4.89	1.47	1.09	0.21	0.99
Payson Weighted	0.61	0.51	0.16	0.39	0.19	0.37	0.39	0.81	0.22	0.16	0.03	0.16
Santaquin Actual	4.49	2.87	1.32	2.56	1.40	2.44	3.45	6.09	1.99	0.55	0.12	1.10
Santaquin Weighted	1.45	1.06	0.49	0.94	0.52	0.97	1.37	2.41	0.89	0.24	0.05	0.44
Lake Elevation	4484.78	4485.17	4485.54	4486.04	4486.59	4487.03	4487.46	4488.34	4489.20	4489.17	4488.66	4488.12
Area (acres)	22590	22959	23287	23698	24103	24457	24828	25672	26611	26577	26008	25405
Weighted Precip. (in)	3.53	1.93	1.12	1.87	0.82	1.83	2.30	5.33	1.54	0.67	0.29	0.74
Volume (Ac-ft)	6648	3695	2177	3689	1644	3732	4756	11403	3423	1487	634	1576

Table D:3 Continued

GOSHEN BAY MONTHLY PRECIPITATION DATA (Inches)
1996 Water Year

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	0.45	0.48	1.03	2.93	2.11	1.53	0.66	0.94	0.19	0.25	0.02	1.90
Orem Weighted	0.20	0.21	0.45	1.28	0.85	0.62	0.27	0.38	0.08	0.11	0.01	0.83
Payson Actual	0.28	0.71	1.74	3.43	3.14	2.29	1.97	1.87	0.24	0.11	0.27	1.35
Payson Weighted	0.05	0.12	0.29	0.57	0.47	0.34	0.30	0.28	0.04	0.02	0.04	0.22
Santaquin Actual	0.06	0.89	1.29	2.23	3.64	3.81	2.07	1.55	0.09	0.15	0.06	1.27
Santaquin Weighted	0.02	0.35	0.51	0.88	1.62	1.70	0.92	0.69	0.04	0.06	0.02	0.50
Lake Elevation	4488.01	4488.27	4488.65	4488.96	4489.23	4489.46	4489.55	4489.59	4489.37	4488.71	4487.91	4487.45
Area (acres)	25342	25601	25997	26338	26646	26919	27028	27077	26811	26062	25245	24819
Weighted Precip. (in)	0.27	0.68	1.25	2.74	2.95	2.66	1.48	1.35	0.15	0.19	0.08	1.56
Volume (Ac-ft)	565	1452	2710	6005	6540	5964	3342	3048	342	406	163	3225

GOSHEN BAY MONTHLY PRECIPITATION DATA (Inches)
1997 Water Year

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.70	1.83	0.98	2.94	1.18	0.14	1.31	1.35	0.62	0.37	0.72	1.49
Orem Weighted	0.74	0.80	0.43	1.29	0.48	0.06	0.53	0.55	0.25	0.15	0.32	0.65
Payson Actual	2.46	2.27	1.25	3.05	1.27	0.62	2.58	1.62	0.80	0.58	0.85	1.95
Payson Weighted	0.41	0.38	0.21	0.51	0.19	0.09	0.39	0.24	0.12	0.09	0.14	0.32
Santaquin Actual	2.11	2.07	2.16	3.50	2.03	0.46	2.96	2.23	0.87	1.52	0.92	2.16
Santaquin Weighted	0.84	0.82	0.86	1.39	0.90	0.20	1.32	0.99	0.39	0.68	0.36	0.86
Lake Elevation	4487.39	4487.78	4488.34	4488.93	4489.49	4489.79	4489.93	4490.13	4490.11	4489.45	4488.77	4488.58
Area (acres)	24766	25122	25672	26304	26955	27235	27503	27677	27664	26907	26127	25922
Weighted Precip. (in)	1.99	2.00	1.49	3.18	1.57	0.35	2.23	1.78	0.76	0.91	0.82	1.83
Volume (Ac-ft)	4104	4183	3192	6971	3531	804	5122	4110	1748	2048	1787	3957

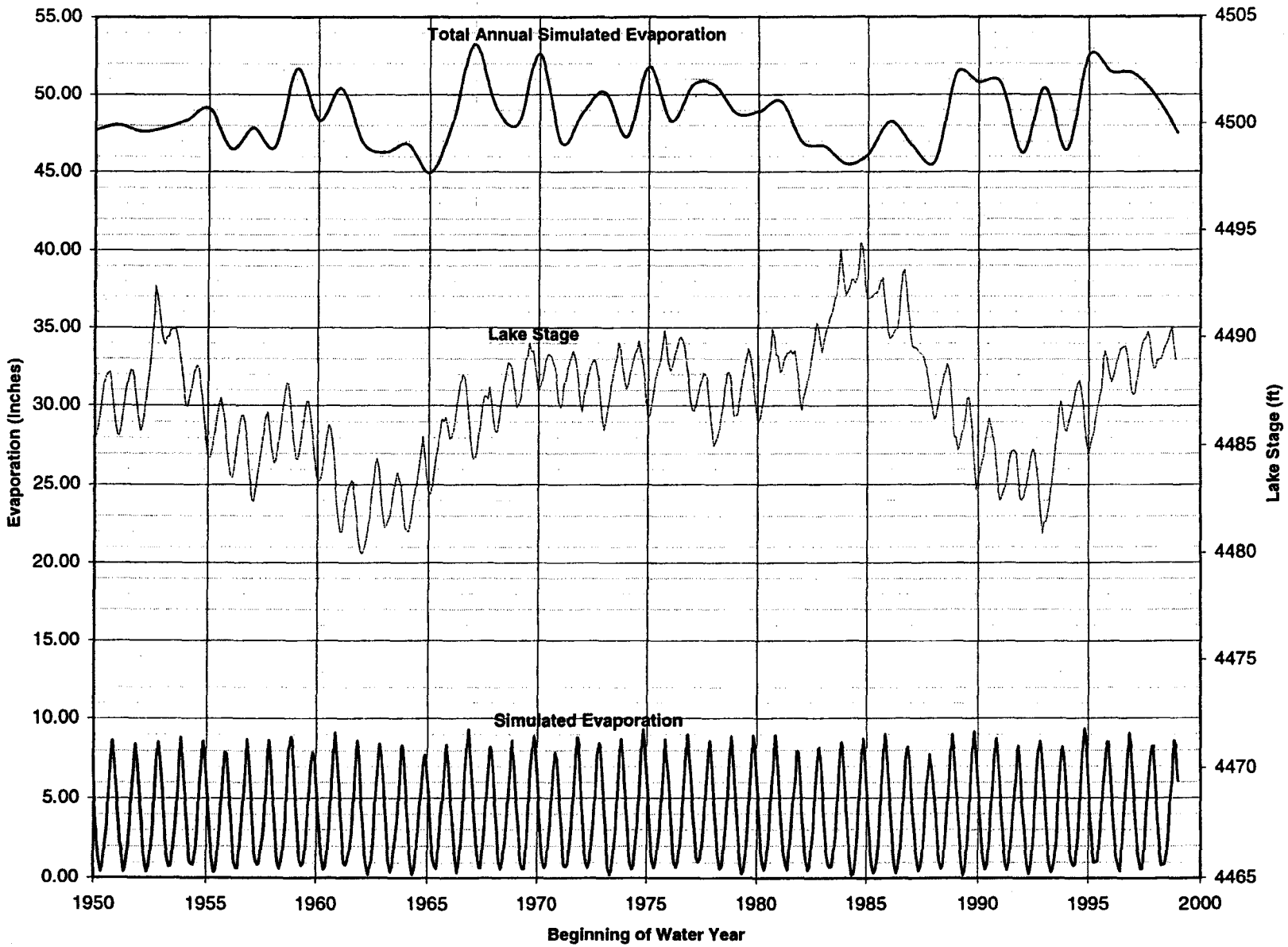
GOSHEN BAY MONTHLY PRECIPITATION DATA (Inches)
1998 Water Year

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	1.05	1.41	0.83	1.89	2.51	1.62	1.26	1.27	2.85	0.98	0.37	0.37
Orem Weighted	0.46	0.62	0.36	0.77	1.02	0.66	0.51	0.51	1.15	0.40	0.15	0.16
Payson Actual	2.25	1.50	1.08	2.89	2.7	1.87	1.59	2.18	2.03	0.86	0.46	0.99
Payson Weighted	0.37	0.25	0.18	0.43	0.41	0.28	0.24	0.33	0.30	0.13	0.07	0.16
Santaquin Actual	1.91	1.50	1.25	2.76	3.25	2.90	1.96	1.45	3.67	1.31	0.45	0.73
Santaquin Weighted	0.76	0.59	0.50	1.23	1.45	1.29	0.87	0.65	1.63	0.58	0.20	0.29
Lake Elevation	4488.78	4488.97	4488.99	4489.13	4489.38	4489.61	4489.79	4490.05	4490.35	4490.06	4489.32	4488.94
Area (acres)	26138	26349	26371	26531	26823	27101	27325	27625	27822	27632	26752	26135
Weighted Precip. (in)	1.59	1.46	1.04	2.43	2.87	2.23	1.62	1.49	3.09	1.11	0.42	0.62
Volume (Ac-ft)	3463	3207	2281	5366	6410	5030	3691	3422	7169	2553	934	1340

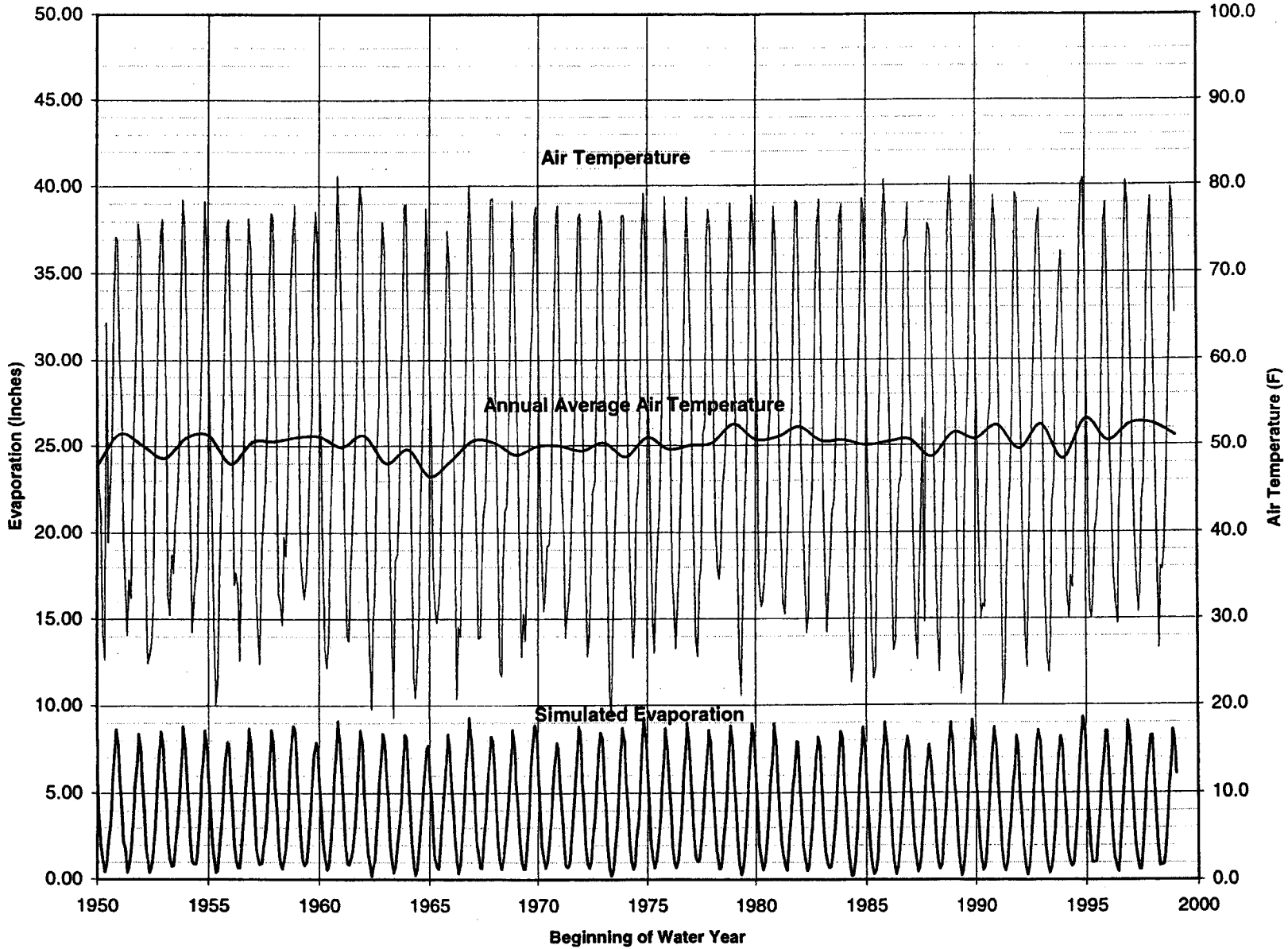
GOSHEN BAY MONTHLY PRECIPITATION DATA (Inches)
1999 Water Year

STATION	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Orem Actual	0.87	0.72	0.78	1.74	1.07	0.29	4.66	2.33	1.58	0.92	0.52	0.27
Orem Weighted	0.37	0.30	0.32	0.72	0.44	0.12	1.93	0.96	0.65	0.39	0.22	0.12
Payson Actual	1.44	1.37	0.89	1.22	1.11	0.56	4.63	2.73	1.61	1.29	0.44	0.15
Payson Weighted	0.23	0.21	0.14	0.19	0.17	0.09	0.71	0.42	0.25	0.20	0.07	0.03
Santaquin Actual	2.21	1.75	1.39	1.82	1.57	0.62	3.87	3.36	1.54	1.61	0.57	0.29
Santaquin Weighted	0.93	0.75	0.60	0.79	0.68	0.27	1.67	1.46	0.67	0.68	0.23	0.12
Lake Elevation	4489.01	4489.22	4489.36	4489.47	4489.57	4489.53	4489.44	4489.59	4489.59	4489.09	4488.49	4488.1
Area (acres)	26394	26635	26799	26931	27052	27004	26895	27077	27077	26485	25827	25430
Weighted Precip. (in)	1.52	1.26	1.06	1.69	1.29	0.48	4.31	2.84	1.57	1.27	0.53	0.26
Volume (Ac-ft)	3351	2797	2364	3803	2915	1068	9669	6405	3536	2801	1135	547

APPENDIX E - Temperature and Evaporation Plots

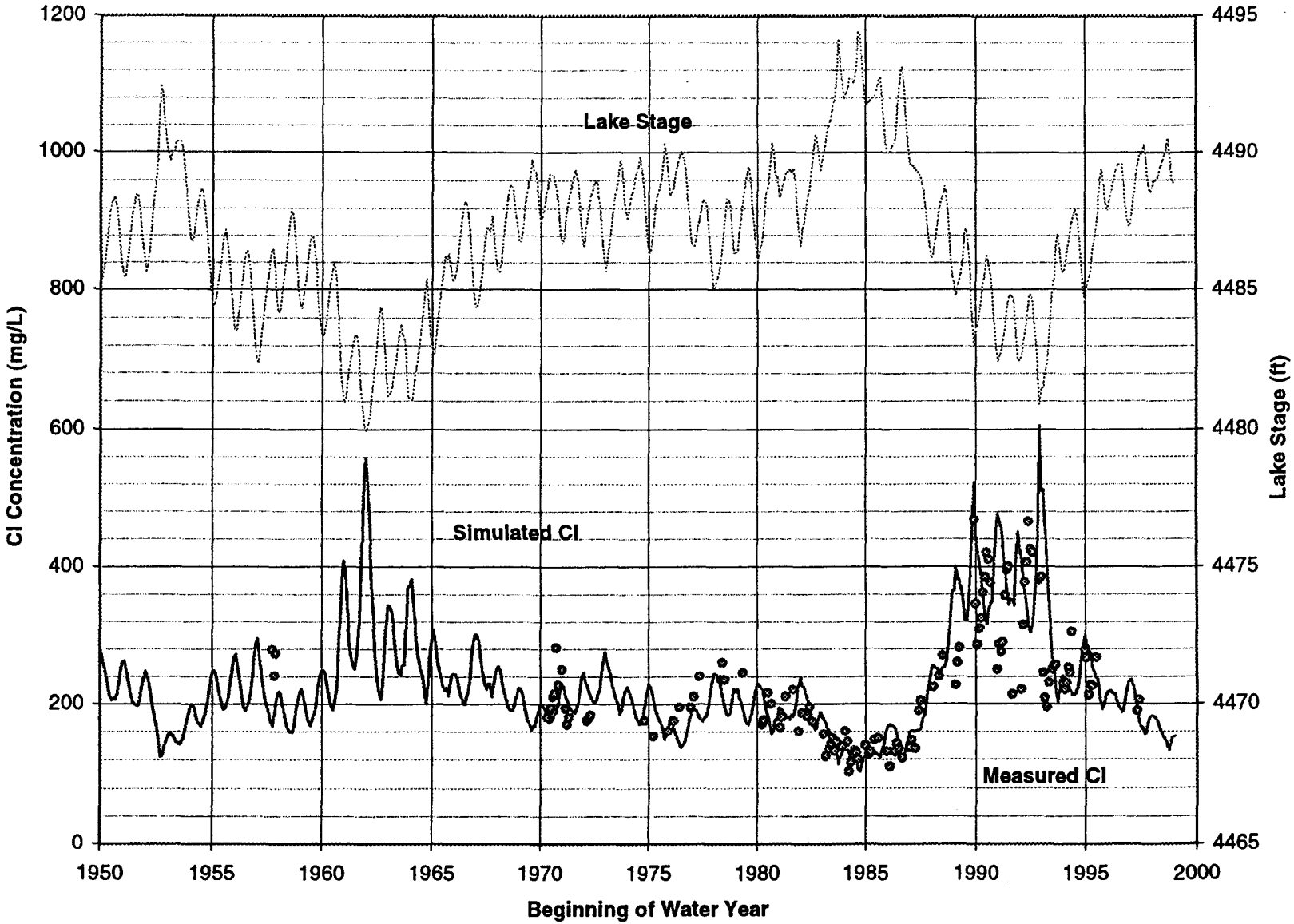


Evaporation and Water Levels in Utah Lake

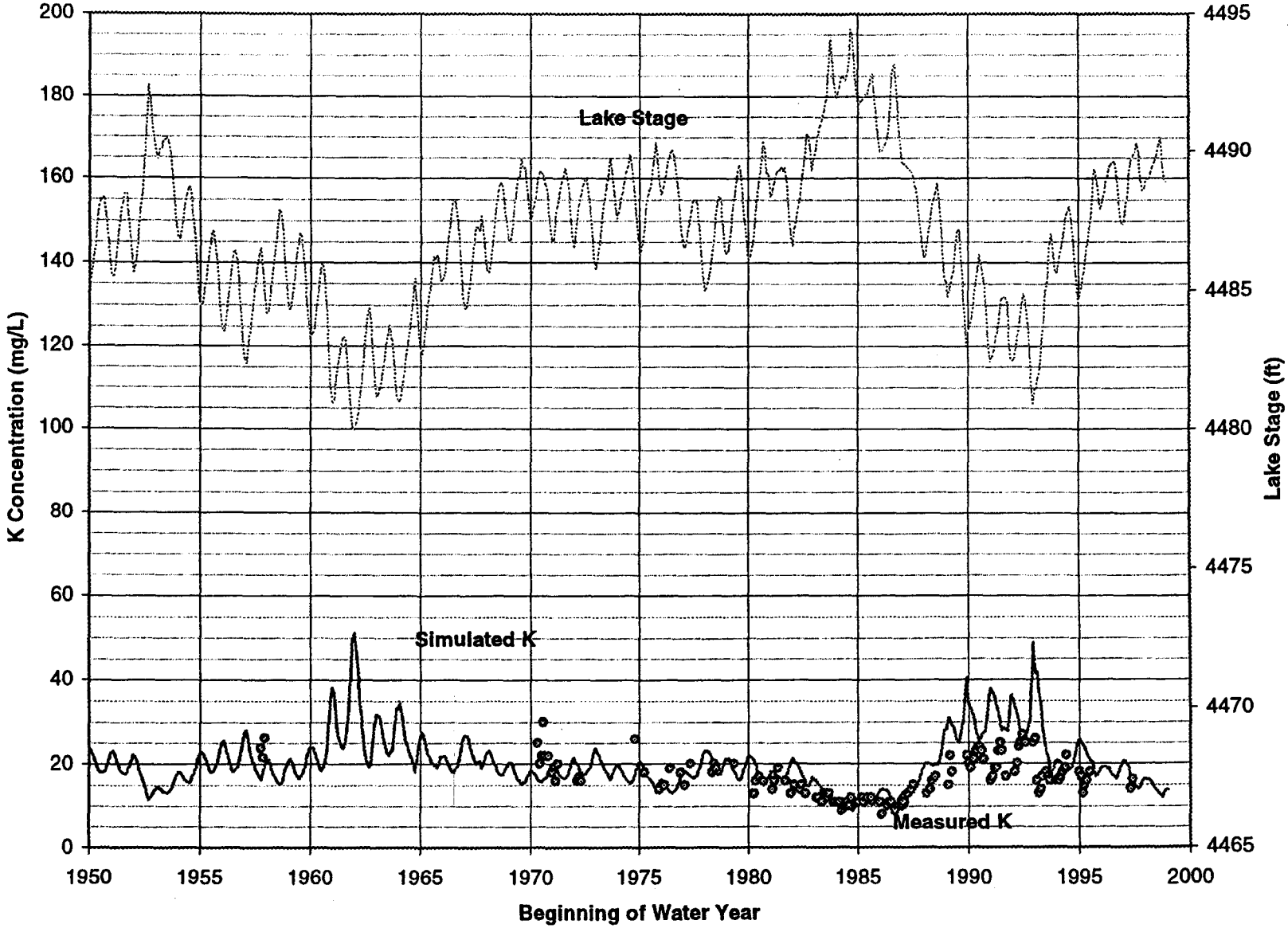


Evaporation and Air Temperature - Utah Lake

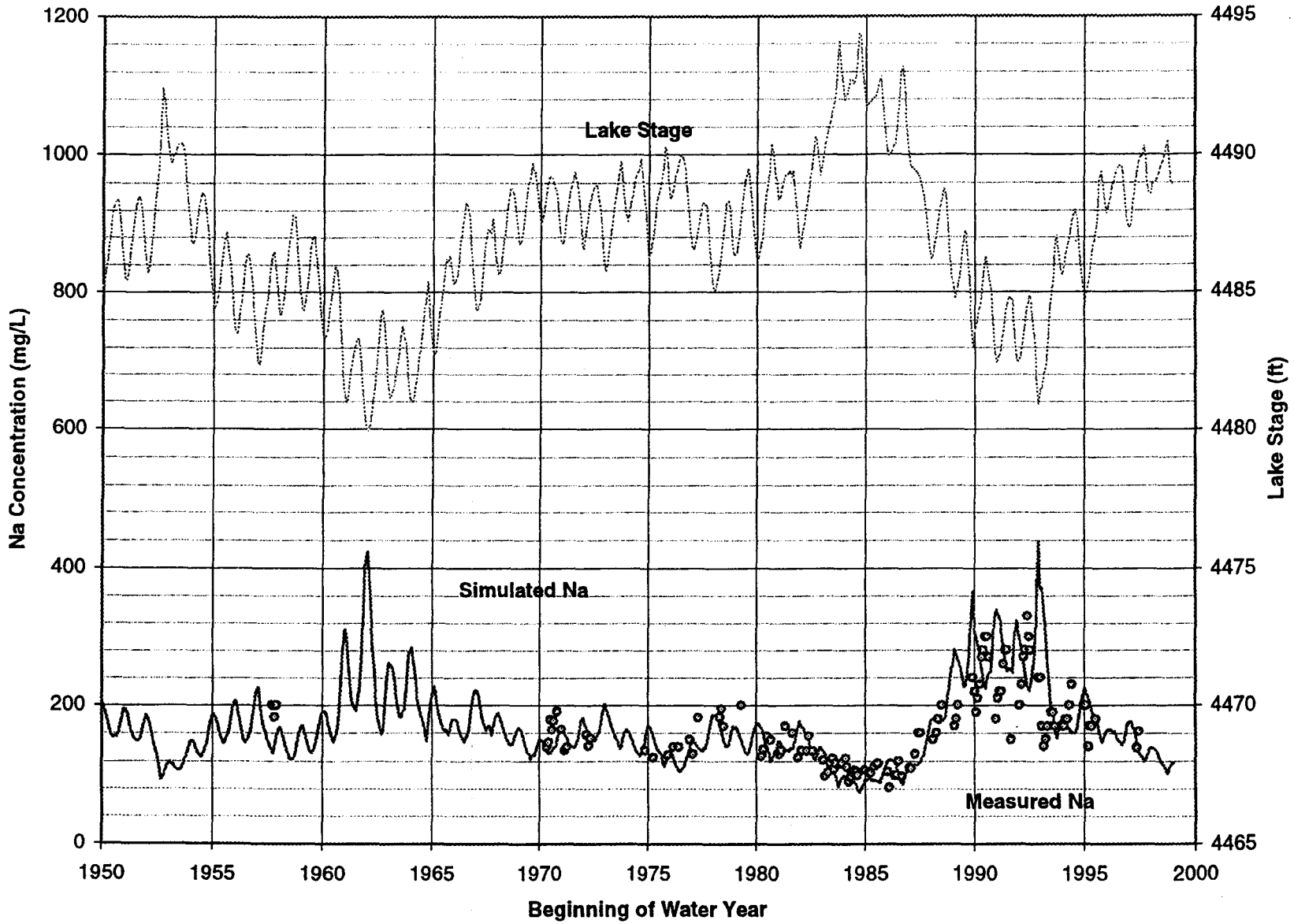
APPENDIX F - Plots of Calibrated LKSIM Results



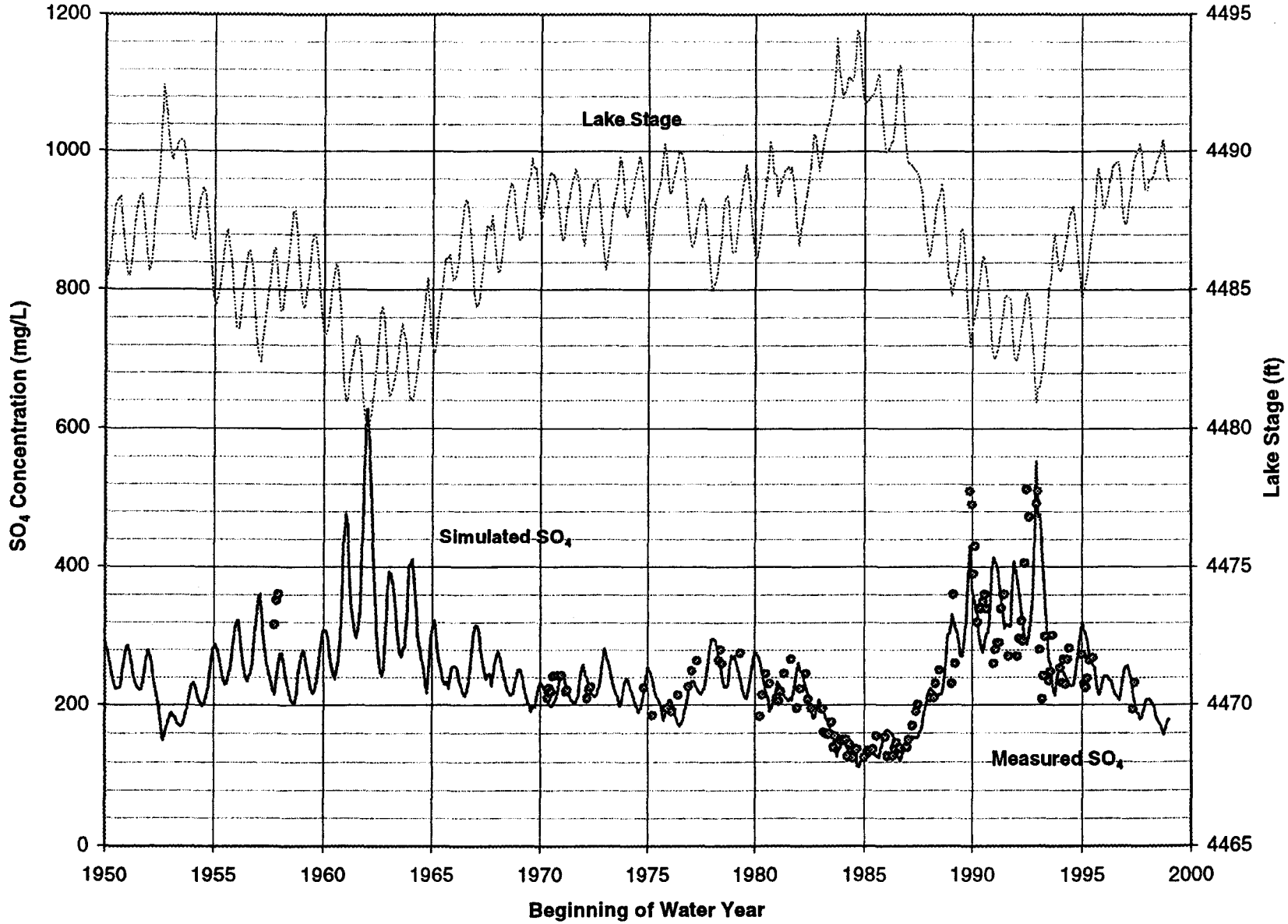
Chloride Concentrations and Water Levels in Utah Lake



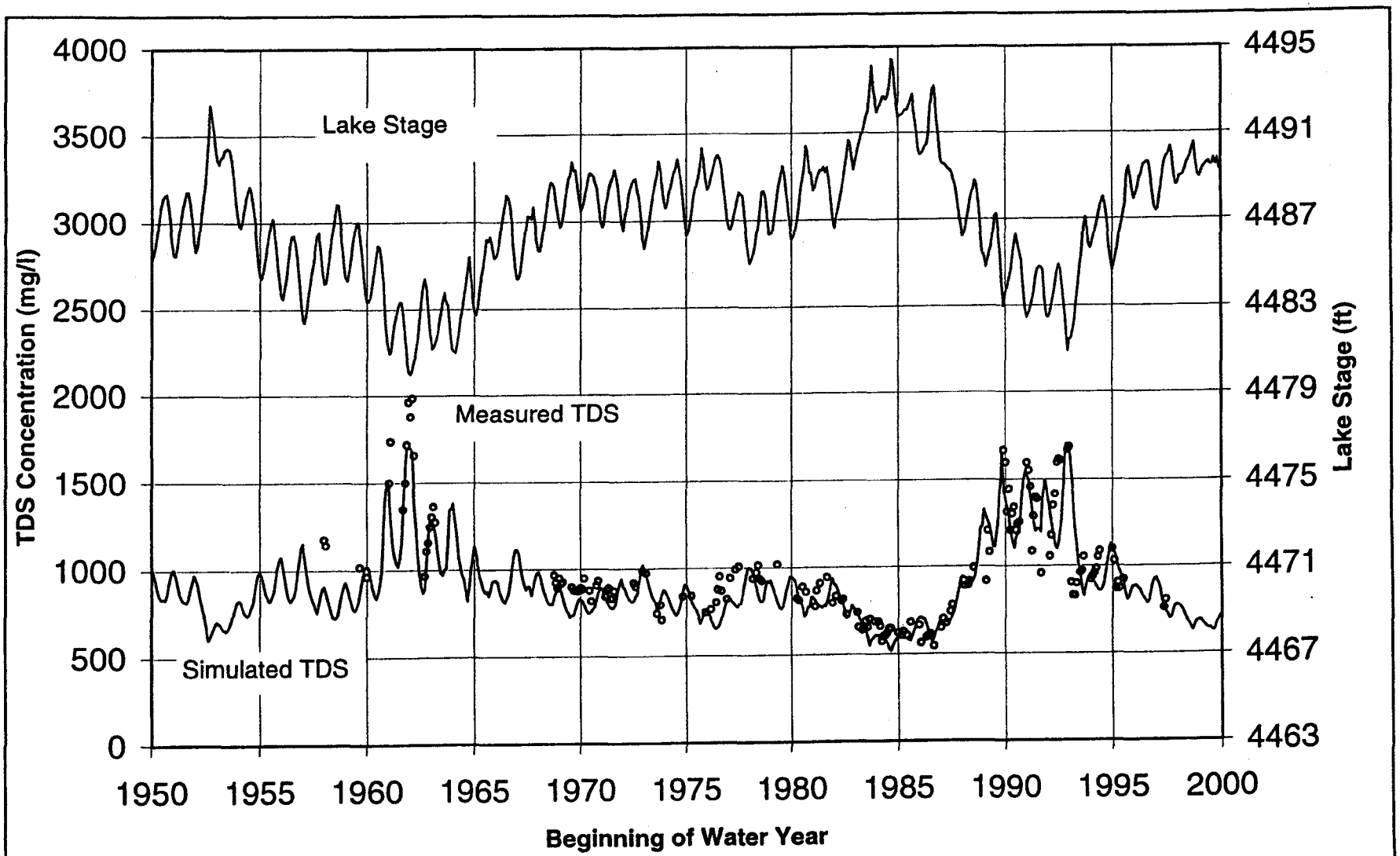
Potassium Concentrations and Water Levels in Utah Lake



Sodium Concentrations and Water Levels in Utah Lake



Sulfate Concentrations and Water Levels in Utah Lake



Total Dissolved Solids and Water Levels in Utah Lake