Appendix A

Groundwater Recharge in the Southern High Plains

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Introduction

This appendix provides a brief overview of previous estimates of groundwater recharge on the Southern High Plains, and presents the results of additional field work and modeling analyses conducted in conjunction with development of the Southern Ogallala GAM model. The field work, conducted in collaboration with the U.S. Geological Survey (USGS) National Water Quality Assessment (NAWQA) program, was included as part of the GAM study to provide additional information concerning irrigation return flow.

Review of Recharge Estimates from Previous Studies

The primary sources of recharge to the Ogallala aquifer in the Southern High Plains are playas, headwater creeks, and irrigation return flow. Previous studies indicate that recharge in interplaya settings from precipitation is negligible, as shown by high chloride concentrations in the unsaturated zone (Aronovici and Schneider 1972; Scanlon et al. 1997). If recharge rates were high in interplaya settings, chloride would be flushed out of the soil profile. Evidence of high recharge rates beneath playas is provided by low levels of calcium carbonate, low chloride concentrations, and deep penetration of bomb pulse tritium from nuclear testing in the 1950s and 1960s (Scanlon et al., 1997; Wood and Sanford, 1995). Recharge rates estimated from tritium concentrations in the unsaturated zone beneath individual playas range from 3 to 4.7 inches per year (in/yr) (Scanlon et al., 1997; Wood et al., 1997). Because of the spatial focusing of recharge beneath playas, it is difficult to calculate the average recharge rate to the aquifer from unsaturated zone data. Numerical modeling studies by Mullican et al. (1997) indicated that accurate representation of spatial focusing of recharge is not important for the Ogallala aquifer; similar modeling results were obtained whether recharge was focused beneath playas or was applied uniformly. Regional estimates of recharge were provided by groundwater tracers such as chloride and tritium. The average groundwater chloride concentration of 25 mg/L in the northern half of the Southern High Plains resulted in a regional recharge rate of 0.4 in/yr (Wood and Sanford, 1995). High tritium concentrations in groundwater in the southeastern part of the Ogallala aquifer in the vicinity of Lubbock, Lynn, and Dawson counties resulted in recharge estimates from 0.5 to 3.2 in/yr (mean 1.6 in/yr) (Nativ, 1988).

Irrigation-return flow may also contribute significant amounts of recharge to the aquifer. Many areas of the aquifer have been irrigated since the 1940s. Irrigation inefficiency was high during early decades, but decreased over time, particularly during the 1980s and 1990s. Luckey et al. (1986) estimated irrigation return flow to be 50% of applied irrigation water or net withdrawal in 1940 to 1960, decreasing to 37 to 46% in the 1960 to 1980 period. Field studies in Nevada in loam to clay-loam soil indicated that flood irrigation on alfalfa resulted in 20% return flow (Roark and Healy, 1998).

Recharge rates applied in previous groundwater modeling studies of the Southern High Plains are variable. Recharge rates in the Knowles et al. (1984) model ranged from 0.06 to 0.83 in/yr. These estimates were based on a study of water content monitoring at irrigated and non-irrigated sites in each county conducted by Klemt (1981). Luckey et al. (1986) applied an average recharge rate of 0.13 in/yr in the Southern High Plains during the predevelopment period. A more recent modeling study conducted by Stovall et al. (2000) applied an

average recharge rate of 2.8 in/yr based on automated inverse modeling. In addition to irrigation return flow applied during aquifer development Luckey et al. (1986) applied an additional 2 in/yr to irrigated and dryland areas during the 1960 to 1980 period.

Recharge Estimation for Current Groundwater Availability Modeling Project

Additional studies were conducted to evaluate recharge in the Southern High Plains. The previous regional estimate of recharge based on groundwater chloride concentrations in Wood and Sanford (1995) was reexamined to evaluate any potential impact of irrigation return flow. Field studies were conducted in collaboration with the U.S. Geological Survey (USGS) National Water-Quality Assessment (NAWQA) program. The NAWQA program involved drilling and sampling of boreholes in irrigated and non-irrigated sites. Samples were collected for tritium analysis to evaluate recharge rates. Pressure monitoring devices were also installed to evaluate infiltration beneath irrigated and non-irrigated sites.

Recharge Estimates Based on Groundwater Chloride Concentrations

Recharge was previously estimated by Wood and Sanford (1995) using an average groundwater chloride concentration of 25 mg/L in the northern half of the Southern High Plains because this region is not affected by saline lakes. Areas of known contamination were excluded in the estimate. The recharge rate was calculated using the chloride mass balance approach, which equates the chloride input to the system (precipitation rate [19.1 in/yr] times chloride concentration in precipitation and dry fallout [0.58 mg/L]) to the chloride output (recharge rate times chloride concentration in groundwater [25.2 mg/L]).

$$R = \frac{P \times Cl_p}{Cl_{gw}} = \frac{19.1 in/yr \times 0.58 mg/L}{25.2 mg/L} = 0.4 in/yr \quad (1)$$

These data resulted in a recharge rate of 0.4 in/yr. We reevaluated this recharge estimate by examining the chloride concentration in precipitation, the precipitation rate, and the groundwater chloride concentration. Chloride concentrations in precipitation (0.13 ± 0.02 mg/L), based on data from the National Atmospheric Deposition (NADP) program (http://nadp.sws.uiuc.edu) from 1985 – 2000 at the Muleshoe National Wildlife Reserve (MNWR) and at a site near the Texas-Oklahoma border (OK29; 0.12 ± 0.02 mg/L), are much lower than the previous estimate of 0.5 mg/L, which was based on one year of data from Amarillo (Wood and Sanford; 1995). The differences in chloride input may be partly related to the fact that the NADP values represent wet deposition only, whereas the data from Amarillo represent wet and dry fallout. Studies by Izbicki (USGS, pers. comm., 2001) indicate that values based on wet deposition should be multiplied by a factor of ~2 to approximate wet and dry deposition. Chloride input was also estimated for the Amarillo region using pre-bomb 36Cl/Cl ratios (~0.3 mg/L). The value of 0.3 mg/L is slightly greater than 2 times the NADP value but is more appropriate than 0.58 mg/L. The average precipitation for the region, based on data from the National Climatic Data Center (http://lwf.ncdc.noaa.gov) for the period 1931 – 2001, was 17.8 in/yr.

Groundwater chloride concentrations were also reevaluated. The previous estimate of 25.2 mg/L (Wood and Sanford, 1995) did not evaluate the impact of irrigation return flow. Groundwater chloride concentrations in irrigated and non-irrigated regions and the distribution of irrigated regions were obtained from the Texas Water Development Board (http://www.twdb.state.tx.us) (fig. 1). High chloride concentrations related to saline lakes and contaminated sites were omitted from average values by excluding data in the predominantly red-colored zone shown in Figure 1 and other concentrations greater than 2 standard deviations above the mean log of the remaining values. Average chloride concentrations in irrigated (15.9 mg/L) and non-irrigated (17.3 mg/L) sites were remarkably similar to and are slightly lower than the average groundwater chloride concentration

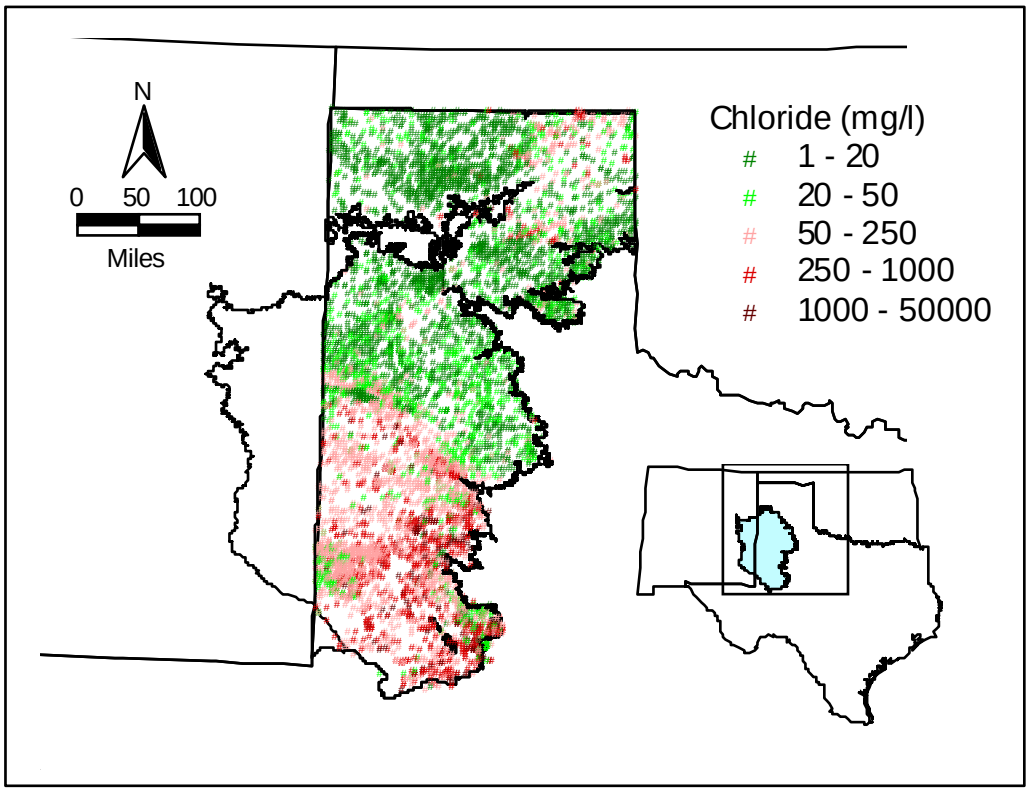

Figure 1. Groundwater chloride concentrations in the High Plains Aquifer in Texas.

previously estimated by Wood and Sanford (1995). The recharge rate for non-irrigated regions was calculated as follows:

$$R = \frac{P \, x \, Cl_p}{Cl_{gw}} = \frac{17.8 in/yr \, x \, 0.3 mg/L}{16.7 mg/L} = 0.31 \, in/yr \quad (2)$$

This estimate of 0.31 in/yr is slightly lower than that estimated by Wood and Sanford (1995). Recharge for irrigated regions can be estimated using the following equation:

$$R = \frac{P \times Cl_p + Irr \times Cl_{irr}}{Cl_{gw}} \quad (3)$$

where *Irr* is the irrigation application and Cl_{irr} is the chloride concentration in the irrigated water.

Estimating recharge rates in irrigated areas requires information on the irrigation application amount, the chloride concentration in the irrigation water, and the chloride concentration in groundwater in irrigated regions. Because groundwater is used for irrigation, one would assume that the chloride concentrations in groundwater in nonirrigated regions and the irrigation water are similar. The similarity in groundwater chloride concentrations in irrigated and nonirrigated regions suggests that either (1) the database and data mining approach are inadequate, (2) there is mixing and dilution of irrigation return flow with regional Ogallala groundwater, (3) irrigation water had not reached the groundwater, or (4) the irrigation system was 100% inefficient. The first two reasons seem most plausible because the field studies described in this report indicate that irrigation water has reached the water table in the areas examined and the maximum inefficiencies of irrigation systems is generally considered to be 50% during flood irrigation. The database includes chloride concentrations that represent a long time period and there may be temporal trends in chloride concentrations

that are not being evaluated in this approach. The Ogallala aquifer represents a huge reservoir of water, and mixing and dilution may mask the input from irrigation return flow. Irrigated regions would not be expected to represent steady state conditions, which add an additional complexity to the use of chloride to estimate groundwater recharge. Tritium concentrations provide a much better indicator of irrigation return flow than chloride and are discussed in a later section.

Recharge Estimates Based on Tritium

Concentrations of tritium in the unsaturated zone and groundwater were used to estimate recharge rates in irrigated areas. Tritium is used to trace water movement because it is part of the water molecule. Tritium is a radioactive isotope of hydrogen with a half life of 12.32 years. Tritium occurs naturally in the atmosphere and enters the subsurface primarily through precipitation. Tritium fallout increased as a result of atmospheric nuclear testing that began in the early 1950s and peaked in 1963 (fig. 2). The distribution of tritium in the subsurface can be used to determine the average velocity of the water. The recharge rate is calculated by multiplying the velocity by the average water content in the unsaturated zone.

Two boreholes were drilled in areas that had been irrigated since 1958 (Roberts and Maple sites) and one borehole was drilled in a non-irrigated site in the MNWR for comparison with irrigated sites (fig. 3). The boreholes in the irrigated sites were located about 5 feet (ft) distant from the edge of cultivated fields. The drilling, sampling, and analyses were conducted by the USGS as part of the NAWQA program. The methods used in this study are similar to those described in McMahon et al. (2002). The boreholes were drilled using an ODEX air-hammer drilling method (Hammermeister et al., 1986). Core samples were collected in an aluminum-lined core barrel for measurement of porosity, water content, and tritium analyses in the unsaturated zone. Groundwater samples at the irrigated sites were also collected for tritium analysis. The porosity of the samples was measured by completely saturating the cores under a vacuum and calculating the volume of pore space as the difference in mass between the saturated and oven-dried sample (McMahon et al., 2002). Gravimetric water content was measured by oven drying the sample at 105ºC for 24 hours and calculating the difference in mass between the initial (field) sample weight and the oven dried sample weight. Unsaturated zone tritium analyses were conducted on water extracted from 1 kilogram (kg) of core by vacuum distillation at 80ºC. Tritium analyses of unsaturated zone pore water and groundwater were conducted at the USGS Tritium Laboratory in Menlo Park, CA using liquid scintillation with electrolytic enrichment (Thatcher et al., 1977).

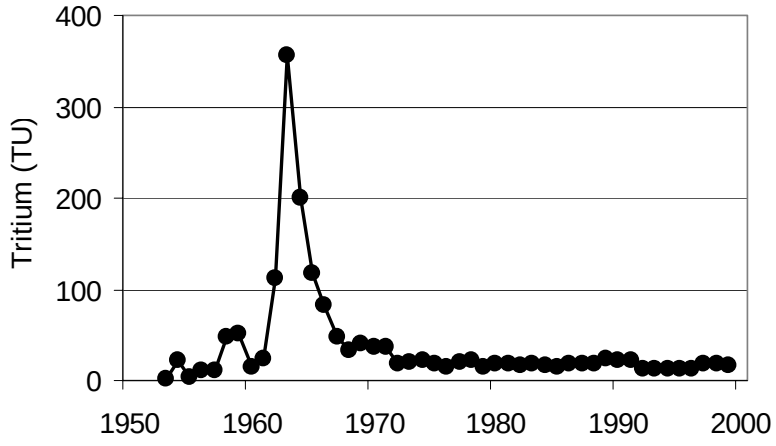

Figure 2. Average annual atmospheric tritium fallout for Ottawa, Ontario.

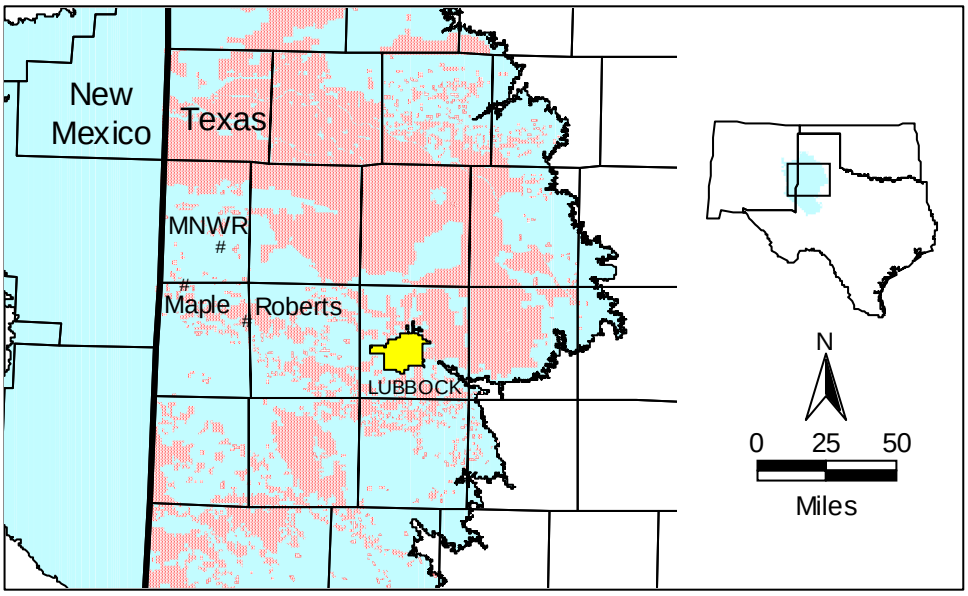

Figure 3. Map of borehole locations with Texas and New Mexico county lines. Blue areas represent extent of Southern High Plains Aquifer. Pink areas represent 1994 irrigated lands in the Texas portion of the aquifer.

Water content at the non-irrigated site was highest at the surface (about 25%) as a result of a recent precipitation and decreased to 10 to 13% at depth (fig. 4). A similar range in water contents was measured at the irrigated sites (8 to 21%). The porosity of the sediments at each site was quite variable, indicating layered sediments of different textures. Porosities ranged from approximately 25 to 48%.

Post-bomb tritium was generally restricted to the root zone at the non-irrigated MNWR site and indicates negligible recharge (fig. 4). The highest tritium concentration at this site was 6.5 tritium units (TU) at a depth of 3.75 ft. In contrast, post-bomb tritium was found throughout much of the unsaturated zone at the two irrigated sites and in the groundwater at the Roberts irrigated site. At depths greater than 20 to 30 ft, some depth intervals containing tritium concentrations below the detection limit are underlain by post-bomb pulse tritium, which suggests non-piston or preferential flow. A range of recharge rates was estimated from the tritium data in the irrigated sites. Pre-bomb tritium activity was estimated to have been about 8 TU (Thatcher, 1962). The activity of pre-bomb tritium in core samples at the time of sampling, A, was distinguished from post-bomb values by using the radioactive decay equation:

$$A = A_0 e^{-\lambda t} \qquad (4)$$

where A_0 is the pre-bomb tritium activity, λ is the half-life, and t is elapsed time. The tritium center of mass is calculated as follows:

$$T_{1/2} = \int_0^z \theta T dz \qquad (5)$$

where θ is the volumetric water content (ft^3/ft^3), T is the tritium activity (TU) and dz is the depth interval. The velocity of the water was calculated using two methods. In the first approach, the depth of the tritium activity center of mass in the subsurface was calculated and assumed to correspond in time with the peak of atmospheric activity (i.e., 1963). In the second approach, the depth of the deepest occurrence of post-bomb tritium activity was determined and assumed to correspond in time with the onset of atmospheric testing (i.e., 1953). Both approaches assume piston-type flow conditions whereas penetration of tritium below the center of mass at both irrigated sited may have occurred as a result of

referential flow. For comparison and to limit the effects of preferential flow in the calculations, the centers of mass were additionally approximated by extrapolating the tritium peaks to pre-bomb values, thus removing the "tails" of the tritium distributions at depth (fig. 4).

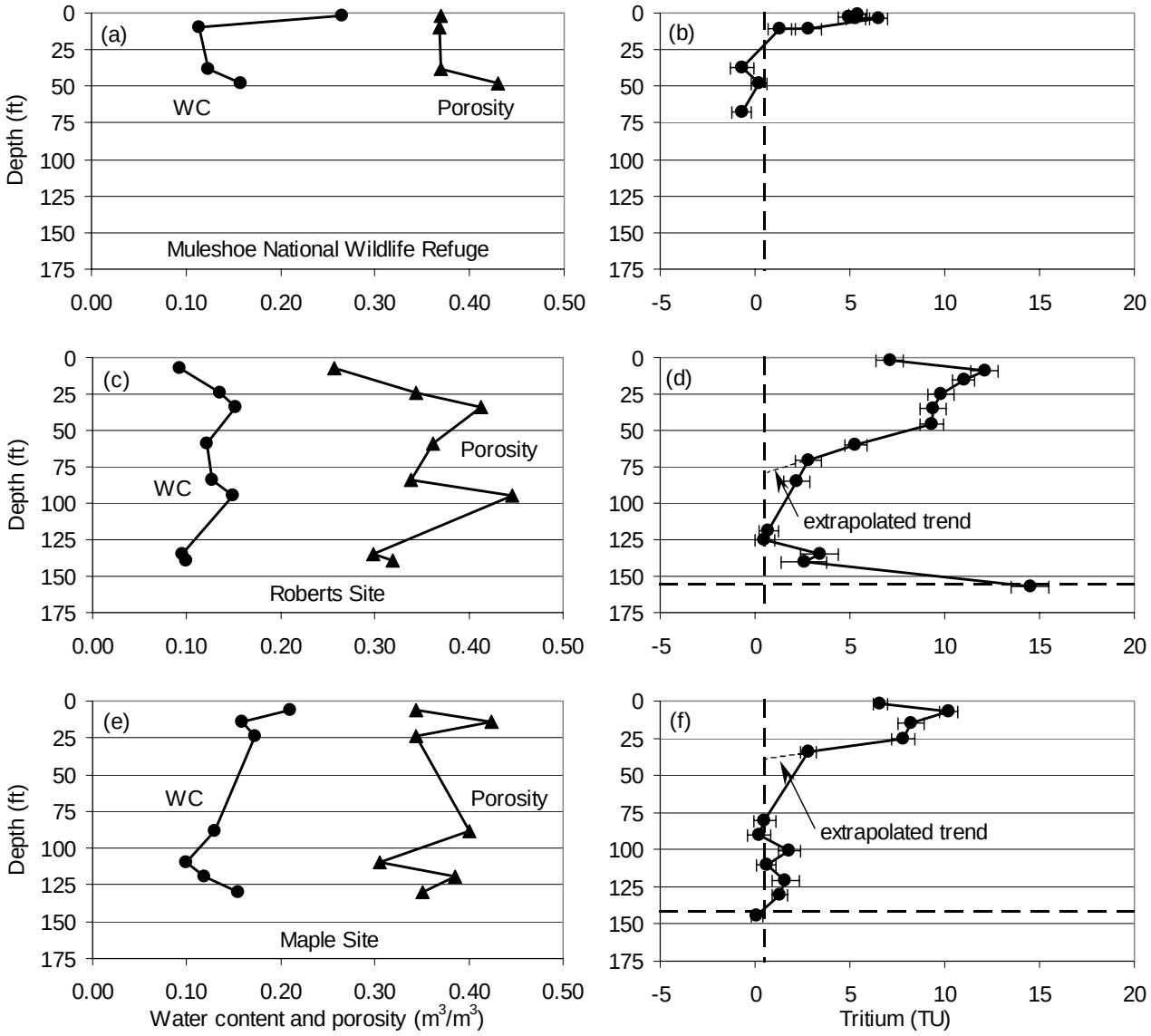

Figure 4. Water content, porosity, and tritium activity with depth at Muleshoe NWR (a, b), Roberts Site (c, d) and Maple Site (e, f). Tritium error bars represent uncertainty (1σ) in measured tritium activity. Vertical dashed lines represent calculated present-day activity (0.5 TU) of pre-bomb tritium (~8 TU) after ~50 years of decay. Horizontal dashed lines represent approximate depth of water table and deepest tritium values represent groundwater activity for the two irrigated sites.

The results of the calculations indicate that the center of mass approach to calculating recharge rates is not sensitive to preferential flow at these sites, as most of the mass is in the near-surface bulge and removal of the tails at depth resulted in only a negligible decrease in calculated recharge rates (table 1). The depth of the center of mass of tritium ranged from 13 to 35 ft. The resultant velocities ranged from 0.34 to 0.91 feet per year (ft/yr) based on the time since peak fallout (1963) and the sampling time (2001) (38 years). The recharge rates, calculated by multiplying the velocity by the average water content, ranged from 0.7 to 1.3 in/yr.

The calculations based on the deepest occurrence approach were very sensitive to the presumed preferential flow at both sites. The deepest occurrence of post-bomb tritium ranged from 136 to 148 ft with average velocities ranging from 2.8 to 3.1 ft/yr and recharge rates ranging from 4.6 to 5.0 in/yr. These recharge rates are approximately 2 to 3 times greater than the rates calculated by removing the tails of the tritium distributions at depth (2.4 and 1.7 in/yr, respectively).

These estimates could be considered bounding values for recharge. The tritium data provide average recharge estimates for the time period considered (38 to 48 years); however, recharge rates probably changed over time as irrigation practices varied. Irrigation began in 1958 at both sites. The plots were furrow irrigated initially, followed by sprinkler irrigation. Cotton was the main crop at both sites. The efficiency of irrigation systems improved over time and the amount of irrigation return flow probably decreased substantially with time. However, the current tritium profiles cannot provide any information on the temporal variability in irrigation return flow.

Matric Potential Monitoring

Heat dissipation sensors were installed to monitor the negative pressures in the unsaturated zone to determine the direction of water movement and to evaluate drainage beneath the irrigated plots. Heat dissipation sensors consist of a heater and thermocouple wire in a cylindrical porous ceramic material. A heat pulse is applied for 30 seconds(s) and the amount of heat dissipation is determined by measuring the temperature change of the instrument. Heat dissipation increases with increasing water content in the soil and is related to the negative pressures in the unsaturated zone through laboratory calibration. The heat dissipation sensors (Model 229, Campbell Scientific Inc., Logan, UT) were calibrated in a pressure plate apparatus in the laboratory using procedures outlined in Scanlon and Andraski (2002) and Flint et al. (2002). Initially, the temperatures were calibrated for temperature changes after 20 seconds of heating. Later, calibrations were changed to use 30 seconds of heating.

Table 1: Recharge estimates from tritium distributions beneath the irrigated sites.

Site	Method	Data used	Depth (ft)	Time (yr)	Average Velocity (ft/yr)	Average Water Content (ft^3/ft^3)	Recharge Rate (in/yr)
Roberts	Center of mass	All	35	38	0.91	0.123	1.3
		(-) Tails	28	38	0.73	0.126	1.1
	Deepest occurrence	All	148	48	3.08	0.123	4.6
		(-) Tails	75	48	1.57	0.126	2.4
Maple	Center of mass	All	16	38	0.42	0.147	0.7
		(-) Tails	13	38	0.34	0.176	0.7
	Deepest occurrence	All	136	48	2.84	0.147	5.0
		(-) Tails	39	48	0.82	0.176	1.7

Note: Recharge rates based on depth of post-bomb 3H center of mass and time since peak atmospheric 3H levels (38 years) and on deepest occurrence of post-bomb 3H levels and time since onset of atmospheric testing (48 years).

Heat dissipation sensors were installed in the deep boreholes drilled by the USGS. The instruments were placed at different depths and were surrounded by a sand and silica flour mixture. A bentonite plug was used to separate the different heat dissipation sensors. In addition, shallow boreholes were drilled to approximately 10 ft using a trailer-mounted drilling rig (Giddings Machine Co., Inc, Giddings, TX) and were located within the swing of the center pivot to monitor water movement directly beneath the irrigated area. The shallowest depth that could be monitored in the irrigated fields was approximately 1.6 ft (0.5 m) because of the approximated 1.3-ft plough depth. The instruments are connected to a data logger and powered by a solar panel. The instruments are logged daily and data are telemetered to the Bureau of Economic Geology using a cell phone system.

Matric potential profiles in the non-irrigated site were generally much lower (more negative) than those in the irrigated sites in the upper 10 ft in the spring and summer, indicating generally drier conditions in the non-irrigated site (fig. 5). The vertical matric potential profile in the non-irrigated site indicates matric potentials as low as –20 to –25 bars in the shallow subsurface, increasing to matric potentials close to zero at a depth of approximately 38 ft. The increase in matric potentials with depth indicates an upward driving force for water movement and suggests upward flow. These monitoring results are similar to results from interplaya settings at the Department of Energy Pantex Plant near Amarillo, Texas (Scanlon et al., 1997). The vertical matric potential profiles in the irrigated plots are close to zero throughout the profile indicating fairly wet conditions as a result of irrigation.

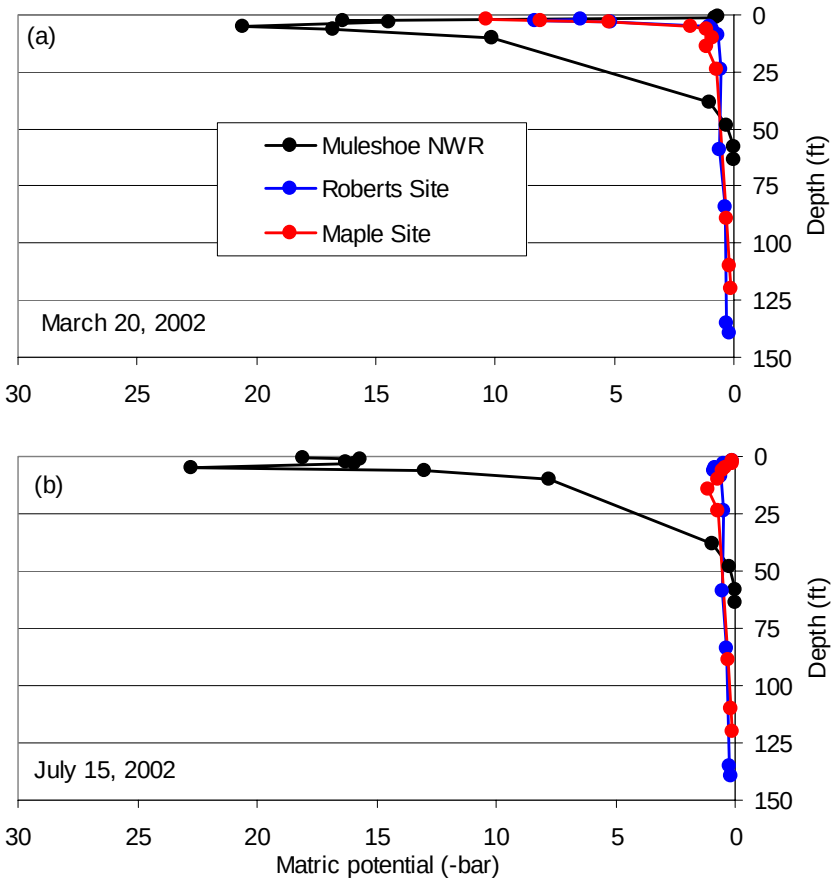

Figure 5. Monitored matric potential depth profiles measured during spring (a) and summer (b) of 2002 at the natural and irrigated sites.

The time series plots of matric potentials provide information on infiltration of water as a result of precipitation and irrigation (fig. 6). Precipitation data are only available from MNWR but are repeated in the other plots to represent widespread rainfall events. Monitoring of the heat dissipation sensors installed in the deep boreholes began in July and August 2001, whereas monitoring of those installed in the shallow boreholes began in November 2001. Monitoring results from the heat dissipation sensors indicate infiltration and deeper penetration of water to a maximum depth of 2.5 ft in response to precipitation in the spring of 2002 at the nonirrigated site (MNWR). However, matric potentials decreased in May and June and remained low throughout the rest of the summer. Matric potentials in the upper 10 ft were generally in the range of –10 to –15 bars, indicating extremely dry conditions. Matric potentials increased to values close to zero at 64 ft depth because there is a perched water table close to this zone.

In contrast, matric potentials throughout much of the unsaturated zone beneath the irrigated plots ranged from –0.5 to –1 bar, which is much wetter than the non-irrigated site. The irrigated sites also show infiltration in response to both precipitation and irrigation. As reported by the landowners, the center pivot irrigation systems at both sites require approximately one week for a single pass around the field. The application depth per pass varies from 0.8 inches at the Maple site to 1.0 inches at the Roberts site. Matric potentials increased to a depth 3.3 and 6.6 ft at both irrigated sites in April. Irrigations at the Roberts site in June and early July resulted in infiltration and redistribution to the 2.5 ft depth. Drying occurred in the top 3.3 ft from late July through August despite continued irrigation at the Roberts site. The Maple site was irrigated beginning in late May. Matric potentials showed no response until early July and again in mid-August when infiltration occurred to the 6.6 ft depth. The monitoring data at both irrigated sites indicate that, in the absence of precipitation, current center pivot irrigation methods generally result in infiltration and redistribution to depths of less than 3.3 ft. When irrigations occur in conjunction with larger precipitation events (≥~1.0 inches), infiltration and redistribution occur to depths between 6.6 and 9.8 ft. Therefore, the monitoring data indicate that the soil profile is much wetter beneath the irrigated fields than at the non-irrigated site.

Time Lag for Irrigation Return Flow

An important factor for transient groundwater simulations in the Southern High Plains is the time lag between drainage below the root zone from irrigation and recharge at the water table. We evaluated this time lag using an analytical approach and numerical modeling. The analytical approach required the following assumptions. We assumed uniform texture and initial matric potential conditions and piston flow. We also assumed unit gradient conditions, i.e. pressure head gradient dh/dz = 0; therefore, the only driving force was gravity. Under these conditions, the flux is equal to the unsaturated hydraulic conductivity at the prevailing water content, ku(θ_f), and the time required for a wetting front induced by a constant flux rate to arrive at a given depth, z, is:

$$t = \frac{z \times \left(\theta_f - \theta_i\right)}{k_u\left(\theta_f\right)} \qquad (6)$$

where θ_f is the final water content and θ_i is the initial water content in the profile.

From our monitoring of interplaya settings at the Department of Energy Pantex Plant near Amarillo, matric potentials at depths below the root zone are approximately –10 bars. This matric potential was applied to calculate initial water contents for each of the sediment textures. Van Genuchten parameters published by Schaap and Leij (1998) were applied for a range of sediment textures derived from multiple parameter databases (table 2).

The retention functions were solved for water contents corresponding to flux rates of 6, 9, and 12 in/yr and determined the number of years required for irrigation return flow to move down

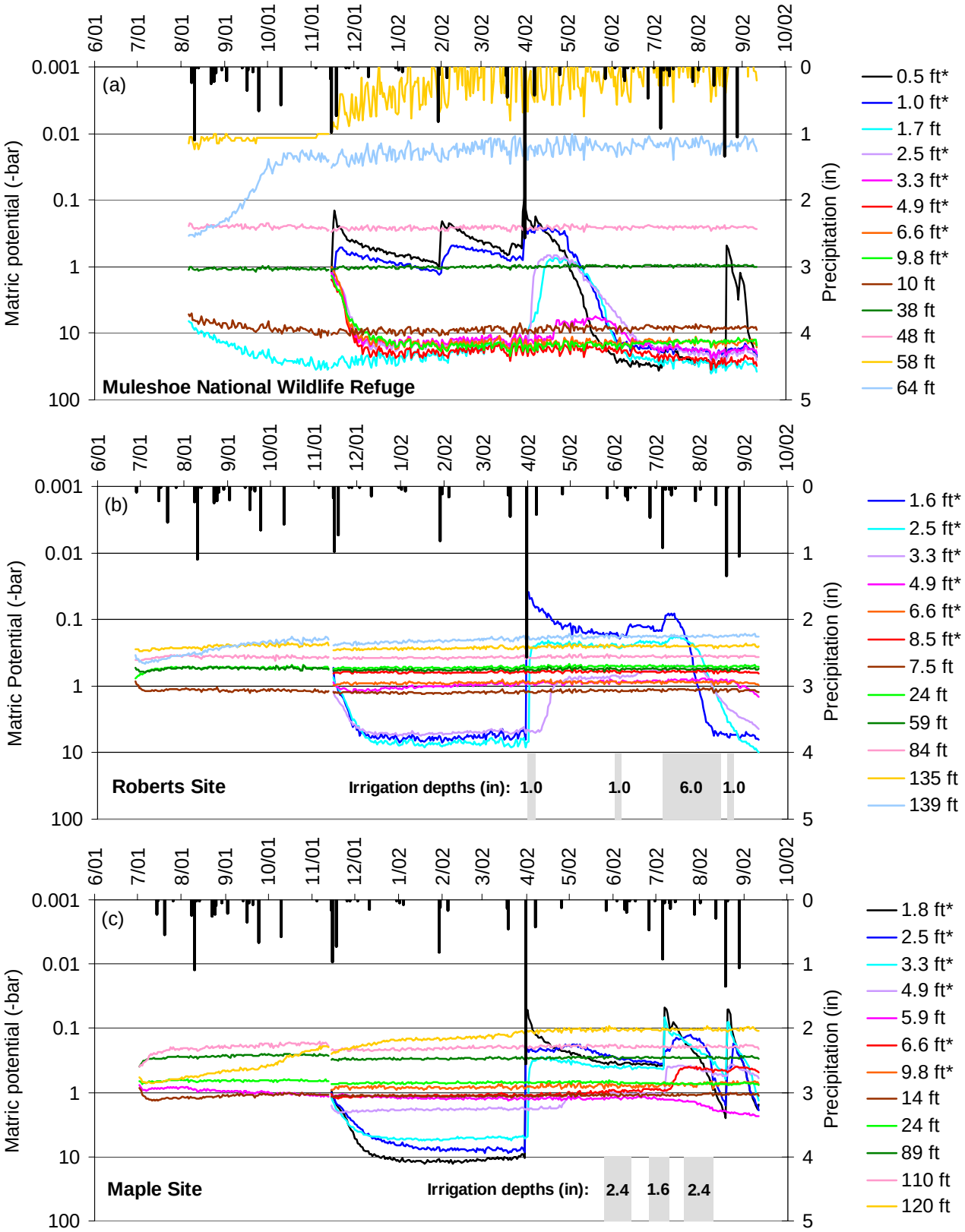

Figure 6. Time series of monitored matric potential with depth at natural (a) and irrigated (b, c) locations. Precipitation values shown for all locations were monitored at Muleshoe NWR. Depths marked with an asterisk (*) indicate sensors installed in shallow boreholes; at the irrigated sites, these sensors are within the irrigated area. Vertical gray bars behind irrigation depth values represent periods of active center pivot irrigation.

1 ft (i.e., the time required for storage to increase from θ_i to θ_f at a flux of $ku(\theta_f)$). For a given texture and flux rate, the wetting front rate of advance is linear and the results were calculated for an unsaturated zone thickness of 100 ft (fig. 7). Sensitivity of arrival time to variations in initial potentials was also examined by varying the initial matric potentials from –10 to –0.5 bars. For a thickness, z, other than 100 ft, the wetting front rate of advance can be calculated by multiplying the results by the ratio of (z/100). The lag time for a sand is less than 5 years; this decreases with increasing applied flux from 6 to 12 in/yr and is insensitive to initial water potential conditions. The lag time for a sandy clay loam was much greater because of the increased storage capacity relative to sand. The lag time for a sandy clay loam varied from 33 years for an applied irrigation of 6 in/yr to 19 years for an applied irrigation of 12 in/yr.

Numerical Simulations

We also conducted numerical simulations of unsaturated flow to evaluate the irrigation return flow lag time. We used the code UNSAT-H (Fayer, 2000) to perform vertical one-dimensional flow simulations. The upper boundary condition was based on 50 yrs of climatic history generated for Lubbock using the computer code GEM (Johnson et al., 2000). Daily weather data were input to the simulations, including precipitation, temperature, relative humidity, solar radiation, and wind speed. A 50-year time period was simulated. To evaluate the impact of irrigation, the weather data were modified by increasing the applied precipitation. Irrigation amounts of 15 inches and 30 inches were evaluated for the 1950 to 1960 time period. The irrigation was distributed in 5 separate applications each lasting 3 days at bimonthly intervals in the summer. The irrigation amount was reduced over time from the designated amount in 1951 to 1960 to 75% in the next 10 years (1961 through 1970), 50% in the following 10 years (1971 through 1980), and 25% in the remaining 20 years (1981 through 1999). Plant transpiration was included in the simulations and parameters for cotton were incorporated (Dugas et al., 1985). A unit gradient lower boundary condition was used to evaluate drainage from irrigation return flow. Profile depths of 15 and 50 ft were used to evaluate variations in irrigation return flow over time at those depths.

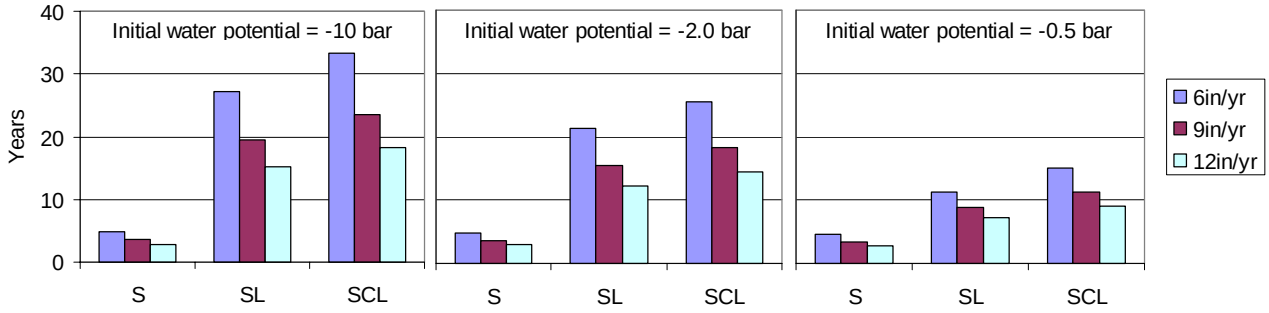

Figure 7. Calculated times required for a piston-flow wetting front to arrive at the base of a 100 ft-thick soil profile of uniform texture. Results are shown for uniform initial water potentials of –10 bar, -2 bar, and –0.5 bar for sand (S), sandy loam (SL), and sandy clay loam (SCL) textures and various imposed recharge rates.

Table 2: van Genuchten parameters used for irrigation return flow time lag estimates.

Texture	θ_s (cm^3/cm^3)	θ_r (cm^3/cm^3)	α (1/cm)	n	Ks (cm/day)
S	0.375	0.053	0.0355	3.16	646
SL	0.387	0.039	0.0269	1.45	76
SCL	0.384	0.063	0.0209	1.32	13

The simulation results indicated that the lag time for irrigation return flow for a sand texture was 0 (15-ft profile) to 3 years (50-ft profile) (table 3). The 3-year lag time is similar to that predicted by the previously described analytical calculations (fig. 7). The simulated drainage ranged from an average of 5 to 14 inches depending on the applied irrigation (15 to 30 inches). These values correspond to about 60% of the applied irrigation. Temporal variations in drainage were much greater at 15 ft than at 50 ft (fig. 8). Drainage rates were similar at 15 and 50 ft depths when the applied irrigation was 30 inches. The lag time for irrigation return flow increased as the sediment texture became finer, particularly when the applied irrigation was low (15 inches). Drainage rates were lower for the sandy clay loam and the lag times ranged from 4 to more than 50 years. These results indicate that various factors are important in controlling the lag time, including applied irrigation amount, sediment texture, and profile depth.

Additional simulations were conducted to determine the impact of a low-permeability layer, such as caliche, on irrigation return flow and drainage. Hydraulic properties were not available for caliche, but were approximated with those of a clay from the Schaap and Leij database (1998). The hydraulic conductivity for a clay in this database is high, and further simulations were conducted with a hydraulic conductivity of 4.4×10^{-8} in/s (equivalent to 10^{-7} cm/s). Results of these simulations indicated little difference in drainage or lag time when the higher conductivity was used to represent the caliche, but showed zero drainage for all cases where the lower hydraulic conductivity was used. The tritium results from the irrigated field plots described earlier indicate that caliche does not preclude drainage from irrigated plots and suggests that caliche is not very effective in reducing drainage.

Table 3: Simulated drainage lag times

USDA Texture Class	Profile Depth (ft)	Initial Annual Irrigation (in)	Simulated Drainage (in)	Lag time (yr)
Sand	15	15	9.8	0
		30	16.7	0
	50	15	5.3	3
		30	16.5	1
Sandy loam	15	15	1.65	4
		30	7	1
	50	15	1.1	21
		30	6.46	5
Sandy clay loam	15	15	0.06	19
		30	1.42	4
	50	15	0	>50
		30	0.94	23

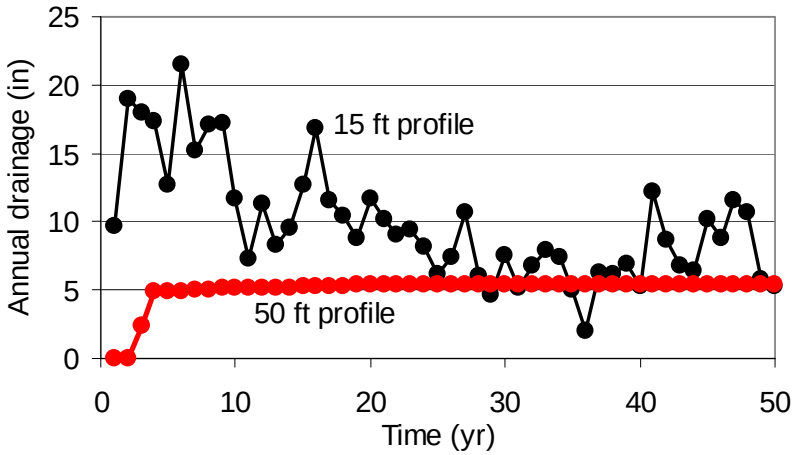

Figure 8. Comparison of simulated annual drainage from the bases of two irrigated sand profiles with different thickness.

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Appendix B

Estimated Irrigation Demand for the Southern Ogallala GAM

Estimated Irrigation Demand for the Southern Ogallala GAM

By

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Amosson Group
Amarillo, Texas

January 2003

Estimated Irrigation Demand for the Southern Ogallala GAM

Dr. Stephen Amosson[1], Thomas Marek,[2] PE Leon New[1], PE,
Fran Bretz[2], and Dr. Lal Almas[3]

Irrigation accounts for approximately 95 percent of the water use in the area covered by the southern portion of the Ogallala Aquifer. Therefore, accurate assessment of water use in irrigated agriculture is critical to the development of any groundwater availability model (GAM). To estimate irrigation demand in the Southern Ogallala GAM region, a procedure similar to the one developed for the Regional Water Planning Group (RWPG) in Region A (Amosson et al., 1999) was utilized. This procedure, which is based on a water balance approach, is being adopted by the Texas Water Development Board (TWDB) for use in water planning across the state. The water demand methodology developed for the Region A Ogallala model was utilized in developing the southern Ogallala GAM Model. The procedure involved using weather data, crops, acreages, irrigation technologies and other relevant data from the region. Observed water levels were used to validate the crop demand estimates where available.

Specific scope of work for developing the irrigation demand for the Southern Ogallala GAM project included:

1) Collection of all required data for determination of annual crop water demand for the southern Ogallala Aquifer region for the period 1940 through 2000. In addition, monthly estimates of irrigation demand will be made for two three-year periods, each centered about a drought period. One three-year period should be during 1980 to 1990, and another 1990 to 2000.

2) Determination of appropriate crop irrigation requirements for the predictive modeling scenarios as described in Section 4.0 of the GAM Request for Proposal (RFP).

3) Provide complete documentation and explanation of analyses conducted and associated results.

4) Provide copies of all data collected and analyses conducted.

5) Participate in up to two Stakeholder Advisory Forums to present or discuss work activities.

6) Identify and estimate "drought of record" irrigation demands for the Southern Ogallala GAM region.

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Methodology

The overall methodology involved estimating irrigation demand for counties in the Southern Ogallala GAM region by month for the selected years of 1982, 1987, 1992 and 1997. These years were selected because two sources of information on irrigated acreage were available (Texas Agricultural Statistics Services (TASS) and the Census of Agriculture) increasing the validity of estimates. In addition, long-term average (LTA) irrigation and water use by crop and by county were calculated to assist in evaluating other years and the impact of drought scenarios. The LTA was developed utilizing long-term rainfall, and crop ET estimates to reflect water use in an "average year". Data and results of the 1997 simulation are presented in the main report with the remaining analysis provided in the appendices.

Computation of irrigation demand is based upon a water balance crop use approach. This approach lends itself well to use demands based on scientific functions of crop production. Production functions are directly related to crop evapotranspiration (ET). Similarly, crop ET can be related to potential ET (PET). A modified Penman-Monteith equation was used for calculation of PET from meteorological data utilizing a well-watered grass reference. Factors influencing the PET demand equation are percentage of crop ET applied, rainfall, soil profile moisture, and irrigation applied. The equation used for the computation(s) is:

$$P_T(ET_C) = IRR_C + ER + SSM_D \qquad (1)$$

where,

P_T = Percentage of crop evapotranspiration applied on a seasonal basis, inches

ET_C = Crop evapotranspiration (or water use) for maximum production potential, inches

IRR_C = Irrigation applied on a seasonal basis to a crop, inches

ER = Effective rainfall computed from seasonal rainfall occurring during the crop season, inches, and

SSM_D = Differential seasonal soil moisture used in crop production which is extracted from the soil profile, inches.

Rearranging the equation and solving for IRR yields:

$$IRR_C = ET_C(P_T) - ER - SSM_D \qquad (2)$$

Summary equation for the crops grown per county yields:

$$IRR_{CTY} = \sum_{1}^{n} IRRc \qquad (3)$$

where,

IRR_{CTY} = Total quantity of irrigation volume applied (pumped) to the crops grown within a county in a given year or season, acre-feet.

Similarly,

$$IRR_Z = \sum_{1}^{36} IRR_{CTY} \qquad (4)$$

where,

IRR_Z = Total quantity of irrigation volume applied (pumped) to crops grown within the study area (Southern Ogallala GAM Region) in a given year or season, acre-feet.

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Data used in computations for specific crops were derived from crop ET data. Crop data were derived for corn, grain sorghum, cotton, peanuts, soybeans, wheat, hay, and pasture and other from each of the stations located in the Southern Ogallala GAM region, where sufficient and accurate data existed. In areas where no useable information was available, surrounding meteorological stations were utilized in determining crop ET. Differential seasonal soil moisture values were derived from sampling data obtained from growers by the Texas Cooperative Extension throughout the Texas Panhandle during the 1998 to 2000 time frame.

Percentage of crop PET used in computations was obtained from data attained by the Texas Cooperative Extension. Comparing the applied or targeted percentage of crop PET agrees well with crop production level(s) and water use. This term of percentage of crop PET essentially represents the water pumped per crop.

Effective precipitation from rainfall events recorded in county data was computed using the National Resources Conservation Service (NRCS, formerly the Soil Conservation Service) method of estimating effective precipitation. This method is described in Part 623 of Chapter 2 of the NRCS National Engineering Handbook. The storage factor was computed using a usable soil water storage value of 6 inches. The equation used was:

$$SF = (0.531747 + 0.295164\ D - 0.057697\ D^2 + 0.003804\ D^3) \qquad (5)$$

where,

D = The usable soil water storage, (in)

Using this factor, the average monthly effective precipitation was calculated using the following equation:

$$ER = SF(0.70917 R_M^{0.82416} - 0.11556)\ (10^{0.02426 ET_{CM}}) \qquad (6)$$

where,

ER = Average monthly effective monthly precipitation, (in)
RM = Mean monthly precipitation, (in)
ET_{CM} = Average monthly crop evapotranspiration, (in) and
SF = Soil water storage factor.

Data Inputs

While the methodology to estimate irrigation demand is relatively simple, the amount of data required to be analyzed can be extensive. In the next sections, base data required/analyzed to estimate irrigation demand is discussed. Where possible, model parameter estimates are incorporated into the text. In other cases, where data is too "bulky", it is located in an attachment or the data sources are cited.

ET and Weather Station Data

Potential evapotranspiration (PET) values were calculated from station data of the North Plains Evapotranspiration Network (NPET) and South Plains Potential Evapotranspiration Network (SP-PET), principally from the station sites of Chillicothe, Dimmitt, Earth, Etter, Farewell, James Bush Farm (Bushland), Lubbock, Lamesa, Morse and Wellington. (Some of these data are available at the web site http://amarillo2.tamu.edu/nppet/station.htm). A proportioning matrix was developed to allocate respective representation and contribution of each of the station sites of the PET network and associated crop values to the desired county. The county attribution was based upon the parameters of longitude, latitude, elevation of the stations and from past analysis and differentiation of crop ETs from the respective locations. Data comparisons of various other PET and meteorological sources were reviewed and partially analyzed, but were determined to be inadequate in terms of accuracy and integrity for purposes of this analysis.

The NPET computations of PET values used in the analysis were obtained using the new American Society of Civil Engineers (ASCE) standardized reference evapotranspiration equation (current draft version) developed by and in cooperation with members of the NPET network development team (Environmental and Water Resources Institute of the American Society of Agricultural Engineers Standardization of Reference Evapotranspiration Task Committee, December 30, 2001 – draft version). The meteorological parameters of temperature, wind speed, solar radiation and elevation are the primary inputs to these computations. Crop ET values for each respective crop used in the irrigation demand analysis were computed by using growth stage crop coefficients determined through explicit prior lysimeter research throughout the cropping season. These crop coefficients were then computed against the standardized values to yield the respective crop ET's used in the analysis. Compiling these values on a monthly basis provided data for the monthly irrigation demand values of each crop.

Rainfall Data

Rainfall data used in the analysis for the respective years of 1982, 1987, 1992 and 1997 were utilized from Texas and New Mexico quadrangle rainfall records of the Texas Water Development Board. In the case where counties spanned multiple quadrangle boundaries, a proportioning of the quadrangle value(s) was attributed and summed to the total county rainfall value. Similar to the ET data, rainfall data were compared from site-specific locations and other sources but were rejected due to the variability (continuity) of the values within the respective locations as compared to across the region. Use of specific weather station data would thus have provided more attenuation of the irrigation demand values than desired. Use of the quadrangle data set reflects a more consistent trend across the region and corresponds more to the intent of the demand analysis.

The respective county rainfall values were used to compute effective rainfall per crop for each respective growing season. The values were computed using the NRCS engineering equation to determine effective rainfall. Summing the respective values per crop resulted in the amount of effective rainfall deducted from the PET demand per crop per county. Monthly rainfall by county used in the project is located in Attachment B1.

Differential Soil Moisture

Differential soil moisture (DSM) is the water existing in (prior to the growing season) and extracted from the soil profile during crop production. Estimates of differential soil moisture for the heavier soils were made based on measurements taken from demonstrations conducted in the Agri-Partner program and research trials from the U.S. Department of Agriculture (USDA) facility in Bushland. Differential soil moisture estimates for areas with sandy soils were modified to reflect smaller holding capacities and water use required by cover crops to reduce wind erosion in these areas. Adjustments to DSM were made with input provided by scientists from Texas Tech University (table 1).

Table 1. Differential soil moisture (DSM) and long-term average (LTA) crop ET used in calculations per crop category for the northern and southern tiers of counties in the GAM Region.

Crop	DSM, Northern Counties (acre-inches)	DSM, Southern Counties (acre-inches)	LTA ET Applied, Northern Counties	LTA ET Applied, Southern Counties
Corn	2.0	2.0	0.95	0.95
Cotton	5.0	2.0	1.00	1.00
Grain Sorghum	2.5	1.5	0.85	0.85
Hay	1.5	1.0	0.95	0.95
Pasture	2.5	2.5	0.80	0.80
Peanuts	2.5	1.5	1.00	1.00
Soybeans	3.0	1.5	0.92	0.92
Wheat	3.5	0.5	0.78	0.60

Producer Use of ET

Actual producer application of irrigation water on a crop in the short run is effected by several factors including: the amount of water available; variable cost of pumping; profitability of the crop; profitability of competing crops; and change in crop yield from an acre-inch of water applied. Agri-Partner demonstration data, water district data and interviews with individual producers were utilized in estimating producer use of ET by crop (table 1).

Current estimates of producer use of ET by crop varied across the region depending on water availability. Current estimates were used in all base years and actual drought year simulations. Long-term average estimates varied slightly from current estimates to reflect expected changes in producer water use. LTA estimates were used in evaluating "drought of record" impacts and as a reference point for water use in non-base or actual drought years for GAM modeling.

Irrigated Acreage

The importance of accurate assessments of irrigated acreage is paramount to estimating water demand. Base years of 1982, 1987, 1992 and 1997 were used to estimate irrigation demand because both of TASS and the Census of Agriculture being available. TASS provides annual estimates of irrigated acreage by major crops annually. The Census of Agriculture provides an estimate of all irrigated acreage delineated into major and minor crops every five years.

In non-base years (i.e., selected three-year drought periods in the 1980s and 1990s), minor irrigated crop acreage was assumed to remain unchanged from the most recent Census of Agriculture estimates. Major crop acreage was altered by the associated TASS estimates for the year.

Acreage estimates for all years needed to be modified to account for "border" conditions (i.e., not all irrigated acreage in counties on the edge of the Ogallala may be over the aquifer). A survey of border county Farm Service Agency (FSA) offices was conducted to determine the percentage of irrigated land in their counties located over the Ogallala (table 2). Border modified irrigated acreage estimates by base and selected drought years, crop and county are located in Attachment B2.

Drought Scenarios

Annual rainfall data obtained from the TWDB for 1940 to 1998 was utilized to identify drought periods to be analyzed. The contract specifies irrigation demands for the lowest three consecutive rainfall periods during the 1980s and 1990s were to be estimated. Analysis of the rainfall data indicated these periods were 1982 to 1984 and 1992 to 1994, where rainfall averaged 18.47 inches per year and 17.08 inches per year, respectively (table 3).

Table 2. Percentage of irrigated land located above the Ogallala Aquifer in border counties of the Southern Ogallala GAM Region.

Border County	Percentage of Irrigated Land Located Over Ogallala Aquifer
Andrews	100
Armstrong	1
Borden	100
Briscoe	60
Crosby	100
Dickens	50
Ector	100
Floyd	97
Garza	100
Glasscock	8
Howard	100
Lea	100
Midland	30
Motley	7
Oldham	100
Potter	100
Quay	1
Randall	80

Table 3. Rainfall (inches) in Southern Ogallala GAM Region for 1980s and 1990s.

Year	Annual Rainfall (inches)		Year	Annual Rainfall (inches)
1980	17.93		1990	18.45
1981	21.83		1991	24.83
1982	19.35		1992	21.45
1983	15.77		1993	15.39
1984	20.28		1994	14.39
1985	23.78		1995	23.98
1986	27.99		1996	15.98
1987	20.70		1997	24.01
1988	19.25		1998	12.80
1989	15.59			
1980, 1981, 1982	19.70		1990, 1991, 1992	21.58
1981, 1982, 1983	18.98		1991, 1992, 1993	20.56
1982, 1983, 1984	18.47		1992, 1993, 1994	17.08
1983, 1984, 1985	19.94		1993, 1994, 1995	17.92
1984, 1985, 1986	24.02		1994, 1995, 1996	18.12
1985, 1986, 1987	24.16		1995, 1996, 1997	21.32
1986, 1987, 1988	22.65		1996, 1997, 1998	17.60
1987, 1988, 1989	18.51			

In addition, the impact of the "drought of record" was to be estimated. After consultation with the TWDB, the five consecutive year period from 1952 to 1956 was identified. This period represented the lowest five-year consecutive annual rainfall period, for the region within the 1947 to 1998 time period (table 4). The average annual rainfall for the period was 13.37 inches while the annual rainfall varied more than six inches in that time period and five years were below the long-term average.

Table 4. Drought of Record in Southern GAM Region (inches).

Year	Annual Rainfall (inches)
1952	12.71
1953	13.72
1954	13.44
1955	16.52
1956	10.48
Average	13.37
1990-1998 Average	18.77

Results

The purpose of the irrigation demand model is to provide water use estimates by month and county for application in the Southern Ogallala GAM model. Irrigation water demand was estimated for the years 1982, 1983, 1984, 1987, 1992, 1993, 1994 and 1997. Another simulation estimating water demand was conducted utilizing 1997 irrigated acreage, average weather related values and average rainfall from the 1940 to 1998 time period. This LTA scenario is considered a proxy for an "average" year irrigation water use estimate. A regional summary of irrigated acreage, total water use and water use per irrigated acre is given in Table 1.

In addition, simulations were conducted to determine the relative impact of irrigated water use by year and month of a "drought of record". All model parameters were assumed to remain unchanged from the LTA scenario with the exception of rainfall. Rainfall totals and distribution were assumed to be identical to the identified "Drought of Record" 1952 to 1956.

Simulations for Base Years

The years 1982, 1987, 1992, and 1997 were selected as the "benchmark" years for simulating water demand. These years were selected because two different sources of information for irrigated acreage are available, thus increasing the accuracy of estimated water projections. County comparisons are presented in Figures 1 through 4 for these years. Regional and county level water use estimates projected by month for each of the benchmark years are presented in Attachment B3.

Drought of Record

The five-year drought of record identified from the Texas Water Development Board (TWDB) records for the Southern Ogallala GAM region was 1952 through 1956. The water use estimates were generated from the weather conditions existing during the drought period and utilizing the most recent irrigated acreage estimates (1997). This was done to provide the most viable estimate of water use during an "extended" record drought now or in the future (assuming irrigated acreage remains constant). Water use

Figure 1. 1982 Southern GAMS Irrigation Water Use Demands by County.

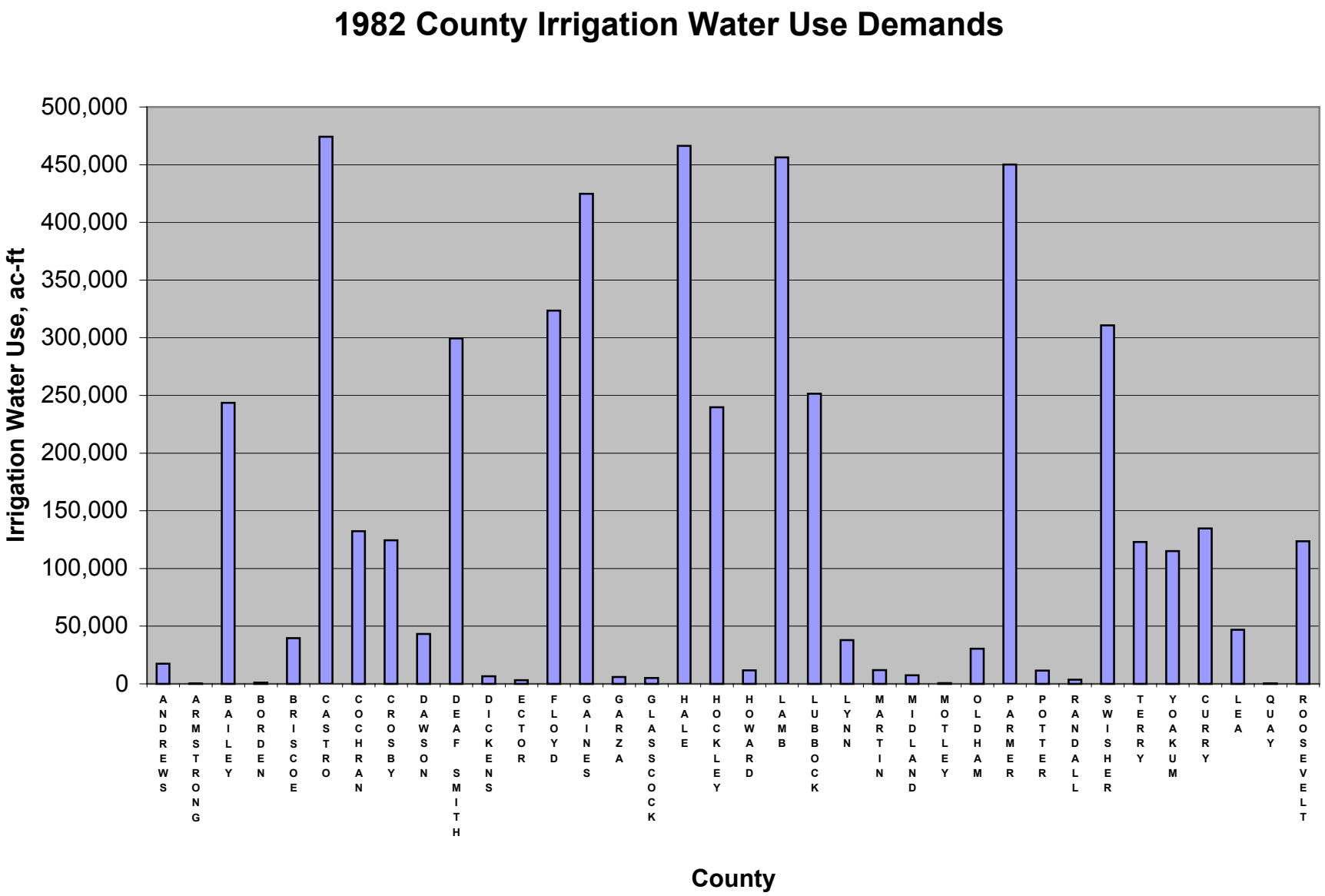


Figure 2. 1987 Southern GAMS Irrigation Water Use Demands by County.

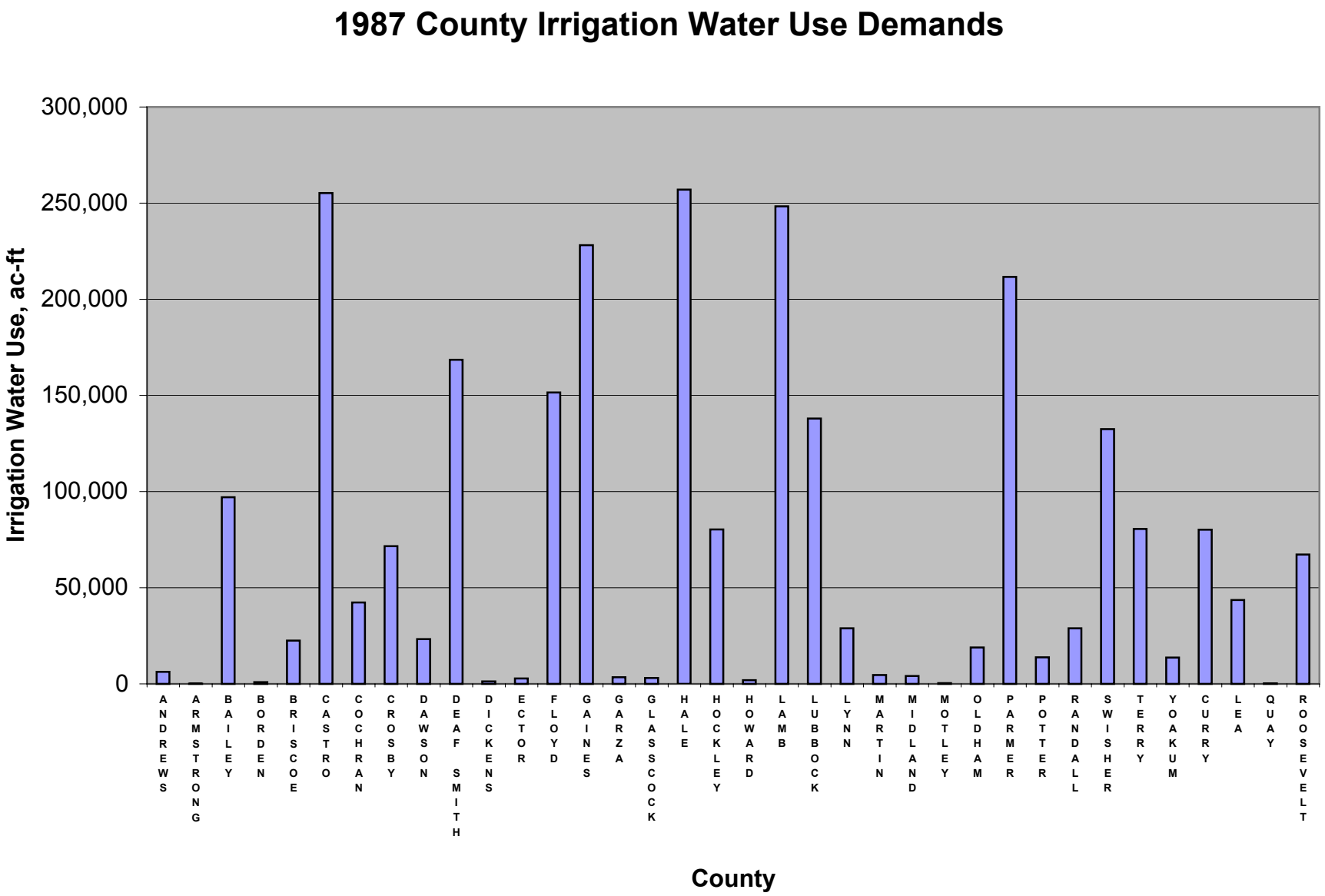


Figure 3. 1992 Southern GAMS Irrigation Water Use Demands by County.

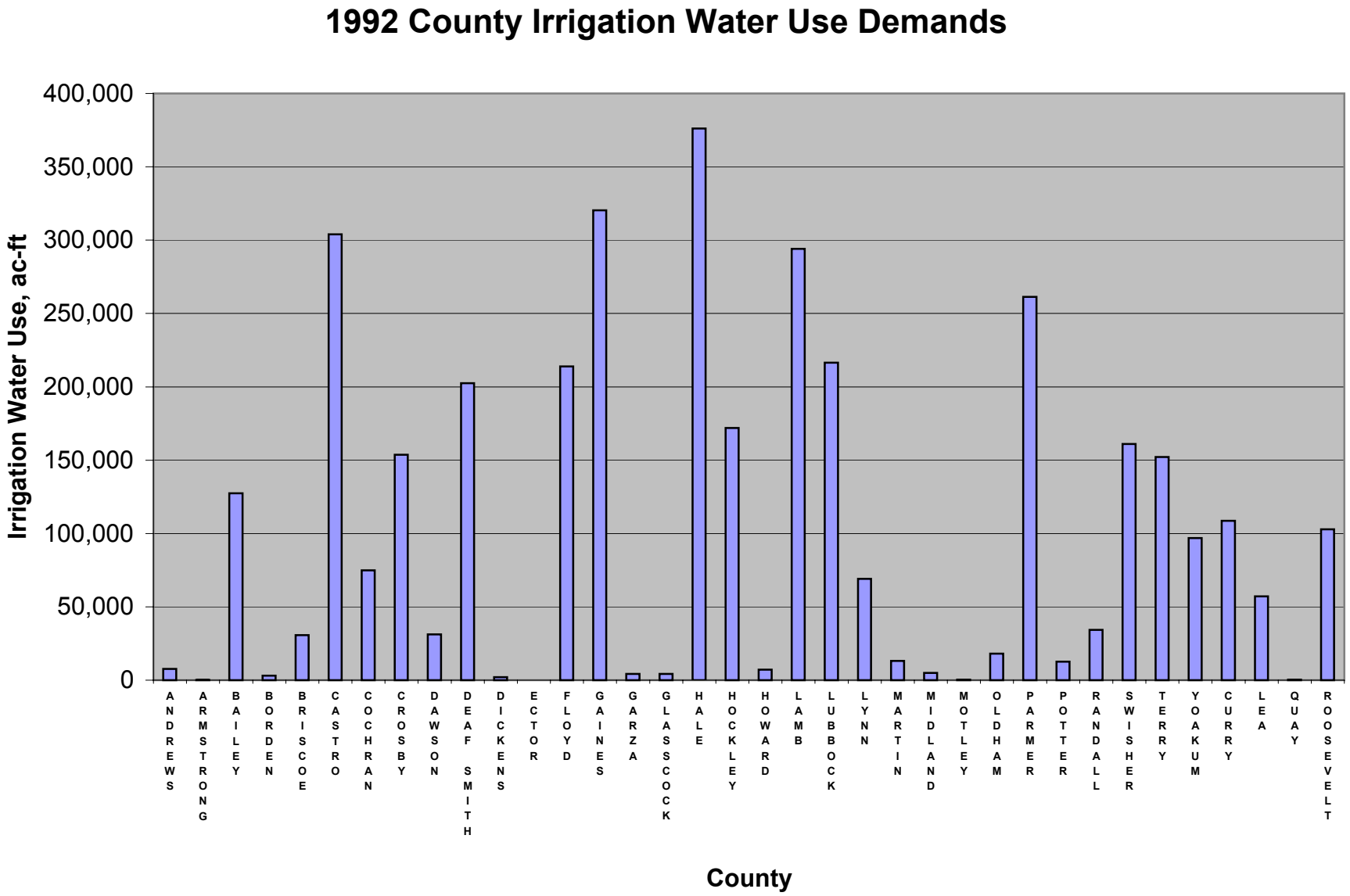
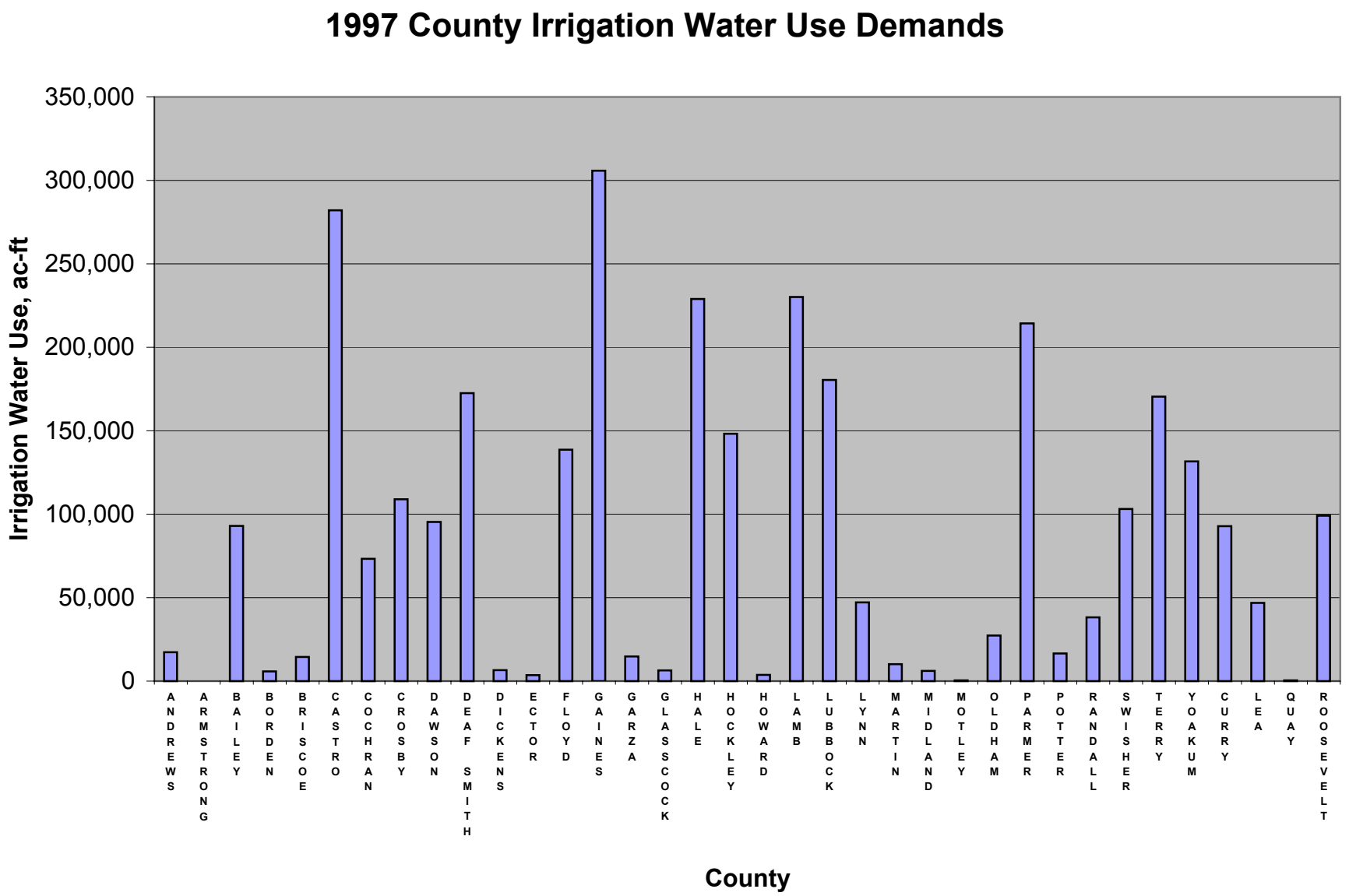


Figure 4. 1997 Southern GAMS Irrigation Water Use Demands by County.



estimates for the "Drought of Record" are presented by year, month and county in Attachment B3.

1980s and 1990s Drought

Irrigation water use in actual three-year periods for the 1980s and 1990s were estimated. These years were identified from TWDB data to be 1982 to 1984 and 1992 to 1994. Actual weather conditions occurring during these years and the associated irrigated acreage for the same years were utilized in the simulation. The resultant water use estimates are summarized and presented by county, year and month in Attachment B3.

Long-term Acreage Simulation

LTA estimates of water use by crop and county were made using average monthly rainfall data for the region over the 1940 to 1998 time frame for the region, Attachment B4. LTA irrigation water use incorporated weather station data and current producer use of ET in its estimates. A county comparison of these estimates is presented in Figure 5.

LTA water use is valuable in estimating water use in years when simulations were not conducted. In addition, LTA water use provides the basic results for approximating average future water use demand for the region.

Estimating Irrigation Demand Prior to 1982

The estimation of irrigation demand in the southern Ogallala region can be done in a number of ways. After discussion among ourselves and other knowledgeable individuals, we have decided to recommend the following procedure as a quick/relatively inexpensive methodology for approximating water use prior to 1982.

Records and experience suggest water use efficiency has improved an average of 1 percent per year from the inception of irrigation in the region through 1997. Therefore, the easiest/simplest way to estimate irrigation demand for a year prior to 1982 is to use the LTA water use per acre by county and then adjust this amount to reflect the difference in acreage and irrigation efficiency for that year.

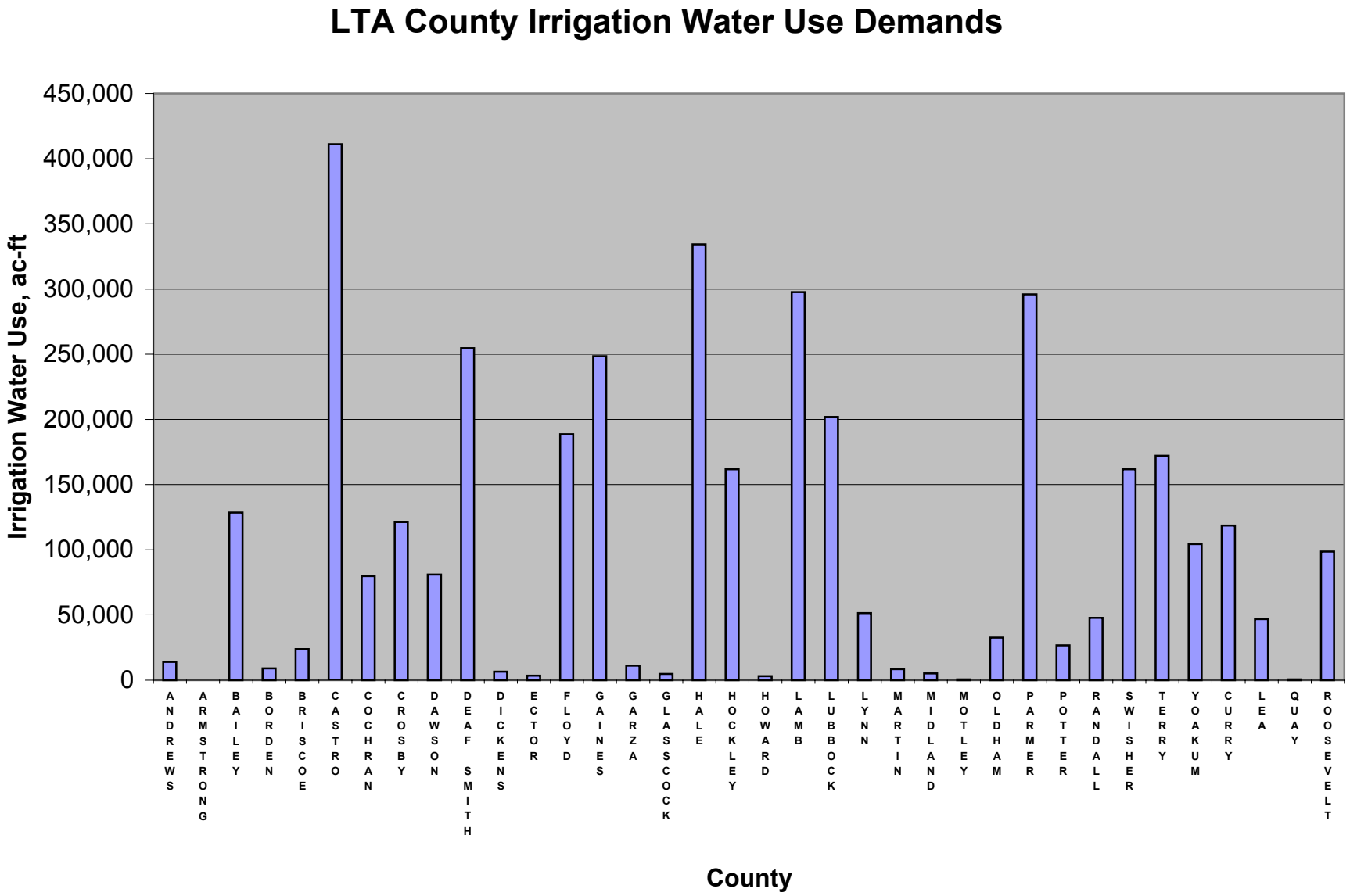
For example, if the LTA irrigation demand (LTA estimates are calculated using 1940 to 1998 conditions.) for a specific county was 13 inches and water use in 1968 needed to be estimated, then the following equation would be used:

$$\underset{\text{By County}}{YIWU = LTA_{WU} \times (1 + (1997 - year)/100) \text{ per acre}} \quad (7)$$

$$\underset{\text{Sum Over Acres}}{CIWU = YIWU * YIA} \quad (8)$$

where,

Figure 5. LTA Southern GAMS Irrigation Water Use Demands by County.



YIWU = Water use per irrigated acre in the year being estimated

LTA_{WU} = Long-term average (1940 - 1998) irrigated water use estimate per acre by county

Y = Year being estimated

YCIA = County irrigated acreage in year being estimated

CIWU = Irrigated water use for the county

If the year is 1968, LTA_{WU} for the county equals 13 inches and 1968 county irrigated acreage is 50,000 acres then estimated irrigation water use should be:

YIWU = 13 x (1 + (1997 - 1968/100)) = 16.77

and

CIWU = 16.77 x 50,000 = 838,500 acre-inches

This methodology represents the easiest and simplest way to make a reasonable estimate of irrigation demand for a county. However, it is important to recognize the procedure's weaknesses. First, water use estimates are specific to a year. If this is the only year estimated for a time period, an alternative procedure that utilizes average time period acreages for irrigated acreage and water use efficiency should be considered.

Second, since LTA water use for the county is used, there is no allowance considered for weather variations such as temperature in that year which leads to potential distortions in water use estimates for that specific year. Finally, estimating irrigation demand for a specific year utilizing LTA water use per irrigated acre can result in some distortion if the assumed LTA crop mix (based on 1997 regional crop patterns) varies from the specific year's crop mix.

The distortion in crop mix can be eliminated by using the LTA water use estimate by crop (included in the LTA estimate). Obviously, this approach increases significantly the workload unless the approach is used only when observed significant variations in crop mix between the LTA and the distribution of estimated irrigated acreage in the year being projected.

Optimally, the best approach would be to run the Southern Ogallala GAM water demand model for every year of the time frame being considered. However, the workload would increase significantly and while the results would increase in accuracy, the expense would need to be warranted.

Regional Assessment

The summary of the planted irrigation acreages (pia), irrigation water use demands and irrigation water use per pia is presented in Figure 6. Graphically viewing this data along with polynomial trendlines reflects the sequence of irrigation water use for the Southern Ogallala Region. Note that the time series axis is not proportionately contiguous. Additionally, in Figure 7, the irrigation water use per pia is presented for the total region. These estimates are supplemented with observations witnessed from scientists and irrigation associated engineers over the respective periods.

Figure 6. Southern GAMS Comparisons Chart.

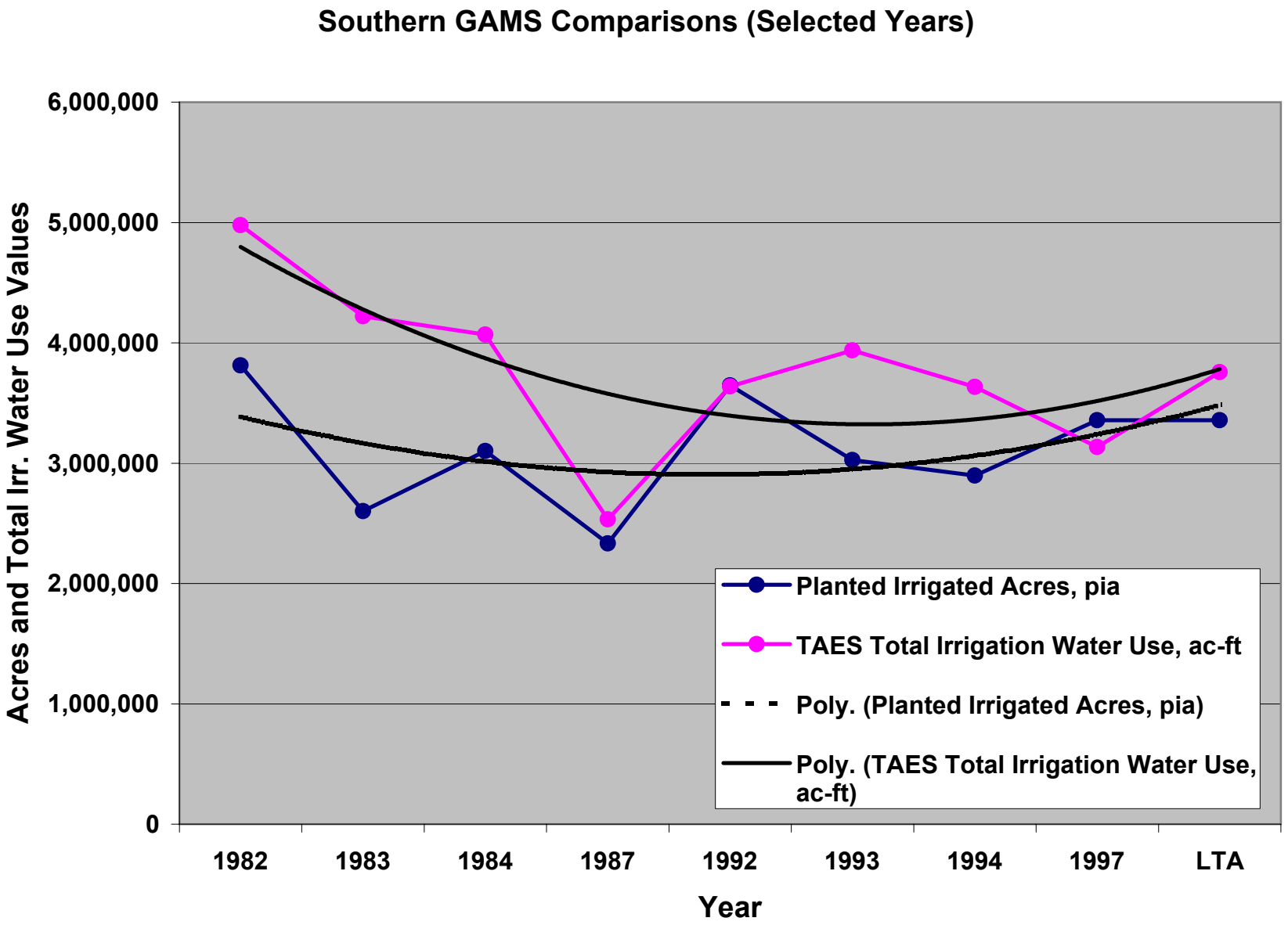
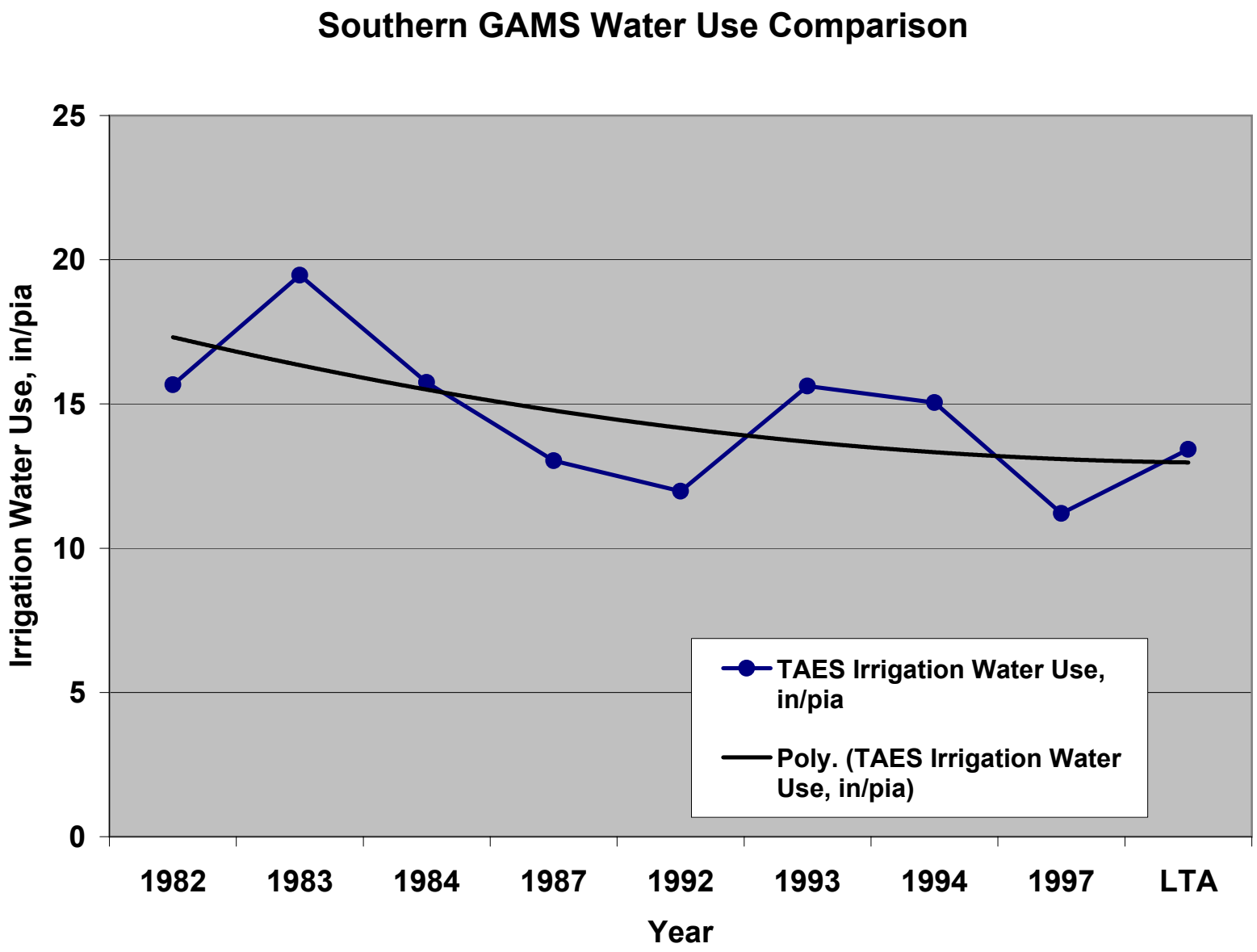


Figure 7. Southern GAMS Water Use Comparison Chart.



Attachment B1

Monthly Rainfall in Inches by County

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Andrews County-Texas														
505	1997	0.30	1.96	0.28	3.12	3.02	3.53	1.85	2.47	2.07	1.09	0.44	2.00	22.11
	1994	0.55	0.04	0.09	0.66	3.22	0.36	1.93	0.46	1.80	0.77	0.85	0.09	10.81
	1993	1.22	0.93	0.98	1.33	1.15	0.72	3.59	1.70	1.05	0.96	0.20	0.33	14.15
	1992	1.56	2.15	0.91	0.76	6.68	3.14	1.45	2.33	0.72	0.01	1.26	0.43	21.41
	1987	0.31	1.52	0.74	0.55	6.47	2.36	0.58	1.97	2.63	0.32	0.07	0.58	18.10
	1984	0.35	0.37	0.38	0.20	3.49	4.17	1.84	4.13	1.53	3.59	2.10	1.41	23.56
	1983	1.55	0.53	0.52	0.70	1.42	1.11	0.94	0.33	0.48	4.41	2.22	0.73	14.95
	1982	0.47	0.32	0.98	1.15	2.90	2.82	2.37	0.59	1.37	0.88	1.53	2.78	18.15
	1956	0.39	1.51	0.08	0.89	1.87	1.23	0.65	0.69	0.18	1.76	0.46	0.33	10.04
	1955	0.81	0.22	0.49	0.94	2.41	1.12	3.56	0.62	1.87	3.54	0.26	0.04	15.87
	1954	0.34	0.07	0.06	2.66	5.78	1.14	0.24	2.54	0.42	3.27	0.40	0.89	17.81
	1953	0.27	0.34	0.87	1.70	5.33	0.45	3.38	1.79	0.73	3.67	0.82	1.15	20.49
	1952	0.48	0.50	0.41	1.50	2.05	0.40	2.75	0.52	1.94	0.03	1.46	1.04	13.06
	LTA	0.76	0.73	0.73	1.12	2.43	2.04	2.28	1.99	2.48	1.69	0.78	0.78	17.82
Armstrong County-Texas														
206&306	1997	0.59	1.57	0.34	7.50	3.50	2.91	2.56	3.90	2.25	1.05	0.87	2.01	29.01
	1994	0.72	0.12	1.31	2.22	2.49	1.39	3.93	2.09	1.76	0.94	0.83	0.44	18.20
	1993	1.17	0.70	1.17	0.92	2.17	2.79	3.81	3.06	1.21	0.81	0.62	0.51	18.90
	1992	0.75	0.67	1.08	2.11	4.14	6.63	2.70	2.65	0.51	0.08	1.52	0.89	23.70
	1987	0.85	1.32	1.24	0.33	5.18	3.19	2.36	3.75	3.34	0.90	0.48	1.89	24.80
	1984	0.36	0.57	1.12	1.02	0.56	4.14	1.30	3.45	0.83	2.45	1.28	1.57	18.63
	1983	1.58	1.67	0.79	1.11	2.27	2.57	0.60	0.84	1.04	4.09	0.50	0.63	17.66
	1982	0.18	0.63	0.72	0.56	4.92	5.06	4.79	1.08	1.19	0.39	1.04	1.13	21.67
	1956	0.20	1.81	0.13	0.30	3.82	1.65	2.52	0.81	0.49	0.62	0.23	0.34	12.88
	1955	0.45	0.22	0.28	0.70	6.02	3.55	2.02	1.19	1.94	1.02	0.14	0.05	17.54
	1954	0.36	0.06	0.17	1.98	4.37	1.73	1.21	2.35	0.38	0.83	0.03	0.40	13.85
	1953	0.69	0.32	0.66	0.90	1.03	0.34	3.24	2.57	0.26	3.61	0.39	0.48	14.47
	1952	0.70	0.29	0.51	2.63	1.18	1.99	2.18	1.51	0.58	0.00	1.08	0.57	13.19
	LTA	0.62	0.75	0.92	1.45	3.05	3.33	2.74	2.67	2.16	1.65	0.76	0.71	20.81
Bailey County-Texas														
305&405	1997	0.54	0.83	0.09	4.62	2.51	3.11	2.56	3.07	2.61	1.06	0.62	2.04	23.65
	1994	0.16	0.10	1.01	1.46	4.13	1.60	2.93	1.84	1.03	0.45	0.65	0.26	15.63
	1993	1.07	0.36	0.59	0.67	1.47	1.55	3.88	2.56	1.80	1.15	0.53	0.30	15.94
	1992	1.07	0.65	1.16	1.13	4.40	5.16	1.91	2.87	1.17	0.02	1.19	0.77	21.50
	1987	0.71	0.97	0.30	0.18	4.08	2.08	1.43	4.68	3.40	0.78	0.31	1.68	20.60
	1984	0.24	0.14	0.67	0.29	1.01	3.42	2.12	5.54	0.53	3.33	1.28	1.59	20.17
	1983	1.47	0.94	0.39	0.65	1.45	1.67	0.62	0.62	0.76	3.45	0.56	0.45	13.00
	1982	0.15	0.38	0.37	0.48	2.52	3.28	3.93	1.08	0.74	0.44	1.16	1.61	16.12
	1956	0.18	1.21	0.11	0.37	2.40	1.90	1.02	0.96	0.21	0.68	0.03	0.17	9.23
	1955	0.67	0.15	0.22	0.54	3.47	0.95	2.53	1.05	1.98	2.19	0.15	0.03	13.95
	1954	0.18	0.19	0.14	1.17	2.59	0.91	0.57	2.75	0.51	1.67	0.02	0.28	10.99
	1953	0.44	0.44	0.94	0.93	1.20	0.86	2.28	2.00	0.41	2.45	0.24	0.22	12.40
	1952	0.57	0.25	0.42	1.86	0.99	1.53	1.95	1.57	0.85	0.00	1.04	0.36	11.38
	LTA	0.59	0.63	0.64	1.04	2.34	2.57	2.50	2.55	2.21	1.57	0.68	0.71	18.04

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Borden County-Texas														
506	1997	0.17	3.11	0.27	4.41	2.77	5.34	1.13	3.21	1.76	1.45	0.51	1.63	25.77
	1994	0.99	0.26	0.15	0.81	4.03	0.50	1.16	0.35	3.35	1.12	1.45	0.48	14.64
	1993	1.09	1.12	0.66	1.76	1.93	3.31	2.42	1.73	1.49	2.04	0.26	0.47	18.27
	1992	1.76	2.69	0.65	1.59	7.21	4.33	1.30	2.36	1.24	0.02	1.30	0.56	25.03
	1987	0.41	1.85	0.75	0.46	7.53	2.97	1.67	1.52	2.82	0.07	0.06	0.79	20.90
	1984	0.54	0.82	0.45	0.21	2.06	2.02	1.86	3.28	2.55	3.85	2.77	2.29	22.70
	1983	2.03	0.64	0.93	1.11	2.36	1.46	1.31	0.28	0.78	4.39	1.58	1.63	18.52
	1982	1.56	1.07	0.90	2.07	4.54	6.47	1.74	2.26	0.74	1.34	2.67	5.73	31.10
	1956	0.52	1.25	0.10	1.99	2.16	1.20	0.56	0.44	0.53	1.82	0.57	0.66	11.80
	1955	0.90	0.67	1.47	1.17	4.39	1.45	3.10	1.39	3.61	2.19	0.19	0.11	20.66
	1954	0.69	0.15	0.12	3.54	4.26	1.67	0.17	1.16	0.57	3.11	0.78	0.92	17.14
	1953	0.68	0.67	1.71	2.13	2.49	0.52	2.10	1.22	1.27	3.55	0.55	0.54	17.43
	1952	0.60	0.49	0.81	1.09	1.92	0.19	1.65	0.98	2.39	0.06	2.55	1.69	14.42
	LTA	0.96	1.01	1.04	1.70	3.08	2.49	2.27	2.10	2.86	2.06	1.05	1.12	21.74
Briscoe County-Texas														
306	1997	0.65	2.34	0.67	7.35	4.17	3.31	2.01	4.05	2.65	1.18	0.73	1.94	31.05
	1994	0.65	0.13	1.44	2.64	3.23	1.23	3.64	1.48	1.98	0.53	0.85	0.35	18.15
	1993	1.28	0.62	0.96	1.02	1.95	1.54	4.00	2.81	0.71	1.13	0.56	0.50	17.06
	1992	0.89	0.92	0.99	2.15	4.70	7.04	2.80	1.37	0.62	0.03	1.57	0.88	23.95
	1987	0.70	1.42	0.55	0.23	5.37	2.31	2.80	3.82	2.95	0.68	0.37	2.18	23.37
	1984	0.26	0.59	0.69	0.71	0.56	4.14	1.58	3.73	0.76	1.90	1.59	1.68	18.19
	1983	1.90	1.47	0.41	0.94	1.91	2.23	0.64	0.66	1.32	5.71	0.42	0.61	18.21
	1982	0.22	0.36	0.70	0.49	5.56	5.39	3.14	0.75	0.66	0.28	1.32	1.27	20.15
	1956	0.30	2.63	0.18	0.45	4.97	1.54	2.10	0.61	0.43	0.85	0.45	0.65	15.16
	1955	0.65	0.34	0.45	0.54	6.61	4.51	2.01	1.07	1.64	1.89	0.20	0.04	19.95
	1954	0.48	0.09	0.19	2.23	4.07	1.44	0.92	2.16	0.29	0.62	0.06	0.58	13.14
	1953	0.85	0.29	0.84	1.01	1.24	0.37	2.70	2.66	0.31	3.34	0.33	0.39	14.33
	1952	1.07	0.24	0.41	2.79	1.09	1.55	2.37	0.89	0.68	0.00	1.18	0.58	12.85
	LTA	0.67	0.78	0.88	1.48	3.05	3.39	2.51	2.53	2.34	1.72	0.75	0.75	20.85
Castro County-Texas														
305	1997	0.56	0.64	0.08	4.79	2.48	2.99	2.59	3.22	2.90	0.99	0.62	2.07	23.92
	1994	0.17	0.10	1.14	1.45	4.17	1.88	3.22	2.12	1.09	0.46	0.64	0.31	16.75
	1993	0.98	0.35	0.51	0.58	1.59	1.71	3.89	2.85	2.02	1.22	0.55	0.34	16.60
	1992	1.00	0.48	1.25	1.10	4.19	5.46	1.95	2.99	1.16	0.02	1.14	0.79	21.53
	1987	0.76	0.87	0.31	0.15	3.79	1.94	1.26	4.70	3.52	0.82	0.33	1.63	20.09
	1984	0.28	0.16	0.79	0.34	0.80	2.95	2.28	5.91	0.41	3.44	1.17	1.59	20.12
	1983	1.39	1.04	0.47	0.63	1.33	1.74	0.56	0.59	0.82	2.97	0.43	0.47	12.41
	1982	0.07	0.39	0.36	0.50	2.18	3.35	3.92	1.24	0.57	0.45	1.14	1.50	15.65
	1956	0.21	1.20	0.13	0.40	2.60	1.85	1.04	1.05	0.20	0.57	0.03	0.14	9.42
	1955	0.65	0.18	0.24	0.61	3.63	0.99	2.56	1.25	1.96	1.17	0.12	0.04	13.41
	1954	0.22	0.22	0.17	0.99	2.41	0.99	0.61	2.86	0.56	1.45	0.02	0.27	10.76
	1953	0.43	0.52	0.99	0.99	1.28	0.89	2.31	2.09	0.41	2.25	0.26	0.25	12.65
	1952	0.55	0.26	0.52	1.95	0.87	1.67	1.94	1.70	0.79	0.00	1.11	0.43	11.78
	LTA	0.60	0.63	0.66	1.04	2.32	2.58	2.50	2.60	2.13	1.55	0.70	0.74	18.04

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Cochran County-Texas														
405	1997	0.48	1.57	0.11	3.92	2.64	3.57	2.46	2.47	1.43	1.33	0.63	1.94	22.56
	1994	0.14	0.08	0.48	1.49	3.96	0.50	1.77	0.73	0.81	0.42	0.69	0.07	11.14
	1993	1.41	0.42	0.89	1.05	1.01	0.91	3.82	1.41	0.94	0.89	0.46	0.12	13.31
	1992	1.37	1.34	0.80	1.23	5.24	3.98	1.76	2.39	1.19	0.01	1.38	0.67	21.36
	1987	0.50	1.37	0.28	0.32	5.22	2.63	2.09	4.61	2.91	0.60	0.24	1.87	22.65
	1984	0.10	0.07	0.19	0.09	1.85	5.32	1.47	4.06	1.02	2.90	1.70	1.60	20.38
	1983	1.81	0.52	0.07	0.72	1.93	1.38	0.85	0.74	0.50	5.37	1.10	0.35	15.34
	1982	0.46	0.33	0.43	0.40	3.90	3.00	3.95	0.45	1.41	0.38	1.24	2.03	18.00
	1956	0.07	1.23	0.04	0.23	1.60	2.10	0.95	0.62	0.23	1.10	0.02	0.29	8.47
	1955	0.74	0.03	0.12	0.27	2.85	0.77	2.43	0.27	2.08	6.27	0.27	0.00	16.11
	1954	0.04	0.05	0.01	1.91	3.31	0.60	0.41	2.32	0.33	2.56	0.04	0.33	11.92
	1953	0.48	0.12	0.75	0.71	0.88	0.72	2.16	1.66	0.40	3.27	0.14	0.12	11.42
	1952	0.65	0.23	0.03	1.50	1.46	0.97	1.97	1.04	1.08	0.00	0.78	0.07	9.76
	LTA	0.57	0.64	0.57	1.04	2.41	2.55	2.52	2.37	2.52	1.66	0.61	0.61	18.08
Crosby County-Texas														
406	1997	0.46	2.23	0.22	6.40	3.64	4.26	2.21	1.96	2.01	1.15	0.53	1.98	27.06
	1994	0.34	0.35	0.42	2.49	4.41	0.50	1.60	1.08	2.44	1.13	1.33	0.19	16.28
	1993	1.31	1.06	0.71	1.25	1.85	1.50	2.46	1.93	0.51	1.30	0.35	0.60	14.84
	1992	1.51	2.46	0.66	2.31	5.73	5.45	2.13	1.53	0.82	0.00	1.76	0.95	25.32
	1987	0.75	2.75	0.64	0.40	5.02	2.82	3.95	2.10	2.71	0.85	1.29	1.94	25.24
	1984	0.33	1.36	0.79	0.60	1.11	3.65	1.58	3.41	1.40	3.43	2.55	1.81	22.03
	1983	2.35	1.45	0.92	1.18	2.96	1.65	1.02	0.67	0.52	7.70	1.49	2.31	24.23
	1982	0.93	0.76	1.09	1.45	5.84	5.37	1.96	1.07	1.94	1.33	1.91	2.70	26.36
	1956	1.41	2.80	0.94	1.94	2.53	2.33	1.47	0.79	0.55	1.24	2.37	1.05	19.43
	1955	1.27	1.19	1.57	0.94	4.71	2.63	4.13	0.90	3.12	3.58	0.58	0.21	24.83
	1954	1.65	0.20	0.31	2.64	4.69	0.64	0.46	1.84	0.31	1.59	0.86	2.00	17.20
	1953	1.10	1.58	1.92	2.42	2.16	0.56	2.69	2.04	0.64	4.04	0.52	0.79	20.47
	1952	1.89	1.32	1.15	2.98	2.48	0.96	3.18	1.28	1.31	0.03	1.70	1.38	19.67
	LTA	1.19	1.28	1.21	1.78	3.22	2.90	2.53	2.26	2.72	2.12	1.24	1.19	23.65
Dawson County-Texas														
505&506	1997	0.21	2.77	0.27	4.02	2.85	4.80	1.35	2.99	1.85	1.34	0.49	1.74	24.67
	1994	0.64	0.08	0.10	0.69	3.38	0.39	1.78	0.44	2.11	0.84	0.97	0.17	11.58
	1993	1.19	0.97	0.92	1.42	1.31	1.24	3.36	1.71	1.14	1.18	0.21	0.36	14.97
	1992	1.70	2.53	0.73	1.34	7.05	3.97	1.35	2.35	1.08	0.02	1.29	0.52	23.94
	1987	0.38	1.75	0.75	0.49	7.21	2.79	1.34	1.66	2.76	0.15	0.06	0.73	20.06
	1984	0.39	0.46	0.39	0.20	3.20	3.74	1.84	3.96	1.73	3.64	2.23	1.59	23.39
	1983	1.65	0.55	0.60	0.78	1.61	1.18	1.01	0.32	0.54	4.41	2.09	0.91	15.66
	1982	1.23	0.85	0.92	1.79	4.05	5.38	1.93	1.76	0.93	1.20	2.33	4.85	27.22
	1956	0.48	1.33	0.09	1.66	2.07	1.21	0.59	0.52	0.43	1.80	0.54	0.56	11.27
	1955	0.87	0.54	1.18	1.10	3.80	1.35	3.24	1.16	3.09	2.60	0.21	0.09	19.22
	1954	0.59	0.13	0.10	3.28	4.72	1.51	0.19	1.57	0.53	3.16	0.67	0.91	17.34
	1953	0.56	0.57	1.46	2.00	3.34	0.50	2.48	1.39	1.11	3.59	0.63	0.72	18.35
	1952	0.56	0.49	0.69	1.21	1.96	0.25	1.98	0.84	2.26	0.05	2.22	1.50	14.01
	LTA	0.80	0.79	0.79	1.23	2.56	2.13	2.28	2.01	2.55	1.77	0.84	0.85	18.60

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Deaf Smith County-Texas														
205&305	1997	0.53	0.59	0.07	4.79	2.27	2.87	2.75	3.54	2.63	0.94	0.65	2.06	23.69
	1994	0.29	0.06	1.04	1.34	3.87	1.73	3.65	2.27	0.77	1.10	0.56	0.40	17.06
	1993	0.98	0.48	0.89	0.57	1.83	3.24	3.19	2.76	1.44	1.13	0.53	0.39	17.40
	1992	0.93	0.46	1.17	1.06	4.07	5.30	2.14	3.09	1.00	0.03	1.09	0.76	21.10
	1987	0.82	1.07	0.50	0.25	3.80	1.96	1.14	4.59	3.28	0.78	0.42	1.46	20.09
	1984	0.33	0.21	1.23	1.16	0.86	2.90	1.94	5.05	0.45	3.51	0.93	1.55	20.11
	1983	1.41	0.96	0.78	0.69	1.82	1.59	0.93	0.89	0.67	2.21	0.46	0.71	13.07
	1982	0.10	0.43	0.41	0.48	2.16	3.25	4.41	1.62	0.86	0.57	1.04	1.39	16.71
	1956	0.21	1.13	0.12	0.38	2.36	1.71	1.29	1.24	0.17	0.59	0.09	0.18	9.48
	1955	0.55	0.19	0.25	0.95	3.61	0.98	2.50	1.44	1.99	1.00	0.12	0.04	13.62
	1954	0.31	0.22	0.16	0.95	2.45	1.17	0.95	2.76	0.61	1.52	0.03	0.28	11.38
	1953	0.36	0.50	0.89	0.85	1.26	0.78	2.48	2.28	0.39	2.24	0.38	0.31	12.71
	1952	0.53	0.27	0.59	2.09	0.92	1.60	1.92	2.04	0.77	0.00	1.07	0.44	12.25
	LTA	0.59	0.63	0.77	1.13	2.37	2.56	2.74	2.77	2.02	1.44	0.71	0.71	18.44
Dickens County-Texas														
407	1997	0.37	3.86	0.25	6.42	3.24	3.91	2.12	2.16	2.37	2.13	0.63	3.52	30.98
	1994	0.89	1.17	0.82	1.88	4.72	0.44	1.69	0.74	3.03	2.22	1.86	0.52	19.99
	1993	1.23	2.25	1.07	1.84	2.49	1.71	1.20	2.61	1.30	1.40	0.45	0.91	18.45
	1992	1.89	3.12	1.03	2.02	4.22	7.36	0.97	1.60	0.91	0.01	2.67	1.03	26.85
	1987	1.08	2.64	1.37	0.42	8.58	3.95	2.84	1.55	2.84	0.75	1.23	2.24	29.49
	1984	0.61	1.59	1.15	1.28	2.20	2.17	1.49	3.36	1.66	3.95	2.53	3.60	25.60
	1983	2.41	1.57	1.60	2.34	3.96	2.66	0.38	1.74	1.03	8.38	1.93	1.78	29.78
	1982	1.77	1.60	1.02	1.31	7.27	5.50	1.60	1.27	2.85	0.46	1.95	2.30	28.90
	1956	0.37	1.22	0.05	0.23	2.31	0.60	1.09	0.28	0.05	1.29	0.27	0.71	8.46
	1955	0.92	1.25	1.26	0.35	4.38	3.68	2.52	1.59	3.65	3.81	0.09	0.11	23.61
	1954	0.28	0.02	0.18	2.41	7.14	0.73	0.35	1.07	0.45	0.84	0.72	1.02	15.22
	1953	0.09	0.59	1.13	1.22	0.65	0.40	3.17	2.73	0.27	4.10	0.45	0.27	15.08
	1952	0.59	0.46	0.85	2.68	2.02	0.39	2.69	0.69	1.21	0.00	1.28	1.02	13.89
	LTA	0.97	1.19	1.16	1.81	3.39	2.91	2.12	2.49	2.92	2.16	1.09	1.09	23.32
Ector County-Texas														
605	1997	0.16	1.99	0.16	1.60	1.68	2.46	1.04	1.32	2.04	0.62	0.56	1.63	15.26
	1994	1.09	0.35	0.05	0.35	1.34	0.24	2.03	1.33	1.98	0.71	0.52	0.39	10.38
	1993	0.99	0.56	0.27	0.64	1.27	0.35	1.79	1.89	1.33	1.02	0.09	0.52	10.73
	1992	1.31	2.09	0.62	0.97	6.77	1.47	1.66	2.55	0.80	0.08	0.61	0.63	19.55
	1987	0.09	1.57	1.07	1.33	5.02	2.42	0.42	1.77	2.08	0.55	0.05	0.51	16.89
	1984	0.52	0.12	0.01	0.00	2.69	2.13	0.47	0.86	2.27	2.68	1.96	1.21	14.94
	1983	0.78	0.25	0.21	0.07	0.77	0.87	0.12	0.26	0.64	3.64	1.82	0.25	9.68
	1982	0.23	0.15	0.00	1.14	3.50	1.31	0.94	0.97	0.51	0.21	0.79	1.68	11.44
	1956	0.29	0.27	0.01	0.60	0.55	0.67	0.95	1.17	0.26	0.53	0.00	0.34	5.66
	1955	0.87	0.27	0.00	0.07	2.07	1.56	2.41	0.81	0.51	0.68	0.38	0.02	9.66
	1954	0.19	0.03	0.18	1.54	2.03	1.74	0.15	1.43	0.16	2.30	0.03	0.01	9.79
	1953	0.00	0.46	0.48	0.55	0.03	0.31	0.54	0.84	0.05	2.39	0.00	0.28	5.91
	1952	0.34	0.25	0.04	0.82	1.39	0.42	1.62	0.25	0.93	0.00	1.13	0.85	8.04
	LTA	0.65	0.68	0.40	0.82	1.92	1.50	1.48	1.58	2.07	1.47	0.58	0.65	13.81

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Floyd County-Texas														
306&406	1997	0.61	2.32	0.58	7.16	4.06	3.50	2.05	3.63	2.52	1.17	0.69	1.95	30.25
	1994	0.59	0.17	1.24	2.61	3.47	1.08	3.23	1.40	2.07	0.65	0.95	0.32	17.78
	1993	1.29	0.71	0.91	1.07	1.93	1.53	3.69	2.63	0.67	1.16	0.52	0.52	16.62
	1992	1.01	1.23	0.92	2.18	4.91	6.72	2.67	1.40	0.66	0.02	1.61	0.89	24.22
	1987	0.71	1.69	0.57	0.26	5.30	2.41	3.03	3.48	2.90	0.71	0.55	2.13	23.74
	1984	0.27	0.74	0.71	0.69	0.67	4.04	1.58	3.67	0.89	2.21	1.78	1.71	18.96
	1983	1.99	1.47	0.51	0.99	2.12	2.11	0.72	0.66	1.16	6.11	0.63	0.95	19.41
	1982	0.36	0.44	0.78	0.68	5.62	5.39	2.90	0.81	0.92	0.49	1.44	1.56	21.39
	1956	0.52	2.66	0.33	0.75	4.48	1.70	1.97	0.65	0.45	0.93	0.83	0.73	16.01
	1955	0.77	0.51	0.67	0.62	6.23	4.13	2.43	1.04	1.94	2.23	0.28	0.07	20.93
	1954	0.71	0.11	0.21	2.31	4.19	1.28	0.83	2.10	0.29	0.81	0.22	0.86	13.95
	1953	0.90	0.55	1.06	1.29	1.42	0.41	2.70	2.54	0.38	3.48	0.37	0.47	15.56
	1952	1.23	0.46	0.56	2.83	1.37	1.43	2.53	0.97	0.81	0.01	1.28	0.74	14.21
	LTA	0.77	0.88	0.94	1.54	3.09	3.29	2.52	2.48	2.42	1.80	0.85	0.83	21.41
Gaines County-Texas														
505	1997	0.30	1.96	0.28	3.12	3.02	3.53	1.85	2.47	2.07	1.09	0.44	2.00	22.11
	1994	0.55	0.04	0.09	0.66	3.22	0.36	1.93	0.46	1.80	0.77	0.85	0.09	10.81
	1993	1.22	0.93	0.98	1.33	1.15	0.72	3.59	1.70	1.05	0.96	0.20	0.33	14.15
	1992	1.56	2.15	0.91	0.76	6.68	3.14	1.45	2.33	0.72	0.01	1.26	0.43	21.41
	1987	0.31	1.52	0.74	0.55	6.47	2.36	0.58	1.97	2.63	0.32	0.07	0.58	18.10
	1984	0.35	0.37	0.38	0.20	3.49	4.17	1.84	4.13	1.53	3.59	2.10	1.41	23.56
	1983	1.55	0.53	0.52	0.70	1.42	1.11	0.94	0.33	0.48	4.41	2.22	0.73	14.95
	1982	0.47	0.32	0.98	1.15	2.90	2.82	2.37	0.59	1.37	0.88	1.53	2.78	18.15
	1956	0.39	1.51	0.08	0.89	1.87	1.23	0.65	0.69	0.18	1.76	0.46	0.33	10.04
	1955	0.81	0.22	0.49	0.94	2.41	1.12	3.56	0.62	1.87	3.54	0.26	0.04	15.87
	1954	0.34	0.07	0.06	2.66	5.78	1.14	0.24	2.54	0.42	3.27	0.40	0.89	17.81
	1953	0.27	0.34	0.87	1.70	5.33	0.45	3.38	1.79	0.73	3.67	0.82	1.15	20.49
	1952	0.48	0.50	0.41	1.50	2.05	0.40	2.75	0.52	1.94	0.03	1.46	1.04	13.06
	LTA	0.76	0.73	0.73	1.12	2.43	2.04	2.28	1.99	2.48	1.69	0.78	0.78	17.82
Garza County-Texas														
406	1997	0.46	2.23	0.22	6.40	3.64	4.26	2.21	1.96	2.01	1.15	0.53	1.98	27.06
	1994	0.34	0.35	0.42	2.49	4.41	0.50	1.60	1.08	2.44	1.13	1.33	0.19	16.28
	1993	1.31	1.06	0.71	1.25	1.85	1.50	2.46	1.93	0.51	1.30	0.35	0.60	14.84
	1992	1.51	2.46	0.66	2.31	5.73	5.45	2.13	1.53	0.82	0.00	1.76	0.95	25.32
	1987	0.75	2.75	0.64	0.40	5.02	2.82	3.95	2.10	2.71	0.85	1.29	1.94	25.24
	1984	0.33	1.36	0.79	0.60	1.11	3.65	1.58	3.41	1.40	3.43	2.55	1.81	22.03
	1983	2.35	1.45	0.92	1.18	2.96	1.65	1.02	0.67	0.52	7.70	1.49	2.31	24.23
	1982	0.93	0.76	1.09	1.45	5.84	5.37	1.96	1.07	1.94	1.33	1.91	2.70	26.36
	1956	1.41	2.80	0.94	1.94	2.53	2.33	1.47	0.79	0.55	1.24	2.37	1.05	19.43
	1955	1.27	1.19	1.57	0.94	4.71	2.63	4.13	0.90	3.12	3.58	0.58	0.21	24.83
	1954	1.65	0.20	0.31	2.64	4.69	0.64	0.46	1.84	0.31	1.59	0.86	2.00	17.20
	1953	1.10	1.58	1.92	2.42	2.16	0.56	2.69	2.04	0.64	4.04	0.52	0.79	20.47
	1952	1.89	1.32	1.15	2.98	2.48	0.96	3.18	1.28	1.31	0.03	1.70	1.38	19.67
	LTA	1.19	1.28	1.21	1.78	3.22	2.90	2.53	2.26	2.72	2.12	1.24	1.19	23.65

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Glasscock County-Texas														
606	1997	0.21	3.04	0.82	3.15	1.95	3.47	0.49	1.83	1.88	0.65	0.57	1.50	19.54
	1994	1.82	0.35	0.11	0.93	2.63	0.42	0.84	0.34	2.43	1.20	0.72	0.53	12.32
	1993	1.14	0.67	0.46	0.44	2.31	0.83	1.52	2.63	1.44	0.80	0.13	0.58	12.96
	1992	1.91	2.99	0.70	1.66	4.70	3.43	1.98	3.68	0.60	0.21	0.30	0.50	22.67
	1987	0.31	2.07	1.47	1.04	5.11	2.83	0.28	1.83	3.21	0.52	0.05	1.64	20.36
	1984	0.61	0.28	0.37	0.01	1.12	1.39	1.06	0.68	3.26	2.89	2.23	1.72	15.62
	1983	1.65	0.26	0.48	0.25	0.41	1.47	0.23	0.31	0.30	4.19	0.89	0.52	10.96
	1982	0.73	0.38	0.38	0.75	4.27	2.65	0.92	1.19	1.10	0.66	0.99	2.00	16.03
	1956	0.67	0.42	0.03	1.89	1.06	0.26	1.40	0.68	0.71	1.40	0.07	0.72	9.30
	1955	0.83	0.63	0.03	0.56	2.05	1.53	1.87	1.87	0.68	1.13	0.21	0.08	11.46
	1954	0.28	0.18	0.17	2.76	2.26	2.16	0.01	0.62	0.30	1.35	0.37	0.31	10.76
	1953	0.00	0.33	1.86	0.64	0.80	0.30	1.14	1.70	0.36	1.96	0.02	0.15	9.26
	1952	1.83	0.18	0.23	1.12	1.72	0.23	1.45	1.15	1.01	0.00	1.71	1.14	11.78
	LTA	0.88	0.96	0.81	1.43	2.51	1.93	1.77	1.96	2.58	1.84	0.84	0.94	18.45
Hale County-Texas														
306&406	1997	0.61	2.32	0.58	7.16	4.06	3.50	2.05	3.63	2.52	1.17	0.69	1.95	30.25
	1994	0.59	0.17	1.24	2.61	3.47	1.08	3.23	1.40	2.07	0.65	0.95	0.32	17.78
	1993	1.29	0.71	0.91	1.07	1.93	1.53	3.69	2.63	0.67	1.16	0.52	0.52	16.62
	1992	1.01	1.23	0.92	2.18	4.91	6.72	2.67	1.40	0.66	0.02	1.61	0.89	24.22
	1987	0.71	1.69	0.57	0.26	5.30	2.41	3.03	3.48	2.90	0.71	0.55	2.13	23.74
	1984	0.27	0.74	0.71	0.69	0.67	4.04	1.58	3.67	0.89	2.21	1.78	1.71	18.96
	1983	1.99	1.47	0.51	0.99	2.12	2.11	0.72	0.66	1.16	6.11	0.63	0.95	19.41
	1982	0.36	0.44	0.78	0.68	5.62	5.39	2.90	0.81	0.92	0.49	1.44	1.56	21.39
	1956	0.52	2.66	0.33	0.75	4.48	1.70	1.97	0.65	0.45	0.93	0.83	0.73	16.01
	1955	0.77	0.51	0.67	0.62	6.23	4.13	2.43	1.04	1.94	2.23	0.28	0.07	20.93
	1954	0.71	0.11	0.21	2.31	4.19	1.28	0.83	2.10	0.29	0.81	0.22	0.86	13.95
	1953	0.90	0.55	1.06	1.29	1.42	0.41	2.70	2.54	0.38	3.48	0.37	0.47	15.56
	1952	1.23	0.46	0.56	2.83	1.37	1.43	2.53	0.97	0.81	0.01	1.28	0.74	14.21
	LTA	0.77	0.88	0.94	1.54	3.09	3.29	2.52	2.48	2.42	1.80	0.85	0.83	21.41
Hockley County-Texas														
405	1997	0.48	1.57	0.11	3.92	2.64	3.57	2.46	2.47	1.43	1.33	0.63	1.94	22.56
	1994	0.14	0.08	0.48	1.49	3.96	0.50	1.77	0.73	0.81	0.42	0.69	0.07	11.14
	1993	1.41	0.42	0.89	1.05	1.01	0.91	3.82	1.41	0.94	0.89	0.46	0.12	13.31
	1992	1.37	1.34	0.80	1.23	5.24	3.98	1.76	2.39	1.19	0.01	1.38	0.67	21.36
	1987	0.50	1.37	0.28	0.32	5.22	2.63	2.09	4.61	2.91	0.60	0.24	1.87	22.65
	1984	0.10	0.07	0.19	0.09	1.85	5.32	1.47	4.06	1.02	2.90	1.70	1.60	20.38
	1983	1.81	0.52	0.07	0.72	1.93	1.38	0.85	0.74	0.50	5.37	1.10	0.35	15.34
	1982	0.46	0.33	0.43	0.40	3.90	3.00	3.95	0.45	1.41	0.38	1.24	2.03	18.00
	1956	0.07	1.23	0.04	0.23	1.60	2.10	0.95	0.62	0.23	1.10	0.02	0.29	8.47
	1955	0.74	0.03	0.12	0.27	2.85	0.77	2.43	0.27	2.08	6.27	0.27	0.00	16.11
	1954	0.04	0.05	0.01	1.91	3.31	0.60	0.41	2.32	0.33	2.56	0.04	0.33	11.92
	1953	0.48	0.12	0.75	0.71	0.88	0.72	2.16	1.66	0.40	3.27	0.14	0.12	11.42
	1952	0.65	0.23	0.03	1.50	1.46	0.97	1.97	1.04	1.08	0.00	0.78	0.07	9.76
	LTA	0.57	0.64	0.57	1.04	2.41	2.55	2.52	2.37	2.52	1.66	0.61	0.61	18.08

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Howard County-Texas														
506	1997	0.17	3.11	0.27	4.41	2.77	5.34	1.13	3.21	1.76	1.45	0.51	1.63	25.77
	1994	0.99	0.26	0.15	0.81	4.03	0.50	1.16	0.35	3.35	1.12	1.45	0.48	14.64
	1993	1.09	1.12	0.66	1.76	1.93	3.31	2.42	1.73	1.49	2.04	0.26	0.47	18.27
	1992	1.76	2.69	0.65	1.59	7.21	4.33	1.30	2.36	1.24	0.02	1.30	0.56	25.03
	1987	0.41	1.85	0.75	0.46	7.53	2.97	1.67	1.52	2.82	0.07	0.06	0.79	20.90
	1984	0.54	0.82	0.45	0.21	2.06	2.02	1.86	3.28	2.55	3.85	2.77	2.29	22.70
	1983	2.03	0.64	0.93	1.11	2.36	1.46	1.31	0.28	0.78	4.39	1.58	1.63	18.52
	1982	1.56	1.07	0.90	2.07	4.54	6.47	1.74	2.26	0.74	1.34	2.67	5.73	31.10
	1956	0.52	1.25	0.10	1.99	2.16	1.20	0.56	0.44	0.53	1.82	0.57	0.66	11.80
	1955	0.90	0.67	1.47	1.17	4.39	1.45	3.10	1.39	3.61	2.19	0.19	0.11	20.66
	1954	0.69	0.15	0.12	3.54	4.26	1.67	0.17	1.16	0.57	3.11	0.78	0.92	17.14
	1953	0.68	0.67	1.71	2.13	2.49	0.52	2.10	1.22	1.27	3.55	0.55	0.54	17.43
	1952	0.60	0.49	0.81	1.09	1.92	0.19	1.65	0.98	2.39	0.06	2.55	1.69	14.42
	LTA	0.96	1.01	1.04	1.70	3.08	2.49	2.27	2.10	2.86	2.06	1.05	1.12	21.74
Lamb County-Texas														
305&405	1997	0.54	0.83	0.09	4.62	2.51	3.11	2.56	3.07	2.61	1.06	0.62	2.04	23.65
	1994	0.16	0.10	1.01	1.46	4.13	1.60	2.93	1.84	1.03	0.45	0.65	0.26	15.63
	1993	1.07	0.36	0.59	0.67	1.47	1.55	3.88	2.56	1.80	1.15	0.53	0.30	15.94
	1992	1.07	0.65	1.16	1.13	4.40	5.16	1.91	2.87	1.17	0.02	1.19	0.77	21.50
	1987	0.71	0.97	0.30	0.18	4.08	2.08	1.43	4.68	3.40	0.78	0.31	1.68	20.60
	1984	0.24	0.14	0.67	0.29	1.01	3.42	2.12	5.54	0.53	3.33	1.28	1.59	20.17
	1983	1.47	0.94	0.39	0.65	1.45	1.67	0.62	0.62	0.76	3.45	0.56	0.45	13.00
	1982	0.15	0.38	0.37	0.48	2.52	3.28	3.93	1.08	0.74	0.44	1.16	1.61	16.12
	1956	0.18	1.21	0.11	0.37	2.40	1.90	1.02	0.96	0.21	0.68	0.03	0.17	9.23
	1955	0.67	0.15	0.22	0.54	3.47	0.95	2.53	1.05	1.98	2.19	0.15	0.03	13.95
	1954	0.18	0.19	0.14	1.17	2.59	0.91	0.57	2.75	0.51	1.67	0.02	0.28	10.99
	1953	0.44	0.44	0.94	0.93	1.20	0.86	2.28	2.00	0.41	2.45	0.24	0.22	12.40
	1952	0.57	0.25	0.42	1.86	0.99	1.53	1.95	1.57	0.85	0.00	1.04	0.36	11.38
	LTA	0.59	0.63	0.64	1.04	2.34	2.57	2.50	2.55	2.21	1.57	0.68	0.71	18.04
Lubbock County-Texas														
406	1997	0.46	2.23	0.22	6.40	3.64	4.26	2.21	1.96	2.01	1.15	0.53	1.98	27.06
	1994	0.34	0.35	0.42	2.49	4.41	0.50	1.60	1.08	2.44	1.13	1.33	0.19	16.28
	1993	1.31	1.06	0.71	1.25	1.85	1.50	2.46	1.93	0.51	1.30	0.35	0.60	14.84
	1992	1.51	2.46	0.66	2.31	5.73	5.45	2.13	1.53	0.82	0.00	1.76	0.95	25.32
	1987	0.75	2.75	0.64	0.40	5.02	2.82	3.95	2.10	2.71	0.85	1.29	1.94	25.24
	1984	0.33	1.36	0.79	0.60	1.11	3.65	1.58	3.41	1.40	3.43	2.55	1.81	22.03
	1983	2.35	1.45	0.92	1.18	2.96	1.65	1.02	0.67	0.52	7.70	1.49	2.31	24.23
	1982	0.93	0.76	1.09	1.45	5.84	5.37	1.96	1.07	1.94	1.33	1.91	2.70	26.36
	1956	1.41	2.80	0.94	1.94	2.53	2.33	1.47	0.79	0.55	1.24	2.37	1.05	19.43
	1955	1.27	1.19	1.57	0.94	4.71	2.63	4.13	0.90	3.12	3.58	0.58	0.21	24.83
	1954	1.65	0.20	0.31	2.64	4.69	0.64	0.46	1.84	0.31	1.59	0.86	2.00	17.20
	1953	1.10	1.58	1.92	2.42	2.16	0.56	2.69	2.04	0.64	4.04	0.52	0.79	20.47
	1952	1.89	1.32	1.15	2.98	2.48	0.96	3.18	1.28	1.31	0.03	1.70	1.38	19.67
	LTA	1.19	1.28	1.21	1.78	3.22	2.90	2.53	2.26	2.72	2.12	1.24	1.19	23.65

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Lynn County-Texas														
406	1997	0.46	2.23	0.22	6.40	3.64	4.26	2.21	1.96	2.01	1.15	0.53	1.98	27.06
	1994	0.34	0.35	0.42	2.49	4.41	0.50	1.60	1.08	2.44	1.13	1.33	0.19	16.28
	1993	1.31	1.06	0.71	1.25	1.85	1.50	2.46	1.93	0.51	1.30	0.35	0.60	14.84
	1992	1.51	2.46	0.66	2.31	5.73	5.45	2.13	1.53	0.82	0.00	1.76	0.95	25.32
	1987	0.75	2.75	0.64	0.40	5.02	2.82	3.95	2.10	2.71	0.85	1.29	1.94	25.24
	1984	0.33	1.36	0.79	0.60	1.11	3.65	1.58	3.41	1.40	3.43	2.55	1.81	22.03
	1983	2.35	1.45	0.92	1.18	2.96	1.65	1.02	0.67	0.52	7.70	1.49	2.31	24.23
	1982	0.93	0.76	1.09	1.45	5.84	5.37	1.96	1.07	1.94	1.33	1.91	2.70	26.36
	1956	1.41	2.80	0.94	1.94	2.53	2.33	1.47	0.79	0.55	1.24	2.37	1.05	19.43
	1955	1.27	1.19	1.57	0.94	4.71	2.63	4.13	0.90	3.12	3.58	0.58	0.21	24.83
	1954	1.65	0.20	0.31	2.64	4.69	0.64	0.46	1.84	0.31	1.59	0.86	2.00	17.20
	1953	1.10	1.58	1.92	2.42	2.16	0.56	2.69	2.04	0.64	4.04	0.52	0.79	20.47
	1952	1.89	1.32	1.15	2.98	2.48	0.96	3.18	1.28	1.31	0.03	1.70	1.38	19.67
	LTA	1.19	1.28	1.21	1.78	3.22	2.90	2.53	2.26	2.72	2.12	1.24	1.19	23.65
Martin County-Texas														
505&506	1997	0.21	2.77	0.27	4.02	2.85	4.80	1.35	2.99	1.85	1.34	0.49	1.74	24.67
	1994	0.64	0.08	0.10	0.69	3.38	0.39	1.78	0.44	2.11	0.84	0.97	0.17	11.58
	1993	1.19	0.97	0.92	1.42	1.31	1.24	3.36	1.71	1.14	1.18	0.21	0.36	14.97
	1992	1.70	2.53	0.73	1.34	7.05	3.97	1.35	2.35	1.08	0.02	1.29	0.52	23.94
	1987	0.38	1.75	0.75	0.49	7.21	2.79	1.34	1.66	2.76	0.15	0.06	0.73	20.06
	1984	0.39	0.46	0.39	0.20	3.20	3.74	1.84	3.96	1.73	3.64	2.23	1.59	23.39
	1983	1.65	0.55	0.60	0.78	1.61	1.18	1.01	0.32	0.54	4.41	2.09	0.91	15.66
	1982	1.23	0.85	0.92	1.79	4.05	5.38	1.93	1.76	0.93	1.20	2.33	4.85	27.22
	1956	0.48	1.33	0.09	1.66	2.07	1.21	0.59	0.52	0.43	1.80	0.54	0.56	11.27
	1955	0.87	0.54	1.18	1.10	3.80	1.35	3.24	1.16	3.09	2.60	0.21	0.09	19.22
	1954	0.59	0.13	0.10	3.28	4.72	1.51	0.19	1.57	0.53	3.16	0.67	0.91	17.34
	1953	0.56	0.57	1.46	2.00	3.34	0.50	2.48	1.39	1.11	3.59	0.63	0.72	18.35
	1952	0.56	0.49	0.69	1.21	1.96	0.25	1.98	0.84	2.26	0.05	2.22	1.50	14.01
	LTA	0.80	0.79	0.79	1.23	2.56	2.13	2.28	2.01	2.55	1.77	0.84	0.85	18.60
Midland County														
605&606	1997	0.19	2.52	0.49	2.38	1.82	2.97	0.77	1.58	1.96	0.64	0.57	1.57	17.40
	1994	1.46	0.35	0.08	0.64	1.99	0.33	1.44	0.84	2.21	0.96	0.62	0.46	11.35
	1993	1.07	0.62	0.37	0.54	1.79	0.59	1.66	2.26	1.39	0.91	0.11	0.55	11.85
	1992	1.61	2.54	0.66	1.32	5.74	2.45	1.82	3.12	0.70	0.15	0.46	0.57	21.11
	1987	0.20	1.82	1.27	1.19	5.07	2.63	0.35	1.80	2.65	0.54	0.05	1.08	18.63
	1984	0.57	0.20	0.19	0.01	1.91	1.76	0.77	0.77	2.77	2.79	2.10	1.47	15.28
	1983	1.22	0.26	0.35	0.16	0.59	1.17	0.18	0.29	0.47	3.92	1.36	0.39	10.32
	1982	0.48	0.27	0.19	0.95	3.89	1.98	0.93	1.08	0.81	0.44	0.89	1.84	13.74
	1956	0.48	0.35	0.02	1.25	0.81	0.47	1.18	0.93	0.49	0.97	0.04	0.53	7.48
	1955	0.85	0.45	0.02	0.32	2.06	1.55	2.14	1.34	0.60	0.91	0.30	0.05	10.56
	1954	0.24	0.11	0.18	2.15	2.15	1.95	0.08	1.03	0.23	1.83	0.20	0.16	10.28
	1953	0.00	0.40	1.17	0.60	0.42	0.31	0.84	1.27	0.21	2.18	0.01	0.22	7.59
	1952	1.09	0.22	0.14	0.97	1.56	0.33	1.54	0.70	0.97	0.00	1.42	1.00	9.91
	LTA	0.77	0.82	0.60	1.13	2.22	1.72	1.63	1.77	2.32	1.66	0.71	0.79	16.13

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Motley County-Texas														
307	1997	0.59	2.85	0.00	10.02	3.58	3.46	1.64	4.49	3.46	2.05	0.70	2.75	35.59
	1994	0.81	0.50	1.87	3.03	2.16	0.77	3.02	0.64	1.41	2.00	1.45	0.33	17.98
	1993	1.58	1.12	1.00	1.74	3.81	1.30	3.02	1.83	0.96	1.35	0.40	0.59	18.70
	1992	1.15	1.61	0.96	2.35	3.80	7.57	1.70	0.92	0.90	0.01	3.11	1.32	25.41
	1987	0.82	2.17	1.06	0.12	4.98	2.49	2.22	2.90	2.70	0.76	0.32	1.99	22.51
	1984	0.24	0.75	0.65	0.81	0.52	3.58	1.38	2.84	0.28	0.80	2.01	2.77	16.62
	1983	1.51	1.25	1.97	0.87	1.57	2.75	0.63	0.34	0.68	8.10	0.86	0.55	21.07
	1982	0.18	0.37	0.88	0.77	5.08	5.19	3.05	0.64	0.87	0.25	1.67	1.23	20.17
	1956	0.14	0.56	0.05	0.13	5.00	1.20	1.44	0.10	0.52	1.94	0.13	0.51	11.72
	1955	0.64	0.61	0.27	0.26	6.68	7.07	1.99	0.25	2.29	3.46	0.00	0.02	23.54
	1954	0.06	0.00	0.09	1.71	6.78	1.00	0.25	2.11	0.14	0.62	0.07	0.78	13.60
	1953	0.35	0.43	0.81	1.40	1.48	0.30	3.41	2.26	0.18	5.04	0.81	0.07	16.54
	1952	1.14	0.26	0.70	4.80	2.36	0.60	1.99	0.85	0.53	0.00	1.07	1.03	15.32
	LTA	0.72	0.91	1.03	1.94	3.59	3.29	2.13	2.30	2.53	2.01	0.86	0.83	22.12
Oldham County-Texas														
205	1997	0.4	0.39	0.01	4.81	1.44	2.38	3.39	4.82	1.56	0.76	0.75	2.04	22.75
	1994	0.41	0.02	0.93	1.23	3.57	1.57	4.08	2.42	0.45	1.74	0.47	0.49	17.37
	1993	0.97	0.61	1.26	0.55	2.06	4.77	2.49	2.67	0.85	1.03	0.51	0.43	18.2
	1992	0.63	0.38	0.83	0.92	3.57	4.66	2.92	3.5	0.38	0.06	0.88	0.63	19.38
	1987	1.06	1.87	1.28	0.66	3.86	2.02	0.64	4.15	2.34	0.64	0.79	0.8	20.1
	1984	0.38	0.26	1.67	1.98	0.91	2.85	1.6	4.18	0.49	3.58	0.69	1.51	20.1
	1983	1.42	0.87	1.09	0.75	2.31	1.43	1.29	1.19	0.52	1.44	0.48	0.95	13.73
	1982	0.21	0.57	0.6	0.4	2.1	2.85	6.37	3.14	2.01	1.05	0.66	0.97	20.94
	1956	0.21	0.83	0.1	0.32	1.42	1.17	2.29	1.99	0.05	0.65	0.34	0.36	9.7
	1955	0.15	0.24	0.31	2.29	3.54	0.94	2.28	2.18	2.09	0.3	0.11	0.06	14.48
	1954	0.66	0.21	0.14	0.77	2.59	1.88	2.29	2.36	0.79	1.82	0.05	0.3	13.86
	1953	0.08	0.44	0.49	0.3	1.19	0.35	3.16	3.06	0.31	2.19	0.84	0.53	12.96
	1952	0.43	0.3	0.86	2.67	1.14	1.34	1.85	3.42	0.69	0.01	0.93	0.47	14.11
	LTA	0.59	0.63	0.87	1.22	2.42	2.55	2.99	2.95	1.92	1.32	0.73	0.68	18.85
Parmer County-Texas														
305	1997	0.56	0.64	0.08	4.79	2.48	2.99	2.59	3.22	2.90	0.99	0.62	2.07	23.92
	1994	0.17	0.10	1.14	1.45	4.17	1.88	3.22	2.12	1.09	0.46	0.64	0.31	16.75
	1993	0.98	0.35	0.51	0.58	1.59	1.71	3.89	2.85	2.02	1.22	0.55	0.34	16.60
	1992	1.00	0.48	1.25	1.10	4.19	5.46	1.95	2.99	1.16	0.02	1.14	0.79	21.53
	1987	0.76	0.87	0.31	0.15	3.79	1.94	1.26	4.70	3.52	0.82	0.33	1.63	20.09
	1984	0.28	0.16	0.79	0.34	0.80	2.95	2.28	5.91	0.41	3.44	1.17	1.59	20.12
	1983	1.39	1.04	0.47	0.63	1.33	1.74	0.56	0.59	0.82	2.97	0.43	0.47	12.41
	1982	0.07	0.39	0.36	0.50	2.18	3.35	3.92	1.24	0.57	0.45	1.14	1.50	15.65
	1956	0.21	1.20	0.13	0.40	2.60	1.85	1.04	1.05	0.20	0.57	0.03	0.14	9.42
	1955	0.65	0.18	0.24	0.61	3.63	0.99	2.56	1.25	1.96	1.17	0.12	0.04	13.41
	1954	0.22	0.22	0.17	0.99	2.41	0.99	0.61	2.86	0.56	1.45	0.02	0.27	10.76
	1953	0.43	0.52	0.99	0.99	1.28	0.89	2.31	2.09	0.41	2.25	0.26	0.25	12.65
	1952	0.55	0.26	0.52	1.95	0.87	1.67	1.94	1.70	0.79	0.00	1.11	0.43	11.78
	LTA	0.60	0.63	0.66	1.04	2.32	2.58	2.50	2.60	2.13	1.55	0.70	0.74	18.04

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Potter County-Texas														
206	1997	0.52	0.79	0	7.64	2.82	2.5	3.1	3.74	1.85	0.91	1	2.08	26.96
	1994	0.78	0.1	1.17	1.8	1.75	1.55	4.21	2.69	1.53	1.34	0.81	0.52	18.24
	1993	1.05	0.78	1.37	0.82	2.38	4.04	3.61	3.3	1.71	0.48	0.68	0.52	20.74
	1992	0.61	0.41	1.16	2.07	3.58	6.22	2.59	3.93	0.39	0.13	1.46	0.89	23.44
	1987	1	1.21	1.92	0.43	4.99	4.07	1.91	3.67	3.72	1.11	0.59	1.6	26.22
	1984	0.46	0.54	1.55	1.33	0.56	4.14	1.01	3.17	0.9	2.99	0.96	1.46	19.07
	1983	1.26	1.87	1.16	1.27	2.63	2.9	0.55	1.02	0.75	2.47	0.57	0.64	17.1
	1982	0.14	0.9	0.74	0.63	4.28	4.72	6.43	1.41	1.71	0.5	0.75	0.99	23.19
	1956	0.09	0.99	0.07	0.14	2.66	1.75	2.94	1	0.55	0.38	0	0.03	10.6
	1955	0.24	0.09	0.11	0.85	5.43	2.59	2.02	1.3	2.23	0.15	0.08	0.06	15.13
	1954	0.24	0.03	0.14	1.73	4.67	2.01	1.49	2.53	0.47	1.04	0	0.22	14.56
	1953	0.52	0.35	0.47	0.79	0.81	0.31	3.77	2.48	0.21	3.87	0.44	0.57	14.6
	1952	0.33	0.33	0.6	2.46	1.26	2.43	1.99	2.12	0.48	0	0.98	0.55	13.52
	LTA	0.58	0.73	0.96	1.42	3.05	3.26	2.97	2.81	1.98	1.58	0.76	0.67	20.76
Randall County-Texas														
206&306	1997	0.59	1.57	0.34	7.50	3.50	2.91	2.56	3.90	2.25	1.05	0.87	2.01	29.01
	1994	0.72	0.12	1.31	2.22	2.49	1.39	3.93	2.09	1.76	0.94	0.83	0.44	18.20
	1993	1.17	0.70	1.17	0.92	2.17	2.79	3.81	3.06	1.21	0.81	0.62	0.51	18.90
	1992	0.75	0.67	1.08	2.11	4.14	6.63	2.70	2.65	0.51	0.08	1.52	0.89	23.70
	1987	0.85	1.32	1.24	0.33	5.18	3.19	2.36	3.75	3.34	0.90	0.48	1.89	24.80
	1984	0.36	0.57	1.12	1.02	0.56	4.14	1.30	3.45	0.83	2.45	1.28	1.57	18.63
	1983	1.58	1.67	0.79	1.11	2.27	2.57	0.60	0.84	1.04	4.09	0.50	0.63	17.66
	1982	0.18	0.63	0.72	0.56	4.92	5.06	4.79	1.08	1.19	0.39	1.04	1.13	21.67
	1956	0.20	1.81	0.13	0.30	3.82	1.65	2.52	0.81	0.49	0.62	0.23	0.34	12.88
	1955	0.45	0.22	0.28	0.70	6.02	3.55	2.02	1.19	1.94	1.02	0.14	0.05	17.54
	1954	0.36	0.06	0.17	1.98	4.37	1.73	1.21	2.35	0.38	0.83	0.03	0.40	13.85
	1953	0.69	0.32	0.66	0.90	1.03	0.34	3.24	2.57	0.26	3.61	0.39	0.48	14.47
	1952	0.70	0.29	0.51	2.63	1.18	1.99	2.18	1.51	0.58	0.00	1.08	0.57	13.19
	LTA	0.62	0.75	0.92	1.45	3.05	3.33	2.74	2.67	2.16	1.65	0.76	0.71	20.81
Swisher County-Texas														
306	1997	0.65	2.34	0.67	7.35	4.17	3.31	2.01	4.05	2.65	1.18	0.73	1.94	31.05
	1994	0.65	0.13	1.44	2.64	3.23	1.23	3.64	1.48	1.98	0.53	0.85	0.35	18.15
	1993	1.28	0.62	0.96	1.02	1.95	1.54	4.00	2.81	0.71	1.13	0.56	0.50	17.06
	1992	0.89	0.92	0.99	2.15	4.70	7.04	2.80	1.37	0.62	0.03	1.57	0.88	23.95
	1987	0.70	1.42	0.55	0.23	5.37	2.31	2.80	3.82	2.95	0.68	0.37	2.18	23.37
	1984	0.26	0.59	0.69	0.71	0.56	4.14	1.58	3.73	0.76	1.90	1.59	1.68	18.19
	1983	1.90	1.47	0.41	0.94	1.91	2.23	0.64	0.66	1.32	5.71	0.42	0.61	18.21
	1982	0.22	0.36	0.70	0.49	5.56	5.39	3.14	0.75	0.66	0.28	1.32	1.27	20.15
	1956	0.30	2.63	0.18	0.45	4.97	1.54	2.10	0.61	0.43	0.85	0.45	0.65	15.16
	1955	0.65	0.34	0.45	0.54	6.61	4.51	2.01	1.07	1.64	1.89	0.20	0.04	19.95
	1954	0.48	0.09	0.19	2.23	4.07	1.44	0.92	2.16	0.29	0.62	0.06	0.58	13.14
	1953	0.85	0.29	0.84	1.01	1.24	0.37	2.70	2.66	0.31	3.34	0.33	0.39	14.33
	1952	1.07	0.24	0.41	2.79	1.09	1.55	2.37	0.89	0.68	0.00	1.18	0.58	12.85
	LTA	0.67	0.78	0.88	1.48	3.05	3.39	2.51	2.53	2.34	1.72	0.75	0.75	20.85

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Terry County-Texas														
405	1997	0.48	1.57	0.11	3.92	2.64	3.57	2.46	2.47	1.43	1.33	0.63	1.94	22.56
	1994	0.14	0.08	0.48	1.49	3.96	0.50	1.77	0.73	0.81	0.42	0.69	0.07	11.14
	1993	1.41	0.42	0.89	1.05	1.01	0.91	3.82	1.41	0.94	0.89	0.46	0.12	13.31
	1992	1.37	1.34	0.80	1.23	5.24	3.98	1.76	2.39	1.19	0.01	1.38	0.67	21.36
	1987	0.50	1.37	0.28	0.32	5.22	2.63	2.09	4.61	2.91	0.60	0.24	1.87	22.65
	1984	0.10	0.07	0.19	0.09	1.85	5.32	1.47	4.06	1.02	2.90	1.70	1.60	20.38
	1983	1.81	0.52	0.07	0.72	1.93	1.38	0.85	0.74	0.50	5.37	1.10	0.35	15.34
	1982	0.46	0.33	0.43	0.40	3.90	3.00	3.95	0.45	1.41	0.38	1.24	2.03	18.00
	1956	0.07	1.23	0.04	0.23	1.60	2.10	0.95	0.62	0.23	1.10	0.02	0.29	8.47
	1955	0.74	0.03	0.12	0.27	2.85	0.77	2.43	0.27	2.08	6.27	0.27	0.00	16.11
	1954	0.04	0.05	0.01	1.91	3.31	0.60	0.41	2.32	0.33	2.56	0.04	0.33	11.92
	1953	0.48	0.12	0.75	0.71	0.88	0.72	2.16	1.66	0.40	3.27	0.14	0.12	11.42
	1952	0.65	0.23	0.03	1.50	1.46	0.97	1.97	1.04	1.08	0.00	0.78	0.07	9.76
	LTA	0.57	0.64	0.57	1.04	2.41	2.55	2.52	2.37	2.52	1.66	0.61	0.61	18.08
Yoakum County-Texas														
405	1997	0.48	1.57	0.11	3.92	2.64	3.57	2.46	2.47	1.43	1.33	0.63	1.94	22.56
	1994	0.14	0.08	0.48	1.49	3.96	0.50	1.77	0.73	0.81	0.42	0.69	0.07	11.14
	1993	1.41	0.42	0.89	1.05	1.01	0.91	3.82	1.41	0.94	0.89	0.46	0.12	13.31
	1992	1.37	1.34	0.80	1.23	5.24	3.98	1.76	2.39	1.19	0.01	1.38	0.67	21.36
	1987	0.50	1.37	0.28	0.32	5.22	2.63	2.09	4.61	2.91	0.60	0.24	1.87	22.65
	1984	0.10	0.07	0.19	0.09	1.85	5.32	1.47	4.06	1.02	2.90	1.70	1.60	20.38
	1983	1.81	0.52	0.07	0.72	1.93	1.38	0.85	0.74	0.50	5.37	1.10	0.35	15.34
	1982	0.46	0.33	0.43	0.40	3.90	3.00	3.95	0.45	1.41	0.38	1.24	2.03	18.00
	1956	0.07	1.23	0.04	0.23	1.60	2.10	0.95	0.62	0.23	1.10	0.02	0.29	8.47
	1955	0.74	0.03	0.12	0.27	2.85	0.77	2.43	0.27	2.08	6.27	0.27	0.00	16.11
	1954	0.04	0.05	0.01	1.91	3.31	0.60	0.41	2.32	0.33	2.56	0.04	0.33	11.92
	1953	0.48	0.12	0.75	0.71	0.88	0.72	2.16	1.66	0.40	3.27	0.14	0.12	11.42
	1952	0.65	0.23	0.03	1.50	1.46	0.97	1.97	1.04	1.08	0.00	0.78	0.07	9.76
	LTA	0.57	0.64	0.57	1.04	2.41	2.55	2.52	2.37	2.52	1.66	0.61	0.61	18.08
Curry County-New Mexico														
304	1997	0.67	0.71	0.01	4.34	1.43	2.93	2.68	3.00	2.27	0.94	0.65	2.67	22.29
	1994	0.07	0.06	1.03	0.80	3.78	0.83	2.61	1.89	0.61	1.26	0.43	0.45	13.82
	1993	0.81	0.29	0.78	0.40	1.25	1.86	4.59	3.40	1.65	1.10	0.50	0.14	16.77
	1992	1.16	0.33	0.37	1.09	3.86	2.95	1.64	3.30	1.29	0.20	0.44	0.65	17.27
	1987	0.95	1.55	0.42	0.35	2.57	3.04	0.76	5.80	2.07	0.51	0.39	1.24	19.65
	1984	0.45	0.16	0.52	0.95	2.83	4.67	2.61	4.62	0.48	3.58	1.50	1.10	23.47
	1983	1.23	0.65	0.69	0.80	1.24	1.74	0.91	0.62	0.76	3.21	0.64	0.55	13.05
	1982	0.20	0.38	0.19	0.28	1.36	1.94	4.41	1.81	1.42	1.41	0.85	1.38	15.65
	1956	0.09	0.95	0.03	0.24	1.66	2.13	2.07	1.12	0.22	1.00	0.08	0.02	9.62
	1955	0.22	0.06	0.08	1.06	2.13	1.23	3.60	1.44	2.41	0.61	0.03	0.07	12.95
	1954	0.13	0.23	0.05	0.74	1.44	0.92	1.29	4.41	0.35	3.06	0.09	0.08	12.79
	1953	0.30	0.28	0.42	0.41	1.22	0.24	3.93	2.02	0.00	1.23	0.40	0.45	10.91
	1952	0.32	0.23	0.09	1.92	0.38	1.34	2.38	2.24	0.81	0.00	1.01	0.29	11.02
	LTA	0.48	0.52	0.55	0.85	1.95	2.22	2.81	2.84	2.00	1.42	0.58	0.60	16.82

Attachment B1. Monthly rainfall in inches by county for selected years and long-term average (LTA) in the Southern Ogallala GAM region.

CTY/QID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Lea County-New Mexico														
504	1997	0.21	1.32	0.12	1.93	2.62	2.01	2.38	2.14	3.27	1.90	0.54	1.84	20.28
	1994	0.29	0.01	0.08	0.39	3.70	0.58	1.88	0.37	1.08	0.68	0.81	0.05	9.91
	1993	1.11	0.51	0.35	0.95	0.35	0.77	2.91	1.55	0.59	0.72	0.27	0.03	10.12
	1992	1.03	1.20	0.27	0.27	7.57	3.10	1.29	1.43	0.63	0.14	0.83	0.69	18.45
	1987	0.16	0.98	0.63	0.46	3.45	2.32	0.29	2.87	1.04	0.49	0.25	0.96	13.88
	1984	0.06	0.01	0.01	0.02	3.85	3.71	0.93	5.56	1.40	2.56	1.28	1.29	20.67
	1983	1.06	0.41	0.17	0.61	1.01	0.72	0.41	0.62	2.04	2.45	1.35	0.43	11.27
	1982	0.32	0.11	0.24	0.84	2.17	1.00	1.97	1.20	1.94	0.32	1.08	1.67	12.87
	1956	0.17	1.07	0.25	0.38	1.92	1.10	1.27	0.77	0.88	1.38	0.12	0.60	9.91
	1955	0.87	0.40	0.04	0.64	1.74	0.82	3.23	1.25	2.20	2.03	0.49	0.15	13.86
	1954	0.24	0.11	0.18	1.46	3.29	0.97	0.73	2.44	0.55	2.35	0.20	0.46	12.97
	1953	0.18	0.58	0.43	0.97	0.93	0.78	1.96	1.95	0.39	2.61	0.75	0.64	12.19
	1952	0.32	0.81	0.38	1.10	1.49	1.07	1.86	0.70	0.70	0.00	0.70	0.03	9.16
	LTA	0.72	0.69	0.63	0.76	1.92	1.74	2.22	2.26	2.44	1.37	0.71	0.75	16.21
Quay County-New Mexico														
204&304	1997	0.53	0.68	0.03	4.47	1.28	2.91	2.71	3.30	1.99	1.00	0.72	2.34	21.93
	1994	0.12	0.04	1.13	1.33	3.98	0.99	2.42	1.98	0.61	1.47	0.45	0.44	14.95
	1993	0.78	0.41	1.05	0.37	1.44	3.04	3.33	3.01	0.96	0.90	0.46	0.10	15.83
	1992	0.83	0.36	0.38	0.86	3.04	2.99	2.57	3.21	1.01	0.23	0.46	0.53	16.44
	1987	1.07	1.64	0.46	0.46	3.15	2.74	0.53	5.27	1.86	0.30	0.48	1.04	18.96
	1984	0.40	0.12	0.92	1.19	2.28	3.58	2.22	4.23	0.56	3.53	1.17	0.92	21.09
	1983	1.08	0.78	0.75	0.67	1.29	1.78	1.09	0.79	0.64	2.38	0.62	0.65	12.51
	1982	0.15	0.28	0.20	0.32	1.56	2.79	5.04	1.93	1.76	1.16	0.66	1.10	16.94
	1956	0.15	0.83	0.10	0.33	1.86	1.87	2.42	1.23	0.16	0.70	0.15	0.07	9.84
	1955	0.27	0.20	0.18	1.58	2.65	0.84	3.15	1.71	2.25	0.38	0.07	0.12	13.40
	1954	0.42	0.21	0.20	0.76	1.96	0.83	1.60	3.03	0.81	2.54	0.17	0.05	12.55
	1953	0.32	0.44	1.00	0.87	1.39	0.22	3.81	2.32	0.13	1.05	0.69	0.74	12.95
	1952	0.47	0.31	0.66	2.18	0.94	1.12	2.28	2.82	0.69	0.03	1.26	0.43	13.16
	LTA	0.49	0.55	0.64	1.01	2.06	2.21	2.85	2.80	1.95	1.30	0.65	0.57	17.08
Roosevelt County-New Mexico														
404	1997	0.83	1.01	0.28	2.94	1.57	1.68	2.33	2.64	2.04	1.52	0.49	2.02	19.36
	1994	0.02	0.00	0.31	0.45	3.50	0.51	2.52	0.74	0.96	0.50	0.69	0.05	10.26
	1993	0.67	0.17	0.40	0.67	0.57	1.05	5.22	3.37	2.54	0.51	0.54	0.05	15.76
	1992	1.35	0.53	0.27	0.71	6.96	2.07	1.61	2.38	0.91	0.11	0.65	0.48	18.02
	1987	0.36	1.08	0.38	0.19	4.09	2.64	1.00	3.79	3.03	0.70	0.45	1.22	18.93
	1984	0.12	0.01	0.11	0.08	3.46	3.65	2.43	4.74	0.85	3.03	1.41	1.53	21.43
	1983	1.03	0.47	0.07	0.28	1.59	0.89	0.66	0.50	1.23	3.55	1.03	0.15	11.45
	1982	0.47	0.31	0.23	0.23	1.93	1.16	4.84	1.07	2.65	0.87	1.29	1.56	16.60
	1956	0.08	1.34	0.00	0.16	1.50	1.13	1.32	1.16	0.30	1.34	0.00	0.08	8.40
	1955	0.54	0.01	0.08	0.35	2.06	0.37	2.98	0.51	2.42	4.01	0.18	0.00	13.50
	1954	0.06	0.01	0.00	0.82	2.53	0.45	0.50	4.02	0.33	3.24	0.13	0.20	12.29
	1953	0.50	0.20	0.49	0.63	1.66	0.23	2.52	2.25	0.15	2.17	0.11	0.23	11.13
	1952	0.33	0.15	0.06	1.29	0.81	1.29	2.95	1.85	0.94	0.02	0.69	0.15	10.52
	LTA	0.51	0.53	0.48	0.73	1.88	1.97	2.60	2.46	2.29	1.48	0.61	0.56	16.11

Attachment B2

Irrigated Acreage by Crop and County for 1982, 1983, 1994, 1987, 1992, 1993, 1994, and 1997

Attachment B2. Irrigated acreage by crop and county in the Southern Ogallala GAM region for 1982, 1983, 1994, 1987, 1992, 1993, 1994 and 1997.

Table 1. Irrigated Crop Acreage by County, 1982

Counties	Corn	Cotton	Hay	Pasture	Peanuts	Sorghum	Soybeans	Wheat	County Total
Andrews		7,000		81		2,900		900	10,881
Armstrong		2,000				3,600		7,400	13,000
Bailey	44,000	56,200		5,576		26,000	14,000	14,100	159,876
Borden		500						500	1,000
Briscoe	1,700	23,900		1,947		7,800	8,000	8,200	51,547
Castro	90,500	63,100		6,345		24,000	28,000	71,300	283,245
Cochran		51,700		1,263		41,000		8,300	102,263
Crosby		78,400		1,726		19,000	15,000	4,600	118,726
Dawson		19,000		329		9,500	1,000	800	30,629
Deaf Smith	33,200	8,900		3,336		55,000		91,200	191,636
Dickens		7,300		513		300	1,200	1,400	10,713
Ector				911					911
Floyd	16,900	136,700		3,327		41,500	83,000	29,000	310,427
Gaines		167,700		2,684	12,600	42,000	4,000	37,700	266,684
Garza		3,900				200		100	4,200
Glasscock		29,900		1,217		1,100		1,500	33,717
Hale	67,500	190,400		1,826		30,500	144,000	39,200	473,426
Hockley		118,600		2,277		59,000	6,000	2,800	188,677
Howard		7,600				100		900	8,600
Lamb	63,700	139,800		3,392		28,500	50,000	32,600	317,992
Lubbock	2,100	170,700		7,143		28,000	19,000	6,700	233,643
Lynn		24,800		532		6,000	4,000	2,600	37,932
Martin		6,300				1,400		900	8,600
Midland		11,400		292		1,000		1,300	13,992
Motley		1,500		251	2,000	400		300	4,451
Oldham						11,000		12,100	23,100
Parmer	102,700	55,700		6,242		35,000	32,000	73,700	305,342
Potter				1		5,800		5,100	10,901
Randall	1,200					11,500		34,200	46,900
Swisher	29,400	68,400		4,977		30,000	28,000	92,400	253,177
Terry		69,500		654		24,000		10,400	104,554
Yoakum	4,000	53,400		1,033		10,500		3,900	72,833
Subtotal TX	456,900	1,565,300	0	57,794	14,600	550,100	437,200	587,800	3,669,694
Curry	17,300	2,750		7,565		36,500		57,300	121,415
Lea	2,700	7,630		4,063		4,500		10,000	28,893
Quay	700	1,930		3,770		15,900		16,300	38,600
Roosevelt	8,800	9,200		7,028		47,000		33,500	105,528
Subtotal NM	29,500	21,510	0	22,426	0	103,900	0	117,100	294,436
Crop G.Total	**486,400**	**1,586,810**	**0**	**80,220**	**14,600**	**654,000**	**437,200**	**704,900**	**3,964,130**

[1]Sources: Texas Agricultural Statistics Services, Census of Agriculture.

Attachment B2. Irrigated acreage by crop and county in the Southern Ogallala GAM region for 1982, 1983, 1994, 1987, 1992, 1993, 1994 and 1997.

Table 2. Irrigated Crop Acreage by County, 1983

Counties	Corn	Cotton	Hay	Pasture	Peanuts	Sorghum	Soybeans	Wheat	C.Total
Andrews		16,000	1,400					1,000	18,400
Armstrong						2,800		5,300	8,100
Bailey	24,800	34,900				13,300	8,000	21,900	102,900
Borden									0
Briscoe	1,300	18,900				2,100		9,300	31,600
Castro	70,600	42,900				11,000	7,000	60,400	191,900
Cochran		36,500				10,000		9,300	55,800
Crosby		85,300				9,500	2,000	6,600	103,400
Dawson		21,100				3,100		1,100	25,300
Deaf Smith	26,000	3,300				35,500	2,000	80,800	147,600
Dickens		3,900				700		1,900	6,500
Ector									0
Floyd	13,400	94,200				14,000	8,000	27,800	157,400
Gaines		143,800			14,800	16,000		41,700	216,300
Garza		4,000				200		100	4,300
Glasscock		33,200				1,800		1,100	36,100
Hale	54,300	130,400				20,000	21,000	43,300	269,000
Hockley		108,900				10,000	1,000	4,500	124,400
Howard		1,500				200		1,100	2,800
Lamb	42,300	95,700				13,500	18,000	56,300	225,800
Lubbock	1,400	119,100				13,000	3,000	5,100	141,600
Lynn		27,300				2,500	1,000	2,000	32,800
Martin		7,500				200		1,000	8,700
Midland		4,100				600		600	5,300
Motley		1,800			1,300	300		200	3,600
Oldham						6,200		11,300	17,500
Parmer	82,400	35,500				14,500	8,500	47,400	188,300
Potter	3,600					4,900	1,000	5,500	15,000
Randall	1,800					8,800		18,100	28,700
Swisher	25,500	54,500				21,000	9,000	50,200	160,200
Terry		93,100			1,400	12,000		15,400	121,900
Yoakum		42,000				4,000		6,300	52,300
Subtotal TX	347,400	1,259,400	1,400	0	17,500	251,700	89,500	536,600	2,503,500
Curry	12,500	2,120				22,000		55,000	91,620
Lea	2,300	6,700				2,150		9,200	20,350
Quay	250	1,060				10,000		21,400	32,710
Roosevelt	5,550	10,550				9,500		35,000	60,600
Subtotal NM	20,600	20,430	0	0	0	43,650	0	120,600	205,280
Crop G.Total	**368,000**	**1,279,830**	**1,400**	**0**	**17,500**	**295,350**	**89,500**	**657,200**	**2,708,780**

Attachment B2. Irrigated acreage by crop and county in the Southern Ogallala GAM region for 1982, 1983, 1994, 1987, 1992, 1993, 1994 and 1997.

Table 3. Irrigated Crop Acreage by County, 1984

Counties	Corn	Cotton	Hay	Pasture	Peanuts	Sorghum	Soybeans	Wheat	C.Total
Andrews		9,300				900		1,600	11,800
Armstrong						5,200		4,500	9,700
Bailey	30,700	41,200				10,500	1,100	25,900	109,400
Borden								500	500
Briscoe	1,600	22,400				3,900		3,400	31,300
Castro	101,400	63,000				14,000	4,400	57,600	240,400
Cochran		60,700				11,500		10,800	83,000
Crosby		110,400				11,000		6,400	127,800
Dawson		32,200				2,000		1,200	35,400
Deaf Smith	28,000	5,700				50,000	2,500	55,300	141,500
Dickens		6,600				500		900	8,000
Ector									0
Floyd	13,800	134,400				22,000	3,000	25,600	198,800
Gaines		177,800			27,400	16,000		30,200	251,400
Garza		5,600					100		5,700
Glasscock		39,400				1,000		400	40,800
Hale	76,000	167,300				17,000	14,000	45,200	319,500
Hockley		132,100				8,100		8,800	149,000
Howard		2,500				500		200	3,200
Lamb	52,700	129,600				8,100	4,500	38,600	233,500
Lubbock	4,900	171,700				12,000		10,700	199,300
Lynn		39,400				1,500		2,800	43,700
Martin		7,600				500		1,400	9,500
Midland		6,400						500	6,900
Motley		3,000			1,900			100	5,000
Oldham						8,300		9,400	17,700
Parmer	99,800	48,400				20,500	2,800	56,700	228,200
Potter	3,500					7,500		16,600	27,600
Randall	4,100					12,500		27,100	43,700
Swisher	35,600	65,800				28,500	6,500	60,400	196,800
Terry		113,500			1,500	11,500		13,400	139,900
Yoakum		51,200			2,500	4,600		7,100	65,400
Subtotal TX	452,100	1,647,200	0	0	33,300	289,600	38,900	523,300	2,984,400
Curry	24,300	3,300				33,000		45,000	105,600
Lea	2,200	6,800				4,000		12,800	25,800
Quay	350	2,600				13,000		20,000	35,950
Roosevelt	8,500	17,300				15,000		32,000	72,800
Subtotal NM	35,350	30,000	0	0	0	65,000	0	109,800	240,150
Crop G.Total	**487,450**	**1,677,200**	**0**	**0**	**33,300**	**354,600**	**38,900**	**633,100**	**3,224,550**

Attachment B2. Irrigated acreage by crop and county in the Southern Ogallala GAM region for 1982, 1983, 1994, 1987, 1992, 1993, 1994 and 1997.

Table 4. Irrigated Crop Acreage by County, 1987

Counties	Corn	Cotton	Hay	Pasture	Peanuts	Sorghum	Soybeans	Wheat	County Total
Andrews		2,400		516		300		1,800	5,016
Armstrong	250		398	170		4,100		2,800	7,718
Bailey	16,100	35,000		5,906		7,200		23,400	87,606
Borden		700							700
Briscoe	2,800	15,000		1,184		4,100		4,900	27,984
Castro	59,000	43,000		7,533		12,000	4,100	53,400	179,033
Cochran		34,600				6,300		3,700	44,600
Crosby		65,300		710		7,600		2,200	75,810
Dawson		15,200		501		700		100	16,501
Deaf Smith	21,200	2,000		3,456		42,500	1,100	67,300	137,556
Dickens		1,200		430				100	1,730
Ector				984					984
Floyd	10,000	111,000		3,976		13,500	4,200	18,100	160,776
Gaines		110,600		6,661	15,100	3,200		15,800	151,361
Garza		2,100				500		500	3,100
Glasscock		20,800		1,284		1,100		400	23,584
Hale	60,000	137,000		8,307		20,000	16,700	55,800	297,807
Hockley		80,200		388		4,600		3,600	88,788
Howard		1,100				200		400	1,700
Lamb	37,100	109,500		13,162		9,100	3,100	46,600	218,562
Lubbock	2,200	126,400		2,633		7,600		5,900	144,733
Lynn		30,000				1,100		200	31,300
Martin		3,000				200		500	3,700
Midland		7,500		528		300		300	8,628
Motley		1,100			2,000	200		100	3,400
Oldham			480	1	1	6,400		8,400	15,282
Parmer	60,200	38,000		4,527		14,500	2,000	51,800	171,027
Potter			1,725	1		3,200		5,700	10,626
Randall	2,100		2,709	829		12,000		14,200	31,838
Swisher	17,000	44,000		4,134		16,000	3,000	34,600	118,734
Terry		76,100		1,082	1,000	5,600		7,200	90,982
Yoakum				400	1,200	4,900		12,900	19,400
Subtotal TX	287,700	1,110,400	4,914	68,617	19,301	204,600	34,200	438,100	2,167,832
Curry	17,800	2,300		6,564		16,000		46,000	88,664
Lea	650	6,150		4,315		2,000		29,200	42,315
Quay	750	700		5,273		8,000		11,000	25,723
Roosevelt	10,000	4,000		7,007		14,000		50,000	85,007
Subtotal NM	29,200	13,150	0	23,159	0	40,000	0	136,200	241,709
Crop G.Total	**316,900**	**1,123,550**	**4,914**	**91,776**	**19,301**	**244,600**	**34,200**	**574,300**	**2,409,541**

Attachment B2. Irrigated acreage by crop and county in the Southern Ogallala GAM region for 1982, 1983, 1994, 1987, 1992, 1993, 1994 and 1997.

Table 5. Irrigated Crop Acreage by County, 1992

Counties	Corn	Cotton	Hay	Pasture	Peanuts	Sorghum	Soybeans	Wheat	County Total
Andrews		500		401		6,400		300	7,601
Armstrong	1,300		393	208		2,700		10,400	15,001
Bailey	19,000	38,600		10,686	0	29,000	6,800	23,400	127,486
Borden		600				600		700	1,900
Briscoe	4,900	19,900		1,980	1,400	14,000	0	4,200	46,380
Castro	94,200	45,300		13,172	0	21,700	13,900	63,900	252,172
Cochran	0	34,700		260	0	40,500	2,100	700	78,260
Crosby	0	95,400		2,030	0	68,500	9,600	1,400	176,930
Dawson	0	18,700		613	0	7,000	0	900	27,213
Deaf Smith	38,500	3,700		11,275	0	41,800	0	82,000	177,275
Dickens	0	2,600			0	500	0	200	3,300
Ector	0	0			0	0	0	0	0
Floyd	19,200	124,800		2,562	0	68,400	23,500	11,000	249,462
Gaines	0	158,100		5,374	33,200	20,100	0	25,800	242,574
Garza	0	3,200			0	0	0	800	4,000
Glasscock		35,100		712		1,300		800	37,912
Hale	84,400	173,400		7,218	0	102,800	70,200	24,700	462,718
Hockley	0	95,800		852	0	82,400	0	1,100	180,152
Howard		5,200		230		100		700	6,230
Lamb	59,000	120,200		8,547	1,000	57,700	42,400	29,700	318,547
Lubbock	3,500	130,100		2,415	0	86,800	24,500	1,800	249,115
Lynn	0	44,500		1,016	0	32,000	1,200	200	78,916
Martin		9,300		344	0	600	0	400	10,644
Midland	0	8,000		2,203	0	0	0	300	10,503
Motley	0	800		250	1,900	0	0	0	2,950
Oldham			814	1		5,600		9,800	16,215
Parmer	99,300	44,700		12,494	0	32,100	18,200	48,500	255,294
Potter			987	652		2,100		7,800	11,539
Randall	2,100		2,709	829		12,500		19,700	37,838
Swisher	26,900	52,400		6,781	0	38,800	0	35,400	160,281
Terry	0	106,500		1,145	3,500	45,100	0	3,400	159,645
Yoakum	1,400	49,300		142	4,400	22,000	0	3,100	80,342
Subtotal TX	452,400	1,420,900	4,510	93,783	45,400	834,000	212,400	402,400	3,465,793
Curry	25,150	1,900		3,200	1,100	25,700		73,500	130,550
Lea	3,200	11,000		7,251	4,000	5,400		11,200	42,051
Quay	2,050	800		8,827	0	3,800		6,000	21,477
Roosevelt	21,000	4,800		4,910	16,000	13,200		40,000	99,910
Subtotal NM	51,400	18,500	0	24,188	21,100	48,100	0	130,700	293,988
Crop G.Total	**503,800**	**1,439,400**	**4,510**	**117,971**	**66,500**	**882,100**	**212,400**	**533,100**	**3,759,781**

Attachment B2. Irrigated acreage by crop and county in the Southern Ogallala GAM region for 1982, 1983, 1994, 1987, 1992, 1993, 1994 and 1997.

Table 6. Irrigated Crop Acreage by County, 1993

Counties	Corn	Cotton	Hay	Pasture	Peanuts	Sorghum	Soybeans	Wheat	County Total
Andrews		3,100							3,100
Armstrong	2,100					2,300		4,900	9,300
Bailey	21,000	59,000				13,900		16,200	110,100
Borden									0
Briscoe	3,500	27,000			1,200	3,200		8,100	43,000
Castro	99,300	45,400				13,900	3,400	65,400	227,400
Cochran		55,000				2,600		2,100	59,700
Crosby	2,500	133,000				11,200		2,200	148,900
Dawson		40,700				1,400		1,200	43,300
Deaf Smith	49,000	3,800				38,900		76,200	167,900
Dickens		2,000							2,000
Ector									0
Floyd	19,800	129,200				26,400	2,800	9,700	187,900
Gaines		183,300			36,500	1,200		30,300	251,300
Garza		4,200							4,200
Glasscock		38,200							38,200
Hale	85,300	176,000				24,300	5,500	28,300	319,400
Hockley		125,200				6,500			131,700
Howard		3,400							3,400
Lamb	60,600	133,500				9,100	2,800	37,900	243,900
Lubbock	1,600	175,000				7,600	1,200	3,000	188,400
Lynn		41,200				1,300			42,500
Martin		11,300							11,300
Midland		6,400							6,400
Motley		1,500			1,200				2,700
Oldham						3,700		6,900	10,600
Parmer	104,500	48,200				26,600	2,100	48,200	229,600
Potter						2,200		10,000	12,200
Randall	4,300					6,400		26,900	37,600
Swisher	29,200	53,700				17,800	1,200	27,800	129,700
Terry		116,100			3,000	7,300		4,900	131,300
Yoakum	1,400	49,600			4,200	1,200		3,300	59,700
Subtotal TX	484,100	1,665,000	0	0	46,100	229,000	19,000	413,500	2,856,700
Curry	30,850	2,400			1,900	25,200		64,700	125,050
Lea	2,300	8,500			3,900	1,600		12,750	29,050
Quay	2,600	450				5,800		5,000	13,850
Roosevelt	23,500	6,550			16,000	13,100		34,100	93,250
Subtotal NM	59,250	17,900	0	0	21,800	45,700	0	116,550	261,200
Crop G.Total	**543,350**	**1,682,900**	**0**	**0**	**67,900**	**274,700**	**19,000**	**530,050**	**3,117,900**

Attachment B2. Irrigated acreage by crop and county in the Southern Ogallala GAM region for 1982, 1983, 1994, 1987, 1992, 1993, 1994 and 1997.

Table 7. Irrigated Crop Acreage by County, 1994

Counties	Corn	Cotton	Hay	Pasture	Peanuts	Sorghum	Soybeans	Wheat	County Total
Andrews		2,900			1,500				4,400
Armstrong	1,900					1,400		7,600	10,900
Bailey	19,400	55,900				6,700		27,400	109,400
Borden		1,500							1,500
Briscoe	3,700	23,200			1,300	3,300		6,500	38,000
Castro	18,100	51,500				9,000	3,500	49,900	132,000
Cochran	1,200	53,500				2,300		2,100	59,100
Crosby		119,500				10,400		3,400	133,300
Dawson		38,000			2,300			4,100	44,400
Deaf Smith	56,800	4,500				29,200		58,000	148,500
Dickens		3,500							3,500
Ector									0
Floyd	21,200	131,000				18,500	1,000	12,200	183,900
Gaines		193,400			39,500	1,800		19,600	254,300
Garza		7,800							7,800
Glasscock		44,500				1,100		1,400	47,000
Hale	83,400	185,000				20,700	4,500	29,800	323,400
Hockley	1,300	135,200				1,800		2,000	140,300
Howard		1,400						1,600	3,000
Lamb	58,100	128,700				11,300	4,200	29,400	231,700
Lubbock	1,700	170,900				3,800		1,400	177,800
Lynn		46,000				1,200			47,200
Martin		9,900							9,900
Midland		9,100							9,100
Motley		1,800			2,800				4,600
Oldham						5,400		9,200	14,600
Parmer	109,400	51,000				20,700	4,300	37,400	222,800
Potter						2,700		8,600	11,300
Randall	5,600					9,600		22,000	37,200
Swisher	32,500	63,100				16,800		22,900	135,300
Terry	1,300	110,000			3,200	4,100		3,800	122,400
Yoakum	1,000	66,100			4,700	2,200		3,400	77,400
Subtotal TX	416,600	1,708,900	0	0	55,300	184,000	17,500	363,700	2,746,000
Curry	35,800	2,350			1,900	24,000		59,000	123,050
Lea	4,450	9,850			2,800	1,400		9,000	27,500
Quay	2,600	800				5,500		8,400	17,300
Roosevelt	22,900	8,200			16,300	8,400		25,000	80,800
Subtotal NM	65,750	21,200	0	0	21,000	39,300	0	101,400	248,650
Crop G.Total	**482,350**	**1,730,100**	**0**	**0**	**76,300**	**223,300**	**17,500**	**465,100**	**2,994,650**

Attachment B2. Irrigated acreage by crop and county in the Southern Ogallala GAM region for 1982, 1983, 1994, 1987, 1992, 1993, 1994 and 1997.

Table 8. Irrigated Crop Acreage by County, 1997

Counties	Corn	Cotton	Hay	Pasture	Peanuts	Sorghum	Soybeans	Wheat	County Total
Andrews		8,200		571	3,500				12,271
Armstrong	1,200	800	60	316		2,100		5,000	9,476
Bailey	15,500	50,900	0	8,102	0	13,600	1,200	6,100	95,402
Borden		5,000							5,000
Briscoe	2,900	21,400	0	495	1,500	3,500	0	3,600	33,395
Castro	119,200	60,600	0	6,707	0	16,200	3,000	70,200	275,907
Cochran	2,000	55,400	0	850	2,300	15,700	0	0	76,250
Crosby	0	126,700	0	235	0	6,800	1,100	0	134,835
Dawson	0	52,000	0	1,105	16,700	4,800	0	2,800	77,405
Deaf Smith	44,000	7,700	0	9,093	0	36,400	0	100,800	197,993
Dickens	0	5,400	0	3,966	0	0	0	0	9,366
Ector	0	0	0	1,313	0	0	0	0	1,313
Floyd	18,500	125,800	0	1,938	0	24,700	10,600	8,200	189,738
Gaines	1,600	144,000	0	3,272	64,600	6,700	0	10,700	230,872
Garza		12,500	0	0	0	0	0	0	12,500
Glasscock		50,700		295		1,900			52,895
Hale	62,600	202,200	0	8,963	0	34,900	14,600	37,500	360,763
Hockley		143,400	0	1,994	1,000	12,000	0	1,200	159,594
Howard		2,800		200					3,000
Lamb	62,700	123,600	0	4,662	1,100	14,900	5,100	14,200	226,262
Lubbock	1,000	188,900	0	3,738	2,500	14,000	3,600	3,600	217,338
Lynn	0	51,300	0	930	1,500	2,100	0	0	55,830
Martin		6,000		90	1,800				7,890
Midland	0	10,300	0	2,094	0	0	0	0	12,394
Motley	0	0	0	1,855	3,300	0	0	0	5,155
Oldham	862	0	0	520	0	10,500	0	18,300	30,182
Parmer	91,700	65,700	0	9,719	0	17,500	1,600	46,600	232,819
Potter	971	0	0	2,948	0	1,500	0	22,800	28,219
Randall	5,500	100	2,185	6,570	0	14,800	0	17,700	46,855
Swisher	27,900	61,200	0	3,776	0	21,000	5,600	19,400	138,876
Terry	1,200	133,100	0	2,331	21,100	8,200	0	6,100	172,031
Yoakum	1,900	78,700	0	409	11,800	8,700	0	4,400	105,909
Subtotal TX	460,033	1,785,400	0	88,170	129,200	290,400	46,400	394,200	3,193,803
Curry	33,000	2,400	0	5,195	1,600	23,500	0	52,000	117,695
Lea	4,200	12,200	0	6,291	3,200	2,400	0	6,000	34,291
Quay	2,200	2,500	0	14,345	0	5,500	0	9,000	33,545
Roosevelt	22,000	13,600	0	3,848	13,200	10,400	0	30,000	93,048
Subtotal NM	61,400	30,700	0	29,679	18,000	41,800	0	97,000	278,579
Crop G.Total	**521,433**	**1,816,100**	**0**	**117,849**	**147,200**	**332,200**	**46,400**	**491,200**	**3,472,382**

Attachment B3

Irrigation Data by County for Base Years, Drought Years, Drought-of-Record Years, and Long-Term Average Years

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1982	1982	1982	1982
				January	February	March	April
COUNTY	1982 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	10,881	17,407	19.20	0	0	35	167
ARMSTRONG	130	134	12.34	0	0	7	29
BAILEY	159,876	243,703	18.29	0	0	563	8,172
BORDEN	1,000	1,089	13.07	0	0	0	0
BRISCOE	30,928	39,628	15.38	0	0	693	3,137
CASTRO	283,245	474,172	20.09	0	0	9,933	51,391
COCHRAN	102,263	132,458	15.54	0	0	1,103	4,784
CROSBY	118,726	124,402	12.57	0	0	516	2,528
DAWSON	30,629	43,361	16.99	0	0	14	147
DEAF SMITH	191,636	299,417	18.75	0	0	12,637	55,069
DICKENS	5,357	6,681	14.97	0	0	21	146
ECTOR	911	3,122	0.00	0	0	0	312
FLOYD	301,114	323,462	12.89	0	0	1,465	8,073
GAINES	266,684	424,730	19.11	0	0	1,485	6,790
GARZA	4,200	6,029	17.23	0	0	3	13
GLASSCOCK	2,866	5,154	21.58	0	0	6	58
HALE	473,426	466,255	11.82	0	0	251	7,407
HOCKLEY	188,677	239,790	15.25	0	0	125	1,174
HOWARD	8,600	11,638	16.24	0	0	7	28
LAMB	317,992	456,212	17.22	0	0	1,200	12,219
LUBBOCK	233,643	251,439	12.91	0	0	203	2,887
LYNN	37,932	37,848	11.97	0	0	83	476
MARTIN	8600	11846	16.53	0	0	15	61
MIDLAND	4198	7465	21.34	0	0	21	113
MOTLEY	334	598	21.48	0	0	1	8
OLDHAM	23,100	30,414	15.80	0	0	1,715	6,862
PARMER	305,342	450,146	17.69	0	0	9,760	50,363
POTTER	10,901	11,530	12.69	0	0	523	2,093
RANDALL	3,200	3,528	13.23	0	0	259	1,036
SWISHER	253,177	310,690	14.73	0	0	9,728	42,972
TERRY	104,554	122,876	14.10	0	0	499	2,194
YOAKUM	72,833	115,054	18.96	0	0	190	1,462
CURRY	121,415	134,694	13.31	0	0	2,573	13,891
LEA	28,893	46,833	19.45	0	0	554	3,892
QUAY	386	469	14.59	0	0	7	40
ROOSEVELT	105,528	123,539	14.05	0	0	957	6,436
TOTALS	3,813,176	4,977,813	15.67	0	0	57,156	296,430

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1982	1982	1982	1982	1982	1982	1982	1982
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	904	3,418	7,025	5,747	38	35	35	0
ARMSTRONG	24	11	24	22	0	7	7	0
BAILEY	17,966	50,120	89,454	72,385	3,917	563	563	0
BORDEN	54	229	457	349	0	0	0	0
BRISCOE	3,739	6,189	12,796	10,841	846	693	693	0
CASTRO	57,746	81,174	138,226	109,752	6,086	9,933	9,933	0
COCHRAN	8,727	23,413	49,156	42,511	558	1,103	1,103	0
CROSBY	6,926	22,766	48,408	40,214	2,013	516	516	0
DAWSON	2,028	8,524	17,713	14,671	237	14	14	0
DEAF SMITH	49,484	35,906	63,994	55,635	1,418	12,637	12,637	0
DICKENS	422	1,296	2,571	2,046	138	21	21	0
ECTOR	468	624	624	624	468	0	0	0
FLOYD	17,382	55,814	123,569	105,469	8,761	1,465	1,465	0
GAINES	24,068	83,755	166,142	135,507	4,013	1,485	1,485	0
GARZA	305	1,251	2,515	1,935	0	3	3	0
GLASSCOCK	304	1,061	2,063	1,600	50	6	6	0
HALE	23,716	87,656	182,412	151,676	12,635	251	251	0
HOCKLEY	11,165	46,334	97,096	81,950	1,697	125	125	0
HOWARD	597	2,425	4,856	3,710	0	7	7	0
LAMB	29,425	90,172	173,446	139,922	7,429	1,200	1,200	0
LUBBOCK	13,740	49,337	99,422	80,938	4,507	203	203	0
LYNN	1,944	7,127	15,039	12,447	566	83	83	0
MARTIN	598	2391	4879	3870	0	15	15	0
MIDLAND	446	1503	2974	2322	44	21	21	0
MOTLEY	33	129	207	189	30	1	1	0
OLDHAM	5,544	2,254	5,304	5,304	0	1,715	1,715	0
PARMER	55,721	76,358	129,455	103,383	5,585	9,760	9,760	0
POTTER	1,759	1,071	2,518	2,518	0	523	523	0
RANDALL	805	160	375	375	0	259	259	0
SWISHER	41,781	42,371	81,592	68,180	4,609	9,728	9,728	0
TERRY	7,000	23,558	48,486	39,844	299	499	499	0
YOAKUM	6,673	23,524	46,032	36,318	475	190	190	0
CURRY	15,757	22,050	38,214	34,242	2,820	2,573	2,573	0
LEA	5,268	8,513	13,770	11,678	2,049	554	554	0
QUAY	48	73	138	132	16	7	7	0
ROOSEVELT	9,942	22,003	41,606	38,105	2,577	957	957	0
TOTALS	422,509	884,557	1,712,560	1,416,411	73,880	57,156	57,156	0

pia = planted irrigation acreages
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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1983	1983	1983	1983
				January	February	March	April
COUNTY	1983 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**18,400**	**34,009**	**22.18**	0	0	42	763
ARMSTRONG	**81**	**98**	**14.56**	0	0	5	20
BAILEY	**102,900**	**180,360**	**21.03**	0	0	842	6,799
BORDEN	**0**	**0**	**0.00**	0	0	0	0
BRISCOE	**18,960**	**34,208**	**21.65**	0	0	950	3,907
CASTRO	**191,900**	**401,774**	**25.12**	0	0	8,008	42,549
COCHRAN	**55,800**	**91,785**	**19.74**	0	0	1,266	5,063
CROSBY	**103,400**	**158,593**	**18.41**	0	0	682	2,729
DAWSON	**25,200**	**41,475**	**19.75**	0	0	44	177
DEAF SMITH	**147,600**	**259,146**	**21.07**	0	0	10,748	46,810
DICKENS	**3,250**	**3,578**	**13.21**	0	0	25	99
ECTOR	**0**	**0**	**0.00**	0	0	0	0
FLOYD	**152,678**	**233,128**	**18.32**	0	0	1,227	6,627
GAINES	**216,300**	**322,204**	**17.88**	0	0	1,742	6,968
GARZA	**4,300**	**6,587**	**18.38**	0	0	3	10
GLASSCOCK	**3,069**	**5,515**	**21.57**	0	0	5	20
HALE	**269,000**	**408,155**	**18.21**	0	0	10	7,362
HOCKLEY	**124,400**	**205,683**	**19.84**	0	0	215	861
HOWARD	**2,800**	**3,104**	**13.30**	0	0	38	152
LAMB	**225,800**	**374,602**	**19.91**	0	0	1,993	13,896
LUBBOCK	**141,600**	**218,825**	**18.54**	0	0	120	657
LYNN	**32,800**	**48,882**	**17.88**	0	0	50	201
MARTIN	**8700**	**13505**	**18.63**	0	0	40	161
MIDLAND	**1590**	**2693**	**20.32**	0	0	10	39
MOTLEY	**270**	**433**	**19.26**	0	0	0	1
OLDHAM	**17,500**	**26,995**	**18.51**	0	0	1,589	6,356
PARMER	**188,300**	**369,520**	**23.55**	0	0	5,963	34,702
POTTER	**15,000**	**25,692**	**20.55**	0	0	549	2,695
RANDALL	**22,960**	**31,438**	**16.43**	0	0	1,499	6,203
SWISHER	**160,200**	**269,198**	**20.16**	0	0	4,996	23,662
TERRY	**121,900**	**185,150**	**18.23**	0	0	788	3,153
YOAKUM	**52,300**	**79,331**	**18.20**	0	0	328	1,311
CURRY	**91,620**	**96,177**	**12.60**	0	0	2,178	10,343
LEA	**20,350**	**26,548**	**15.65**	0	0	504	2,340
QUAY	**327**	**299**	**10.96**	0	0	7	30
ROOSEVELT	**60,600**	**62,509**	**12.38**	0	0	1,220	5,625
TOTALS	**2,601,855**	**4,221,199**	**19.47**	0	0	47,686	242,290

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1983	1983	1983	1983	1983	1983	1983	1983
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	2,401	6,995	12,797	10,034	894	42	42	0
ARMSTRONG	17	8	19	19	0	5	5	0
BAILEY	13,304	36,196	66,631	53,344	1,558	842	842	0
BORDEN	0	0	0	0	0	0	0	0
BRISCOE	4,146	5,181	10,180	7,945	0	950	950	0
CASTRO	49,493	73,564	119,671	91,081	1,390	8,008	8,008	0
COCHRAN	7,416	15,942	32,896	26,672	0	1,266	1,266	0
CROSBY	9,156	30,877	63,373	50,047	363	682	682	0
DAWSON	2,078	8,404	17,127	13,554	0	44	44	0
DEAF SMITH	42,136	31,847	56,962	48,754	391	10,748	10,748	0
DICKENS	231	679	1,389	1,106	0	25	25	0
ECTOR	0	0	0	0	0	0	0	0
FLOYD	15,301	45,331	89,634	71,148	1,408	1,227	1,227	0
GAINES	19,623	63,465	124,876	100,042	2,005	1,742	1,742	0
GARZA	329	1,366	2,750	2,125	0	3	3	0
GLASSCOCK	282	1,137	2,290	1,772	0	5	5	0
HALE	25,328	86,335	159,783	125,725	3,592	10	10	0
HOCKLEY	10,388	41,855	85,108	66,633	194	215	215	0
HOWARD	244	559	1,138	898	0	38	38	0
LAMB	27,386	74,366	139,481	109,952	3,544	1,993	1,993	0
LUBBOCK	10,737	44,426	90,635	71,465	545	120	120	0
LYNN	2,400	9,804	20,205	15,940	182	50	50	0
MARTIN	769	2,738	5,496	4,220	0	40	40	0
MIDLAND	152	532	1,083	857	0	10	10	0
MOTLEY	20	92	164	142	12	0	0	0
OLDHAM	5,100	1,888	4,442	4,442	0	1,589	1,589	0
PARMER	43,016	71,174	114,195	87,053	1,491	5,963	5,963	0
POTTER	2,899	4,111	7,582	6,581	179	549	549	0
RANDALL	5,279	3,124	6,372	5,962	0	1,499	1,499	0
SWISHER	28,016	45,593	85,819	69,454	1,669	4,996	4,996	0
TERRY	10,802	36,479	73,818	58,350	182	788	788	0
YOAKUM	4,653	15,706	31,810	24,869	0	328	328	0
CURRY	11,125	15,408	28,205	24,561	0	2,178	2,178	0
LEA	2,839	4,632	8,506	6,720	0	504	504	0
QUAY	30	40	90	87	0	7	7	0
ROOSEVELT	6,592	10,503	19,759	16,369	0	1,220	1,220	0
TOTALS	363,689	790,354	1,484,286	1,177,924	19,600	47,686	47,686	0

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1984	1984	1984	1984
				January	February	March	April
COUNTY	1984 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**11,800**	**11,563**	**11.76**	0	0	75	299
ARMSTRONG	**97**	**125**	**15.52**	0	0	5	19
BAILEY	**109,400**	**146,389**	**16.06**	0	0	963	7,140
BORDEN	**500**	**168**	**0.00**	0	0	17	67
BRISCOE	**18,780**	**28,312**	**18.09**	0	0	343	1,486
CASTRO	**240,400**	**416,520**	**20.79**	0	0	7,300	40,974
COCHRAN	**83,000**	**100,166**	**14.48**	0	0	1,469	5,877
CROSBY	**127,800**	**163,163**	**15.32**	0	0	723	2,891
DAWSON	**35,400**	**38,078**	**12.91**	0	0	53	211
DEAF SMITH	**141,500**	**220,633**	**18.71**	0	0	6,640	29,986
DICKENS	**4,000**	**4,952**	**14.86**	0	0	11	44
ECTOR	**0**	**0**	**0.00**	0	0	0	0
FLOYD	**192,836**	**255,234**	**15.88**	0	0	1,161	6,170
GAINES	**251,400**	**255,210**	**12.18**	0	0	1,409	5,637
GARZA	**5,700**	**7,353**	**15.48**	0	0	0	0
GLASSCOCK	**3,468**	**5,167**	**17.88**	0	0	1	6
HALE	**319,500**	**423,736**	**15.91**	0	0	72	9,120
HOCKLEY	**149,000**	**169,640**	**13.66**	0	0	425	1,701
HOWARD	**3,200**	**3,812**	**14.30**	0	0	7	27
LAMB	**233,500**	**321,725**	**16.53**	0	0	1,319	10,996
LUBBOCK	**199,300**	**253,456**	**15.26**	0	0	343	1,926
LYNN	**43,700**	**53,493**	**14.69**	0	0	94	377
MARTIN	**9,500**	**9,509**	**12.01**	0	0	62	246
MIDLAND	**2,070**	**2,898**	**16.80**	0	0	7	28
MOTLEY	**375**	**555**	**17.77**	0	0	0	1
OLDHAM	**17,700**	**24,085**	**16.33**	0	0	1,119	4,478
PARMER	**228,200**	**349,416**	**18.37**	0	0	6,807	37,357
POTTER	**27,600**	**37,689**	**16.39**	0	0	1,682	7,183
RANDALL	**34,960**	**48,629**	**16.69**	0	0	2,488	10,370
SWISHER	**196,800**	**306,589**	**18.69**	0	0	7,274	33,501
TERRY	**139,900**	**152,415**	**13.07**	0	0	693	2,770
YOAKUM	**65,400**	**70,780**	**12.99**	0	0	373	1,492
CURRY	**105,600**	**102,397**	**11.64**	0	0	1,764	9,295
LEA	**25,800**	**23,083**	**10.74**	0	0	756	3,238
QUAY	**360**	**311**	**10.38**	0	0	7	30
ROOSEVELT	**72,800**	**62,394**	**10.28**	0	0	1,015	4,855
TOTALS	**3,101,346**	**4,069,648**	**15.75**	0	0	46,477	239,797

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1984	1984	1984	1984	1984	1984	1984	1984
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	746	2,234	4,524	3,537	0	75	75	0
ARMSTRONG	17	13	31	31	0	5	5	0
BAILEY	12,666	30,636	52,538	40,358	162	963	963	0
BORDEN	50	0	0	0	0	17	17	0
BRISCOE	2,318	5,180	10,220	8,080	0	343	343	0
CASTRO	50,103	79,997	127,248	95,634	664	7,300	7,300	0
COCHRAN	8,416	17,419	35,633	28,412	0	1,469	1,469	0
CROSBY	9,684	32,184	65,212	51,024	0	723	723	0
DAWSON	1,992	7,799	15,728	12,190	0	53	53	0
DEAF SMITH	29,382	31,739	58,424	50,791	390	6,640	6,640	0
DICKENS	268	1,003	2,027	1,577	0	11	11	0
ECTOR	0	0	0	0	0	0	0	0
FLOYD	16,392	50,741	99,524	78,472	453	1,161	1,161	0
GAINES	15,594	50,677	97,732	78,851	2,491	1,409	1,409	0
GARZA	360	1,527	3,085	2,365	16	0	0	0
GLASSCOCK	259	1,077	2,162	1,659	0	1	1	0
HALE	28,739	92,776	164,454	126,396	2,033	72	72	0
HOCKLEY	9,359	34,359	69,276	53,668	0	425	425	0
HOWARD	195	762	1,561	1,248	0	7	7	0
LAMB	24,561	68,216	121,235	92,088	672	1,319	1,319	0
LUBBOCK	13,775	52,331	103,927	80,468	0	343	343	0
LYNN	2,872	10,959	22,033	16,970	0	94	94	0
MARTIN	618	1,846	3,724	2,889	0	62	62	0
MIDLAND	163	594	1,188	905	0	7	7	0
MOTLEY	26	121	212	179	16	0	0	0
OLDHAM	3,745	2,191	5,156	5,156	0	1,119	1,119	0
PARMER	43,967	65,851	103,442	78,017	362	6,807	6,807	0
POTTER	6,309	4,276	7,893	6,983	0	1,682	1,682	0
RANDALL	8,762	4,708	9,081	8,244	0	2,488	2,488	0
SWISHER	36,510	49,710	90,951	73,062	1,033	7,274	7,274	0
TERRY	9,071	30,074	60,658	47,618	145	693	693	0
YOAKUM	4,333	13,943	27,746	21,906	242	373	373	0
CURRY	11,047	18,146	31,743	26,873	0	1,764	1,764	0
LEA	3,176	3,267	6,137	4,996	0	756	756	0
QUAY	30	43	96	91	0	7	7	0
ROOSEVELT	6,130	10,964	20,507	16,893	0	1,015	1,015	0
TOTALS	361,639	777,361	1,425,110	1,117,629	8,679	46,477	46,477	0

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1987	1987	1987	1987
				January	February	March	April
COUNTY	1987 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**5,016**	**6,279**	**15.02**	0	0	96	527
ARMSTRONG	**77**	**77**	**12.03**	0	0	2	11
BAILEY	**87,606**	**97,042**	**13.29**	0	0	825	6,055
BORDEN	**700**	**947**	**16.23**	0	0	0	0
BRISCOE	**16,790**	**22,538**	**16.11**	0	0	536	2,455
CASTRO	**179,033**	**255,231**	**17.11**	0	0	5,760	30,643
COCHRAN	**44,600**	**42,368**	**11.40**	0	0	471	1,882
CROSBY	**75,810**	**71,572**	**11.33**	0	0	231	1,107
DAWSON	**16,501**	**23,229**	**16.89**	0	0	5	154
DEAF SMITH	**137,556**	**168,558**	**14.70**	0	0	7,189	30,885
DICKENS	**865**	**1,228**	**17.04**	0	0	1	52
ECTOR	**984**	**2,823**	**0.00**	0	0	0	282
FLOYD	**155,953**	**151,571**	**11.66**	0	0	737	4,593
GAINES	**151,361**	**228,100**	**18.08**	0	0	841	5,214
GARZA	**3,100**	**3,427**	**13.27**	0	0	14	57
GLASSCOCK	**2,005**	**3,124**	**18.70**	0	0	1	36
HALE	**297,807**	**257,084**	**10.36**	0	0	0	6,820
HOCKLEY	**88,788**	**80,309**	**10.85**	0	0	154	709
HOWARD	**1,700**	**1,867**	**13.18**	0	0	20	79
LAMB	**218,562**	**248,356**	**13.64**	0	0	1,503	12,368
LUBBOCK	**144,733**	**137,948**	**11.44**	0	0	160	1,485
LYNN	**31,300**	**28,868**	**11.07**	0	0	6	23
MARTIN	**3700**	**4621**	**14.99**	0	0	25	101
MIDLAND	**2588**	**4130**	**19.15**	0	0	4	61
MOTLEY	**255**	**445**	**20.96**	0	0	0	1
OLDHAM	**15,282**	**18,906**	**14.85**	0	0	893	3,737
PARMER	**171,027**	**211,698**	**14.85**	0	0	5,255	27,092
POTTER	**10,626**	**13,833**	**15.62**	0	0	449	2,352
RANDALL	**23,851**	**28,960**	**14.57**	0	0	977	4,697
SWISHER	**118,134**	**132,539**	**13.46**	0	0	3,137	15,007
TERRY	**90,982**	**80,554**	**10.62**	0	0	330	1,594
YOAKUM	**19,400**	**13,683**	**8.46**	0	0	603	2,512
CURRY	**88,664**	**80,199**	**10.85**	0	0	1,498	8,901
LEA	**42,315**	**43,631**	**12.37**	0	0	1,600	7,785
QUAY	**257**	**304**	**14.19**	0	0	3	27
ROOSEVELT	**85,007**	**67,221**	**9.49**	0	0	1,419	8,018
TOTALS	**2,332,936**	**2,533,273**	**13.03**	0	0	34,745	187,321

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1987	1987	1987	1987	1987	1987	1987	1987
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	690	1,090	1,913	1,556	215	96	96	0
ARMSTRONG	10	10	19	18	2	2	2	0
BAILEY	9,521	19,359	32,225	25,417	1,990	825	825	0
BORDEN	47	199	398	303	0	0	0	0
BRISCOE	2,721	3,594	6,593	5,320	245	536	536	0
CASTRO	34,284	44,959	70,542	54,442	3,080	5,760	5,760	0
COCHRAN	3,184	7,686	15,707	12,497	0	471	471	0
CROSBY	4,201	14,251	28,550	22,496	274	231	231	0
DAWSON	1,295	4,827	9,427	7,310	201	5	5	0
DEAF SMITH	27,461	19,857	36,582	32,103	103	7,189	7,189	0
DICKENS	111	250	408	333	69	1	1	0
ECTOR	423	565	565	565	423	0	0	0
FLOYD	10,665	29,996	57,274	45,230	1,601	737	737	0
GAINES	14,958	46,479	85,141	68,683	5,101	841	841	0
GARZA	198	672	1,370	1,087	0	14	14	0
GLASSCOCK	188	646	1,238	967	46	1	1	0
HALE	18,759	55,858	96,392	75,388	3,866	0	0	0
HOCKLEY	4,413	16,371	32,795	25,417	142	154	154	0
HOWARD	139	343	698	549	0	20	20	0
LAMB	22,204	50,687	86,440	67,347	4,800	1,503	1,503	0
LUBBOCK	8,004	28,432	55,410	43,138	1,002	160	160	0
LYNN	1,438	6,010	12,081	9,299	0	6	6	0
MARTIN	290	910	1,831	1,414	0	25	25	0
MIDLAND	260	850	1,617	1,263	67	4	4	0
MOTLEY	19	99	158	146	22	0	0	0
OLDHAM	3,176	1,745	3,662	3,662	245	893	893	0
PARMER	29,455	36,748	57,299	43,797	1,542	5,255	5,255	0
POTTER	2,295	1,756	2,623	2,623	837	449	449	0
RANDALL	4,453	3,498	6,099	6,099	1,182	977	977	0
SWISHER	16,459	21,402	37,893	30,720	1,648	3,137	3,137	0
TERRY	5,009	16,042	31,566	24,800	551	330	330	0
YOAKUM	2,183	1,478	2,690	2,690	322	603	603	0
CURRY	10,316	14,050	21,833	18,475	2,132	1,498	1,498	0
LEA	7,515	5,618	8,557	7,374	1,982	1,600	1,600	0
QUAY	35	52	82	79	21	3	3	0
ROOSEVELT	8,956	11,088	17,517	15,163	2,220	1,419	1,419	0
TOTALS	255,338	467,480	825,196	657,772	35,932	34,745	34,745	0

pia = planted irrigation acreages
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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1992	1992	1992	1992
				January	February	March	April
COUNTY	1992 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	7,601	7,720	12.19	0	0	9	139
ARMSTRONG	150	143	11.41	0	0	8	35
BAILEY	127,486	127,389	11.99	0	0	633	6,124
BORDEN	1,900	3,096	19.55	0	0	55	220
BRISCOE	26,988	30,759	13.68	0	0	382	1,986
CASTRO	252,172	303,885	14.46	0	0	5,280	31,427
COCHRAN	78,260	74,803	11.47	0	0	81	386
CROSBY	176,930	153,672	10.42	0	0	145	1,054
DAWSON	27,213	31,262	13.79	0	0	27	257
DEAF SMITH	177,275	202,402	13.70	0	0	7,139	31,658
DICKENS	1,650	2,039	14.83	0	0	2	7
ECTOR	0	0	0.00	0	0	0	0
FLOYD	241,978	213,830	10.60	0	0	432	3,496
GAINES	242,574	320,398	15.85	0	0	855	4,790
GARZA	4,000	4,285	12.85	0	0	22	87
GLASSCOCK	3,223	4,274	15.92	0	0	2	24
HALE	462,718	376,085	9.75	0	0	0	7,329
HOCKLEY	180,152	171,899	11.45	0	0	37	354
HOWARD	6,230	7,230	13.93	0	0	21	138
LAMB	298,547	294,090	11.82	0	0	782	7,833
LUBBOCK	249,115	216,468	10.43	0	0	46	987
LYNN	78,916	69,117	10.51	0	0	5	260
MARTIN	10644	13202	14.88	0	0	12	131
MIDLAND	3151	5002	19.05	0	0	3	180
MOTLEY	221	377	20.47	0	0	0	4
OLDHAM	16,215	18,025	13.34	0	0	985	4,183
PARMER	255,294	261,250	12.28	0	0	3,718	23,911
POTTER	11,539	12,618	13.12	0	0	612	2,881
RANDALL	30,270	34,317	13.60	0	0	1,355	6,338
SWISHER	160,281	161,020	12.06	0	0	2,274	12,496
TERRY	159,645	152,204	11.44	0	0	125	785
YOAKUM	80,342	96,880	14.47	0	0	0	140
CURRY	130,550	108,583	9.98	0	0	3,085	14,946
LEA	42,051	57,197	16.32	0	0	529	4,236
QUAY	215	339	18.92	0	0	2	33
ROOSEVELT	99,910	102,926	12.36	0	0	1,180	7,234
TOTALS	3,645,406	3,638,785	11.98	0	0	29,846	176,089

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1992	1992	1992	1992	1992	1992	1992	1992
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	393	1,354	2,860	2,793	153	9	9	0
ARMSTRONG	29	12	21	19	2	8	8	0
BAILEY	10,760	24,704	43,425	36,695	3,781	633	633	0
BORDEN	269	488	1,046	908	0	55	55	0
BRISCOE	2,780	5,462	10,309	8,712	363	382	382	0
CASTRO	37,757	56,432	88,095	69,117	5,217	5,280	5,280	0
COCHRAN	3,164	13,835	30,150	26,768	257	81	81	0
CROSBY	7,042	28,899	61,598	53,302	1,343	145	145	0
DAWSON	1,661	6,257	12,573	10,211	221	27	27	0
DEAF SMITH	29,987	28,746	47,765	41,221	1,606	7,139	7,139	0
DICKENS	102	415	844	665	0	2	2	0
ECTOR	0	0	0	0	0	0	0	0
FLOYD	11,718	41,185	83,722	70,279	2,134	432	432	0
GAINES	18,485	65,943	121,571	100,308	6,736	855	855	0
GARZA	269	854	1,708	1,302	0	22	22	0
GLASSCOCK	232	887	1,751	1,351	22	2	2	0
HALE	22,728	76,400	144,207	119,778	5,644	0	0	0
HOCKLEY	7,357	32,927	70,053	60,789	308	37	37	0
HOWARD	467	1,466	2,827	2,188	83	21	21	0
LAMB	18,710	56,726	110,340	92,201	5,934	782	782	0
LUBBOCK	9,450	40,759	87,342	75,349	2,442	46	46	0
LYNN	3,124	13,305	27,923	24,053	436	5	5	0
MARTIN	763	2,718	5,302	4,127	124	12	12	0
MIDLAND	426	1,027	1,719	1,389	251	3	3	0
MOTLEY	20	84	127	119	24	0	0	0
OLDHAM	3,491	1,461	2,786	2,786	362	985	985	0
PARMER	30,411	50,155	78,924	62,285	4,411	3,718	3,718	0
POTTER	2,551	1,235	1,732	1,732	651	612	612	0
RANDALL	5,815	3,975	6,603	6,341	1,179	1,355	1,355	0
SWISHER	16,347	28,934	51,420	42,920	2,080	2,274	2,274	0
TERRY	7,311	30,155	61,325	51,342	910	125	125	0
YOAKUM	4,495	19,795	39,281	32,507	662	0	0	0
CURRY	15,187	16,788	27,742	23,534	1,131	3,085	3,085	0
LEA	6,118	10,865	16,484	14,509	3,399	529	529	0
QUAY	45	63	81	76	32	2	2	0
ROOSEVELT	10,047	20,367	30,964	27,171	3,602	1,180	1,180	0
TOTALS	289,512	684,682	1,274,619	1,068,845	55,499	29,846	29,846	0

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1993	1993	1993	1993
				January	February	March	April
COUNTY	1993 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**3,501**	**5,136**	**17.60**	0	0	0	115
ARMSTRONG	**93**	**117**	**15.04**	0	0	5	22
BAILEY	**110,100**	**140,049**	**15.26**	0	0	635	4,713
BORDEN	**0**	**0**	**0.00**	0	0	0	0
BRISCOE	**25,080**	**36,299**	**17.37**	0	0	840	3,585
CASTRO	**227,400**	**368,552**	**19.45**	0	0	7,903	42,474
COCHRAN	**59,700**	**79,749**	**16.03**	0	0	264	1,054
CROSBY	**148,900**	**193,050**	**15.56**	0	0	263	1,318
DAWSON	**43,300**	**53,333**	**14.78**	0	0	56	222
DEAF SMITH	**167,700**	**240,951**	**17.24**	0	0	8,499	39,253
DICKENS	**1,000**	**1,279**	**15.35**	0	0	0	0
ECTOR	**0**	**0**	**0.00**	0	0	0	0
FLOYD	**182,263**	**231,136**	**15.22**	0	0	451	3,757
GAINES	**251,300**	**303,810**	**14.51**	0	0	1,401	5,606
GARZA	**4,200**	**5,390**	**15.40**	0	0	0	0
GLASSCOCK	**3,247**	**4,073**	**15.05**	0	0	0	0
HALE	**319,400**	**398,524**	**14.97**	0	0	118	9,315
HOCKLEY	**131,700**	**175,304**	**15.97**	0	0	0	0
HOWARD	**3,400**	**3,837**	**13.54**	0	0	0	0
LAMB	**243,900**	**323,177**	**15.90**	0	0	1,363	11,804
LUBBOCK	**188,400**	**243,639**	**15.52**	0	0	127	681
LYNN	**47,200**	**54,541**	**13.87**	0	0	0	0
MARTIN	**11,300**	**14,166**	**15.04**	0	0	0	0
MIDLAND	**1,920**	**2,530**	**15.81**	0	0	0	0
MOTLEY	**203**	**238**	**14.09**	0	0	0	0
OLDHAM	**10,600**	**11,776**	**13.33**	0	0	740	2,961
PARMER	**229,600**	**327,375**	**17.11**	0	0	5,526	32,101
POTTER	**12,200**	**11,275**	**11.09**	0	0	897	3,587
RANDALL	**30,080**	**36,216**	**14.45**	0	0	2,305	9,577
SWISHER	**129,700**	**184,368**	**17.06**	0	0	3,269	16,251
TERRY	**131,300**	**167,234**	**15.28**	0	0	234	936
YOAKUM	**59,700**	**76,500**	**15.38**	0	0	160	794
CURRY	**125,050**	**115,350**	**11.07**	0	0	2,695	13,614
LEA	**29,050**	**32,847**	**13.57**	0	0	706	3,089
QUAY	**139**	**158**	**13.67**	0	0	2	10
ROOSEVELT	**93,250**	**95,996**	**12.35**	0	0	1,231	7,156
TOTALS	**3,025,875**	**3,937,974**	**15.62**	0	0	39,689	213,996

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1993	1993	1993	1993	1993	1993	1993	1993
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	372	1,067	1,904	1,505	172	0	0	0
ARMSTRONG	20	15	25	21	0	5	5	0
BAILEY	10,437	29,161	52,785	41,046	0	635	635	0
BORDEN	0	0	0	0	0	0	0	0
BRISCOE	4,088	5,934	11,351	8,820	0	840	840	0
CASTRO	48,464	68,280	105,944	79,237	443	7,903	7,903	0
COCHRAN	4,578	16,057	32,319	24,951	0	264	264	0
CROSBY	10,289	39,628	79,315	61,712	0	263	263	0
DAWSON	2,771	11,013	22,131	17,029	0	56	56	0
DEAF SMITH	37,613	35,079	57,207	46,301	0	8,499	8,499	0
DICKENS	64	269	537	409	0	0	0	0
ECTOR	0	0	0	0	0	0	0	0
FLOYD	13,844	47,530	91,766	72,515	370	451	451	0
GAINES	18,137	61,847	116,951	93,384	3,681	1,401	1,401	0
GARZA	269	1,132	2,264	1,725	0	0	0	0
GLASSCOCK	204	855	1,711	1,303	0	0	0	0
HALE	28,162	88,643	153,810	117,550	690	118	118	0
HOCKLEY	8,594	36,472	73,457	56,781	0	0	0	0
HOWARD	192	806	1,611	1,228	0	0	0	0
LAMB	25,515	69,242	120,825	91,323	379	1,363	1,363	0
LUBBOCK	12,386	50,443	101,321	78,247	180	127	127	0
LYNN	2,694	11,387	22,874	17,587	0	0	0	0
MARTIN	708	2,975	5,950	4,533	0	0	0	0
MIDLAND	127	531	1,063	810	0	0	0	0
MOTLEY	11	52	90	77	8	0	0	0
OLDHAM	2,352	743	1,749	1,749	0	740	740	0
PARMER	39,538	63,835	99,719	75,372	232	5,526	5,526	0
POTTER	2,759	393	924	924	0	897	897	0
RANDALL	7,811	2,813	4,909	4,191	0	2,305	2,305	0
SWISHER	20,004	33,252	58,748	46,144	161	3,269	3,269	0
TERRY	8,713	34,336	68,670	53,569	308	234	234	0
YOAKUM	4,286	15,912	30,658	23,939	431	160	160	0
CURRY	14,783	19,810	32,425	26,478	156	2,695	2,695	0
LEA	3,566	5,662	9,856	8,124	434	706	706	0
QUAY	14	28	53	47	0	2	2	0
ROOSEVELT	9,658	19,180	30,124	24,922	1,265	1,231	1,231	0
TOTALS	343,021	774,380	1,395,046	1,083,553	8,911	39,689	39,689	0

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1994	1994	1994	1994
				January	February	March	April
COUNTY	1994 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**4,400**	**5,963**	**16.26**	0	0	0	0
ARMSTRONG	**109**	**129**	**14.25**	0	0	7	31
BAILEY	**109,400**	**124,924**	**13.70**	0	0	1,183	6,624
BORDEN	**1,500**	**2,803**	**22.43**	0	0	0	0
BRISCOE	**22,020**	**33,584**	**18.30**	0	0	674	2,960
CASTRO	**132,000**	**160,445**	**14.59**	0	0	5,436	23,596
COCHRAN	**59,100**	**80,122**	**16.27**	0	0	300	1,333
CROSBY	**133,300**	**154,332**	**13.89**	0	0	452	1,808
DAWSON	**44,400**	**54,051**	**14.61**	0	0	245	980
DEAF SMITH	**148,500**	**221,386**	**17.89**	0	0	6,429	31,598
DICKENS	**1,750**	**2,060**	**14.13**	0	0	0	0
ECTOR	**0**	**0**	**0.00**	0	0	0	0
FLOYD	**178,383**	**215,910**	**14.52**	0	0	643	4,666
GAINES	**254,300**	**322,453**	**15.22**	0	0	1,221	4,884
GARZA	**7,800**	**8,998**	**13.84**	0	0	0	0
GLASSCOCK	**3,995**	**5,324**	**15.99**	0	0	6	23
HALE	**323,400**	**385,001**	**14.29**	0	0	303	9,877
HOCKLEY	**140,300**	**185,934**	**15.90**	0	0	119	619
HOWARD	**3,000**	**2,473**	**9.89**	0	0	81	322
LAMB	**231,700**	**301,970**	**15.64**	0	0	1,248	10,739
LUBBOCK	**177,800**	**208,500**	**14.07**	0	0	75	480
LYNN	**47,200**	**54,445**	**13.84**	0	0	0	0
MARTIN	**9,900**	**12,568**	**15.23**	0	0	0	0
MIDLAND	**2,730**	**3,686**	**16.20**	0	0	0	0
MOTLEY	**345**	**442**	**15.37**	0	0	0	0
OLDHAM	**14,600**	**18,144**	**14.91**	0	0	1,168	4,672
PARMER	**222,800**	**300,227**	**16.17**	0	0	3,848	25,119
POTTER	**11,300**	**12,038**	**12.78**	0	0	874	3,498
RANDALL	**29,760**	**37,554**	**15.14**	0	0	1,826	7,799
SWISHER	**135,300**	**185,382**	**16.44**	0	0	2,260	12,619
TERRY	**122,400**	**157,783**	**15.47**	0	0	238	1,095
YOAKUM	**77,400**	**99,129**	**15.37**	0	0	216	972
CURRY	**137,550**	**138,782**	**12.11**	0	0	3,460	17,312
LEA	**27,500**	**34,537**	**15.07**	0	0	587	2,839
QUAY	**173**	**184**	**12.74**	0	0	4	17
ROOSEVELT	**80,809**	**103,046**	**15.30**	0	0	1,100	6,780
TOTALS	**2,896,924**	**3,634,311**	**15.05**	0	0	34,003	183,264

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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1994	1994	1994	1994	1994	1994	1994	1994
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	276	1,297	2,304	1,930	156	0	0	0
ARMSTRONG	26	13	21	17	0	7	7	0
BAILEY	10,944	24,961	44,699	34,147	0	1,183	1,183	0
BORDEN	140	589	1,177	897	0	0	0	0
BRISCOE	3,572	5,736	10,849	8,445	0	674	674	0
CASTRO	23,032	22,852	41,658	32,582	417	5,436	5,436	0
COCHRAN	4,828	16,180	32,145	24,736	0	300	300	0
CROSBY	8,607	30,982	62,682	48,897	0	452	452	0
DAWSON	3,282	10,903	21,370	16,546	235	245	245	0
DEAF SMITH	32,331	36,311	57,054	44,805	0	6,429	6,429	0
DICKENS	103	433	865	659	0	0	0	0
ECTOR	0	0	0	0	0	0	0	0
FLOYD	14,040	44,741	84,627	65,793	116	643	643	0
GAINES	18,543	66,229	124,985	100,049	4,099	1,221	1,221	0
GARZA	450	1,890	3,779	2,879	0	0	0	0
GLASSCOCK	278	1,101	2,209	1,695	0	6	6	0
HALE	27,986	85,722	147,756	112,262	488	303	303	0
HOCKLEY	9,690	38,816	77,345	59,107	0	119	119	0
HOWARD	325	350	701	534	0	81	81	0
LAMB	23,444	64,296	113,177	86,041	530	1,248	1,248	0
LUBBOCK	10,705	43,597	86,914	66,579	0	75	75	0
LYNN	2,695	11,378	22,839	17,533	0	0	0	0
MARTIN	628	2,639	5,279	4,022	0	0	0	0
MIDLAND	184	774	1,548	1,180	0	0	0	0
MOTLEY	19	98	162	144	19	0	0	0
OLDHAM	3,698	1,099	2,586	2,586	0	1,168	1,168	0
PARMER	33,755	61,500	95,841	72,039	431	3,848	3,848	0
POTTER	2,722	560	1,317	1,317	0	874	874	0
RANDALL	6,749	4,070	7,223	6,234	0	1,826	1,826	0
SWISHER	18,067	36,185	62,926	48,804	0	2,260	2,260	0
TERRY	8,474	32,626	64,551	50,001	321	238	238	0
YOAKUM	5,481	20,471	39,912	31,173	471	216	216	0
CURRY	18,453	23,539	38,089	30,837	173	3,460	3,460	0
LEA	3,607	6,425	10,936	8,674	296	587	587	0
QUAY	19	30	57	50	0	4	4	0
ROOSEVELT	9,841	21,247	33,089	27,214	1,573	1,100	1,100	0
TOTALS	306,996	719,640	1,302,672	1,010,405	9,325	34,003	34,003	0

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1997	1997	1997	1997
				January	February	March	April
COUNTY	1997 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**12,271**	**17,309**	**16.93**	0	0	0	128
ARMSTRONG	**95**	**63**	**7.94**	0	0	2	8
BAILEY	**95,402**	**93,040**	**11.70**	0	0	172	2,921
BORDEN	**5,000**	**5,864**	**14.07**	0	0	0	0
BRISCOE	**19,137**	**14,455**	**9.06**	0	0	52	356
CASTRO	**275,907**	**282,039**	**12.27**	0	0	2,993	22,139
COCHRAN	**76,250**	**73,224**	**11.52**	0	0	0	316
CROSBY	**134,835**	**108,959**	**9.70**	0	0	0	46
DAWSON	**77,405**	**95,400**	**14.79**	0	0	91	596
DEAF SMITH	**197,993**	**172,527**	**10.46**	0	0	4,774	24,053
DICKENS	**4,683**	**6,524**	**16.72**	0	0	0	314
ECTOR	**1,313**	**3,542**	**32.37**	0	0	0	354
FLOYD	**184,046**	**138,604**	**9.04**	0	0	119	1,881
GAINES	**230,872**	**305,859**	**15.90**	0	0	379	2,367
GARZA	**12,500**	**14,748**	**14.16**	0	0	0	0
GLASSCOCK	**4,496**	**6,395**	**17.07**	0	0	0	6
HALE	**360,763**	**229,009**	**7.62**	0	0	0	5,134
HOCKLEY	**159,594**	**148,181**	**11.14**	0	0	40	565
HOWARD	**3,000**	**3,733**	**14.93**	0	0	0	45
LAMB	**226,262**	**230,078**	**12.20**	0	0	359	6,624
LUBBOCK	**217,338**	**180,437**	**9.96**	0	0	113	1,223
LYNN	**55,830**	**47,218**	**10.15**	0	0	0	181
MARTIN	**7,890**	**10,184**	**15.49**	0	0	0	19
MIDLAND	**3,718**	**6,151**	**19.85**	0	0	0	163
MOTLEY	**387**	**406**	**12.60**	0	0	0	14
OLDHAM	**30,182**	**27,314**	**10.86**	0	0	1,520	6,230
PARMER	**232,819**	**214,388**	**11.05**	0	0	2,214	16,475
POTTER	**28,219**	**16,548**	**7.04**	0	0	917	4,185
RANDALL	**37,484**	**38,190**	**12.23**	0	0	817	4,780
SWISHER	**138,876**	**103,085**	**8.91**	0	0	472	4,297
TERRY	**172,031**	**170,468**	**11.89**	0	0	220	1,474
YOAKUM	**105,909**	**131,643**	**14.92**	0	0	162	877
CURRY	**117,695**	**92,905**	**9.47**	0	0	1,343	8,357
LEA	**34,291**	**46,921**	**16.42**	0	0	247	2,773
QUAY	**335**	**397**	**14.21**	0	0	2	33
ROOSEVELT	**93,048**	**99,103**	**12.78**	0	0	440	4,114
TOTALS	**3,357,876**	**3,134,910**	**11.20**	0	0	17,447	123,048

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1997	1997	1997	1997	1997	1997	1997	1997
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	935	3,739	6,462	5,444	601	0	0	0
ARMSTRONG	8	10	17	14	1	2	2	0
BAILEY	7,065	19,435	34,087	27,257	1,757	172	172	0
BORDEN	293	1,231	2,463	1,876	0	0	0	0
BRISCOE	971	2,954	5,586	4,378	53	52	52	0
CASTRO	31,427	59,523	90,569	67,799	1,603	2,993	2,993	0
COCHRAN	3,664	15,002	29,562	24,161	519	0	0	0
CROSBY	5,367	22,619	45,548	35,270	110	0	0	0
DAWSON	4,891	20,193	36,733	30,526	2,189	91	91	0
DEAF SMITH	24,850	27,575	43,682	35,946	2,101	4,774	4,774	0
DICKENS	640	1,339	2,050	1,711	471	0	0	0
ECTOR	531	708	708	708	531	0	0	0
FLOYD	8,185	28,853	55,179	43,574	575	119	119	0
GAINES	15,900	65,386	115,275	97,149	8,647	379	379	0
GARZA	737	3,097	6,194	4,719	0	0	0	0
GLASSCOCK	323	1,336	2,669	2,052	9	0	0	0
HALE	16,082	50,243	87,697	68,161	1,692	0	0	0
HOCKLEY	7,688	30,607	60,819	47,659	724	40	40	0
HOWARD	232	779	1,469	1,141	67	0	0	0
LAMB	17,214	50,403	86,884	66,524	1,352	359	359	0
LUBBOCK	9,754	37,126	73,097	57,459	1,440	113	113	0
LYNN	2,487	9,875	19,207	15,046	422	0	0	0
MARTIN	500	2,193	3,980	3,264	227	0	0	0
MIDLAND	471	1,275	2,224	1,772	245	0	0	0
MOTLEY	32	89	116	116	40	0	0	0
OLDHAM	5,117	2,193	4,613	4,477	123	1,520	1,520	0
PARMER	23,600	44,784	68,811	52,147	1,930	2,214	2,214	0
POTTER	3,608	1,509	1,993	1,840	661	917	917	0
RANDALL	5,236	6,010	9,333	8,632	1,746	817	817	0
SWISHER	8,399	21,478	37,257	29,478	760	472	472	0
TERRY	9,177	35,764	66,173	54,034	3,186	220	220	0
YOAKUM	6,871	27,492	52,318	42,103	1,494	162	162	0
CURRY	10,538	17,636	27,979	23,115	1,249	1,343	1,343	0
LEA	4,650	9,486	14,461	12,240	2,570	247	247	0
QUAY	49	76	102	95	36	2	2	0
ROOSEVELT	7,963	21,253	33,678	28,222	2,553	440	440	0
TOTALS	245,458	643,272	1,128,993	900,112	41,685	17,447	17,447	0

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				LTA	LTA	LTA	LTA
				January	February	March	April
COUNTY	LTA Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	12,271	14,051	13.74	0	0	0	141
ARMSTRONG	95	94	11.89	0	0	4	16
BAILEY	95,402	128,592	16.17	0	0	321	4,554
BORDEN	5,000	9,055	21.73	0	0	0	0
BRISCOE	19,137	23,777	14.91	0	0	333	1,564
CASTRO	275,907	411,125	17.88	0	0	6,617	40,239
COCHRAN	76,250	79,734	12.55	0	0	0	384
CROSBY	134,835	121,345	10.80	0	0	0	52
DAWSON	77,405	80,954	12.55	0	0	115	726
DEAF SMITH	197,993	254,672	15.44	0	0	9,537	44,686
DICKENS	4,683	6,505	16.67	0	0	0	397
ECTOR	1,313	3,534	32.30	0	0	0	353
FLOYD	184,046	188,617	12.30	0	0	341	3,350
GAINES	230,872	248,450	12.91	0	0	457	2,788
GARZA	12,500	11,211	10.76	0	0	0	0
GLASSCOCK	4,496	4,798	12.81	0	0	0	6
HALE	360,763	334,295	11.12	0	0	1	7,489
HOCKLEY	159,594	161,837	12.17	0	0	53	670
HOWARD	3,000	3,112	12.45	0	0	0	47
LAMB	226,262	297,598	15.78	0	0	443	8,830
LUBBOCK	217,338	201,952	11.15	0	0	98	1,301
LYNN	55,830	51,468	11.06	0	0	0	206
MARTIN	7,890	8,411	12.79	0	0	0	22
MIDLAND	3,718	5,089	16.42	0	0	0	162
MOTLEY	387	499	15.47	0	0	0	26
OLDHAM	30,182	32,556	12.94	0	0	1,817	7,467
PARMER	232,819	295,996	15.26	0	0	4,120	26,552
POTTER	28,219	26,620	11.32	0	0	1,716	7,562
RANDALL	37,484	47,832	15.31	0	0	1,128	6,511
SWISHER	138,876	161,748	13.98	0	0	1,498	9,487
TERRY	172,031	172,157	12.01	0	0	286	1,810
YOAKUM	105,909	104,474	11.84	0	0	210	1,114
CURRY	117,695	118,523	12.08	0	0	1,975	11,894
LEA	34,291	46,745	16.36	0	0	267	3,095
QUAY	335	499	17.86	0	0	3	47
ROOSEVELT	93,048	98,687	12.73	0	0	855	6,235
TOTALS	3,357,876	3,756,611	13.42	0	0	32,193	199,784

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	LTA	LTA	LTA	LTA	LTA	LTA	LTA	LTA
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	801	3,020	5,216	4,370	503	0	0	0
ARMSTRONG	15	12	21	18	1	4	4	0
BAILEY	10,124	26,646	46,391	37,213	2,700	321	321	0
BORDEN	453	1,902	3,803	2,898	0	0	0	0
BRISCOE	2,205	4,329	8,168	6,423	89	333	333	0
CASTRO	50,304	80,992	123,985	93,235	2,521	6,617	6,617	0
COCHRAN	4,037	16,312	32,251	26,275	475	0	0	0
CROSBY	5,941	25,108	50,706	39,343	195	0	0	0
DAWSON	4,310	16,930	31,074	25,800	1,770	115	115	0
DEAF SMITH	42,300	35,265	55,348	45,476	2,985	9,537	9,537	0
DICKENS	722	1,326	1,859	1,606	595	0	0	0
ECTOR	530	707	707	707	530	0	0	0
FLOYD	11,291	38,089	74,063	59,173	1,626	341	341	0
GAINES	13,616	52,528	93,358	78,180	6,609	457	457	0
GARZA	561	2,354	4,709	3,588	0	0	0	0
GLASSCOCK	243	1,000	1,998	1,542	9	0	0	0
HALE	22,910	71,917	127,663	100,356	3,956	1	1	0
HOCKLEY	8,437	33,383	66,402	52,018	769	53	53	0
HOWARD	203	649	1,203	939	71	0	0	0
LAMB	22,418	65,077	111,928	85,871	2,147	443	443	0
LUBBOCK	10,785	41,325	81,926	64,534	1,786	98	98	0
LYNN	2,727	10,744	20,987	16,386	417	0	0	0
MARTIN	421	1,806	3,295	2,686	180	0	0	0
MIDLAND	416	1,052	1,781	1,434	243	0	0	0
MOTLEY	49	107	130	130	56	0	0	0
OLDHAM	6,139	2,620	5,443	5,268	169	1,817	1,817	0
PARMER	34,774	59,141	91,132	69,192	2,843	4,120	4,120	0
POTTER	6,289	1,941	2,482	2,293	907	1,716	1,716	0
RANDALL	6,967	7,379	11,056	10,184	2,351	1,128	1,128	0
SWISHER	14,576	31,374	55,569	44,519	1,729	1,498	1,498	0
TERRY	9,591	35,750	67,418	54,225	2,505	286	286	0
YOAKUM	5,723	21,566	41,163	33,196	1,083	210	210	0
CURRY	14,352	22,103	34,448	28,182	1,619	1,975	1,975	0
LEA	4,941	9,409	13,976	11,832	2,691	267	267	0
QUAY	66	94	122	114	48	3	3	0
ROOSEVELT	9,519	20,374	31,755	26,076	2,163	855	855	0
TOTALS	328,756	744,332	1,303,541	1,035,280	48,341	32,193	32,193	0

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1952	1952	1952	1952
				January	February	March	April
COUNTY	1952 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**12,271**	**16,626**	**16.26**	0	0	0	161
ARMSTRONG	**95**	**129**	**16.34**	0	0	5	24
BAILEY	**95,402**	**150,169**	**18.89**	0	0	234	4,646
BORDEN	**5,000**	**7,259**	**17.42**	0	0	0	0
BRISCOE	**19,137**	**29,657**	**18.60**	0	0	320	1,563
CASTRO	**275,907**	**497,533**	**21.64**	0	0	8,651	50,545
COCHRAN	**76,250**	**106,574**	**16.77**	0	0	0	462
CROSBY	**134,835**	**155,424**	**13.83**	0	0	0	61
DAWSON	**77,405**	**99,741**	**15.46**	0	0	98	707
DEAF SMITH	**197,993**	**315,649**	**19.13**	0	0	12,365	57,085
DICKENS	**4,683**	**8,707**	**22.31**	0	0	0	509
ECTOR	**1,313**	**4,090**	**37.38**	0	0	0	409
FLOYD	**184,046**	**257,595**	**16.80**	0	0	363	3,870
GAINES	**230,872**	**293,907**	**15.28**	0	0	478	3,008
GARZA	**12,500**	**14,367**	**13.79**	0	0	0	0
GLASSCOCK	**4,496**	**6,223**	**16.61**	0	0	0	8
HALE	**360,763**	**463,178**	**15.41**	0	0	82	9,471
HOCKLEY	**159,594**	**217,573**	**16.36**	0	0	66	827
HOWARD	**3,000**	**4,163**	**16.65**	0	0	0	59
LAMB	**226,262**	**365,955**	**19.41**	0	0	534	10,364
LUBBOCK	**217,338**	**255,984**	**14.13**	0	0	78	1,371
LYNN	**55,830**	**65,591**	**14.10**	0	0	0	241
MARTIN	**7,890**	**10,405**	**15.82**	0	0	0	26
MIDLAND	**3,718**	**6,267**	**20.23**	0	0	0	192
MOTLEY	**387**	**625**	**19.40**	0	0	0	33
OLDHAM	**30,182**	**42,090**	**16.73**	0	0	2,443	9,998
PARMER	**232,819**	**365,164**	**18.82**	0	0	5,462	33,586
POTTER	**28,219**	**36,211**	**15.40**	0	0	2,458	10,677
RANDALL	**37,484**	**62,775**	**20.10**	0	0	1,616	8,890
SWISHER	**138,876**	**222,391**	**19.22**	0	0	2,204	13,147
TERRY	**172,031**	**230,197**	**16.06**	0	0	356	2,232
YOAKUM	**105,909**	**139,934**	**15.86**	0	0	260	1,371
CURRY	**117,695**	**140,779**	**14.35**	0	0	2,396	14,176
LEA	**34,291**	**56,280**	**19.69**	0	0	334	3,691
QUAY	**335**	**568**	**20.30**	0	0	3	51
ROOSEVELT	**93,048**	**113,597**	**14.65**	0	0	1,206	7,916
TOTALS	**3,357,876**	**4,763,375**	**17.02**	0	0	42,012	251,375

pia = planted irrigation acreages
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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1952	1952	1952	1952	1952	1952	1952	1952
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	944	3,572	6,195	5,176	579	0	0	0
ARMSTRONG	22	16	27	24	1	5	5	0
BAILEY	11,344	31,286	54,896	44,139	3,157	234	234	0
BORDEN	363	1,524	3,049	2,323	0	0	0	0
BRISCOE	2,503	5,590	10,591	8,337	114	320	320	0
CASTRO	61,731	96,049	148,352	111,893	3,011	8,651	8,651	0
COCHRAN	5,335	21,759	43,202	35,226	591	0	0	0
CROSBY	7,607	32,169	64,960	50,398	229	0	0	0
DAWSON	5,189	20,939	38,530	31,950	2,134	98	98	0
DEAF SMITH	53,264	42,191	67,025	55,459	3,532	12,365	12,365	0
DICKENS	944	1,778	2,538	2,176	763	0	0	0
ECTOR	614	818	818	818	614	0	0	0
FLOYD	14,867	52,039	102,000	81,635	2,096	363	363	0
GAINES	15,928	62,213	110,974	92,730	7,621	478	478	0
GARZA	718	3,017	6,034	4,598	0	0	0	0
GLASSCOCK	314	1,297	2,592	2,000	11	0	0	0
HALE	30,691	98,648	178,400	140,633	5,088	82	82	0
HOCKLEY	11,270	44,880	89,413	70,038	944	66	66	0
HOWARD	267	868	1,618	1,261	89	0	0	0
LAMB	27,061	79,651	138,308	106,365	2,603	534	534	0
LUBBOCK	13,474	52,495	104,255	82,061	2,094	78	78	0
LYNN	3,454	13,689	26,807	20,911	488	0	0	0
MARTIN	520	2,234	4,083	3,324	218	0	0	0
MIDLAND	506	1,297	2,209	1,775	289	0	0	0
MOTLEY	61	134	164	164	70	0	0	0
OLDHAM	8,150	3,199	6,710	6,513	192	2,443	2,443	0
PARMER	43,122	71,572	111,789	85,253	3,455	5,462	5,462	0
POTTER	8,759	2,375	3,074	2,852	1,100	2,458	2,458	0
RANDALL	9,265	9,334	14,315	13,263	2,861	1,616	1,616	0
SWISHER	19,912	42,498	76,505	61,483	2,234	2,204	2,204	0
TERRY	12,684	47,809	90,550	72,703	3,150	356	356	0
YOAKUM	7,576	28,878	55,355	44,599	1,375	260	260	0
CURRY	16,977	25,947	40,880	33,702	1,909	2,396	2,396	0
LEA	5,889	11,271	16,930	14,332	3,164	334	334	0
QUAY	73	108	140	131	55	3	3	0
ROOSEVELT	11,353	22,842	35,832	29,554	2,480	1,206	1,206	0
TOTALS	412,752	935,986	1,659,121	1,319,795	58,310	42,012	42,012	0

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TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1953	1953	1953	1953
				January	February	March	April
COUNTY	1953 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	12,271	13,512	13.21	0	0	0	129
ARMSTRONG	95	131	16.57	0	0	6	25
BAILEY	95,402	149,736	18.83	0	0	249	4,605
BORDEN	5,000	6,231	14.96	0	0	0	0
BRISCOE	19,137	29,165	18.29	0	0	349	1,657
CASTRO	275,907	492,625	21.43	0	0	8,597	50,075
COCHRAN	76,250	109,888	17.29	0	0	0	451
CROSBY	134,835	164,469	14.64	0	0	0	57
DAWSON	77,405	91,924	14.25	0	0	124	765
DEAF SMITH	197,993	316,165	19.16	0	0	12,574	57,802
DICKENS	4,683	8,263	21.17	0	0	0	468
ECTOR	1,313	4,170	38.11	0	0	0	417
FLOYD	184,046	254,322	16.58	0	0	411	3,974
GAINES	230,872	240,305	12.49	0	0	508	2,913
GARZA	12,500	15,205	14.60	0	0	0	0
GLASSCOCK	4,496	6,595	17.60	0	0	0	8
HALE	360,763	455,998	15.17	0	0	302	10,008
HOCKLEY	159,594	224,380	16.87	0	0	68	806
HOWARD	3,000	4,007	16.03	0	0	0	52
LAMB	226,262	365,817	19.40	0	0	570	10,378
LUBBOCK	217,338	270,004	14.91	0	0	111	1,439
LYNN	55,830	69,168	14.87	0	0	0	225
MARTIN	7,890	9,560	14.54	0	0	0	22
MIDLAND	3,718	6,714	21.67	0	0	0	194
MOTLEY	387	627	19.46	0	0	0	30
OLDHAM	30,182	41,598	16.54	0	0	2,694	11,004
PARMER	232,819	361,234	18.62	0	0	5,427	33,220
POTTER	28,219	37,521	15.96	0	0	2,610	11,255
RANDALL	37,484	62,457	19.99	0	0	1,690	9,088
SWISHER	138,876	216,633	18.72	0	0	2,278	13,258
TERRY	172,031	238,215	16.62	0	0	363	2,227
YOAKUM	105,909	144,930	16.42	0	0	265	1,385
CURRY	117,695	138,139	14.08	0	0	2,429	14,178
LEA	34,291	54,464	19.06	0	0	320	3,494
QUAY	335	569	20.36	0	0	3	52
ROOSEVELT	93,048	116,451	15.02	0	0	1,173	7,790
TOTALS	3,357,876	4,721,195	16.87	0	0	43,121	253,450

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1953	1953	1953	1953	1953	1953	1953	1953
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	764	2,904	5,035	4,209	471	0	0	0
ARMSTRONG	22	16	27	23	1	6	6	0
BAILEY	11,252	31,142	54,853	44,093	3,043	249	249	0
BORDEN	312	1,309	2,617	1,994	0	0	0	0
BRISCOE	2,530	5,420	10,303	8,110	99	349	349	0
CASTRO	61,086	94,962	146,922	110,854	2,934	8,597	8,597	0
COCHRAN	5,473	22,431	44,585	36,361	588	0	0	0
CROSBY	8,040	34,038	68,756	53,344	234	0	0	0
DAWSON	4,849	19,219	35,456	29,360	1,902	124	124	0
DEAF SMITH	53,690	41,813	66,577	55,122	3,439	12,574	12,574	0
DICKENS	881	1,688	2,441	2,083	702	0	0	0
ECTOR	626	834	834	834	626	0	0	0
FLOYD	14,707	51,144	100,566	80,571	2,128	411	411	0
GAINES	13,298	50,638	90,234	75,456	6,241	508	508	0
GARZA	760	3,193	6,386	4,866	0	0	0	0
GLASSCOCK	333	1,375	2,749	2,120	11	0	0	0
HALE	30,499	96,441	175,050	138,110	4,983	302	302	0
HOCKLEY	11,575	46,289	92,307	72,290	910	68	68	0
HOWARD	252	836	1,569	1,220	78	0	0	0
LAMB	26,995	79,445	138,302	106,415	2,572	570	570	0
LUBBOCK	14,154	55,305	110,094	86,627	2,055	111	111	0
LYNN	3,613	14,439	28,328	22,088	475	0	0	0
MARTIN	477	2,051	3,759	3,056	194	0	0	0
MIDLAND	529	1,391	2,394	1,916	291	0	0	0
MOTLEY	58	135	168	168	68	0	0	0
OLDHAM	8,816	2,689	5,505	5,307	195	2,694	2,694	0
PARMER	42,608	70,710	110,671	84,413	3,332	5,427	5,427	0
POTTER	9,173	2,333	3,051	2,826	1,053	2,610	2,610	0
RANDALL	9,335	9,116	14,084	13,045	2,719	1,690	1,690	0
SWISHER	19,624	41,036	74,097	59,601	2,181	2,278	2,278	0
TERRY	13,043	49,506	93,775	75,335	3,240	363	363	0
YOAKUM	7,814	29,923	57,338	46,231	1,443	265	265	0
CURRY	16,803	25,234	39,813	32,905	1,918	2,429	2,429	0
LEA	5,624	10,926	16,529	13,964	2,967	320	320	0
QUAY	74	108	140	131	55	3	3	0
ROOSEVELT	11,393	23,528	37,036	30,630	2,556	1,173	1,173	0
TOTALS	411,082	923,568	1,642,349	1,305,680	55,703	43,121	43,121	0

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1954	1954	1954	1954
				January	February	March	April
COUNTY	1954 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**12,271**	**14,405**	**14.09**	0	0	0	132
ARMSTRONG	**95**	**118**	**15.00**	0	0	5	22
BAILEY	**95,402**	**147,257**	**18.52**	0	0	316	4,838
BORDEN	**5,000**	**9,055**	**21.73**	0	0	0	0
BRISCOE	**19,137**	**29,024**	**18.20**	0	0	372	1,742
CASTRO	**275,907**	**491,810**	**21.39**	0	0	9,031	51,678
COCHRAN	**76,250**	**104,005**	**16.37**	0	0	0	430
CROSBY	**134,835**	**165,722**	**14.75**	0	0	0	61
DAWSON	**77,405**	**92,287**	**14.31**	0	0	153	877
DEAF SMITH	**197,993**	**313,868**	**19.02**	0	0	12,752	58,414
DICKENS	**4,683**	**7,788**	**19.96**	0	0	0	462
ECTOR	**1,313**	**3,681**	**33.64**	0	0	0	368
FLOYD	**184,046**	**240,508**	**15.68**	0	0	477	4,153
GAINES	**230,872**	**257,641**	**13.39**	0	0	633	3,443
GARZA	**12,500**	**15,319**	**14.71**	0	0	0	0
GLASSCOCK	**4,496**	**6,278**	**16.76**	0	0	0	7
HALE	**360,763**	**432,056**	**14.37**	0	0	608	10,920
HOCKLEY	**159,594**	**212,724**	**15.99**	0	0	79	826
HOWARD	**3,000**	**3,950**	**15.80**	0	0	0	50
LAMB	**226,262**	**359,294**	**19.06**	0	0	725	10,872
LUBBOCK	**217,338**	**272,647**	**15.05**	0	0	130	1,579
LYNN	**55,830**	**69,807**	**15.00**	0	0	0	241
MARTIN	**7,890**	**9,566**	**14.55**	0	0	0	22
MIDLAND	**3,718**	**6,032**	**19.47**	0	0	0	176
MOTLEY	**387**	**598**	**18.57**	0	0	0	31
OLDHAM	**30,182**	**40,515**	**16.11**	0	0	2,400	9,817
PARMER	**232,819**	**359,838**	**18.55**	0	0	5,713	34,284
POTTER	**28,219**	**33,476**	**14.24**	0	0	2,302	9,975
RANDALL	**37,484**	**57,662**	**18.46**	0	0	1,548	8,430
SWISHER	**138,876**	**202,114**	**17.46**	0	0	2,149	12,552
TERRY	**172,031**	**225,020**	**15.70**	0	0	420	2,420
YOAKUM	**105,909**	**137,012**	**15.52**	0	0	306	1,534
CURRY	**117,695**	**138,808**	**14.15**	0	0	2,946	16,053
LEA	**34,291**	**51,155**	**17.90**	0	0	381	3,605
QUAY	**335**	**563**	**20.15**	0	0	4	55
ROOSEVELT	**93,048**	**114,675**	**14.79**	0	0	1,447	8,755
TOTALS	**3,357,876**	**4,626,278**	**16.53**	0	0	44,900	258,826

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1954	1954	1954	1954	1954	1954	1954	1954
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	812	3,094	5,390	4,492	485	0	0	0
ARMSTRONG	20	14	24	21	1	5	5	0
BAILEY	11,275	30,484	53,593	43,086	3,032	316	316	0
BORDEN	453	1,902	3,803	2,898	0	0	0	0
BRISCOE	2,573	5,337	10,161	8,000	95	372	372	0
CASTRO	62,012	93,788	144,941	109,347	2,951	9,031	9,031	0
COCHRAN	5,186	21,229	42,204	34,406	550	0	0	0
CROSBY	8,106	34,298	69,272	53,745	240	0	0	0
DAWSON	4,943	19,213	35,578	29,387	1,830	153	153	0
DEAF SMITH	53,956	40,953	65,045	53,814	3,428	12,752	12,752	0
DICKENS	851	1,589	2,256	1,938	692	0	0	0
ECTOR	552	736	736	736	552	0	0	0
FLOYD	14,207	48,265	94,668	75,791	1,991	477	477	0
GAINES	14,473	54,038	96,722	80,639	6,427	633	633	0
GARZA	766	3,217	6,434	4,902	0	0	0	0
GLASSCOCK	316	1,309	2,617	2,019	11	0	0	0
HALE	29,914	90,839	164,223	129,522	4,813	608	608	0
HOCKLEY	11,016	43,854	87,449	68,479	864	79	79	0
HOWARD	247	825	1,549	1,204	75	0	0	0
LAMB	26,954	77,700	135,112	103,941	2,538	725	725	0
LUBBOCK	14,395	55,808	110,983	87,345	2,147	130	130	0
LYNN	3,661	14,571	28,562	22,274	498	0	0	0
MARTIN	478	2,051	3,772	3,057	187	0	0	0
MIDLAND	477	1,249	2,147	1,719	264	0	0	0
MOTLEY	58	128	157	157	67	0	0	0
OLDHAM	7,974	2,995	6,266	6,079	184	2,400	2,400	0
PARMER	43,185	69,756	108,988	83,123	3,363	5,713	5,713	0
POTTER	8,160	2,136	2,748	2,549	1,001	2,302	2,302	0
RANDALL	8,691	8,455	12,868	11,921	2,652	1,548	1,548	0
SWISHER	18,481	38,308	68,874	55,374	2,077	2,149	2,149	0
TERRY	12,534	46,577	88,353	70,893	2,983	420	420	0
YOAKUM	7,536	28,159	54,031	43,516	1,316	306	306	0
CURRY	17,968	24,294	38,325	31,590	1,739	2,946	2,946	0
LEA	5,489	10,092	15,201	12,846	2,779	381	381	0
QUAY	75	104	136	127	52	4	4	0
ROOSEVELT	11,882	22,539	35,471	29,292	2,397	1,447	1,447	0
TOTALS	409,675	899,907	1,598,660	1,270,228	54,282	44,900	44,900	0

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1955	1955	1955	1955
				January	February	March	April
COUNTY	1955 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**5,035**	**7,014**	**16.72**	0	0	0	73
ARMSTRONG	**27**	**44**	**19.56**	0	0	0	2
BAILEY	**54,853**	**91,852**	**20.09**	0	0	0	2,333
BORDEN	**2,617**	**2,816**	**12.91**	0	0	0	0
BRISCOE	**10,303**	**13,584**	**15.82**	0	0	0	177
CASTRO	**146,922**	**314,031**	**25.65**	0	0	0	13,073
COCHRAN	**44,585**	**63,470**	**17.08**	0	0	0	309
CROSBY	**68,756**	**69,906**	**12.20**	0	0	0	30
DAWSON	**35,456**	**42,211**	**14.29**	0	0	0	148
DEAF SMITH	**66,577**	**140,576**	**25.34**	0	0	0	5,826
DICKENS	**2,441**	**3,804**	**18.70**	0	0	0	221
ECTOR	**834**	**2,617**	**37.65**	0	0	0	262
FLOYD	**100,566**	**123,371**	**14.72**	0	0	0	1,571
GAINES	**90,234**	**121,942**	**16.22**	0	0	0	536
GARZA	**6,386**	**6,453**	**12.12**	0	0	0	0
GLASSCOCK	**2,749**	**3,713**	**16.21**	0	0	0	5
HALE	**175,050**	**225,698**	**15.47**	0	0	0	5,918
HOCKLEY	**92,307**	**127,298**	**16.55**	0	0	0	291
HOWARD	**1,569**	**1,866**	**14.27**	0	0	0	29
LAMB	**138,302**	**243,813**	**21.15**	0	0	0	6,326
LUBBOCK	**110,094**	**117,321**	**12.79**	0	0	0	533
LYNN	**28,328**	**29,472**	**12.48**	0	0	0	117
MARTIN	**3,759**	**4,450**	**14.20**	0	0	0	12
MIDLAND	**2,394**	**3,920**	**19.65**	0	0	0	120
MOTLEY	**168**	**240**	**17.11**	0	0	0	13
OLDHAM	**5,505**	**8,922**	**19.45**	0	0	0	155
PARMER	**110,671**	**198,338**	**21.51**	0	0	0	8,150
POTTER	**3,051**	**6,670**	**26.23**	0	0	0	459
RANDALL	**14,084**	**27,048**	**23.05**	0	0	0	1,414
SWISHER	**74,097**	**111,420**	**18.04**	0	0	0	2,981
TERRY	**93,775**	**129,737**	**16.60**	0	0	0	469
YOAKUM	**57,338**	**78,978**	**16.53**	0	0	0	237
CURRY	**39,813**	**74,352**	**22.41**	0	0	0	3,052
LEA	**16,529**	**30,722**	**22.30**	0	0	0	1,409
QUAY	**140**	**318**	**27.20**	0	0	0	22
ROOSEVELT	**37,036**	**67,769**	**21.96**	0	0	0	2,195
TOTALS	**1,642,349**	**2,495,753**	**18.24**	0	0	0	58,467

pia = planted irrigation acreages
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Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1955	1955	1955	1955	1955	1955	1955	1955
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	405	1,503	2,615	2,175	242	0	0	0
ARMSTRONG	3	9	16	13	1	0	0	0
BAILEY	6,667	19,773	34,327	27,217	1,534	0	0	0
BORDEN	141	591	1,183	901	0	0	0	0
BRISCOE	825	2,904	5,401	4,230	46	0	0	0
CASTRO	28,331	74,703	112,530	83,804	1,589	0	0	0
COCHRAN	3,224	13,021	25,726	20,880	309	0	0	0
CROSBY	3,418	14,455	29,211	22,671	121	0	0	0
DAWSON	2,115	8,928	16,528	13,630	862	0	0	0
DEAF SMITH	12,240	31,839	49,281	39,536	1,854	0	0	0
DICKENS	411	777	1,112	952	332	0	0	0
ECTOR	393	523	523	523	393	0	0	0
FLOYD	7,094	25,620	49,042	38,989	1,054	0	0	0
GAINES	6,215	26,216	46,924	38,981	3,070	0	0	0
GARZA	323	1,355	2,710	2,065	0	0	0	0
GLASSCOCK	188	774	1,547	1,193	7	0	0	0
HALE	16,384	49,575	85,230	66,297	2,293	0	0	0
HOCKLEY	6,466	26,355	52,573	41,123	491	0	0	0
HOWARD	122	389	720	562	43	0	0	0
LAMB	18,042	54,785	92,701	70,571	1,388	0	0	0
LUBBOCK	6,117	24,113	47,856	37,677	1,026	0	0	0
LYNN	1,562	6,150	12,031	9,383	229	0	0	0
MARTIN	225	953	1,754	1,419	87	0	0	0
MIDLAND	316	811	1,382	1,110	180	0	0	0
MOTLEY	24	51	62	62	27	0	0	0
OLDHAM	471	1,675	3,345	3,173	103	0	0	0
PARMER	17,806	46,783	70,904	53,158	1,537	0	0	0
POTTER	770	1,395	1,844	1,655	548	0	0	0
RANDALL	2,594	5,571	8,411	7,566	1,491	0	0	0
SWISHER	8,010	24,271	41,870	33,211	1,078	0	0	0
TERRY	6,670	27,381	51,951	41,582	1,685	0	0	0
YOAKUM	3,966	16,644	31,836	25,559	737	0	0	0
CURRY	6,442	16,951	26,116	20,909	882	0	0	0
LEA	2,888	6,626	9,856	8,225	1,718	0	0	0
QUAY	37	65	86	79	30	0	0	0
ROOSEVELT	5,344	15,513	24,148	19,386	1,184	0	0	0
TOTALS	176,248	549,050	943,351	740,466	28,171	0	0	0

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

				1956	1956	1956	1956
				January	February	March	April
COUNTY	1956 Planted Irrigated Acres, pia	TAES Total Irr. Water Use, ac-ft	TAES Irr. Water Use, in/pia	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	**12,271**	**19,096**	**18.67**	0	0	0	169
ARMSTRONG	**95**	**123**	**15.63**	0	0	5	23
BAILEY	**95,402**	**153,505**	**19.31**	0	0	352	5,174
BORDEN	**5,000**	**9,055**	**21.73**	0	0	0	0
BRISCOE	**19,137**	**32,361**	**20.29**	0	0	365	1,746
CASTRO	**275,907**	**499,749**	**21.74**	0	0	9,018	51,895
COCHRAN	**76,250**	**111,715**	**17.58**	0	0	0	471
CROSBY	**134,835**	**168,013**	**14.95**	0	0	0	63
DAWSON	**77,405**	**111,335**	**17.26**	0	0	141	884
DEAF SMITH	**197,993**	**460,250**	**27.89**	0	0	26,611	114,159
DICKENS	**4,683**	**9,758**	**25.01**	0	0	0	567
ECTOR	**1,313**	**4,168**	**38.09**	0	0	0	417
FLOYD	**184,046**	**234,217**	**15.27**	0	0	323	3,520
GAINES	**230,872**	**339,305**	**17.64**	0	0	557	3,381
GARZA	**12,500**	**15,525**	**14.90**	0	0	0	0
GLASSCOCK	**4,496**	**6,652**	**17.75**	0	0	0	7
HALE	**360,763**	**417,414**	**13.88**	0	0	0	8,448
HOCKLEY	**159,594**	**228,118**	**17.15**	0	0	67	850
HOWARD	**3,000**	**4,557**	**18.23**	0	0	0	59
LAMB	**226,262**	**370,191**	**19.63**	0	0	628	10,716
LUBBOCK	**217,338**	**276,018**	**15.24**	0	0	56	1,319
LYNN	**55,830**	**70,863**	**15.23**	0	0	0	250
MARTIN	**7,890**	**11,584**	**17.62**	0	0	0	26
MIDLAND	**3,718**	**6,523**	**21.05**	0	0	0	192
MOTLEY	**387**	**673**	**20.88**	0	0	0	34
OLDHAM	**30,182**	**47,425**	**18.86**	0	0	2,851	11,646
PARMER	**232,819**	**367,301**	**18.93**	0	0	5,704	34,512
POTTER	**28,219**	**40,347**	**17.16**	0	0	2,854	12,286
RANDALL	**37,484**	**60,491**	**19.37**	0	0	1,610	8,827
SWISHER	**138,876**	**194,475**	**16.80**	0	0	1,872	11,388
TERRY	**172,031**	**242,760**	**16.93**	0	0	361	2,274
YOAKUM	**105,909**	**147,453**	**16.71**	0	0	264	1,390
CURRY	**117,695**	**142,460**	**14.52**	0	0	2,693	15,310
LEA	**34,291**	**55,932**	**19.57**	0	0	336	3,658
QUAY	**335**	**596**	**21.33**	0	0	4	58
ROOSEVELT	**93,048**	**123,708**	**15.95**	0	0	1,180	8,026
TOTALS	**3,357,876**	**4,983,716**	**17.81**	0	0	57,852	313,749

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B3. Irrigation data by county in the Southern Ogallala GAM Region for all base years, drought years, drought of record years and long-term average years.

	1956	1956	1956	1956	1956	1956	1956	1956
	May	June	July	August	September	October	November	December
COUNTY	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft	Monthly Pumpage, ac-ft
ANDREWS	1,068	4,106	7,142	5,964	648	0	0	0
ARMSTRONG	21	15	25	22	1	5	5	0
BAILEY	11,848	31,688	55,655	44,804	3,280	352	352	0
BORDEN	453	1,902	3,803	2,898	0	0	0	0
BRISCOE	2,747	6,052	11,528	9,081	113	365	365	0
CASTRO	62,618	95,546	147,846	111,654	3,138	9,018	9,018	0
COCHRAN	5,577	22,802	45,290	36,949	626	0	0	0
CROSBY	8,217	34,767	70,226	54,490	250	0	0	0
DAWSON	5,843	23,292	43,005	35,601	2,285	141	141	0
DEAF SMITH	96,175	42,565	67,686	56,136	3,697	26,611	26,611	0
DICKENS	1,055	1,993	2,852	2,443	850	0	0	0
ECTOR	625	834	834	834	625	0	0	0
FLOYD	13,476	47,210	92,691	74,280	2,072	323	323	0
GAINES	18,279	71,823	128,239	107,189	8,723	557	557	0
GARZA	776	3,260	6,520	4,968	0	0	0	0
GLASSCOCK	335	1,387	2,773	2,139	11	0	0	0
HALE	27,603	88,911	160,644	126,821	4,987	0	0	0
HOCKLEY	11,801	47,061	93,768	73,454	982	67	67	0
HOWARD	286	951	1,785	1,388	88	0	0	0
LAMB	27,444	80,204	139,661	107,544	2,737	628	628	0
LUBBOCK	14,399	56,640	112,607	88,654	2,233	56	56	0
LYNN	3,721	14,792	28,977	22,605	517	0	0	0
MARTIN	577	2,486	4,558	3,703	234	0	0	0
MIDLAND	519	1,351	2,316	1,856	289	0	0	0
MOTLEY	64	145	178	178	74	0	0	0
OLDHAM	9,432	3,421	7,183	6,980	211	2,851	2,851	0
PARMER	43,777	71,373	111,652	85,273	3,600	5,704	5,704	0
POTTER	9,982	2,410	3,091	2,873	1,143	2,854	2,854	0
RANDALL	9,124	8,895	13,471	12,492	2,850	1,610	1,610	0
SWISHER	17,355	37,230	66,903	53,840	2,144	1,872	1,872	0
TERRY	13,306	50,474	95,471	76,755	3,396	361	361	0
YOAKUM	7,937	30,461	58,322	47,051	1,500	264	264	0
CURRY	17,749	25,615	40,384	33,367	1,955	2,693	2,693	0
LEA	5,836	11,203	16,852	14,262	3,114	336	336	0
QUAY	79	111	144	135	57	4	4	0
ROOSEVELT	11,947	25,130	39,544	32,747	2,776	1,180	1,180	0
TOTALS	462,050	948,102	1,683,627	1,341,428	61,205	57,852	57,852	0

pia = planted irrigation acreages
TAES = Texas Agricultural Extension Service

Attachment B4

Regional and County Long-Term Average Estimates for Irrigation Water Demand by Crop

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

ANDREWS COUNTY				
Crop	**LTA Total Irr. Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.46**	**34.00**	**0**	**0**
Cotton:	**12.39**	**22.95**	**8,200**	**8,465**
Hay:	**39.50**	**53.64**	**0**	**0**
Pasture and Other:	**29.53**	**45.17**	**571**	**1,405**
Peanuts:	**14.33**	**25.12**	**3,500**	**4,181**
Sorghum:	**12.33**	**22.76**	**0**	**0**
Soybeans:	**14.88**	**26.31**	**0**	**0**
Wheat - Cover Crop	**5.12**	**8.36**	**0**	**0**
Total			**12,271**	**14,051**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

ARMSTRONG COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.47**	**35.93**	**12**	**22**
Cotton:	**9.84**	**25.55**	**8**	**7**
Hay:	**32.44**	**49.01**	**1**	**2**
Pasture and Other:	**23.70**	**41.27**	**3**	**6**
Peanuts:	**11.84**	**25.74**	**0**	**0**
Sorghum:	**11.87**	**25.64**	**21**	**21**
Soybeans:	**12.00**	**27.22**	**0**	**0**
Wheat - Cover Crop	**8.70**	**23.50**	**50**	**36**
Total			**95**	**94**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

BAILEY COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**24.33**	**34.68**	**15,500**	**31,420**
Cotton:	**14.23**	**24.82**	**50,900**	**60,358**
Hay:	**34.16**	**47.50**	**0**	**0**
Pasture and Other:	**25.16**	**40.00**	**8,102**	**16,988**
Peanuts:	**14.73**	**25.03**	**0**	**0**
Sorghum:	**13.32**	**23.71**	**13,600**	**15,093**
Soybeans:	**15.21**	**26.12**	**1,200**	**1,521**
Wheat - Cover Crop	**6.32**	**6.59**	**6,100**	**3,212**
Total			**95,402**	**128,592**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

BORDEN COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**32.80**	**34.00**	**0**	**0**
Cotton:	**21.73**	**22.95**	**5,000**	**9,055**
Hay:	**53.97**	**53.64**	**0**	**0**
Pasture and Other:	**44.00**	**45.17**	**0**	**0**
Peanuts:	**24.53**	**25.12**	**0**	**0**
Sorghum:	**22.08**	**22.76**	**0**	**0**
Soybeans:	**25.64**	**26.31**	**0**	**0**
Wheat - Cover Crop	**8.57**	**8.36**	**0**	**0**
Total			**5,000**	**9,055**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

BRISCOE COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.71**	**35.50**	**1,740**	**3,439**
Cotton:	**13.09**	**24.94**	**12,840**	**14,010**
Hay:	**33.10**	**48.74**	**0**	**0**
Pasture and Other:	**23.90**	**41.04**	**297**	**592**
Peanuts:	**13.05**	**25.30**	**0**	**0**
Sorghum:	**13.74**	**25.69**	**2,100**	**2,405**
Soybeans:	**13.90**	**26.94**	**0**	**0**
Wheat - Cover Crop	**18.51**	**22.86**	**2,160**	**3,332**
Total			**19,137**	**23,777**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

CASTRO COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**24.82**	**36.82**	**119,200**	**246,564**
Cotton:	**12.07**	**26.63**	**60,600**	**60,934**
Hay:	**34.64**	**49.38**	**0**	**0**
Pasture and Other:	**25.85**	**41.59**	**6,707**	**14,447**
Peanuts:	**13.95**	**26.41**	**0**	**0**
Sorghum:	**14.43**	**27.06**	**16,200**	**19,479**
Soybeans:	**14.14**	**27.86**	**3,000**	**3,536**
Wheat - Cover Crop	**11.31**	**24.52**	**70,200**	**66,166**
Total			**275,907**	**411,125**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

COCHRAN COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.77**	**34.32**	**2,000**	**3,796**
Cotton:	**12.12**	**23.53**	**55,400**	**55,971**
Hay:	**37.17**	**52.00**	**0**	**0**
Pasture and Other:	**27.46**	**43.79**	**850**	**1,945**
Peanuts:	**13.63**	**25.14**	**2,300**	**2,613**
Sorghum:	**11.78**	**23.07**	**15,700**	**15,409**
Soybeans:	**14.13**	**26.32**	**0**	**0**
Wheat - Cover Crop	**14.62**	**17.68**	**0**	**0**
Total			**76,250**	**79,734**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

CROSBY COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**21.60**	**34.00**	**0**	**0**
Cotton:	**10.76**	**22.95**	**126,700**	**113,636**
Hay:	**36.58**	**53.64**	**0**	**0**
Pasture and Other:	**26.61**	**45.17**	**235**	**521**
Peanuts:	**12.28**	**25.12**	**0**	**0**
Sorghum:	**10.63**	**22.76**	**6,800**	**6,023**
Soybeans:	**12.71**	**26.31**	**1,100**	**1,165**
Wheat - Cover Crop	**11.86**	**17.60**	**0**	**0**
Total			**134,835**	**121,345**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

DAWSON COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.25**	**34.00**	**0**	**0**
Cotton:	**12.17**	**22.95**	**52,000**	**52,748**
Hay:	**39.07**	**53.64**	**0**	**0**
Pasture and Other:	**29.10**	**45.17**	**1,105**	**2,680**
Peanuts:	**14.04**	**25.12**	**16,700**	**19,540**
Sorghum:	**12.10**	**22.76**	**4,800**	**4,840**
Soybeans:	**14.57**	**26.31**	**0**	**0**
Wheat - Cover Crop	**4.91**	**8.36**	**2,800**	**1,146**
Total			**77,405**	**80,954**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

DEAF SMITH COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**24.80**	**37.25**	**44,000**	**90,950**
Cotton:	**12.12**	**26.96**	**7,700**	**7,779**
Hay:	**35.20**	**50.30**	**0**	**0**
Pasture and Other:	**26.26**	**42.36**	**9,093**	**19,898**
Peanuts:	**14.02**	**26.81**	**0**	**0**
Sorghum:	**13.41**	**26.18**	**36,400**	**40,673**
Soybeans:	**14.14**	**28.21**	**0**	**0**
Wheat - Cover Crop	**11.35**	**24.56**	**100,800**	**95,372**
Total			**197,993**	**254,672**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

DICKENS COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.09**	**34.59**	**0**	**0**
Cotton:	**11.28**	**23.69**	**2,700**	**2,538**
Hay:	**33.44**	**50.28**	**0**	**0**
Pasture and Other:	**24.00**	**42.34**	**1,983**	**3,967**
Peanuts:	**12.08**	**25.07**	**0**	**0**
Sorghum:	**11.09**	**23.47**	**0**	**0**
Soybeans:	**12.79**	**26.60**	**0**	**0**
Wheat - Cover Crop	**4.43**	**8.96**	**0**	**0**
Total			**4,683**	**6,505**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

ECTOR COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**25.51**	**34.00**	**0**	**0**
Cotton:	**14.26**	**22.95**	**0**	**0**
Hay:	**42.27**	**53.64**	**0**	**0**
Pasture and Other:	**32.30**	**45.17**	**1,313**	**3,534**
Peanuts:	**16.40**	**25.12**	**0**	**0**
Sorghum:	**14.28**	**22.76**	**0**	**0**
Soybeans:	**17.06**	**26.31**	**0**	**0**
Wheat - Cover Crop	**5.75**	**8.36**	**0**	**0**
Total			**1,313**	**3,534**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

FLOYD COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**21.66**	**34.54**	**17,945**	**32,397**
Cotton:	**11.46**	**23.85**	**122,026**	**116,500**
Hay:	**32.39**	**48.45**	**0**	**0**
Pasture and Other:	**23.24**	**40.80**	**1,880**	**3,640**
Peanuts:	**11.88**	**24.61**	**0**	**0**
Sorghum:	**10.95**	**23.27**	**23,959**	**21,865**
Soybeans:	**12.60**	**26.12**	**10,282**	**10,800**
Wheat - Cover Crop	**5.15**	**8.78**	**7,954**	**3,415**
Total			**184,046**	**188,617**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

GAINES COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.46**	**34.00**	**1,600**	**3,128**
Cotton:	**12.39**	**22.95**	**144,000**	**148,660**
Hay:	**39.50**	**53.64**	**0**	**0**
Pasture and Other:	**29.53**	**45.17**	**3,272**	**8,051**
Peanuts:	**14.33**	**25.12**	**64,600**	**77,162**
Sorghum:	**12.33**	**22.76**	**6,700**	**6,882**
Soybeans:	**14.88**	**26.31**	**0**	**0**
Wheat - Cover Crop	**5.12**	**8.36**	**10,700**	**4,566**
Total			**230,872**	**248,450**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

GARZA COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**21.60**	**34.00**	**0**	**0**
Cotton:	**10.76**	**22.95**	**12,500**	**11,211**
Hay:	**36.58**	**53.64**	**0**	**0**
Pasture and Other:	**26.61**	**45.17**	**0**	**0**
Peanuts:	**12.28**	**25.12**	**0**	**0**
Sorghum:	**10.63**	**22.76**	**0**	**0**
Soybeans:	**12.71**	**26.31**	**0**	**0**
Wheat - Cover Crop	**3.45**	**8.36**	**0**	**0**
Total			**12,500**	**11,211**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

GLASSCOCK COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.97**	**34.00**	**0**	**0**
Cotton:	**12.72**	**22.95**	**4,310**	**4,566**
Hay:	**39.51**	**53.64**	**0**	**0**
Pasture and Other:	**29.54**	**45.17**	**25**	**62**
Peanuts:	**14.44**	**25.12**	**0**	**0**
Sorghum:	**12.67**	**22.76**	**162**	**170**
Soybeans:	**14.99**	**26.31**	**0**	**0**
Wheat - Cover Crop	**4.64**	**8.36**	**0**	**0**
Total			**4,496**	**4,798**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

HALE COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.10**	**35.06**	**62,600**	**115,311**
Cotton:	**9.36**	**24.88**	**202,200**	**157,762**
Hay:	**31.64**	**48.17**	**0**	**0**
Pasture and Other:	**23.04**	**40.56**	**8,963**	**17,206**
Peanuts:	**11.41**	**25.20**	**0**	**0**
Sorghum:	**10.40**	**23.79**	**34,900**	**30,254**
Soybeans:	**11.31**	**26.35**	**14,600**	**13,756**
Wheat - Cover Crop	**0.00**	**6.50**	**37,500**	**8**
Total			**360,763**	**334,295**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

HOCKLEY COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.73**	**34.26**	**0**	**0**
Cotton:	**12.04**	**23.43**	**143,400**	**143,846**
Hay:	**37.41**	**52.27**	**0**	**0**
Pasture and Other:	**27.66**	**44.02**	**1,994**	**4,596**
Peanuts:	**13.63**	**25.14**	**1,000**	**1,136**
Sorghum:	**11.73**	**23.02**	**12,000**	**11,733**
Soybeans:	**14.12**	**26.32**	**0**	**0**
Wheat - Cover Crop	**5.27**	**7.90**	**1,200**	**527**
Total			**159,594**	**161,837**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

HOWARD COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.43**	**34.00**	**0**	**0**
Cotton:	**11.32**	**22.95**	**2,800**	**2,641**
Hay:	**38.39**	**54.79**	**0**	**0**
Pasture and Other:	**28.23**	**46.14**	**200**	**471**
Peanuts:	**12.89**	**25.12**	**0**	**0**
Sorghum:	**11.21**	**22.76**	**0**	**0**
Soybeans:	**13.35**	**26.31**	**0**	**0**
Wheat - Cover Crop	**4.10**	**8.36**	**0**	**0**
Total			**3,000**	**3,112**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

LAMB COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.32**	**35.06**	**62,700**	**121,837**
Cotton:	**13.47**	**24.88**	**123,600**	**138,738**
Hay:	**34.01**	**48.17**	**0**	**0**
Pasture and Other:	**24.90**	**40.56**	**4,662**	**9,674**
Peanuts:	**13.82**	**25.20**	**1,100**	**1,267**
Sorghum:	**12.55**	**23.79**	**14,900**	**15,581**
Soybeans:	**14.29**	**26.35**	**5,100**	**6,075**
Wheat - Cover Crop	**3.74**	**6.50**	**14,200**	**4,426**
Total			**226,262**	**297,598**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

LUBBOCK COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**21.69**	**34.10**	**1,000**	**1,807**
Cotton:	**10.93**	**23.14**	**188,900**	**172,114**
Hay:	**36.11**	**53.09**	**0**	**0**
Pasture and Other:	**26.23**	**44.71**	**3,738**	**8,169**
Peanuts:	**12.29**	**25.13**	**2,500**	**2,560**
Sorghum:	**10.72**	**22.86**	**14,000**	**12,503**
Soybeans:	**12.71**	**26.31**	**3,600**	**3,814**
Wheat - Cover Crop	**3.28**	**8.18**	**3,600**	**984**
Total			**217,338**	**201,952**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

LYNN COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**21.60**	**34.00**	**0**	**0**
Cotton:	**10.76**	**22.95**	**51,300**	**46,010**
Hay:	**36.58**	**53.64**	**0**	**0**
Pasture and Other:	**26.61**	**45.17**	**930**	**2,062**
Peanuts:	**12.28**	**25.12**	**1,500**	**1,535**
Sorghum:	**10.63**	**22.76**	**2,100**	**1,860**
Soybeans:	**12.71**	**26.31**	**0**	**0**
Wheat - Cover Crop	**3.45**	**8.36**	**0**	**0**
Total			**55,830**	**51,468**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

MARTIN COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.25**	**34.00**	**0**	**0**
Cotton:	**12.17**	**22.95**	**6,000**	**6,086**
Hay:	**39.07**	**53.64**	**0**	**0**
Pasture and Other:	**29.10**	**45.17**	**90**	**218**
Peanuts:	**14.04**	**25.12**	**1,800**	**2,106**
Sorghum:	**12.10**	**22.76**	**0**	**0**
Soybeans:	**14.57**	**26.31**	**0**	**0**
Wheat - Cover Crop	**4.91**	**8.36**	**0**	**0**
Total			**7,890**	**8,411**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

MIDLAND COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**24.73**	**34.00**	**0**	**0**
Cotton:	**13.48**	**22.95**	**3,090**	**3,471**
Hay:	**40.87**	**53.64**	**0**	**0**
Pasture and Other:	**30.90**	**45.17**	**628**	**1,618**
Peanuts:	**15.41**	**25.12**	**0**	**0**
Sorghum:	**13.46**	**22.76**	**0**	**0**
Soybeans:	**16.01**	**26.31**	**0**	**0**
Wheat - Cover Crop	**5.19**	**8.36**	**0**	**0**
Total			**3,718**	**5,089**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

MOTLEY COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**21.51**	**34.28**	**0**	**0**
Cotton:	**10.98**	**23.34**	**0**	**0**
Hay:	**32.01**	**48.59**	**0**	**0**
Pasture and Other:	**22.84**	**40.92**	**139**	**265**
Peanuts:	**11.33**	**24.32**	**248**	**234**
Sorghum:	**10.70**	**23.00**	**0**	**0**
Soybeans:	**12.20**	**26.00**	**0**	**0**
Wheat - Cover Crop	**3.16**	**6.73**	**0**	**0**
Total			**387**	**499**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

OLDHAM COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**24.36**	**37.25**	**862**	**1,750**
Cotton:	**11.88**	**26.96**	**0**	**0**
Hay:	**34.94**	**50.30**	**0**	**0**
Pasture and Other:	**26.00**	**42.36**	**520**	**1,127**
Peanuts:	**13.73**	**26.81**	**0**	**0**
Sorghum:	**13.16**	**26.18**	**10,500**	**11,513**
Soybeans:	**13.82**	**28.21**	**0**	**0**
Wheat - Cover Crop	**11.91**	**26.38**	**18,300**	**18,166**
Total			**30,182**	**32,556**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

PARMER COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**21.67**	**33.18**	**91,700**	**165,624**
Cotton:	**9.82**	**24.12**	**65,700**	**53,776**
Hay:	**30.08**	**44.27**	**0**	**0**
Pasture and Other:	**22.10**	**37.28**	**9,719**	**17,895**
Peanuts:	**11.68**	**23.91**	**0**	**0**
Sorghum:	**10.91**	**23.02**	**17,500**	**15,911**
Soybeans:	**11.90**	**25.29**	**1,600**	**1,587**
Wheat - Cover Crop	**10.61**	**23.76**	**46,600**	**41,204**
Total			**232,819**	**295,996**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

POTTER COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.31**	**37.25**	**971**	**1,886**
Cotton:	**11.01**	**26.96**	**0**	**0**
Hay:	**33.56**	**50.30**	**0**	**0**
Pasture and Other:	**24.61**	**42.36**	**2,948**	**6,047**
Peanuts:	**12.75**	**26.81**	**0**	**0**
Sorghum:	**12.24**	**26.18**	**1,500**	**1,530**
Soybeans:	**12.78**	**28.21**	**0**	**0**
Wheat - Cover Crop	**9.03**	**23.56**	**22,800**	**17,157**
Total			**28,219**	**26,620**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

RANDALL COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.57**	**37.25**	**4,400**	**8,641**
Cotton:	**11.09**	**26.96**	**80**	**74**
Hay:	**33.57**	**50.30**	**1,748**	**4,890**
Pasture and Other:	**24.63**	**42.36**	**5,256**	**10,786**
Peanuts:	**12.80**	**26.81**	**0**	**0**
Sorghum:	**12.33**	**26.18**	**11,840**	**12,163**
Soybeans:	**12.85**	**28.21**	**0**	**0**
Wheat - Cover Crop	**9.56**	**24.45**	**14,160**	**11,277**
Total			**37,484**	**47,832**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

SWISHER COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**23.54**	**36.90**	**27,900**	**54,735**
Cotton:	**10.93**	**26.69**	**61,200**	**55,760**
Hay:	**32.94**	**49.57**	**0**	**0**
Pasture and Other:	**24.11**	**41.74**	**3,776**	**7,588**
Peanuts:	**12.58**	**26.49**	**0**	**0**
Sorghum:	**13.02**	**26.89**	**21,000**	**22,777**
Soybeans:	**12.67**	**27.93**	**5,600**	**5,911**
Wheat - Cover Crop	**9.26**	**24.44**	**19,400**	**14,978**
Total			**138,876**	**161,748**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

TERRY COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.55**	**34.05**	**1,200**	**2,255**
Cotton:	**11.69**	**23.05**	**133,100**	**129,681**
Hay:	**38.38**	**53.37**	**0**	**0**
Pasture and Other:	**28.45**	**44.94**	**2,331**	**5,527**
Peanuts:	**13.61**	**25.12**	**21,100**	**23,939**
Sorghum:	**11.55**	**22.81**	**8,200**	**7,894**
Soybeans:	**14.12**	**26.31**	**0**	**0**
Wheat - Cover Crop	**5.63**	**8.27**	**6,100**	**2,861**
Total			**172,031**	**172,157**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

YOAKUM COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.50**	**34.00**	**1,900**	**3,562**
Cotton:	**11.61**	**22.95**	**78,700**	**76,112**
Hay:	**38.62**	**53.64**	**0**	**0**
Pasture and Other:	**28.65**	**45.17**	**409**	**976**
Peanuts:	**13.61**	**25.12**	**11,800**	**13,384**
Sorghum:	**11.51**	**22.76**	**8,700**	**8,343**
Soybeans:	**14.11**	**26.31**	**0**	**0**
Wheat - Cover Crop	**5.72**	**8.36**	**4,400**	**2,096**
Total			**105,909**	**104,474**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

CURRY COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**21.81**	**33.16**	**33,000**	**59,968**
Cotton:	**13.45**	**24.59**	**2,400**	**2,690**
Hay:	**31.57**	**44.83**	**0**	**0**
Pasture and Other:	**23.00**	**37.75**	**5,195**	**9,955**
Peanuts:	**13.43**	**24.37**	**1,600**	**1,790**
Sorghum:	**12.44**	**23.38**	**23,500**	**24,368**
Soybeans:	**13.65**	**25.18**	**0**	**0**
Wheat - Cover Crop	**4.56**	**6.93**	**52,000**	**19,750**
Total			**117,695**	**118,523**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

LEA COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**24.00**	**34.00**	**4,200**	**8,399**
Cotton:	**12.83**	**22.95**	**12,200**	**13,042**
Hay:	**40.63**	**53.64**	**0**	**0**
Pasture and Other:	**30.66**	**45.17**	**6,291**	**16,072**
Peanuts:	**15.02**	**25.12**	**3,200**	**4,005**
Sorghum:	**12.78**	**22.76**	**2,400**	**2,557**
Soybeans:	**15.60**	**26.31**	**0**	**0**
Wheat - Cover Crop	**5.34**	**8.36**	**6,000**	**2,670**
Total			**34,291**	**46,745**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

QUAY COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**25.33**	**37.25**	**22**	**46**
Cotton:	**15.55**	**26.96**	**25**	**32**
Hay:	**36.40**	**50.30**	**0**	**0**
Pasture and Other:	**26.96**	**42.36**	**143**	**322**
Peanuts:	**15.51**	**26.81**	**0**	**0**
Sorghum:	**14.85**	**26.18**	**55**	**68**
Soybeans:	**16.16**	**28.21**	**0**	**0**
Wheat - Cover Crop	**4.00**	**6.50**	**90**	**30**
Total			**335**	**499**

Attachment B4. Southern Ogallala GAM regional and county long-term average estimates for irrigation water demand by crop.

ROOSEVELT COUNTY				
Crop	**LTA Total Irr Water Used, in/pia**	**LTA Total Water Used, in/pia**	**Crop Acreage, ac/county**	**Total Irr Demand, ac-ft**
Corn:	**22.60**	**33.17**	**22,000**	**41,442**
Cotton:	**13.55**	**24.21**	**13,600**	**15,351**
Hay:	**31.71**	**44.38**	**0**	**0**
Pasture and Other:	**23.20**	**37.37**	**3,848**	**7,441**
Peanuts:	**13.60**	**24.00**	**13,200**	**14,955**
Sorghum:	**12.63**	**23.09**	**10,400**	**10,949**
Soybeans:	**14.26**	**25.27**	**0**	**0**
Wheat - Cover Crop	**3.42**	**5.73**	**30,000**	**8,548**
Total			**93,048**	**98,687**

Appendix C

Historical and Future Pumping Demands for Southern Ogallala GAM

Historical and Future Pumping Demands for Southern Ogallala GAM Model

Introduction

Table C-1 in this appendix provides the pumping estimates used in the GAM model for the entire simulation period from 1940 through 2050. The following sections provide a brief description of how the pumping estimates were derived for the Texas portion of the study area. Sources for New Mexico pumping are provided in the main report. For the predictive simulations, pumping for New Mexico was continued into the future at year 2000 estimated amounts. Although agricultural pumping is provided in Table C-1, methods of estimation are provided in Appendix B and the main report.

Municipal Point

Municipal point data were obtained from the provided *LinkedwithWellData tables. Initially, all records that included a latitude and longitude were included. Those records were then limited based on the study area. If a well fell geographically outside of the clipped study area, the record was excluded from further consideration. Additional queries were constructed to verify that the raw tables provided did not contain unlinked information. A latitude and longitude (lat/long) is given for each state well number. Each unique state well number, along with its given lat/long, was exported to a dbf file and brought into ArcView. Using ArcView, the lat/long was converted to decimal degrees and then Texas Centric coordinates. Once the state well numbers were displayed in the Texas Centric projection, they were spatially joined with the model grid to obtain cell IDs for each well. The resulting table contained identified state wells with in the study area and their Cell ID numbers. This was done for the state well numbers in both the pre- and post 80s pumpage databases.

The pumping was distributed within a city by dividing the annual pumping for a city by the number of wells in that city that we had actual coordinates for. The pumpage numbers for each model grid cell and each year were then summed to derive pumping for a cell in a particular year.

The well's drilling date was used to screen out wells that were not in use for a particular year wherever available. Additionally, we were able to research and come up with some other drilled dates and end-of-pumping dates, where wells were taken off line.

Decade based census data by county, as supplied by the Texas Water Development Board (TWDB), were used to interpolate data back to 1940. Only wells that had a pumpage value in 1955 were interpolated back in time to 1940. Gaps in annual data were not linearly interpolated for point data.

County Other (Municipal Nonpoint)

County other data were derived from the historical summary table for the post-1980 data. The pre-1980 data give only total municipal amounts, so the point data totals were subtracted from the county totals to determine the county other values within a county for the pre-1980 data. The Census block GIS coverages were used to distribute the county other data. Each census block has a persons/area designation. All census blocks that were outside of a city boundary, as determined by the Texas Natural Resources Information System (TNRIS) city coverage, were intersected with the model grid polygon GIS coverage. By calculating the area of each new polygon using the population distribution of the census blocks within the

model grid cell, a population of each polygon was then calculated within the grid cell.

The County other data were then distributed throughout a county/basin based on the populations of each cell within that county/basin. The 2000 Census blocks were used for 1991 through 2000 data. The 1990 Census blocks were used for the post-1980 data as well as the 1974 and 1977 pre-1980 files. Linear interpolations were used to fill in the gaps between 1974 and 1977 and between 1977 and 1980.

Decade based census data by county, as supplied by the TWDB, were used to interpolate data back to 1940.

Manufacturing Point

The manufacturing point data presented are a combination of innate point data and those that had to be researched. The innate point data are those records in the MFG_LINKED* table that contained a state well number (which comes with lat/long). Those that had to be researched were derived from a location search for the entity. Directories and map engines on the internet were used to obtain latitude and longitude coordinates for the addresses listed for entities in the MFG_LINKED* table. Location data were obtained for approximately 60 percent of the listed users. These coordinates (for both the innate and researched point data) were then projected to the Texas Centric projection. Next, these points were spatially joined in ArcView with the model grid to obtain cell IDs for each location. This allowed each entity to be assigned to a model cell ID.

Decade based census data by county, as supplied by the TWDB, were used to interpolate data back to 1940. Only wells that had a pumpage value in 1955 were interpolated back in time. Gaps in annual data were not linearly interpolated for point data. Point data for which a specific location of the user could not be identified were added into the manufacturing nonpoint use estimates.

Manufacturing Nonpoint

The manufacturing nonpoint pumpage numbers were distributed over the urban, industrial, and mining land uses in their appropriate county/basin as follows:

The 1:250,000-scaled land use data for Texas and New Mexico, clipped to our study area, were used. The land use codes 1, 11, 12, 13, 14, 15, and 75 were selected. These include:

- Urban or built-up land
- Residential,
- Commercial and services
- Industrial
- Transportation, communication , and utilities
- Industrial and commercial complexes
- Mixed urban or built-up land
- Other urban or built-up land
- Strip mines, quarries, and gravel pits

The ArcView function *Intersect* was used to combine this land use data with both the model grid cell ID designations and the county/basin information. The resulting shapefile contained only polygons with urban, industrial, or mining land use, broken up into model grid cells and county/basin areas.

Next, the total area covered by this land use in each county/basin combination was calculated. The area value for each polygon was divided by the total county/basin area value to get a percentage factor. This percentage was then used to weight how much pumpage the polygon's cell ID should receive.

The resulting attribute table was saved and brought into the pre- and post-1980s pumpage databases. Two queries were developed to link the pumpage values with the percentage factors for each model grid cell.

Decade based census data by county, as obtained from the TWDB, were used to interpolate data back in time.

Livestock

Livestock data were derived from the Historical Summary Table in the pre-1980 and post-1980 pumpage databases. Post-1980 data are divided by county and basin and pre-1980 data are broken out only by the county designation. The U.S. Geological Survey land use was used to determine areas where livestock pumping is likely to occur. A query was performed from the GWDB database and 85 percent of livestock wells fell within the agricultural non-irrigated and rangeland land use classes. Any model grid cell with a centroid that landed within these two land use classes was used to distribute the pumpage for that county or county/basin value.

Some stock water was found to exist in the municipal data as well. These municipal amounts, though small, were eliminated to avoid summing them twice (Once as municipal point pumpage and a second time as livestock pumpage.)

Historical data before 1974 were not available, so the 1974 value was applied to all years prior to 1974.

Agricultural

Agricultural pumping was obtained from various sources as documented in the main body of the report. The pumping values provided in Table C-1 are the estimates of agricultural pumping by year for the full transient and predictive simulation period. In the model, return flow of irrigation water was accounted for by direct reduction in agricultural pumping according to the assumed return flow percentage. The pumping volumes listed in Table C-1 have not been reduced by any assumed return flow percentage.

Predictive Pumping Calculations

TWDB decade-based predictive values were used to interpolate annual values to 2050. The predictive values were compiled by the TWDB from Regional Water Planning Group water demand projections completed as part of the SB-1 regional water planning efforts. Only records with an Ogallala aquifer designation and a source County and Basin designation were used. The linear interpolations were made from the year 2000 historical data through 2050. For some wells, historical data existed through the year 1999; for others the data stopped at 1997 or earlier. The 2000 historical value was derived by linearly interpolating any data from 1997 through 1999 to the year 2000.

Each grid cell was assigned a factor representing the percentage of the County/Basin total pumping in the year 2000 that was assigned to that cell. These factors were then used to determine the percentage of estimated pumping for all non-agricultural uses for that model cell during each year of the predictive simulation. Future pumping estimates were available on a decade basis only, and linear interpolation was used between decades to obtain values for intermediate years. If a pumping estimate was not available for a given decade, estimates for adjoining decades were linearly interpolated to derive estimates for the intermediate years.

Table C-1. Municipal Point Total Pumpage (ac-ft/yr)

County	Basin	1940 Total	1941 Total	1942 Total	1943 Total	1944 Total	1945 Total	1946 Total	1947 Total	1948 Total	1949 Total	1950 Total	1951 Total
ANDREWS	COLORADO	8.5	12.0	16.9	23.8	33.7	47.5	67.1	94.7	133.7	188.8	266.5	320.7
BAILEY	BRAZOS	1204.8	1229.6	1254.9	1280.8	1307.1	1334.0	1361.5	1389.5	1418.1	1447.3	1477.0	1506.8
BRISCOE	RED	126.6	125.0	123.4	121.8	120.2	118.7	117.1	115.6	114.2	112.7	111.2	111.4
CASTRO	BRAZOS	290.6	295.6	300.7	305.9	311.2	316.5	322.0	327.6	333.2	339.0	344.8	368.7
COCHRAN	BRAZOS	158.4	168.3	178.8	190.0	201.8	214.4	227.8	242.0	257.1	273.1	290.2	292.6
COCHRAN	COLORADO	70.4	74.8	79.5	84.4	89.7	95.3	101.2	107.6	114.3	121.4	129.0	130.0
CROSBY	BRAZOS	129.7	129.1	128.5	127.9	127.3	126.7	126.1	125.6	125.0	124.4	123.8	124.8
DAWSON	COLORADO	1403.6	1438.6	1474.6	1511.4	1549.2	1587.9	1627.6	1668.2	1709.9	1752.7	1796.4	1797.1
DEAFSMITH	RED	1957.3	2061.3	2170.8	2286.1	2407.6	2535.5	2670.2	2812.0	2961.4	3118.8	3284.5	3438.3
ECTOR	COLORADO	587.8	716.6	873.7	1065.1	1298.5	1583.0	1929.8	2352.6	2868.1	3496.6	4262.7	4822.8
FLOYD	BRAZOS	716.2	715.3	714.5	713.7	712.9	712.0	711.2	710.4	709.5	708.7	707.9	720.4
GAINES	COLORADO	873.8	882.2	890.7	899.2	907.8	916.5	925.3	934.2	943.2	952.2	961.3	999.0
HALE	BRAZOS	1851.1	1948.4	2050.8	2158.7	2272.2	2391.7	2517.4	2649.8	2789.1	2935.8	3090.1	3187.2
HOCKLEY	BRAZOS	386.8	411.8	438.5	466.8	497.0	529.2	563.5	599.9	638.7	680.1	724.1	731.0
HOCKLEY	COLORADO	68.5	72.9	77.6	82.6	88.0	93.7	99.7	106.2	113.1	120.4	128.2	129.4
LAMB	BRAZOS	1566.1	1587.8	1609.8	1632.2	1654.8	1677.8	1701.0	1724.6	1748.6	1772.8	1797.4	1814.5
LUBBOCK	BRAZOS	4564.1	5044.0	5574.3	6160.4	6808.2	7524.0	8315.1	9189.4	10155.6	11223.4	12403.5	13120.6
LYNN	BRAZOS	747.8	742.2	736.7	731.2	725.7	720.2	714.8	709.5	704.2	698.9	693.6	692.9
MARTIN	COLORADO	2315.6	2315.0	2314.4	2313.8	2313.1	2312.5	2311.9	2311.3	2310.6	2310.0	2309.4	2289.9
MIDLAND	COLORADO	797.7	906.5	1030.1	1170.5	1330.2	1511.5	1717.6	1951.8	2217.9	2520.4	2864.0	3420.2
OLDHAM	CANADIAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PARMER	BRAZOS	146.3	146.0	145.8	145.5	145.2	145.0	144.7	144.5	144.2	144.0	143.7	153.8
PARMER	RED	306.9	306.3	305.8	305.3	304.7	304.2	303.7	303.2	302.6	302.1	301.6	322.7
RANDALL	RED	3177.7	3498.5	3851.7	4240.6	4668.8	5140.1	5659.1	6230.5	6859.5	7552.1	8314.6	9738.4
SWISHER	BRAZOS	6.1	6.3	6.5	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2
SWISHER	RED	431.9	443.6	455.6	467.9	480.6	493.6	507.0	520.7	534.8	549.3	564.2	580.8
TERRY	COLORADO	1183.9	1204.9	1226.3	1248.1	1270.2	1292.8	1315.7	1339.1	1362.9	1387.1	1411.7	1446.8
YOAKUM	COLORADO	452.7	444.3	436.0	427.9	419.9	412.1	404.4	396.9	389.5	382.3	375.2	410.1
CURRY	NM	884.0	941.5	999.0	1056.5	1114.0	1171.5	1229.0	1286.5	1344.0	1401.5	1459.0	1509.0
LEA	NM	957.2	991.6	1026.1	1060.6	1095.0	1129.5	1164.0	1198.4	1232.9	2834.0	2915.0	3064.6
QUAY	NM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ROOSEVELT	NM	448.8	475.0	501.2	527.5	553.7	579.9	606.1	632.3	658.6	684.8	711.0	724.9

Table C-1. Municipal Point Total Pumpage (ac-ft/yr)

1952 Total	1953 Total	1954 Total	1955 Total	1956 Total	1957 Total	1958 Total	1959 Total	1960 Total	1961 Total	1962 Total	1963 Total	1964 Total	1965 Total	1966 Total
385.8	464.2	558.6	672.1	840.9	1101.7	1420.9	1314.2	1937.1	1997.2	2167.7	1920.3	2344.3	2038.9	2003.9
1537.1	1568.0	1599.6	1631.8	3645.0	2895.6	3496.6	3437.7	3433.6	4141.3	5191.3	5711.3	7207.7	8219.0	7752.3
111.5	111.7	111.9	112.0	124.3	131.1	112.0	168.0	122.8	116.6	92.1	138.1	199.2	202.9	163.3
394.2	421.5	450.6	481.8	392.2	515.4	612.7	853.2	828.6	635.7	791.6	842.9	932.2	840.3	847.3
295.0	297.5	299.9	302.4	303.8	306.9	337.6	368.3	383.6	346.8	374.4	396.5	498.5	635.1	564.3
131.1	132.2	133.3	134.4	98.2	110.5	73.7	76.7	80.7	79.5	78.3	84.4	93.6	115.1	136.6
125.8	126.8	127.9	128.9	55.2	76.7	168.0	92.1	71.7	104.0	69.0	49.9	192.6	197.0	194.6
1797.8	1798.5	1799.2	1799.8	1804.4	1524.1	1737.0	1843.0	1909.5	1925.8	2125.6	2067.8	2154.0	2001.5	1710.1
3599.3	3767.9	3944.3	4129.0	4556.1	4193.5	4083.4	4650.8	4388.6	4764.0	4861.6	5633.5	6616.0	5419.8	5932.2
5456.4	6173.3	6984.4	7902.1	9377.6	9401.0	7005.5	3698.0	2351.6	3088.8	1453.0	1179.1	1634.0	1808.3	1105.1
733.2	746.2	759.4	772.9	798.7	931.8	758.8	784.1	820.6	757.5	832.0	923.0	1172.7	1197.7	1105.5
1038.1	1078.8	1121.0	1164.9	1173.8	1178.5	2122.1	1649.8	1580.0	1272.8	1276.9	1182.2	2073.5	1879.3	1353.3
3287.2	3390.4	3496.8	3606.6	4460.2	3648.8	3903.5	4076.7	4446.8	519.2	4620.9	5054.8	5431.7	5482.5	4731.0
738.0	745.0	752.2	759.4	1185.5	1268.8	2350.3	2264.5	2267.6	2384.2	2567.8	2834.5	3076.5	3033.6	2822.1
130.6	131.9	133.1	134.4	131.1	131.1	227.1	199.5	177.6	181.7	192.0	204.7	323.5	233.8	238.2
1831.7	1849.1	1866.6	1884.3	2362.0	3401.9	4603.5	5930.8	6988.9	6535.4	7794.8	9436.9	9786.9	9469.2	8766.6
13879.1	14681.4	15530.1	16427.9	16582.0	13573.5	14050.4	14467.6	14448.1	13467.5	14944.1	15741.3	16346.4	16316.6	15813.1
692.2	691.5	690.7	690.0	500.8	468.5	497.5	447.8	569.9	557.0	667.1	633.1	615.9	652.5	609.9
2270.5	2251.3	2232.2	2213.3	1562.0	1941.9	1872.0	2915.3	3731.5	3782.8	4225.3	4659.2	5774.6	5484.8	4852.3
4084.4	4877.6	5824.9	6956.1	7587.0	6980.4	7072.0	7441.8	6855.2	5965.7	6364.2	6771.8	6798.5	6754.0	5925.3
0.0	0.0	0.0	0.0	0.0	73.7	80.1	94.5	96.7	102.6	122.8	135.9	168.0	153.4	194.4
164.6	176.2	188.5	201.8	223.7	257.8	261.0	261.0	252.3	135.6	340.2	384.1	470.8	496.5	404.5
345.4	369.6	395.6	423.4	496.5	489.1	449.0	505.1	462.0	523.4	507.5	553.8	618.7	609.8	636.6
11406.1	13359.4	15647.2	18326.7	21813.7	17867.1	18642.2	22131.4	20535.3	22128.1	23005.8	26304.1	29491.9	26392.4	27771.7
8.5	8.7	9.0	9.3	12.0	12.8	9.7	9.6	17.0	9.3	10.2	31.4	34.3	46.8	36.1
597.8	615.4	633.5	652.2	867.7	763.7	812.7	883.4	834.0	956.4	1078.6	1191.2	1435.7	1521.8	1553.7
1482.7	1519.6	1557.4	1596.1	1727.9	1428.4	1478.7	1564.2	1727.2	1600.3	1670.4	1633.2	1889.1	1741.4	1606.3
448.2	489.9	535.5	585.3	669.6	625.7	690.0	780.1	905.5	889.7	945.4	938.5	1128.5	1079.1	883.5
1558.9	1608.9	1658.8	1708.8	1758.7	1808.7	1858.6	1908.6	1958.5	2017.2	2076.0	2134.7	2193.4	2252.1	2310.9
3214.2	3363.8	3513.4	3662.9	3812.5	5528.8	7245.0	7394.6	7544.2	7648.3	7752.4	7856.5	7960.6	8064.7	8168.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
738.8	752.7	766.6	780.5	794.4	808.3	822.2	836.1	850.0	926.8	1003.6	1080.4	1157.2	1234.0	1310.8

Table C-1. Municipal Point Total Pumpage (ac-ft/yr)

1967 Total	1968 Total	1969 Total	1970 Total	1971 Total	1972 Total	1973 Total	1974 Total	1975 Total	1976 Total	1977 Total	1978 Total	1979 Total	1980 Total	1981 Total
2500.2	1995.8	2190.2	2205.8	2394.2	2284.9	1930.0	2240.8	1791.0	2129.1	2573.2	2702.2	2548.4	2842.4	2611.2
7193.0	3785.5	2026.4	2419.3	1896.2	2342.2	1923.4	2857.1	1753.7	3357.6	4179.3	5357.7	2570.1	3122.7	3557.5
148.1	119.8	127.3	141.2	130.9	137.5	115.3	124.9	120.8	110.7	115.6	144.3	97.1	105.5	105.4
852.3	1060.4	991.8	1098.2	1396.2	1578.9	1863.9	1884.0	1832.5	2123.3	2413.6	2248.1	2216.9	2303.4	2305.3
508.0	441.0	443.1	527.4	492.1	436.8	491.6	580.7	473.6	0.0	450.5	0.0	396.6	409.7	391.6
136.6	52.9	69.6	47.5	54.5	52.7	55.7	59.6	62.9	76.7	95.2	111.3	84.7	123.9	122.8
203.0	187.2	170.9	188.7	191.5	188.0	238.2	218.4	189.7	204.6	217.4	220.4	208.0	272.6	236.5
1743.2	812.5	181.9	1508.6	265.9	89.9	134.5	151.7	43.2	63.3	359.5	322.5	52.9	25.0	104.1
6346.4	5039.2	3565.5	4972.3	4878.2	4996.7	5743.1	6142.4	5945.7	7020.9	6832.0	6845.2	6833.9	7768.3	6635.7
1512.0	949.7	1426.0	17.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1050.1	895.7	1021.9	1135.0	1047.3	980.6	895.8	1040.3	952.7	1037.0	1061.9	1139.7	1012.4	1123.1	1028.1
1169.4	1431.3	1604.7	1732.0	1764.0	1878.9	1675.5	2091.9	1681.9	1865.9	1992.6	2276.1	2131.8	2108.4	1997.1
4386.2	3896.6	2819.9	2790.4	2559.5	2231.4	3158.4	2710.1	2477.4	2990.7	3201.7	3484.3	2515.1	3375.7	3276.0
2537.2	1511.8	1228.3	1282.0	566.9	434.2	504.4	638.3	271.9	608.2	529.3	796.1	513.7	784.7	985.2
260.7	230.9	249.8	320.3	287.1	250.8	298.3	409.1	394.6	382.1	403.7	464.8	422.0	491.3	384.7
8312.7	5131.0	3476.6	4008.8	3424.7	3450.2	3145.4	3601.5	3035.8	3333.3	4570.3	5430.0	3578.8	4576.2	3921.6
14924.2	7514.1	2884.4	3519.0	2373.7	3279.1	2716.0	3179.6	1736.4	4168.8	5106.5	6767.3	3177.4	3263.8	3337.7
511.0	299.8	428.8	152.8	108.8	65.5	68.8	110.1	46.4	148.7	122.5	267.3	106.6	351.2	238.5
5773.9	5806.7	5053.2	1374.4	1688.8	618.9	803.6	1204.3	689.2	856.1	1910.2	2181.0	1696.1	30.6	2524.6
7135.5	7455.1	6540.6	1776.7	2022.6	707.0	1004.5	1551.4	831.6	1090.0	2422.9	2803.9	2157.7	0.0	2811.5
209.8	228.2	227.1	238.1	219.3	212.2	206.5	233.9	229.0	245.0	248.6	228.4	275.4	281.1	282.0
404.1	410.0	397.6	487.3	493.5	540.3	615.3	754.1	745.4	766.4	778.6	804.6	718.1	852.5	662.4
712.7	769.6	611.0	727.9	829.7	645.2	742.5	830.4	699.7	763.0	882.9	876.1	799.7	837.4	734.1
26830.9	14730.9	4910.4	8842.7	9526.2	7060.0	12423.2	11464.3	12492.6	15338.7	17835.8	17137.4	18967.9	20670.0	18387.6
30.9	33.4	70.2	84.4	48.5	59.1	64.4	59.5	64.2	72.4	75.0	82.5	64.6	80.9	67.6
1516.2	1131.5	1083.5	1367.5	1277.2	1077.6	1108.7	1318.3	1243.2	1345.6	1324.8	1211.9	1059.6	1159.0	1094.8
1295.7	668.3	304.3	286.2	293.5	225.6	224.2	414.2	217.9	228.1	184.4	613.4	518.5	760.8	484.5
908.9	918.7	813.8	1072.5	1034.1	993.4	973.5	1137.6	931.3	1074.2	1085.3	1171.1	1040.8	1167.9	885.4
2919.6	3047.7	3175.8	3303.9	3442.3	3580.8	3719.2	3857.7	3996.1	4150.9	4305.7	4460.4	4615.2	4770.0	4566.5
8272.9	8377.0	8481.1	8585.3	8949.1	9313.0	9676.8	10040.7	10404.5	10525.8	10647.1	10768.4	10889.7	11011.0	11002.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1387.6	1464.4	1541.2	1625.7	1620.4	1615.1	1609.8	1604.5	1599.2	1603.7	1608.1	1612.6	1617.1	1621.6	1890.1

Table C-1. Municipal Point Total Pumpage (ac-ft/yr)

1982 Total	1983 Total	1984 Total	1985 Total	1986 Total	1987 Total	1988 Total	1989 Total	1990 Total	1991 Total	1992 Total	1993 Total	1994 Total	1995 Total	1996 Total
2760.6	3246.1	2958.9	4049.5	4162.7	3732.7	3841.0	4505.5	4047.6	4195.2	3681.5	4106.8	4565.5	3066.1	3590.4
3699.9	5113.6	3011.2	2810.7	3231.3	4408.6	3989.4	4593.6	5169.2	3394.3	3175.0	3751.2	6034.1	7745.3	919.3
103.3	116.2	8.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0
2249.1	2284.0	2394.4	2118.7	2611.0	2662.4	2488.3	2631.4	2898.0	2724.7	2772.7	2966.9	2961.1	3035.5	2903.4
500.5	542.5	569.4	524.2	523.3	507.5	536.9	568.2	642.4	571.1	453.5	633.0	547.6	607.8	551.0
122.0	157.5	152.6	117.3	102.8	96.4	107.4	145.7	130.8	120.5	122.5	134.7	139.4	143.2	142.2
222.9	300.3	338.4	245.8	245.4	219.2	238.3	262.6	240.0	241.2	171.4	192.1	220.7	215.3	231.3
98.9	244.6	162.3	117.9	52.2	57.5	380.9	304.7	443.2	189.0	81.7	274.4	283.8	163.6	543.4
5560.7	7511.1	7080.2	5970.7	5777.1	5964.0	5716.5	5728.6	6328.4	6097.5	5516.9	5902.7	6195.2	6155.9	6192.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1031.8	1122.6	201.6	108.0	90.0	1.6	0.4	0.7	0.4	0.0	0.6	0.0	204.3	615.4	665.1
2087.6	2201.6	2247.3	2250.9	2022.7	1830.2	2122.1	2383.8	2249.8	2182.9	2002.3	2149.0	2459.1	2368.6	2226.2
3501.7	3942.9	3533.4	3201.4	3549.4	3411.9	3172.8	3978.6	4393.9	3947.4	3412.1	4085.2	4397.2	4108.2	3698.1
964.5	953.1	887.7	741.5	425.5	657.5	494.3	606.4	709.7	583.5	469.7	653.0	720.6	903.6	760.8
375.5	445.2	302.8	311.9	283.2	271.5	284.0	308.2	355.0	334.0	300.1	366.1	396.2	374.6	295.1
3732.1	4206.3	3485.2	3504.1	3172.9	3422.7	3799.8	3952.3	4192.3	3593.4	3284.0	3380.7	4508.5	5101.1	3084.9
3280.0	4514.0	2749.0	1546.5	1455.9	1541.9	1874.3	2050.4	2141.5	1637.3	1511.8	1819.0	2475.0	2839.1	1082.6
178.9	175.1	629.2	202.2	227.4	119.2	143.9	241.7	228.7	246.1	219.2	264.3	281.7	281.2	235.3
3685.7	5467.7	5668.3	4746.0	3370.9	2417.1	2650.5	3455.0	2715.1	2874.4	2627.6	3185.5	3775.0	858.2	1332.5
4131.9	6155.5	6368.4	5348.2	3780.0	2727.6	3000.9	3909.3	3055.0	3196.6	2904.4	3593.9	4253.9	967.2	1495.9
249.4	265.4	107.4	161.8	134.8	63.3	50.9	104.0	110.6	89.1	77.1	104.1	90.4	73.6	44.8
661.1	717.9	558.5	637.1	634.7	597.7	619.0	722.5	751.4	658.7	574.2	681.7	701.6	738.7	618.0
695.5	685.1	677.3	899.0	777.2	806.2	756.6	837.0	942.9	841.1	753.8	837.4	817.8	851.8	836.9
18702.9	24999.0	20507.1	20665.6	22548.5	24006.4	21889.7	19906.5	21630.9	22438.1	20168.8	20233.3	21375.1	21436.3	20799.0
60.8	59.0	54.4	50.5	61.8	82.7	50.2	56.6	60.9	66.0	49.5	49.7	48.8	58.4	52.0
1060.1	1055.3	310.2	99.3	30.7	32.7	22.0	26.3	26.9	32.4	16.9	27.2	152.6	616.4	739.2
363.9	219.0	98.5	94.9	111.5	391.5	144.4	185.3	202.4	125.9	121.6	437.4	512.6	632.4	717.1
946.2	906.2	1028.3	926.0	826.6	977.8	1289.2	1382.3	1575.4	1425.9	1313.5	1576.3	1743.9	1122.7	1136.2
4363.0	4159.5	3956.0	3752.5	3896.9	4041.3	4185.7	4330.1	4474.5	4571.6	4668.7	4765.9	4863.0	4960.1	4960.1
10993.8	10985.2	10976.6	10968.0	10906.2	10844.4	10782.6	10720.7	10658.9	10645.1	10631.3	10617.4	10603.6	10592.8	10592.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	5.4	5.6	5.8	6.0	6.2	6.2
2158.6	2427.2	2695.7	2964.2	2863.1	2762.0	2660.9	2559.7	2695.5	2851.4	3007.2	3163.1	3318.9	3483.6	3483.6

Table C-1. Municipal Point Total Pumpage (ac-ft/yr)

1997 Total	1998 Total	1999 Total	2000 Total	2001 Total	2002 Total	2003 Total	2004 Total	2005 Total	2006 Total	2007 Total	2008 Total	2009 Total	2010 Total	2011 Total
2992.8	3731.1	3653.7	3653.7	2448.5	2472.3	2496.2	2520	2543.9	2567.7	2591.6	2615.4	2639.3	2663.1	2670.4
814.4	967.6	808.8	808.8	2104.6	3221	4337.5	5453.9	6570.3	7686.7	8803.2	9919.6	11036	12152.5	12182.1
25.2	24.5	30.4	30.4	50.6	50.2	49.8	49.4	49.0	48.6	48.2	47.8	47.4	47.0	46.4
2661.3	2967.7	2912.3	2912.3	147.3	294.6	441.9	589.2	736.5	883.8	1031.1	1178.4	1325.7	1473.0	1478.3
543.3	627.2	466.0	466.0	658	660	662	664	666	668	670	672	674	676	675.7
127.9	143.6	104.5	104.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
213.2	247.3	229.6	229.6	263.4	261.8	260.2	258.6	257	255.4	253.8	252.2	250.6	249	247.2
558.9	645.2	578.8	578.8	0	0	0	0	0	0	0	0	0	0	0
5487.3	3602.2	3601.6	3601.6	440.3	756.5	1072.6	1388.8	1704.9	2021.1	2337.3	2653.4	2969.6	3285.7	3220.9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
508.1	613.2	435.9	435.9	633.9	633.8	633.7	633.6	633.5	633.4	633.3	633.2	633.1	633	637.8
2247.2	2592.8	2245.4	2245.4	2012	2079	2146	2213	2280	2347	2414	2481	2548	2615	2613.7
3464.9	3764.5	3612.5	3612.5	1041.3	1059.6	1077.9	1096.2	1114.5	1132.8	1151.1	1169.4	1187.7	1206	1215.1
529.5	772.5	527.9	527.9	262.5	262	261.5	261	260.5	260	259.5	259	258.5	258	258
304.0	372.4	317.9	317.9	415.3	417.6	419.9	422.2	424.5	426.8	429.1	431.4	433.7	436	437.7
2892.6	3129.6	2581.1	2581.1	1586	1694	1802	1910	2018	2126	2234	2342	2450	2558	2555.4
1041.5	1102.6	1037.9	1037.9	377.4	471.9	566.3	660.7	755.1	849.6	944.0	1038.4	1132.8	1227.3	1231.9
164.3	321.6	171.1	171.1	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3	57	56.2
588.1	1764.1	1734.4	1734.4	198.3	297.6	396.9	496.2	595.5	694.8	794.1	893.4	992.7	1092	1096.1
627.9	1945.6	1945.6	1945.6	0	0	0	0	0	0	0	0	0	0	0
60.8	62.9	62.4	62.4	6.2	12.4	18.5	24.7	30.9	37.1	43.3	49.5	55.6	61.8	61.7
626.2	772.3	666.0	666.0	784.4	789.8	795.2	800.6	806.0	811.4	816.8	822.2	827.6	833.0	837.1
739.6	942.1	741.9	741.9	99.4	198.8	298.2	397.6	497	596.4	695.8	795.2	894.6	994	939.6
17632.2	1320.7	1234.9	1234.9	810.5	810.1	809.7	809.3	808.9	808.5	808.1	807.7	807.3	806.9	788
48.3	64.5	53.5	53.5	0	0	0	0	0	0	0	0	0	0	0
578.9	602.9	536.1	536.1	369.6	370.6	371.6	372.6	373.6	374.6	375.6	376.6	377.6	378.6	378.8
708.5	570.8	289.8	289.8	63.6	63.2	62.8	62.4	62.0	61.6	61.2	60.8	60.4	60.0	59.6
1297.8	1529.5	1267.2	1267.2	336.4	491.9	647.4	802.9	958.4	1113.9	1269.5	1425	1580.5	1736	1743.8
4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1
10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8
6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6

Table C-1. Municipal Point Total Pumpage (ac-ft/yr)

2012 Total	2013 Total	2014 Total	2015 Total	2016 Total	2017 Total	2018 Total	2019 Total	2020 Total	2021 Total	2022 Total	2023 Total	2024 Total	2025 Total	2026 Total
2677.7	2684.9	2692.2	2699.5	2706.7	2714	2721.3	2728.5	2735.8	2741.6	2747.5	2753.3	2759.1	2765	2770.8
12211.8	12241.5	12271.1	12300.8	12330.5	12360.1	12389.8	12419.5	12449.1	12508.4	12567.7	12627	12686.3	12745.6	12804.9
45.8	45.2	44.6	44.0	43.4	42.8	42.2	41.6	41.0	40.3	39.6	38.9	38.2	37.5	36.8
1483.6	1488.9	1494.2	1499.5	1504.8	1510.1	1515.4	1520.7	1526.0	1528.4	1530.8	1533.2	1535.6	1538.0	1540.4
675.4	675.1	674.8	674.5	674.2	673.9	673.6	673.3	673	672.7	672.4	672.1	671.8	671.5	671.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
245.4	243.6	241.8	240	238.2	236.4	234.6	232.8	231	228.8	226.6	224.4	222.2	220	217.8
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3156.1	3091.3	3026.5	2961.7	2896.9	2832.1	2767.3	2702.5	2637.7	2375.8	2113.9	1851.9	1590	1328.1	1066.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
642.6	647.4	652.2	657.1	661.9	666.7	671.5	676.3	681.1	674.7	668.2	661.8	655.3	648.9	642.5
2612.4	2611.1	2609.8	2608.5	2607.2	2605.9	2604.6	2603.3	2602	2602.1	2602.2	2602.3	2602.4	2602.5	2602.6
1224.2	1233.3	1242.4	1251.5	1260.6	1269.7	1278.8	1287.9	1297	1296.9	1296.8	1296.7	1296.6	1296.5	1296.4
258	258	258	258	258	258	258	258	258	257.5	257	256.5	256	255.5	255
439.4	441.1	442.8	444.5	446.2	447.9	449.6	451.3	453	454	455	456	457	458	459
2552.8	2550.2	2547.6	2545	2542.4	2539.8	2537.2	2534.6	2532	2531.7	2531.4	2531.1	2530.8	2530.5	2530.2
1236.5	1241.2	1245.8	1250.5	1255.1	1259.8	1264.4	1269.0	1273.7	1285.4	1297.2	1309.0	1320.7	1332.5	1344.3
55.4	54.6	53.8	53	52.2	51.4	50.6	49.8	49	48.7	48.4	48.1	47.8	47.5	47.2
1100.2	1104.4	1108.5	1112.6	1116.8	1120.9	1125	1129.2	1133.3	1130.7	1128.1	1125.5	1122.9	1120.3	1117.7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61.6	61.5	61.5	61.4	61.3	61.2	61.1	61	60.9	60.9	60.9	60.9	60.9	60.9	60.9
841.2	845.3	849.4	853.5	857.6	861.7	865.8	869.9	874.0	877.5	881.0	884.5	888.0	891.5	895.0
885.2	830.9	776.5	722.1	667.7	613.3	559	504.6	450.2	405.2	360.2	315.1	270.1	225.1	180.1
769	750	731	712	693	674	655.1	636.1	617.1	642.5	668	693.4	718.9	744.4	769.8
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379	379.2	379.4	379.6	379.8	380	380.2	380.4	380.5	381.8	383	384.3	385.5	386.7	388
59.2	58.8	58.4	58.0	57.6	57.2	56.8	56.4	56.0	55.6	55.2	54.8	54.4	54.0	53.6
1751.6	1759.4	1767.2	1775	1782.8	1790.6	1798.4	1806.2	1814	1826.1	1838.2	1850.3	1862.4	1874.5	1886.6
4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1
10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8
6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6

Table C-1. Municipal Point Total Pumpage (ac-ft/yr)

2027 Total	2028 Total	2029 Total	2030 Total	2031 Total	2032 Total	2033 Total	2034 Total	2035 Total	2036 Total	2037 Total	2038 Total	2039 Total	2040 Total	2041 Total
2776.7	2782.5	2788.3	2794.2	2791.9	2789.6	2787.3	2785.1	2782.8	2780.5	2778.2	2775.9	2773.7	2771.4	2775.9
12864.2	12923.5	12982.8	13042.1	13073.1	13104.1	13135.1	13166.1	13197.1	13228.1	13259.1	13290.1	13321.1	13352.1	13423.1
36.1	35.4	34.7	34.0	33.4	32.8	32.2	31.6	31.0	30.4	29.8	29.2	28.6	28.0	27.7
1542.8	1545.2	1547.6	1550.0	1550.5	1551.0	1551.5	1552.0	1552.5	1553.0	1553.5	1554.0	1554.5	1555.0	1557.5
670.9	670.6	670.3	670	669.3	668.6	667.9	667.2	666.5	665.8	665.1	664.4	663.7	663	662
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
215.6	213.4	211.2	209	208.3	207.6	206.9	206.2	205.5	204.8	204.1	203.4	202.7	202	201.7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
804.2	542.3	280.3	18.4	17.4	16.5	15.5	14.6	13.6	12.6	11.7	10.7	9.8	8.8	9.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
636	629.6	623.1	616.7	610.2	603.8	597.4	591	584.6	578.1	571.7	565.3	558.9	552.4	548.5
2602.7	2602.8	2602.9	2603	2604.2	2605.4	2606.6	2607.8	2609	2610.2	2611.4	2612.6	2613.8	2615	2619.1
1296.3	1296.2	1296.1	1296	1295.8	1295.6	1295.4	1295.2	1295	1294.8	1294.6	1294.4	1294.2	1294	1296.3
254.5	254	253.5	253	252	251	250	249	248	247	246	245	244	243	242.4
460	461	462	463	463.2	463.4	463.6	463.8	464	464.2	464.4	464.6	464.8	465	465.8
2529.9	2529.6	2529.3	2529	2528.5	2528	2527.5	2527	2526.5	2526	2525.5	2525	2524.5	2524	2526.9
1356.0	1367.8	1379.5	1391.3	1393.9	1396.5	1399.1	1401.7	1404.3	1406.9	1409.5	1412.1	1414.7	1417.3	1421.9
46.9	46.6	46.3	46	45.7	45.4	45.1	44.8	44.5	44.2	43.9	43.6	43.3	43	42.9
1115.1	1112.5	1109.9	1107.3	1088.3	1069.4	1050.4	1031.5	1012.5	993.5	974.6	955.6	936.7	917.7	928.6
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60.9	60.9	60.9	60.9	60.5	60.2	59.8	59.5	59.1	58.7	58.4	58	57.6	57.3	51.5
898.5	902.0	905.5	909.0	913.1	917.2	921.3	925.4	929.5	933.6	937.7	941.8	945.9	950.0	955.3
135.1	90	45	0	0	0	0	0	0	0	0	0	0	0	0
795.3	820.7	846.2	871.6	861.4	851.1	840.9	830.7	820.4	810.2	799.9	789.7	779.4	769.2	754.6
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
389.2	390.4	391.7	392.9	394.4	395.8	397.3	398.8	400.2	401.7	403.2	404.6	406.1	407.5	409.8
53.2	52.8	52.4	52.0	51.5	51.0	50.5	50.0	49.5	49.0	48.5	48.0	47.5	47.0	46.7
1898.7	1910.8	1922.9	1935	1944.5	1954	1963.5	1973	1982.5	1992	2001.5	2011	2020.5	2030	2042.8
4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1
10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8
6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6

Table C-1. Municipal Point Total Pumpage (ac-ft/yr)

2042 Total	2043 Total	2044 Total	2045 Total	2046 Total	2047 Total	2048 Total	2049 Total	2050 Total
2780.5	2785.1	2789.6	2794.2	2798.8	2803.3	2807.9	2812.4	2817
13494	13565	13635.9	13706.9	13777.8	13848.8	13919.7	13990.7	14061.6
27.4	27.1	26.8	26.5	26.2	25.9	25.6	25.3	25.0
1560.0	1562.5	1565.0	1567.5	1570.0	1572.5	1575.0	1577.5	1580.0
661	660	659	658	657	656	655	654	653
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
201.4	201.1	200.8	200.5	200.2	199.9	199.6	199.3	199
0	0	0	0	0	0	0	0	0
10.4	11.2	12	12.8	13.6	14.4	15.1	15.9	16.7
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
544.6	540.7	536.7	532.8	528.9	525	521	517.1	513.2
2623.2	2627.3	2631.4	2635.5	2639.6	2643.7	2647.8	2651.9	2656
1298.6	1300.9	1303.2	1305.5	1307.8	1310.1	1312.4	1314.7	1317
241.8	241.2	240.6	240	239.4	238.8	238.2	237.6	237
466.6	467.4	468.2	469	469.8	470.6	471.4	472.2	473
2529.8	2532.7	2535.6	2538.5	2541.4	2544.3	2547.2	2550.1	2553
1426.6	1431.3	1436.0	1440.7	1445.4	1450.1	1454.8	1459.4	1464.1
42.8	42.7	42.6	42.5	42.4	42.3	42.2	42.1	42
939.4	950.3	961.1	972	982.8	993.7	1004.5	1015.4	1026.2
0	0	0	0	0	0	0	0	0
45.8	40.1	34.4	28.6	22.9	17.2	11.5	5.7	0
960.6	965.9	971.2	976.5	981.8	987.1	992.4	997.7	1003.0
0	0	0	0	0	0	0	0	0
740	725.4	710.8	696.2	681.6	667	652.4	637.8	623.2
0	0	0	0	0	0	0	0	0
412.1	414.4	416.7	419	421.2	423.5	425.8	428.1	430.4
46.4	46.1	45.8	45.5	45.2	44.9	44.6	44.3	44.0
2055.6	2068.4	2081.2	2094	2106.8	2119.6	2132.4	2145.2	2158
4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1	4960.1
10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8	10592.8
6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6	3483.6

Table C-1. County Other Total Pumpage (ac-ft/yr)

County	Basin	Total 1940	Total 1941	Total 1942	Total 1943	Total 1944	Total 1945	Total 1946	Total 1947	Total 1948	Total 1949	Total 1950	Total 1951
ANDREWS	COLORADO	2.2	2.6	3.2	4.0	5.2	6.9	9.2	12.6	17.2	23.8	33.2	39.7
BAILEY	BRAZOS	220.5	329.0	335.8	342.7	349.8	357.0	364.3	371.8	379.5	387.3	395.3	403.2
BORDEN	BRAZOS	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
BORDEN	COLORADO	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
BRISCOE	RED	215.1	270.7	267.2	263.8	260.4	257.1	253.8	250.5	247.3	244.2	241.1	241.4
CASTRO	BRAZOS	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
CASTRO	RED	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8
COCHRAN	BRAZOS	129.1	137.2	145.7	154.7	164.3	174.6	185.4	196.9	209.2	222.2	236.0	238.0
COCHRAN	COLORADO	14.4	15.3	16.3	17.3	18.3	19.5	20.7	22.0	23.4	24.8	26.4	26.6
CROSBY	BRAZOS	402.6	436.4	434.4	432.4	430.4	428.5	426.5	424.6	422.6	420.7	418.7	422.1
CROSBY	RED	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
CURRY		20.7	20.6	20.6	20.6	20.5	20.5	20.5	20.4	20.4	20.4	20.3	21.7
DAWSON	BRAZOS	114.0	113.4	112.9	112.3	111.7	111.2	110.7	110.2	109.7	109.2	108.7	108.6
DAWSON	COLORADO	82.7	483.1	495.2	507.5	520.2	533.1	546.4	560.1	574.0	588.3	603.0	603.2
DEAFSMITH	RED	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.5
FLOYD	BRAZOS	451.3	488.9	488.4	487.8	487.3	486.7	486.1	485.6	485.0	484.5	483.9	492.5
FLOYD	RED	53.2	53.1	53.0	53.0	52.9	52.8	52.7	52.7	52.6	52.5	52.5	53.4
GAINES	COLORADO	125.9	376.8	380.0	383.3	386.6	389.9	393.2	396.7	400.1	403.6	407.1	423.7
GARZA	BRAZOS	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
HALE	BRAZOS	493.3	681.9	717.7	755.5	795.2	837.0	880.9	927.2	976.0	1,027.3	1,081.3	1,115.2
HALE	RED	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
HOCKLEY	BRAZOS	279.2	297.4	316.9	337.6	359.7	383.3	408.4	435.2	463.8	494.3	526.8	532.6
HOCKLEY	COLORADO	25.2	26.9	28.6	30.4	32.4	34.5	36.7	39.0	41.6	44.2	47.1	47.5
HOWARD	COLORADO	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4
LAMB	BRAZOS	480.1	486.8	493.6	500.4	507.4	514.5	521.6	528.9	536.2	543.7	551.3	556.5
LEA		0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
LUBBOCK	BRAZOS	506.2	555.1	609.0	668.6	734.3	806.8	886.9	975.3	1,072.9	1,180.6	1,299.6	1,372.1
LYNN	BRAZOS	410.5	614.0	609.7	605.5	601.3	597.2	593.2	589.3	585.4	581.6	577.9	577.7
LYNN	COLORADO	5.2	5.2	5.2	5.1	5.1	5.1	5.0	5.0	4.9	4.9	4.9	4.9
MARTIN	COLORADO	307.7	464.8	464.6	464.5	464.4	464.3	464.2	464.1	464.0	463.9	463.8	459.9
MIDLAND	COLORADO	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0
OLDHAM	CANADIAN	172.2	175.8	179.6	183.4	187.2	191.2	195.2	199.4	203.6	207.9	212.3	215.6
OLDHAM	RED	2.7	2.7	2.8	2.8	2.9	3.0	3.0	3.1	3.2	3.2	3.3	3.3
PARMER	BRAZOS	73.8	106.1	106.0	105.9	105.8	105.7	105.7	105.6	105.5	105.4	105.3	112.5
PARMER	RED	62.4	114.6	114.4	114.2	114.0	113.8	113.6	113.4	113.2	113.0	112.8	120.7
POTTER	CANADIAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C-1. County Other Total Pumpage (ac-ft/yr)

Total 1952	Total 1953	Total 1954	Total 1955	Total 1956	Total 1957	Total 1958	Total 1959	Total 1960	Total 1961	Total 1962	Total 1963	Total 1964	Total 1965	Total 1966
47.5	56.9	68.3	81.9	98.3	118.0	141.7	170.2	204.6	200.0	195.6	191.2	187.0	182.8	178.7
411.4	419.6	428.1	436.7	445.5	454.5	463.6	472.9	482.5	479.3	476.1	473.0	469.9	466.8	463.7
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
241.7	242.1	242.5	242.8	243.2	243.5	243.9	244.2	244.6	239.3	234.2	229.2	224.3	219.5	214.8
0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
240.0	242.0	244.0	246.0	248.1	250.2	252.3	254.4	256.5	252.3	248.1	243.9	239.9	235.9	231.9
26.8	27.0	27.3	27.5	27.7	28.0	28.2	28.5	28.7	28.2	27.8	27.3	26.9	26.4	26.0
425.5	429.0	432.4	435.9	439.4	443.0	446.6	450.2	453.8	448.4	443.0	437.6	432.3	427.1	422.0
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
23.3	24.9	26.6	28.5	30.5	32.6	34.9	37.4	40.0	40.4	40.8	41.2	41.6	42.0	42.4
108.5	108.4	108.3	108.2	108.1	108.0	107.9	107.8	107.7	106.0	104.3	102.6	101.0	99.4	97.8
603.5	603.7	603.9	604.2	604.4	604.6	604.9	605.1	605.3	597.3	589.4	581.5	573.8	566.2	558.7
1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	1.9	2.0	2.0	2.0	2.1
501.2	510.1	519.2	528.4	537.7	547.3	557.0	566.8	576.9	570.8	564.7	558.7	552.8	547.0	541.2
54.3	55.2	56.2	57.2	58.2	59.2	60.2	61.3	62.3	61.7	61.0	60.3	59.7	59.0	58.4
441.0	459.0	477.9	497.5	518.0	539.4	561.7	585.1	609.4	606.0	602.6	599.2	595.9	592.5	589.2
0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
1,150.2	1,186.3	1,223.6	1,262.0	1,301.6	1,342.5	1,384.6	1,428.1	1,472.9	1,462.3	1,451.8	1,441.4	1,431.1	1,420.8	1,410.6
0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
538.6	544.6	550.8	557.1	563.5	570.1	576.7	583.5	590.4	586.0	581.7	577.3	573.1	568.9	564.7
48.0	48.5	48.9	49.4	49.9	50.4	50.8	51.3	51.8	51.4	50.9	50.5	50.1	49.6	49.2
1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
561.9	567.2	572.6	578.1	583.6	589.2	594.9	600.5	606.3	595.1	584.1	573.4	562.8	552.4	542.2
0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5
1,448.8	1,530.0	1,615.7	1,706.3	1,802.1	1,903.4	2,010.5	2,123.7	2,243.4	2,274.7	2,306.5	2,338.7	2,371.5	2,404.8	2,438.6
577.5	577.4	577.2	577.1	577.0	577.0	576.9	576.9	577.0	568.0	559.1	550.4	541.8	533.3	525.0
4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.8	4.7	4.6	4.6	4.5	4.4
456.0	452.2	448.4	444.6	440.8	437.1	433.5	429.8	426.2	423.8	421.3	418.9	416.4	414.0	411.6
1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
218.9	222.4	225.8	229.3	232.9	236.5	240.2	243.9	247.7	252.0	256.4	260.9	265.4	270.0	274.8
3.4	3.4	3.5	3.6	3.6	3.7	3.7	3.8	3.8	3.9	4.0	4.0	4.1	4.2	4.3
120.1	128.3	137.1	146.5	156.5	167.2	178.7	191.0	204.1	206.0	208.0	209.9	211.9	213.8	215.8
129.2	138.3	148.0	158.4	169.5	181.4	194.1	207.7	222.3	224.5	226.7	228.9	231.1	233.4	235.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C-1. County Other Total Pumpage (ac-ft/yr)

Total 1967	Total 1968	Total 1969	Total 1970	Total 1971	Total 1972	Total 1973	Total 1974	Total 1975	Total 1976	Total 1977	Total 1978	Total 1979	Total 1980	Total 1981
174.8	170.9	167.1	163.4	168.1	173.0	178.1	183.3	183.0	182.8	182.6	219.7	256.8	293.9	413.2
460.6	457.6	454.6	451.6	449.9	448.2	446.5	444.9	433.5	422.1	410.7	401.9	393.0	384.1	388.0
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.2	4.0	5.8	6.1
0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	21.5	42.5	63.5	64.0
210.3	205.8	201.4	197.1	195.6	194.1	192.6	191.1	193.8	196.5	199.1	198.9	198.6	198.3	191.2
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.3	100.4	200.6	300.7	314.1
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.0	0.9	77.9	155.0	232.0	256.3
228.1	224.3	220.6	216.9	214.9	212.9	210.9	209.0	193.3	177.6	162.0	156.7	151.5	146.2	162.5
25.6	25.1	24.7	24.3	24.1	23.9	23.7	23.5	21.8	20.1	18.4	47.6	76.8	105.9	108.6
416.9	411.9	406.9	402.0	401.0	400.0	399.0	398.0	381.2	364.4	347.6	337.1	326.7	316.2	315.3
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	1.8	3.2	4.6	4.8
42.8	43.2	43.6	44.0	44.3	44.5	44.7	44.9	44.6	44.3	43.9	29.5	15.1	0.6	0.6
96.2	94.7	93.2	91.7	91.2	90.7	90.2	89.8	87.7	85.7	83.6	84.7	85.8	86.9	102.8
551.3	544.0	536.7	529.6	528.3	526.9	525.6	524.3	523.7	523.1	522.5	513.5	504.5	495.6	498.7
2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	8.0	13.8	19.6	240.3	461.0	681.7	685.7
535.4	529.8	524.1	518.6	513.0	507.4	501.9	496.5	466.8	437.1	407.4	352.8	298.2	243.6	237.5
57.8	57.2	56.5	55.9	55.3	54.7	54.2	53.6	50.4	47.3	44.1	80.8	117.5	154.2	154.6
585.9	582.6	579.3	576.0	583.9	591.8	599.8	608.0	586.7	565.4	544.1	548.5	552.9	557.3	580.8
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	39.5	78.7	118.0	124.3
1,400.5	1,390.4	1,380.4	1,370.5	1,384.5	1,398.7	1,412.9	1,427.4	1,261.1	1,094.9	928.7	963.1	997.6	1,032.0	1,042.5
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	1.8	3.1	4.5	4.7
560.6	556.5	552.5	548.5	556.3	564.3	572.4	580.6	627.4	674.2	721.0	740.8	760.6	780.4	797.0
48.8	48.4	47.9	47.5	48.2	48.9	49.5	50.2	55.6	60.9	66.2	59.7	53.1	46.6	47.8
1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.1	1.0	0.9	276.0	551.0	826.1	855.5
532.2	522.4	512.8	503.4	505.9	508.5	511.1	513.6	343.1	172.6	2.1	253.5	505.0	756.4	762.0
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.7	0.7
2,472.9	2,507.7	2,543.1	2,579.0	2,625.4	2,672.7	2,720.8	2,769.7	1,975.9	1,182.0	388.1	1,142.0	1,895.8	2,649.7	2,769.9
516.9	508.9	501.0	493.3	490.9	488.5	486.2	483.8	467.7	451.5	435.4	436.9	438.4	439.9	533.0
4.3	4.3	4.2	4.1	4.1	4.1	4.1	4.0	3.9	3.8	3.7	8.5	13.2	18.0	16.8
409.2	406.9	404.5	402.2	401.4	400.7	399.9	399.2	361.6	324.1	286.5	285.3	284.0	282.7	290.5
1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	639.2	1,277.5	1,915.9	2,146.8
279.5	284.4	289.4	294.4	294.7	295.0	295.4	295.7	1,258.6	2,221.6	3,184.5	2,169.3	1,154.1	138.9	943.9
4.3	4.4	4.5	4.6	4.6	4.6	4.6	4.6	19.5	34.5	49.4	40.2	31.1	21.9	25.4
217.8	219.9	221.9	224.0	225.1	226.2	227.3	228.4	226.6	224.7	222.9	280.9	338.9	396.9	396.2
237.9	240.3	242.6	245.0	246.2	247.5	248.7	250.0	248.1	246.2	244.2	216.0	187.8	159.6	159.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	226.0	452.0	677.9	705.2

Table C-1. County Other Total Pumpage (ac-ft/yr)

Total 1982	Total 1983	Total 1984	Total 1985	Total 1986	Total 1987	Total 1988	Total 1989	Total 1990	Total 1991	Total 1992	Total 1993	Total 1994	Total 1995	Total 1996
532.5	651.8	771.1	735.0	622.7	590.6	534.5	594.8	634.8	715.9	699.9	718.0	756.5	790.9	885.0
392.0	395.9	399.8	405.7	430.2	424.4	388.1	336.0	345.9	322.4	318.3	325.0	320.3	321.4	311.3
6.4	6.8	7.1	6.7	6.6	6.6	6.5	5.5	5.5	7.0	6.9	6.8	6.6	11.1	10.2
64.5	65.1	65.6	70.6	61.4	69.7	60.5	52.9	55.3	64.5	61.8	60.2	53.9	52.0	50.2
184.1	176.9	169.8	175.8	220.9	219.0	259.1	184.3	187.4	181.0	169.2	182.9	181.9	182.9	157.6
327.6	341.0	354.5	346.1	340.4	370.8	364.3	299.2	266.8	252.7	288.9	288.3	279.6	270.2	261.8
280.6	304.8	329.1	313.8	254.4	255.4	264.5	221.2	218.9	210.1	196.6	211.4	208.2	207.4	226.2
178.8	195.1	211.4	179.6	160.5	163.5	138.1	168.5	180.3	172.0	173.8	164.1	172.2	198.6	194.8
111.3	114.0	116.6	119.5	115.6	115.6	101.2	122.3	119.5	123.3	122.5	119.4	126.1	102.1	103.8
314.4	313.6	312.7	282.3	251.1	250.8	261.7	219.5	219.4	232.0	219.7	218.4	217.8	227.5	230.0
4.9	5.1	5.2	4.6	4.6	4.6	4.6	3.9	3.3	5.0	5.0	4.4	4.3	2.9	2.9
0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.7	0.7	18.1	14.2	14.7	14.8	14.9	14.9
118.8	134.8	150.7	86.5	91.3	71.5	72.7	65.5	61.7	25.2	24.6	28.3	27.1	37.7	36.8
501.8	504.9	508.0	506.6	523.1	488.6	472.3	422.8	404.9	384.3	393.4	497.1	424.4	432.4	451.6
689.7	693.7	697.7	700.6	693.0	662.6	622.7	557.2	556.6	548.7	546.9	546.1	544.1	562.4	575.4
231.3	225.2	219.1	211.0	174.0	168.2	189.0	156.1	151.0	150.1	150.9	152.0	154.9	162.8	166.2
155.0	155.3	155.7	150.8	128.7	129.5	137.1	118.4	113.1	109.1	106.1	107.0	107.0	117.3	118.1
604.4	627.9	651.4	638.3	628.4	633.3	653.0	717.1	726.0	704.2	694.2	717.9	753.3	739.6	768.2
130.7	137.0	143.3	140.7	136.4	132.1	122.7	135.5	132.9	139.6	146.7	148.5	142.2	125.4	124.5
1,053.0	1,063.5	1,074.0	1,073.0	1,015.8	1,095.8	998.7	870.0	855.7	866.0	847.1	892.6	919.1	1,203.0	989.8
4.9	5.1	5.3	5.3	5.2	5.3	5.2	4.5	4.5	2.8	2.8	2.8	2.8	0.5	0.4
813.7	830.4	847.0	827.2	723.6	763.2	694.9	750.2	724.6	797.9	792.1	843.0	842.0	836.6	887.3
49.0	50.3	51.5	56.4	53.5	50.5	49.6	53.4	53.4	46.4	47.2	47.4	47.4	29.7	29.0
885.0	914.5	943.9	902.1	773.8	687.2	689.9	689.1	674.3	789.7	756.7	808.6	820.9	821.5	874.3
767.6	773.2	778.8	777.8	785.7	699.3	700.3	625.8	591.8	628.2	605.9	621.9	619.7	629.3	651.4
0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	8.6	8.4	8.5	8.8	8.5	8.7
2,890.2	3,010.4	3,130.6	2,776.7	3,004.8	3,005.8	2,682.8	2,724.1	2,903.0	2,765.7	2,943.3	2,969.3	3,050.4	3,500.9	3,937.3
626.0	719.1	812.2	435.6	458.2	336.2	357.4	330.0	314.4	348.3	335.6	345.5	355.6	364.5	365.0
15.5	14.3	13.0	12.1	11.4	12.8	12.1	8.4	6.9	9.0	11.5	12.4	12.4	10.7	10.7
298.2	306.0	313.7	317.5	302.7	294.1	302.5	299.7	296.8	280.1	286.0	322.1	316.8	321.6	317.6
2,377.6	2,608.5	2,839.3	2,834.3	2,132.5	1,598.1	2,124.3	2,645.4	2,694.2	2,472.6	2,686.7	2,703.1	2,646.4	2,712.2	2,770.1
1,748.9	2,553.9	3,358.9	3,342.2	2,339.9	2,166.0	2,460.9	2,444.0	2,439.9	1,853.5	595.9	530.6	454.3	416.2	410.0
28.8	32.3	35.7	41.9	38.8	38.6	41.7	43.7	41.6	570.8	212.8	194.1	172.4	166.7	164.9
395.6	394.9	394.3	399.3	391.6	396.7	477.8	438.1	474.9	457.2	355.0	365.7	369.3	371.0	370.8
159.1	158.9	158.7	185.5	172.6	183.5	151.7	137.7	137.8	132.0	132.7	132.7	131.8	123.9	123.9
732.5	759.8	787.0	900.0	785.1	919.4	801.5	801.0	859.4	773.7	832.6	828.5	908.9	1,037.5	1,074.2

Table C-1. County Other Total Pumpage (ac-ft/yr)

Total 1997	Total 1998	Total 1999	Total 2000	Total 2001	Total 2002	Total 2003	Total 2004	Total 2005	Total 2006	Total 2007	Total 2008	Total 2009	Total 2010	Total 2011
822.9	830.6	838.3	846.1	282.3	274.7	267.1	259.5	251.9	244.2	236.6	229.0	221.4	213.8	213.8
307.2	308.3	309.3	310.4	61.5	58.0	54.5	51.1	47.6	44.1	40.6	37.1	33.6	30.1	30.1
10.2	10.2	10.2	10.2	538.5	563.9	589.4	614.8	640.3	665.7	691.2	716.6	742.1	767.5	773.9
52.1	52.1	52.2	52.2	1,524.6	1,493.4	1,462.3	1,431.1	1,400.0	1,368.8	1,337.6	1,306.5	1,275.3	1,244.1	1,264.1
74.3	74.3	74.4	74.4	1.4	1.9	2.3	2.8	3.2	3.7	4.1	4.6	5.0	5.4	5.4
266.0	268.5	271.0	273.5	24.9	22.7	20.6	18.5	16.3	14.2	12.1	9.9	7.8	5.7	5.7
200.0	201.9	203.8	205.7	161	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0
94.8	95.5	96.3	97.1	3869.5	3,761.1	3,652.6	3,544.1	3,435.6	3,327.1	3,218.7	3,110.2	3,001.7	2,893.2	2,939.7
85.5	86.2	86.9	87.6	3637.9	3,618.8	3,599.8	3,580.7	3,561.7	3,542.7	3,523.6	3,504.6	3,485.5	3,466.5	3,522.2
219.4	219.8	220.2	220.6	372.1	502.3	632.4	762.5	892.6	1,022.7	1,152.9	1,283.0	1,413.1	1,543.2	1,568.0
2.9	2.9	2.9	2.9	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1
14.7	14.8	14.9	15.0	162	162	162	162	162	162	162	162	162	162	162
33.8	34.0	34.1	34.3	7	7	7	7	7	7	7	7	7	7	7
574.4	576.9	579.5	582.1	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9
578.7	584.8	591.0	597.2	4	4	4	4	4	4	4	4	4	4	4
157.6	158.1	158.6	159.2	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1
114.4	114.8	115.1	115.5	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0
759.3	765.6	771.9	778.3	16842.4	17154.5	17466.7	17778.8	18090.9	18403	18715.1	19027.3	19339.4	19651.5	19967.3
60.5	60.6	60.8	61.0	15	15	15	15	15	15	15	15	15	15	15
1,081.0	1,088.4	1,095.9	1,103.5	10	10	10	10	10	10	10	10	10	10	10
0.4	0.4	0.4	0.4	194	194	194	194	194	194	194	194	194	194	194
881.0	888.8	896.7	904.7	490.6	495.2	499.8	504.4	509.0	513.6	518.2	522.9	527.5	532.1	540.6
29.0	29.3	29.6	29.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8
821.5	826.5	831.5	836.6	1425.2	1344.8	1264.5	1184.1	1103.7	1023.3	943	862.6	782.2	701.9	713.1
529.3	531.5	533.6	535.8	44	44	44	44	44	44	44	44	44	44	44
8.5	8.6	8.6	8.7	141.8	129.6	117.4	105.2	93	80.8	68.6	56.4	44.2	32.1	32.1
3,364.4	3,392.3	3,420.5	3,448.9	2,193.7	2,289.5	2,385.3	2,481.1	2,576.8	2,672.6	2,768.4	2,864.2	2,960.0	3,055.8	3,104.9
277.4	278.6	279.8	281.0	355.3	336.7	318.1	299.5	280.9	262.2	243.6	225	206.4	187.8	190.8
10.6	10.6	10.7	10.7	60	60	60	60	60	60	60	60	60	60	60
379.1	381.9	384.7	387.6	311	329	347	365	383	401	419	437	455	473	473
2,809.2	2,858.1	2,907.8	2,958.4	3794.5	4626.5	5458.6	6290.6	7122.7	7954.7	8786.7	9618.8	10450.8	11282.9	11463.7
325.4	327.0	328.5	330.1	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5
178.5	179.4	180.3	181.1	1,971.2	1,954.2	1,937.1	1,920.1	1,903.0	1,886.0	1,868.9	1,851.9	1,834.9	1,817.8	1,847.0
366.8	369.7	372.5	375.3	132	132	132	132	132	132	132	132	132	132	132
120.9	121.9	122.8	123.8	10	10	10	10	10	10	10	10	10	10	10
1,059.7	1,074.8	1,090.1	1,105.6	232	242.1	252.1	262.2	272.2	282.2	292.3	302.3	312.4	322.4	322.4

Table C-1. County Other Total Pumpage (ac-ft/yr)

Total 2012	Total 2013	Total 2014	Total 2015	Total 2016	Total 2017	Total 2018	Total 2019	Total 2020	Total 2021	Total 2022	Total 2023	Total 2024	Total 2025	Total 2026
213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8
30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
780.2	786.5	792.9	799.2	805.5	811.9	818.2	824.5	830.9	837.3	843.7	850.1	856.5	862.9	869.3
1,284.0	1,303.9	1,323.8	1,343.7	1,363.6	1,383.5	1,403.4	1,423.4	1,443.3	1,458.3	1,473.4	1,488.5	1,503.6	1,518.6	1,533.7
5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0
2,986.2	3,032.7	3,079.2	3,125.6	3,172.1	3,218.6	3,265.1	3,311.6	3,358.0	3,393.1	3,428.2	3,463.3	3,498.4	3,533.5	3,568.6
3,577.8	3,633.4	3,689.1	3,744.7	3,800.4	3,856.0	3,911.7	3,967.3	4,023.0	4,065.0	4,107.1	4,149.2	4,191.3	4,233.3	4,275.4
1,592.9	1,617.7	1,642.5	1,667.3	1,692.1	1,716.9	1,741.7	1,766.5	1,791.3	1,810.0	1,828.8	1,847.5	1,866.2	1,884.9	1,903.6
440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1
162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1
962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0
20283	20598.8	20914.6	21230.3	21546.1	21861.9	22177.7	22493.4	22809.2	23047.8	23286.4	23525.1	23763.7	24002.3	24241
15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
194	194	194	194	194	194	194	194	194	194	194	194	194	194	194
549.1	557.6	566.1	574.5	583.0	591.5	600.0	608.5	617.0	623.4	629.8	636.1	642.5	648.9	655.2
1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8
724.3	735.5	746.7	757.9	769.1	780.3	791.5	802.7	813.9	822.5	831	839.6	848.1	856.7	865.2
44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
3,154.0	3,203.1	3,252.2	3,301.4	3,350.5	3,399.6	3,448.7	3,497.9	3,547.0	3,584.0	3,621.0	3,658.1	3,695.1	3,732.1	3,769.1
193.9	196.9	200	203	206.1	209.1	212.2	215.3	218.3	220.6	222.8	225	227.3	229.5	231.8
60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
473	473	473	473	473	473	473	473	473	473	473	473	473	473	473
11644.6	11825.5	12006.3	12187.2	12368.1	12548.9	12729.8	12910.7	13091.5	13228.2	13365	13501.7	13638.4	13775.1	13911.8
1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5
1,876.1	1,905.3	1,934.4	1,963.6	1,992.7	2,021.9	2,051.0	2,080.2	2,109.3	2,131.4	2,153.5	2,175.6	2,197.7	2,219.8	2,241.9
132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4

Table C-1. County Other Total Pumpage (ac-ft/yr)

Total 2027	Total 2028	Total 2029	Total 2030	Total 2031	Total 2032	Total 2033	Total 2034	Total 2035	Total 2036	Total 2037	Total 2038	Total 2039	Total 2040	Total 2041
213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8
30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
875.7	882.1	888.5	894.9	901.9	908.9	915.9	922.9	929.9	936.8	943.8	950.8	957.8	964.8	972.6
1,548.8	1,563.8	1,578.9	1,594.0	1,610.7	1,627.3	1,644.0	1,660.7	1,677.4	1,694.1	1,710.8	1,727.4	1,744.1	1,760.8	1,779.3
5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0
3,603.7	3,638.8	3,673.9	3,709.0	3,747.9	3,786.8	3,825.7	3,864.6	3,903.5	3,942.4	3,981.3	4,020.2	4,059.1	4,098.0	4,140.7
4,317.5	4,359.5	4,401.6	4,443.7	4,490.2	4,536.7	4,583.3	4,629.8	4,676.3	4,722.9	4,769.4	4,816.0	4,862.5	4,909.0	4,960.4
1,922.3	1,941.0	1,959.7	1,978.5	1,999.1	2,019.7	2,040.3	2,060.9	2,081.5	2,102.1	2,122.7	2,143.3	2,163.9	2,184.5	2,207.4
440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1
162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1
962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0
24479.6	24718.2	24956.9	25195.5	25458.7	25721.9	25985	26248.2	26511.4	26774.6	27037.7	27300.9	27564.1	27827.2	28118.3
15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
194	194	194	194	194	194	194	194	194	194	194	194	194	194	194
661.6	668.0	674.3	680.7	688.0	695.3	702.5	709.8	717.1	724.3	731.6	738.9	746.1	753.4	761.2
1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8
873.8	882.3	890.9	899.4	908.9	918.3	927.8	937.2	946.6	956.1	965.5	974.9	984.4	993.8	1004.1
44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
3,806.1	3,843.2	3,880.2	3,917.2	3,958.2	3,999.2	4,040.2	4,081.2	4,122.2	4,163.2	4,204.2	4,245.2	4,286.2	4,327.2	4,372.5
234	236.3	238.5	240.8	243.3	245.8	248.4	250.9	253.4	256	258.5	261	263.6	266.1	268.9
60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
473	473	473	473	473	473	473	473	473	473	473	473	473	473	473
14048.5	14185.2	14322	14458.7	14610.3	14761.9	14913.5	15065.1	15216.7	15368.3	15519.9	15671.5	15823.2	15974.8	16141.8
1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5
2,264.0	2,286.1	2,308.2	2,330.3	2,354.6	2,378.9	2,403.3	2,427.6	2,451.9	2,476.2	2,500.6	2,524.9	2,549.2	2,573.5	2,600.4
132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4

Table C-1. County Other Total Pumpage (ac-ft/yr)

Total 2042	Total 2043	Total 2044	Total 2045	Total 2046	Total 2047	Total 2048	Total 2049	Total 2050
213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8	213.8
30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
980.5	988.3	996.1	1,003.9	1,011.8	1,019.6	1,027.4	1,035.2	1,043.0
1,797.8	1,816.2	1,834.7	1,853.2	1,871.7	1,890.2	1,908.6	1,927.1	1,945.6
5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0	161.0
4,183.5	4,226.3	4,269.1	4,311.9	4,354.7	4,397.5	4,440.3	4,483.1	4,525.9
5,011.7	5,063.1	5,114.5	5,165.8	5,217.2	5,268.5	5,319.9	5,371.3	5,422.6
2,230.3	2,253.2	2,276.2	2,299.1	2,322.0	2,344.9	2,367.8	2,390.8	2,413.7
440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1
162	162	162	162	162	162	162	162	162
7	7	7	7	7	7	7	7	7
2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9
4	4	4	4	4	4	4	4	4
186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1	186.1
962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0
28409.3	28700.3	28991.3	29282.3	29573.4	29864.4	30155.4	30446.4	30737.4
15	15	15	15	15	15	15	15	15
10	10	10	10	10	10	10	10	10
194	194	194	194	194	194	194	194	194
769.0	776.9	784.7	792.5	800.3	808.2	816.0	823.8	831.6
1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8	1032.8
1014.5	1024.8	1035.1	1045.4	1055.7	1066.1	1076.4	1086.7	1097
44	44	44	44	44	44	44	44	44
32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
4,417.8	4,463.2	4,508.5	4,553.8	4,599.2	4,644.5	4,689.8	4,735.2	4,780.5
271.6	274.4	277.2	279.9	282.7	285.5	288.2	291	293.8
60	60	60	60	60	60	60	60	60
473	473	473	473	473	473	473	473	473
16308.8	16475.9	16642.9	16809.9	16977	17144	17311	17478.1	17645.1
1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5	1347.5
2,627.4	2,654.3	2,681.2	2,708.1	2,735.1	2,762.0	2,788.9	2,815.8	2,842.8
132	132	132	132	132	132	132	132	132
10	10	10	10	10	10	10	10	10
322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4	322.4

Table C-1. Manufacturing Point Total Pumpage (ac-ft/yr)

County	Basin	Total 1940	Total 1941	Total 1942	Total 1943	Total 1944	Total 1945	Total 1946	Total 1947	Total 1948	Total 1949	Total 1950	Total 1951	Total 1952
ANDREWS	Colorado	320.7	330.3	340.3	350.5	361.0	371.9	383.0	394.5	406.4	418.6	431.2	438.6	446.1
CASTRO	Brazos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAWSON	Colorado	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEAFSMITH	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GAINES	Colorado	32.1	32.1	32.1	32.2	32.2	32.2	32.3	32.3	32.3	32.3	32.4	32.5	32.6
HALE	Brazos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOCKLEY	Brazos	191.2	192.4	193.6	194.8	196.0	197.2	198.4	199.6	200.8	202.0	203.3	203.5	203.6
LAMB	Brazos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LUBBOCK	Brazos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TERRY	Colorado	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YOAKUM	Colorado	3,633.4	3,626.5	3,619.6	3,612.8	3,605.9	3,599.1	3,592.3	3,585.5	3,578.7	3,572.0	3,565.2	3,595.8	3,626.7

Table C-1. Manufacturing Point Total Pumpage (ac-ft/yr)

Total 1953	Total 1954	Total 1955	Total 1956	Total 1957	Total 1958	Total 1959	Total 1960	Total 1961	Total 1962	Total 1963	Total 1964	Total 1965	Total 1966	Total 1967
453.8	461.6	461.0	426.6	375.9	476.5	440.1	537.4	0.0	622.9	614.1	636.9	664.8	659.4	669.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	636.4	477.0	512.2	469.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,377.0	2,253.8	2,336.7
32.7	32.9	33.0	33.6	33.6	36.8	33.6	63.5	7.4	7.8	7.5	340.0	423.0	738.5	696.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,590.3	1,590.9	53.8
203.8	204.0	203.8	185.5	200.0	198.3	194.3	178.4	235.6	236.7	255.6	282.6	758.7	289.1	274.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	41.1	1,332.4	1,335.2	8,626.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	322.6	161.3	161.3	161.3	161.3	160.9
3,657.8	3,689.2	3,688.8	4,642.5	5,063.6	4,871.4	6,368.9	5,921.3	6,149.0	6,485.1	6,045.8	6,793.7	6,368.1	7,037.1	6,541.4

Table C-1. Manufacturing Point Total Pumpage (ac-ft/yr)

Total 1968	Total 1969	Total 1970	Total 1971	Total 1972	Total 1973	Total 1974	Total 1975	Total 1976	Total 1977	Total 1978	Total 1979	Total 1980	Total 1981	Total 1982
601.5	566.2	560.4	516.7	463.3	475.5	391.0	390.4	184.9	169.3	130.4	129.0	127.9	243.9	234.6
493.7	364.6	0.0	448.1	926.8	987.3	991.2	1,188.3	1,780.8	2,344.9	851.7	967.2	935.6	996.7	1,112.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2,150.4	2,212.2	6,578.8	9,792.7	10,297.5	8,492.2	10,080.7	6,951.6	8,463.2	8,421.1	6,181.0	5,521.5	5,259.2	7,180.4	8,012.2
907.2	641.3	867.5	896.0	891.1	735.3	779.0	740.9	789.7	364.9	479.1	652.8	692.4	2,396.9	2,461.8
674.2	3,526.5	3,081.1	4,476.4	5,473.2	5,315.3	5,785.4	6,090.9	6,453.6	6,515.6	6,548.1	6,836.7	6,766.9	5,939.1	5,964.2
289.7	370.9	366.1	396.8	851.2	288.1	285.7	270.7	265.5	201.7	190.8	195.0	193.3	187.2	199.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	157.6	132.1	133.3
1,400.0	1,856.5	2,213.4	1,324.0	1,305.3	1,623.9	1,147.8	1,560.5	1,526.1	1,545.4	1,888.3	1,927.4	1,551.7	1,407.0	1,692.4
161.3	164.4	161.9	282.3	193.6	193.6	193.6	159.1	161.3	143.8	160.9	160.9	160.9	160.8	161.3
6,848.6	7,076.6	6,393.8	7,081.3	7,349.0	7,174.0	8,317.4	5,122.7	5,192.4	5,664.3	5,521.5	4,515.5	4,811.4	4,460.3	4,601.7

Table C-1. Manufacturing Point Total Pumpage (ac-ft/yr)

Total 1983	Total 1984	Total 1985	Total 1986	Total 1987	Total 1988	Total 1989	Total 1990	Total 1991	Total 1992	Total 1993	Total 1994	Total 1995	Total 1996	Total 1997
241.3	249.6	337.7	343.9	335.1	445.2	398.0	251.7	250.2	249.4	249.9	249.3	249.3	229.6	24.5
716.8	967.3	1,041.0	912.2	464.8	258.9	673.9	1,741.9	995.7	1,018.9	675.5	426.0	351.1	475.1	171.1
0.0	0.0	34.0	20.6	36.9	25.5	20.0	44.4	23.2	23.2	30.0	39.1	26.9	26.7	30.0
8,482.3	10,088.7	9,983.3	6,081.5	3,682.1	3,936.3	3,253.2	3,558.9	4,040.7	4,732.0	4,439.8	4,291.6	4,583.3	3,834.1	4,366.9
2,692.5	766.3	738.2	599.7	454.2	525.2	652.1	1,255.0	580.3	628.1	1,388.1	987.5	752.5	839.5	733.1
6,265.7	6,211.8	5,979.1	5,508.1	5,422.9	5,583.8	6,151.6	5,934.7	6,235.6	6,052.9	6,443.3	6,543.7	6,987.7	7,994.5	8,912.1
186.9	124.3	65.2	60.3	70.2	76.9	52.3	6.5	23.9	25.0	51.7	62.8	26.5	12.6	13.1
143.0	156.2	120.6	126.3	123.8	97.3	25.9	13.6	14.4	4.9	7.6	7.9	2.5	2.2	0.9
1,202.3	2,025.5	2,983.2	2,478.6	1,451.2	2,898.9	1,584.8	1,495.5	1,474.9	1,498.6	1,042.1	2,436.1	1,294.1	2,795.5	2,043.6
162.4	162.4	112.9	58.9	40.4	15.9	0.0	0.0	0.0	0.0	2.7	6.8	4.8	4.5	5.5
3,960.2	4,309.3	1,327.1	183.4	310.0	244.2	477.0	1,926.3	726.6	753.2	1,475.3	2,537.4	2,228.0	2,945.8	2,209.1

Table C-1. Manufacturing Point Total Pumpage (ac-ft/yr)

Total 1998	Total 1999	Total 2000	Total 2001	Total 2002	Total 2003	Total 2004	Total 2005	Total 2006	Total 2007	Total 2008	Total 2009	Total 2010	Total 2011	Total 2012
0.1	0.1	0.1	9.8	9.6	9.5	9.4	9.2	9.1	8.9	8.8	8.6	8.5	8.4	8.3
190.6	187.0	187.0	2120.3	2153.7	2187.1	2220.5	2253.9	2287.3	2320.7	2354.1	2387.5	2420.9	2451.1	2481.3
20.8	12.5	12.5	884.1	868.1	852.2	836.2	820.2	804.3	788.3	772.4	756.4	740.5	727.4	714.3
3,682.1	5,771.9	5,771.9	546.0	549.9	553.8	557.7	561.6	565.5	569.4	573.3	577.2	581.1	584.2	587.3
654.9	856.7	856.7	9377.9	9219.8	9061.8	8903.7	8745.6	8587.6	8429.5	8271.5	8113.4	7955.3	7808.3	7661.2
6,237.2	8,780.0	8,780.0	2016.1	2022.4	2028.7	2035.0	2041.3	2047.6	2053.9	2060.2	2066.5	2072.8	2080.2	2087.7
7.9	7.9	7.9	135.4	133.5	131.6	129.7	127.8	126.0	124.1	122.2	120.3	118.4	116.6	114.8
1.2	0.9	0.9	16780.5	16772.7	16765.0	16757.2	16749.5	16741.7	16734.0	16726.2	16718.5	16710.7	17327.8	17944.8
1,242.4	1,138.0	1,138.0	2054.8	2081.7	2108.5	2135.4	2162.3	2189.2	2216.1	2243.0	2269.8	2296.7	2293.8	2290.9
4.1	3.7	3.7	271.3	266.2	261.2	256.1	251.1	246.0	241.0	235.9	230.9	225.8	221.7	217.6
2,819.2	2,819.2	2,819.2	9364.4	9230.9	9097.4	8963.9	8830.4	8696.9	8563.4	8429.9	8296.5	8163.0	8053.9	7944.8

Table C-1. Manufacturing Point Total Pumpage (ac-ft/yr)

Total 2013	Total 2014	Total 2015	Total 2016	Total 2017	Total 2018	Total 2019	Total 2020	Total 2021	Total 2022	Total 2023	Total 2024	Total 2025	Total 2026	Total 2027
8.3	8.2	8.1	8.1	8.0	7.9	7.9	7.8	7.8	7.8	7.7	7.7	7.7	7.7	7.6
2511.5	2541.7	2571.9	2602.1	2632.3	2662.5	2692.7	2722.9	2750.0	2777.1	2804.2	2831.3	2858.4	2885.5	2912.6
701.3	688.2	675.2	662.1	649.0	636.0	622.9	609.8	599.1	588.4	577.7	567.0	556.3	545.6	534.9
590.4	593.5	596.6	599.7	602.8	605.9	609.0	612.1	614.6	617.1	619.6	622.1	624.6	627.1	629.6
7514.1	7367.0	7220.0	7072.9	6925.8	6778.7	6631.6	6484.6	6394.6	6304.7	6214.8	6124.8	6034.9	5944.9	5855.0
2095.2	2102.7	2110.2	2117.7	2125.2	2132.7	2140.1	2147.6	2155.5	2163.4	2171.3	2179.2	2187.1	2195.0	2202.9
113.0	111.2	109.5	107.7	105.9	104.1	102.3	100.5	99.0	97.5	96.0	94.6	93.1	91.6	90.1
18561.9	19178.9	19796.0	20413.0	21030.1	21647.2	22264.2	22881.3	22881.0	22880.7	22880.5	22880.2	22879.9	22879.7	22879.4
2287.9	2285.0	2282.1	2279.2	2276.3	2273.3	2270.4	2267.5	2274.0	2280.5	2287.0	2293.5	2300.0	2306.5	2313.0
213.4	209.3	205.2	201.0	196.9	192.8	188.6	184.5	181.1	177.8	174.4	171.0	167.6	164.3	160.9
7835.7	7726.6	7617.5	7508.4	7399.3	7290.2	7181.1	7072.0	6982.9	6893.8	6804.7	6715.6	6626.5	6537.4	6448.3

Table C-1. Manufacturing Point Total Pumpage (ac-ft/yr)

Total 2028	Total 2029	Total 2030	Total 2031	Total 2032	Total 2033	Total 2034	Total 2035	Total 2036	Total 2037	Total 2038	Total 2039	Total 2040	Total 2041	Total 2042
7.6	7.6	7.6	7.6	7.6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.4	7.4	7.4
2939.7	2966.8	2993.9	3035.6	3077.3	3119.0	3160.7	3202.4	3244.1	3285.8	3327.5	3369.1	3410.8	3452.1	3493.4
524.2	513.5	502.8	494.1	485.5	476.9	468.3	459.7	451.0	442.4	433.8	425.2	416.5	409.5	402.4
632.1	634.6	637.1	642.3	647.5	652.7	658.0	663.2	668.4	673.6	678.8	684.0	689.3	693.0	696.7
5765.1	5675.1	5585.2	5501.3	5417.4	5333.5	5249.6	5165.7	5081.8	4997.9	4914.0	4830.1	4746.2	4678.4	4610.5
2210.7	2218.6	2226.5	2243.8	2261.1	2278.3	2295.6	2312.9	2330.2	2347.4	2364.7	2382.0	2399.2	2546.1	2693.0
88.6	87.1	85.7	84.5	83.3	82.1	80.9	79.7	78.5	77.3	76.1	74.9	73.8	72.7	71.6
22879.1	22878.9	22878.6	22878.4	22878.2	22878.1	22877.9	22877.7	22877.5	22877.3	22877.2	22877.0	22876.8	23322.4	23768.0
2319.5	2326.1	2332.6	2360.7	2388.8	2416.9	2445.0	2473.1	2501.2	2529.3	2557.4	2585.5	2613.6	2643.3	2672.9
157.5	154.2	150.8	148.0	145.2	142.5	139.7	136.9	134.2	131.4	128.6	125.9	123.1	120.8	118.6
6359.2	6270.1	6181.0	6108.2	6035.4	5962.6	5889.8	5817.0	5744.2	5671.4	5598.6	5525.8	5453.0	5393.5	5334.0

Table C-1. Manufacturing Point Total Pumpage (ac-ft/yr)

Total 2043	Total 2044	Total 2045	Total 2046	Total 2047	Total 2048	Total 2049	Total 2050
7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
3534.7	3576.0	3617.3	3658.6	3699.9	3741.2	3782.5	3823.8
395.3	388.3	381.2	374.1	367.1	360.0	352.9	345.9
700.5	704.2	708.0	711.7	715.4	719.2	722.9	726.7
4542.7	4474.9	4407.1	4339.3	4271.4	4203.6	4135.8	4068.0
2839.9	2986.7	3133.6	3280.5	3427.3	3574.2	3721.1	3867.9
70.5	69.4	68.3	67.2	66.1	65.0	63.9	62.8
24213.6	24659.2	25104.8	25550.4	25996.0	26441.6	26887.2	27332.8
2702.5	2732.1	2761.7	2791.3	2821.0	2850.6	2880.2	2909.8
116.4	114.1	111.9	109.7	107.4	105.2	103.0	100.7
5274.5	5215.0	5155.5	5096.0	5036.5	4977.0	4917.5	4858.0

Table C-1. Manufacturing NonPoint Total Pumpage (ac-ft/yr)

County	Basin	Total 1940	Total 1941	Total 1942	Total 1943	Total 1944	Total 1945	Total 1946	Total 1947	Total 1948	Total 1949	Total 1950	Total 1951	Total 1952
ANDREWS	COLORADO	9.6	13.5	19.1	26.9	38.0	53.6	75.7	106.9	150.9	213.1	300.9	362.0	435.6
ARMSTRONG	RED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAILEY	BRAZOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BORDEN	COLORADO	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
CASTRO	BRAZOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CASTRO	RED	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.8	6.0	6.4	6.8
COCHRAN	BRAZOS	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
COCHRAN	COLORADO	8.1	8.7	9.2	9.8	10.4	11.0	11.7	12.4	13.2	14.0	14.9	15.0	15.2
CROSBY	BRAZOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAWSON	BRAZOS	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DAWSON	COLORADO	17.2	17.2	17.6	17.6	18.1	18.1	18.5	18.5	19.0	19.0	19.5	19.5	19.5
DEAF SMITH	RED	12.0	12.6	12.7	13.3	13.4	14.0	14.1	14.7	14.8	15.5	15.6	16.3	17.1
ECTOR	COLORADO	196.1	239.0	291.4	355.3	433.1	528.0	643.7	784.7	956.7	1166.3	1421.8	1608.7	1820.0
FLOYD	BRAZOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GAINES	COLORADO	1870.6	1888.5	1906.6	1924.9	1943.4	1962.0	1980.8	1999.8	2019.0	2038.4	2057.9	2138.5	2222.3
GARZA	BRAZOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GLASSCOCK	COLORADO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HALE	BRAZOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOCKLEY	BRAZOS	4.2	4.5	4.8	5.1	5.4	5.8	6.2	6.6	7.0	7.4	7.9	8.0	8.1
HOWARD	COLORADO	10.5	10.8	11.1	11.4	11.7	12.1	12.4	12.8	13.1	13.5	13.9	14.6	15.4
LAMB	BRAZOS	14.0	14.2	14.4	14.6	14.8	15.0	15.2	15.4	15.6	15.8	16.1	16.2	16.4
LEA		8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.8	9.9	10.0	10.4	10.8
LUBBOCK	BRAZOS	51.0	56.3	62.2	68.8	76.0	84.0	92.8	102.6	113.4	125.3	138.5	146.5	155.0
LYNN	BRAZOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MARTIN	COLORADO	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6
MIDLAND	COLORADO	70.8	80.5	91.5	103.9	118.1	134.2	152.5	173.3	196.9	223.8	254.3	303.6	362.6
OLDHAM	CANADIAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OLDHAM	RED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PARMER	RED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POTTER	CANADIAN	111.5	115.5	119.7	124.1	128.6	133.3	138.2	143.2	148.5	153.9	159.5	169.2	179.5
POTTER	RED	37.2	38.6	40.0	41.4	42.9	44.5	46.1	47.8	49.5	51.3	53.2	56.5	59.9
RANDALL	RED	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	1.0
SWISHER	BRAZOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SWISHER	RED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TERRY	COLORADO	656.1	667.8	679.6	691.7	704.0	716.5	729.2	742.1	755.3	768.7	782.4	801.8	821.8
YOAKUM	COLORADO	56.8	55.8	54.7	53.7	52.7	51.7	50.8	49.8	48.9	48.0	47.1	51.5	56.3

Table C-1. Manufacturing NonPoint Total Pumpage (ac-ft/yr)

Total 1953	Total 1954	Total 1955	Total 1956	Total 1957	Total 1958	Total 1959	Total 1960	Total 1961	Total 1962	Total 1963	Total 1964	Total 1965	Total 1966	Total 1967
524.1	630.6	758.7	963.9	1052.5	1053.0	1197.9	1127.9	1059.9	1029.3	1019.3	1111.0	820.5	745.6	785.9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
7.3	7.8	8.3	8.3	8.3	8.3	8.3	8.3	0.9	0.0	0.0	0.0	0.0	0.0	0.3
0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
15.3	15.4	15.6	14.4	14.4	14.4	14.4	14.4	14.6	14.3	14.9	13.9	13.9	13.9	13.9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.3	19.0	18.8	21.1	20.2	20.0	20.0
17.9	18.7	19.6	20.5	21.5	22.5	23.5	24.6	25.8	27.0	28.2	29.5	30.9	32.3	33.8
2059.1	2329.7	2635.8	2762.9	3123.1	3109.4	3374.9	3386.6	3964.2	3864.4	4053.0	4307.9	4559.0	4835.2	4903.9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.6	4.0
2309.3	2399.8	2493.8	2584.3	2355.6	1627.8	1277.8	1151.6	1344.7	1253.6	1298.0	1342.7	1363.0	1283.7	2238.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	0.3	0.4	0.4	0.0
0.0	0.0	66.0	68.1	70.3	72.5	74.7	77.1	10.9	22.7	109.2	26.8	26.8	26.8	26.8
8.2	8.2	8.3	8.3	8.3	8.3	8.3	8.3	0.9	154.3	231.1	463.9	501.0	501.0	159.0
16.2	17.0	17.9	22.4	22.4	18.3	14.2	10.0	5.9	1.8	1.8	1.7	1.7	1.7	1.6
16.5	16.7	16.8	15.6	15.6	15.6	15.6	15.6	8.3	8.4	7.8	7.1	9.9	8.0	23.3
11.2	11.6	12.0	12.4	11.4	8.0	6.4	5.8	6.7	6.3	6.5	6.7	6.8	6.5	11.2
163.9	173.4	183.4	209.2	233.7	230.6	216.2	217.1	165.9	184.5	174.6	161.4	219.5	193.1	154.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.6	0.6	0.6	0.7	0.6	0.6	0.7	0.5	0.6	0.6	0.7	0.8	0.6	0.5	0.6
433.0	517.1	617.6	666.4	562.9	619.4	697.6	511.4	609.8	604.7	501.9	520.5	326.9	316.7	361.5
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190.5	202.1	214.5	283.4	331.7	382.9	406.0	512.9	560.2	559.7	632.1	742.5	684.1	722.9	760.3
63.6	67.5	71.6	94.6	110.7	127.8	135.5	171.1	187.0	186.8	211.0	247.8	228.3	241.3	253.7
1.2	1.4	1.6	1.6	0.9	0.9	0.9	0.9	7.8	7.8	7.8	8.4	10.2	10.0	9.9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
842.2	863.1	884.6	664.0	664.0	643.3	865.6	58.6	890.8	918.7	0.3	703.4	214.1	44.7	58.1
61.5	67.2	73.5	73.1	73.1	101.9	107.5	102.5	89.7	88.9	95.3	95.1	90.8	348.7	796.2

Table C-1. Manufacturing NonPoint Total Pumpage (ac-ft/yr)

Total 1968	Total 1969	Total 1970	Total 1971	Total 1972	Total 1973	Total 1974	Total 1975	Total 1976	Total 1977	Total 1978	Total 1979	Total 1980	Total 1981	Total 1982
624.8	527.3	510.5	546.2	587.4	564.2	602.0	509.2	563.2	545.5	331.9	336.2	345.6	342.2	356.8
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.2	0.1	0.3	0.4	0.1	0.3	0.2	0.1	0.3	0.3	0.1	0.5	0.3	0.3	0.4
0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.2	0.0	0.1	0.1	0.1
14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	2.1	0.2	0.8	0.6	0.7
0.0	0.0	0.0	0.0	0.0	0.0	0.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28.7	21.1	20.2	19.5	20.2	10.9	14.1	10.9	9.4	9.4	7.8	7.3	7.3	7.4	7.5
26.6	9.4	39.6	50.3	15.6	36.9	21.2	10.0	36.8	38.9	12.5	66.7	34.7	44.7	47.5
4579.6	4554.3	4672.7	5702.0	4589.8	4335.9	4395.5	4661.0	4622.9	4580.2	3690.3	3860.8	302.0	303.4	296.9
1.3	1.3	1.1	1.0	1.1	1.3	1.0	1.0	1.0	0.9	1.0	0.9	1.0	0.9	1.0
1662.5	1766.9	1623.7	1788.5	2000.5	1986.0	1864.9	1665.4	1395.0	1431.9	1284.9	1316.9	1232.4	1115.4	1298.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20.5	31.4	31.5	260.5	347.6	47.0	43.5	160.0	150.8	131.9	39.5	61.9	21.8	9.8	11.5
99.4	99.4	63.1	114.9	82.7	105.2	184.7	106.5	109.9	56.1	364.5	10.0	244.4	244.4	245.0
1.6	1.6	1.6	1.6	1.6	1.6	1.6	68.0	67.0	84.5	185.1	460.5	228.0	171.5	111.8
7.5	16.3	9.2	7.5	6.4	7.1	7.8	7.2	6.0	5.2	2.6	2.1	2.1	0.9	17.3
8.2	8.6	8.0	8.8	9.7	9.7	9.1	8.2	6.9	7.1	6.1	6.2	5.8	5.2	6.1
154.3	202.0	177.0	199.3	217.9	234.5	271.5	181.8	200.1	311.3	175.0	521.6	92.2	140.7	19.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.8	0.7	0.7	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.4	9.7	9.7	9.7	9.7
509.1	502.6	489.9	615.2	439.7	444.9	446.1	421.3	422.7	373.8	313.9	292.3	3.5	2.5	2.4
0.0	0.0	0.0	0.0	152.6	152.6	152.6	160.1	8.6	1.6	1.6	1.6	1.6	1.6	1.6
0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	90.9	87.5	87.3	86.1	83.8	97.3	169.9	215.9	215.9	155.3
807.3	968.3	884.3	878.4	885.6	1004.1	901.2	1062.5	1033.5	1001.3	893.8	911.3	962.9	949.8	903.0
352.9	387.4	371.9	366.8	303.5	335.9	366.8	414.0	408.7	396.3	362.6	365.9	384.3	366.4	355.8
7.4	8.5	6.5	6.5	7.2	6.9	7.0	6.9	7.6	7.4	7.0	2.0	4.4	5.0	6.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36.5	45.1	373.5	335.5	323.2	418.6	198.5	155.1	323.2	45.2	46.2	39.8	0.9	13.8	20.7
85.4	85.0	87.8	115.0	101.5	116.2	115.5	132.7	146.9	153.1	146.7	139.9	136.6	149.0	139.9

Table C-1. Manufacturing NonPoint Total Pumpage (ac-ft/yr)

Total 1983	Total 1984	Total 1985	Total 1986	Total 1987	Total 1988	Total 1989	Total 1990	Total 1991	Total 1992	Total 1993	Total 1994	Total 1995	Total 1996	Total 1997
436.3	442.6	349.5	453.5	435.7	368.6	369.7	254.2	56.8	62.2	56.4	107.0	161.5	242.2	101.8
0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1
0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	0.3	0.2	0.3	0.3	0.3	0.1	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0
0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.7	2995.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
195.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0	195.0	178.7
0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.5	10.9	10.9	10.8	10.7	10.5	10.4	10.4	10.5	10.5	10.6	10.6	10.7	10.7	10.8
44.0	38.8	24.7	34.8	33.5	39.0	6.8	38.3	44.5	8.2	11.7	8.4	8.5	8.6	8.7
312.9	374.9	335.3	319.6	250.2	522.6	435.5	399.2	435.5	300.6	300.6	300.6	300.6	280.4	33.6
0.7	1.1	1.2	0.7	7.2	13.8	20.3	26.8	33.4	39.9	46.5	53.0	53.0	53.0	53.0
1250.9	1000.2	1110.0	1294.1	1569.5	1194.7	728.8	576.7	515.0	423.0	104.3	98.9	99.5	111.5	102.2
3.9	3.9	3.9	4.7	4.7	4.7	4.2	4.2	6.9	20.1	3.9	3.9	3.9	3.9	3.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.4	9.2	9.7	4.9	4.5	2.8	0.7	3.4	6.0	6.0	6.1	6.0	6.8	6.9	6.9
245.6	246.2	246.8	247.4	248.0	248.6	249.2	251.2	253.3	255.4	257.5	259.6	261.7	263.9	266.1
47.0	91.6	204.9	312.8	188.2	212.1	294.3	301.2	302.4	285.4	77.1	336.8	342.1	164.8	134.3
21.6	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5.9	1929.2	5.1	6.0	7.3	5.5	3.4	2.7	2.4	2.0	0.5	0.5	0.5	0.5	0.5
11.5	11.8	12.2	10.9	3.3	6.2	2.7	54.3	56.6	53.4	74.5	76.8	52.5	52.3	62.3
0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.4	2.2	0.0	0.0	0.0	0.0	0.0
9.7	3.6	48.9	32.4	28.4	27.2	29.0	39.1	24.4	15.2	32.9	46.9	50.1	37.6	49.9
0.5	10.3	21.0	30.6	40.5	109.2	155.3	56.7	19.9	36.2	97.0	172.0	189.2	157.1	135.3
1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200.9	136.2	147.4	63.5	28.3	28.0	27.6	27.8	28.1	28.3	28.5	28.7	28.9	29.2	29.4
1691.9	1695.8	1375.3	1157.7	1179.7	1173.3	1386.3	1376.7	1057.4	878.6	1197.1	1200.2	1069.3	540.9	745.8
620.2	618.4	512.4	419.0	424.6	418.5	490.1	482.5	373.8	363.5	494.7	489.2	446.2	266.4	319.8
4.2	12.8	6.2	6.1	3.6	3.7	1.2	9.8	0.6	0.3	0.3	12.4	0.2	0.3	5.6
0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.0	1.4	0.9	7.1	7.0	6.8	6.7	6.7	6.8	6.8	6.9	6.9	7.0	7.0	7.1
19.9	20.4	28.6	25.5	27.6	26.0	33.6	24.3	31.9	29.7	29.2	32.1	30.1	12.5	12.6
117.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C-1. Manufacturing NonPoint Total Pumpage (ac-ft/yr)

Total 1998	Total 1999	Total 2000	Total 2001	Total 2002	Total 2003	Total 2004	Total 2005	Total 2006	Total 2007	Total 2008	Total 2009	Total 2010	Total 2011	Total 2012
88.2	72.5	72.5	9572.3	9426.9	9281.4	9135.9	8990.4	8845.0	8699.5	8554.0	8408.6	8263.1	8199.1	8135.2
0.0	0.0	0.0	24.9	24.8	24.7	24.6	24.5	24.4	24.3	24.2	24.1	24.0	24.1	24.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
195.0	178.7	178.7	534.8	535.5	536.2	536.9	537.6	538.2	538.9	539.6	540.3	541.0	542.6	544.3
0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.8	10.9	10.9	766.7	752.9	739.1	725.2	711.4	697.6	683.7	669.9	656.0	642.2	630.9	619.5
8.8	8.8	8.8	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.7
34.0	34.3	34.3	10.0	9.9	9.9	9.8	9.8	9.7	9.7	9.6	9.6	9.5	9.5	9.4
52.2	52.4	52.4	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	41.0	41.3	41.6
113.3	12.0	12.0	261.5	257.1	252.7	248.3	243.9	239.5	235.1	230.6	226.2	221.8	217.7	213.6
3.9	3.6	3.6	1461.9	1434.8	1407.7	1380.6	1353.5	1326.4	1299.3	1272.2	1245.1	1218.0	1195.8	1173.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.9	6.9	6.9	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3
268.3	270.5	270.5	4650.0	4585.3	4520.6	4455.9	4391.2	4326.4	4261.7	4197.0	4132.3	4067.6	4006.0	3944.4
129.1	129.1	129.1	466.0	466.7	467.5	468.2	469.0	469.7	470.5	471.2	472.0	472.7	473.3	473.8
0.1	0.1	0.1	1996.4	1995.5	1994.6	1993.6	1992.7	1991.8	1990.9	1990.0	1989.0	1988.1	2061.5	2134.9
0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.1	8.6	8.6	124.1	125.7	127.4	129.0	130.6	132.2	133.9	135.5	137.1	138.7	138.6	138.4
0.0	0.0	0.0	48.3	47.6	46.9	46.2	45.5	44.8	44.1	43.4	42.7	42.0	41.5	41.0
34.3	31.6	31.6	408.6	400.3	392.0	383.6	375.3	367.0	358.7	350.4	342.1	333.7	338.4	343.1
106.7	0.5	0.5	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.0	6.0
1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	268.8	269.6	270.4	271.2	272.0	272.8	273.6	274.4	275.2	276.0	276.8	277.6
29.6	29.8	29.8	1608.3	1617.8	1627.3	1636.8	1646.3	1655.8	1665.3	1674.8	1684.3	1693.8	1700.2	1706.6
845.9	136.2	136.2	5795.3	5983.4	6171.5	6359.7	6547.8	6735.9	6924.1	7112.2	7300.4	7488.5	7711.9	7935.3
341.4	63.6	63.6	221.1	223.7	226.3	228.9	231.4	234.0	236.6	239.2	241.7	244.3	246.9	249.4
0.2	0.1	0.1	295.2	292.2	289.2	286.2	283.3	280.3	277.3	274.4	271.4	268.4	264.9	261.4
0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.2	7.2	7.2	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.9	1.8
12.8	12.9	12.9	938.0	920.6	903.1	885.7	868.2	850.8	833.3	815.8	798.4	780.9	766.6	752.3
0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0

Table C-1. Manufacturing NonPoint Total Pumpage (ac-ft/yr)

Total 2013	Total 2014	Total 2015	Total 2016	Total 2017	Total 2018	Total 2019	Total 2020	Total 2021	Total 2022	Total 2023	Total 2024	Total 2025	Total 2026	Total 2027
8071.3	8007.3	7943.4	7879.4	7815.5	7751.5	7687.6	7623.7	7601.7	7579.8	7557.9	7536.0	7514.1	7492.2	7470.2
24.3	24.4	24.5	24.6	24.7	24.8	24.9	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.9	11.8	11.7	11.6	11.5	11.4	11.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
546.0	547.6	549.3	550.9	552.6	554.3	555.9	557.6	559.2	560.9	562.6	564.2	565.9	567.5	569.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
608.2	596.9	585.6	574.2	562.9	551.6	540.2	528.9	519.6	510.3	501.0	491.8	482.5	473.2	463.9
2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9
9.4	9.3	9.3	9.2	9.2	9.1	9.0	9.0	9.0	8.9	8.9	8.9	8.9	8.8	8.8
41.9	42.2	42.5	42.8	43.1	43.4	43.7	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7
209.5	205.4	201.3	197.2	193.1	189.0	184.9	180.8	178.3	175.8	173.3	170.8	168.3	165.8	163.3
1151.4	1129.2	1107.0	1084.8	1062.6	1040.4	1018.2	996.0	977.9	959.8	941.7	923.6	905.5	887.4	869.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
3882.8	3821.2	3759.5	3697.9	3636.3	3574.7	3513.1	3451.5	3400.6	3349.7	3298.8	3247.8	3196.9	3146.0	3095.1
474.3	474.8	475.3	475.8	476.3	476.8	477.3	477.8	478.4	478.9	479.4	479.9	480.4	481.0	481.5
2208.3	2281.8	2355.2	2428.6	2502.0	2575.4	2648.8	2722.2	2722.2	2722.2	2722.1	2722.1	2722.1	2722.0	2722.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
138.2	138.0	137.8	137.7	137.5	137.3	137.1	137.0	137.4	137.8	138.1	138.5	138.9	139.3	139.7
40.5	40.0	39.5	39.0	38.5	38.0	37.5	37.0	36.3	35.6	34.9	34.2	33.5	32.8	32.1
347.7	352.4	357.1	361.7	366.4	371.1	375.7	380.4	395.5	410.6	425.8	440.9	456.0	471.1	486.2
6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
278.4	279.2	280.0	280.8	281.6	282.4	283.2	284.0	284.9	285.8	286.7	287.6	288.5	289.4	290.3
1713.0	1719.4	1725.8	1732.2	1738.6	1745.0	1751.4	1757.8	1762.0	1766.2	1770.4	1774.6	1778.8	1783.0	1787.2
8158.7	8382.1	8605.5	8828.9	9052.3	9275.7	9499.1	9722.5	9810.5	9898.6	9986.6	10074.6	10162.6	10250.7	10338.7
251.9	254.5	257.0	259.5	262.1	264.6	267.2	269.7	265.4	261.1	256.8	252.5	248.2	243.9	239.6
257.9	254.4	250.8	247.3	243.8	240.3	236.8	233.3	234.7	236.0	237.4	238.8	240.2	241.6	243.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
738.1	723.8	709.5	695.2	680.9	666.6	652.3	638.0	626.4	614.7	603.0	591.4	579.7	568.0	556.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C-1. Manufacturing NonPoint Total Pumpage (ac-ft/yr)

Total 2028	Total 2029	Total 2030	Total 2031	Total 2032	Total 2033	Total 2034	Total 2035	Total 2036	Total 2037	Total 2038	Total 2039	Total 2040	Total 2041	Total 2042
7448.3	7426.4	7404.5	7391.3	7378.2	7365.0	7351.9	7338.7	7325.6	7312.4	7299.3	7286.1	7273.0	7270.0	7266.9
25.8	25.9	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11.2	11.1	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.9	10.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
570.9	572.5	574.2	575.8	577.5	579.2	580.8	582.5	584.1	585.8	587.5	589.1	590.8	592.4	594.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
454.6	445.3	436.0	428.6	421.1	413.6	406.1	398.7	391.2	383.7	376.2	368.7	361.3	355.1	349.0
2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.2	3.2
8.8	8.8	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.6	8.6	8.6	8.6	8.6	8.6
44.8	44.9	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	46.0	46.1	46.2
160.8	158.2	155.7	153.4	151.1	148.7	146.4	144.0	141.7	139.4	137.0	134.7	132.3	130.5	128.6
851.2	833.1	815.0	800.3	785.6	770.9	756.2	741.5	726.8	712.1	697.4	682.7	668.0	655.9	643.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.8	4.0	4.2
3044.2	2993.3	2942.3	2901.4	2860.5	2819.6	2778.7	2737.8	2696.9	2656.0	2615.1	2574.2	2533.2	2495.6	2458.0
482.0	482.5	483.1	483.6	484.2	484.7	485.2	485.8	486.3	486.9	487.4	488.0	488.5	488.7	488.9
2722.0	2721.9	2721.9	2721.9	2721.9	2721.8	2721.8	2721.8	2721.8	2721.8	2721.7	2721.7	2721.7	2774.7	2827.7
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140.1	140.5	140.9	142.6	144.3	146.0	147.7	149.4	151.1	152.8	154.5	156.2	157.9	159.7	161.5
31.4	30.7	30.0	29.6	29.2	28.8	28.4	28.0	27.6	27.2	26.8	26.4	26.0	25.6	25.2
501.4	516.5	531.6	537.3	543.0	548.7	554.4	560.1	565.8	571.6	577.3	583.0	588.7	594.5	600.4
6.0	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.4	5.3	5.2	5.1	5.0	5.1	5.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
291.2	292.1	293.0	293.9	294.8	295.7	296.6	297.5	298.4	299.3	300.2	301.1	302.0	271.8	241.6
1791.4	1795.6	1799.8	1812.3	1824.8	1837.3	1849.8	1862.3	1874.8	1887.3	1899.8	1912.3	1924.8	1936.5	1948.2
10426.7	10514.8	10602.8	9844.9	9087.0	8329.0	7571.1	6813.2	6055.3	5297.4	4539.5	3781.6	3023.7	2770.6	2517.5
235.3	231.0	226.7	216.7	206.6	196.5	186.4	176.3	166.2	156.1	146.0	136.0	125.9	113.3	100.7
244.3	245.7	247.1	242.7	238.3	234.0	229.6	225.2	220.8	216.4	212.0	207.6	203.3	196.1	189.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	1.0	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0
544.7	533.1	521.4	511.8	502.2	492.7	483.1	473.5	463.9	454.3	444.8	435.2	425.6	417.9	410.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C-1. Manufacturing NonPoint Total Pumpage (ac-ft/yr)

Total 2043	Total 2044	Total 2045	Total 2046	Total 2047	Total 2048	Total 2049	Total 2050
7263.9	7260.9	7257.9	7254.9	7251.9	7248.8	7245.8	7242.8
26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.7	10.6	10.5	10.4	10.3	10.2	10.1	10.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
595.8	597.4	599.1	600.7	602.4	604.1	605.7	607.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
342.9	336.8	330.6	324.5	318.4	312.2	306.1	300.0
3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.3
8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
46.3	46.4	46.5	46.6	46.7	46.8	46.9	47.0
126.7	124.8	122.9	121.0	119.1	117.2	115.3	113.4
631.7	619.6	607.5	595.4	583.3	571.2	559.1	547.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.4	4.7	4.9	5.1	5.4	5.6	5.8	6.1
2420.4	2382.8	2345.2	2307.6	2270.0	2232.4	2194.8	2157.2
489.1	489.2	489.4	489.6	489.8	490.0	490.1	490.3
2880.7	2933.8	2986.8	3039.8	3092.8	3145.8	3198.8	3251.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
163.2	165.0	166.8	168.6	170.4	172.2	174.0	175.8
24.8	24.4	24.0	23.6	23.2	22.8	22.4	22.0
606.3	612.2	618.1	623.9	629.8	635.7	641.6	647.4
5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
211.4	181.2	151.0	120.8	90.6	60.4	30.2	0.0
1959.9	1971.6	1983.3	1995.0	2006.7	2018.4	2030.1	2041.8
2264.4	2011.3	1758.2	1505.1	1252.0	998.9	745.8	492.7
88.1	75.5	62.9	50.3	37.8	25.2	12.6	0.0
181.9	174.8	167.7	160.6	153.5	146.4	139.3	132.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
402.4	394.7	387.0	379.3	371.5	363.8	356.1	348.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C-1. Livestock Total Pumpage (ac-ft/yr)

County	Basin	Total 1940	Total 1941	Total 1942	Total 1943	Total 1944	Total 1945	Total 1946	Total 1947	Total 1948	Total 1949	Total 1950	Total 1951	Total 1952	Total 1953
ANDREWS	COLORADO	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6
ANDREWS	RIO GRANDE	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
ARMSTRONG	RED	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0
BAILEY	BRAZOS	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9
BORDEN	BRAZOS	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6
BORDEN	COLORADO	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4
BRISCOE	RED	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0
CASTRO	BRAZOS	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6
CASTRO	RED	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4
COCHRAN	BRAZOS	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
COCHRAN	COLORADO	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5
CROSBY	BRAZOS	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1
CROSBY	RED	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
CURRY	NM	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8
DAWSON	BRAZOS	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
DAWSON	COLORADO	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4
DEAFSMITH	CANADIAN	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0
DEAFSMITH	RED	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8
DICKENS	BRAZOS	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8
DICKENS	RED	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2
ECTOR	COLORADO	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
FLOYD	BRAZOS	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3
FLOYD	RED	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6
GAINES	COLORADO	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9
GARZA	BRAZOS	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0
GLASSCOCK	COLORADO	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0
HALE	BRAZOS	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9
HOCKLEY	BRAZOS	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9
HOCKLEY	COLORADO	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
HOWARD	COLORADO	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0
LAMB	BRAZOS	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2
LEA	NM	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8
LUBBOCK	BRAZOS	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2
LYNN	BRAZOS	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6
LYNN	COLORADO	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
MARTIN	COLORADO	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0

Table C-1. Livestock Total Pumpage (ac-ft/yr)

Total 1954	Total 1955	Total 1956	Total 1957	Total 1958	Total 1959	Total 1960	Total 1961	Total 1962	Total 1963	Total 1964	Total 1965	Total 1966	Total 1967
222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6	222.6
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0	610.0
789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9	789.9
24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6
97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4
135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0
628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6	628.6
1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4
186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5	665.5
390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8	672.8
6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4	193.4
106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0	106.0
3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8
88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8	88.8
106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2	106.2
95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3	116.3
414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6	414.6
479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9	479.9
110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0
362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0	362.0
1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9
314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9	314.9
80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0
1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2
581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8	581.8
1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2
230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6	230.6
20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0	248.0

Table C-1. Livestock Total Pumpage (ac-ft/yr)

Total 1968	Total 1969	Total 1970	Total 1971	Total 1972	Total 1973	Total 1974	Total 1975	Total 1976	Total 1977	Total 1978	Total 1979	Total 1980	Total 1981	Total 1982
222.6	222.6	222.6	222.6	222.6	222.6	222.6	231.5	240.4	250.3	243.4	236.4	189.9	225.7	261.4
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.7	2.8	2.7	2.7	42.0	50.0	58.0
610.0	610.0	610.0	610.0	610.0	610.0	610.0	601.0	592.0	582.0	613.0	644.0	675.0	618.0	561.0
789.9	789.9	789.9	789.9	789.9	789.9	789.9	653.9	517.9	381.9	483.9	585.9	687.9	780.1	872.4
24.6	24.6	24.6	24.6	24.6	24.6	24.6	19.8	14.9	10.3	9.9	9.5	1.0	1.0	1.0
97.4	97.4	97.4	97.4	97.4	97.4	97.4	78.2	59.1	40.7	39.1	37.5	45.0	42.5	40.0
135.0	135.0	135.0	135.0	135.0	135.0	135.0	267.0	399.1	531.1	535.1	539.1	543.1	475.1	407.1
628.6	628.6	628.6	628.6	628.6	628.6	628.6	678.5	728.4	778.4	783.4	788.4	1,647.0	1,742.5	1,838.0
1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	1,876.4	2,025.5	2,174.5	2,323.6	2,338.6	2,353.6	1,514.0	1,602.0	1,690.0
186.3	186.3	186.3	186.3	186.3	186.3	186.3	183.9	181.5	179.3	165.5	151.7	224.0	232.5	241.0
665.5	665.5	665.5	665.5	665.5	665.5	665.5	656.9	648.3	640.5	591.3	542.1	406.1	422.1	438.1
390.1	390.1	390.1	390.1	390.1	390.1	390.1	388.1	386.1	384.1	370.2	356.3	332.0	322.8	313.5
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.7	2.6	14.0	13.5	13.0
672.8	672.8	800.0	766.0	732.0	697.0	663.0	629.0	624.0	619.0	613.0	608.0	603.0	614.2	625.5
6.6	6.6	6.6	6.6	6.6	6.6	6.6	15.3	23.9	32.5	22.6	12.7	1.0	1.0	1.0
193.4	193.4	193.4	193.4	193.4	193.4	193.4	443.8	694.2	945.6	657.5	369.4	84.0	87.3	90.5
106.0	106.0	106.0	106.0	106.0	106.0	106.0	126.9	147.9	168.8	172.1	175.4	321.0	377.5	434.0
3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	3,362.8	4,027.7	4,692.7	5,357.7	5,462.4	5,567.1	5,528.4	6,497.3	7,466.2
88.8	88.8	88.8	88.8	88.8	88.8	88.8	72.4	56.0	39.2	37.8	36.4	45.0	41.2	37.5
106.2	106.2	106.2	106.2	106.2	106.2	106.2	86.6	67.0	46.8	45.2	43.6	31.0	28.2	25.5
95.0	95.0	95.0	95.0	95.0	95.0	95.0	124.0	153.0	181.0	159.0	137.0	79.0	109.0	139.0
116.3	116.3	116.3	116.3	116.3	116.3	116.3	140.4	164.5	188.6	189.0	189.5	277.0	277.7	278.5
414.6	414.6	414.6	414.6	414.6	414.6	414.6	500.5	586.4	672.2	673.8	675.4	589.9	591.4	592.9
479.9	479.9	479.9	479.9	479.9	479.9	479.9	424.9	369.9	314.9	365.9	416.9	467.9	500.1	532.3
110.0	110.0	110.0	110.0	110.0	110.0	110.0	94.0	78.0	63.0	57.0	51.0	44.0	45.0	46.0
362.0	362.0	362.0	362.0	362.0	362.0	362.0	332.0	302.0	271.0	262.0	253.0	243.0	260.7	278.5
1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,756.9	1,642.9	1,528.9	1,414.9	1,445.9	1,476.9	1,505.9	1,456.7	1,407.4
314.9	314.9	314.9	314.9	314.9	314.9	314.9	352.4	389.9	426.5	401.0	375.5	377.9	367.4	356.9
80.0	80.0	80.0	80.0	80.0	80.0	80.0	89.6	99.1	108.4	101.9	95.4	60.0	58.3	56.5
192.0	192.0	192.0	192.0	192.0	192.0	192.0	179.0	166.0	154.0	163.0	172.0	181.0	197.2	213.5
1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,131.2	1,208.2	1,285.2	1,362.2	1,272.2	1,182.2	1,092.2	1,348.5	1,604.7
581.8	581.8	899.7	822.7	744.7	667.7	589.8	512.8	513.8	514.8	516.8	517.8	518.8	494.3	469.8
1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,576.2	1,452.2	1,328.2	1,205.2	1,188.2	1,171.2	1,155.2	1,305.9	1,456.7
230.6	230.6	230.6	230.6	230.6	230.6	230.6	206.7	182.8	158.9	155.3	151.6	151.0	164.0	177.0
20.4	20.4	20.4	20.4	20.4	20.4	20.4	18.3	16.1	14.0	13.7	13.4	11.0	12.0	13.0
248.0	248.0	248.0	248.0	248.0	248.0	248.0	226.0	204.0	182.0	164.0	146.0	128.0	160.7	193.5

Table C-1. Livestock Total Pumpage (ac-ft/yr)

Total 1983	Total 1984	Total 1985	Total 1986	Total 1987	Total 1988	Total 1989	Total 1990	Total 1991	Total 1992	Total 1993	Total 1994	Total 1995	Total 1996	Total 1997
297.1	332.9	244.9	178.9	135.0	57.0	150.9	148.9	151.9	236.9	239.9	247.9	285.9	274.9	289.9
66.0	74.0	54.0	39.0	30.0	12.0	33.0	33.0	34.0	53.0	53.0	55.0	64.0	61.0	65.0
504.0	447.0	468.0	492.0	517.0	497.0	517.0	518.0	529.0	853.0	926.0	669.0	504.0	493.0	513.0
964.6	1,056.8	1,271.8	1,959.7	1,338.8	1,017.9	1,014.9	1,111.8	1,137.8	1,603.8	1,934.7	1,752.7	2,074.7	1,977.7	1,555.8
1.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0
37.5	35.0	23.0	28.0	17.0	19.0	18.0	18.0	19.0	22.0	22.0	41.0	41.0	27.0	27.0
339.0	271.0	204.0	217.0	150.0	163.0	161.0	159.0	162.0	215.0	242.0	242.0	243.0	202.0	161.0
1,933.5	2,029.0	2,535.0	2,089.0	2,089.0	1,201.0	1,230.0	1,408.0	1,448.0	2,895.0	3,344.0	3,764.0	3,869.0	3,655.0	3,978.0
1,778.0	1,866.0	2,330.9	1,920.0	1,921.0	1,104.0	1,131.0	1,294.0	1,331.0	2,660.9	3,073.9	3,459.9	3,556.9	3,360.9	3,656.9
249.5	258.0	335.0	301.0	238.0	152.0	150.0	168.0	173.0	233.0	262.0	208.0	248.0	236.0	242.0
454.1	470.1	609.2	547.1	432.1	276.1	272.1	306.1	315.1	424.1	476.1	377.1	450.1	429.1	440.1
304.3	295.0	291.0	202.0	203.0	218.0	214.0	212.0	217.0	218.0	243.0	228.0	214.0	201.0	162.0
12.5	12.0	12.0	8.0	8.0	9.0	9.0	9.0	9.0	9.0	10.0	10.0	9.0	9.0	7.0
636.7	648.0	659.0	759.0	858.0	958.0	1,058.0	1,157.0	1,256.9	1,356.9	1,455.9	1,555.9	2,355.9	2,355.9	2,355.9
1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	2.0	3.0	3.0	2.0	2.0	3.0	4.0
93.8	97.0	85.0	98.0	73.0	80.0	79.0	78.0	80.0	133.0	133.0	93.0	118.0	131.0	186.1
490.5	547.0	635.0	575.0	565.0	347.0	355.0	395.0	406.0	719.0	820.0	766.0	837.0	932.0	962.0
8,435.1	9,404.0	10,921.9	9,892.0	9,709.0	5,976.4	6,103.4	6,801.3	6,976.3	12,350.7	14,085.5	13,167.6	14,372.5	16,017.3	16,530.3
33.7	30.0	30.0	30.0	32.0	35.0	35.0	35.0	36.0	33.0	53.0	28.0	23.0	20.0	15.0
22.7	20.0	20.0	20.0	22.0	23.0	24.0	23.0	24.0	22.0	36.0	19.0	15.0	13.0	10.0
169.0	199.0	188.0	243.0	188.0	207.0	193.0	191.0	195.0	118.0	107.0	183.0	183.0	161.0	194.0
279.2	280.0	352.0	287.0	291.0	193.0	199.0	217.0	223.0	382.0	413.0	404.0	406.0	590.0	486.0
594.4	595.9	747.9	609.9	618.9	410.9	422.9	460.9	472.9	811.9	878.9	858.9	863.9	1,252.8	1,032.8
564.6	596.8	677.8	590.8	586.8	405.9	399.9	440.9	451.9	873.7	917.7	1,006.7	1,073.7	1,636.5	1,505.6
47.0	48.0	33.0	34.0	39.0	42.0	42.0	41.0	42.0	32.0	32.0	47.0	51.0	51.0	44.0
296.2	314.0	261.0	170.0	211.0	224.0	220.0	218.0	223.0	161.0	157.0	156.0	169.0	127.0	154.0
1,358.2	1,309.0	1,351.9	1,337.9	1,286.0	621.0	606.0	679.0	699.0	1,472.9	1,608.9	1,780.9	2,051.9	2,036.9	2,097.9
346.4	335.9	450.9	351.9	370.9	202.0	199.0	226.0	233.0	585.9	628.9	459.9	456.9	468.9	373.9
54.8	53.0	72.0	56.0	59.0	32.0	31.0	36.0	37.0	94.0	101.0	74.0	73.0	75.0	60.0
229.7	246.0	165.0	193.0	179.0	198.0	196.0	193.0	197.0	264.0	263.0	227.0	225.0	195.0	293.0
1,861.0	2,117.3	2,384.4	1,959.3	2,229.3	1,564.2	1,568.2	1,734.3	1,773.3	2,399.4	2,571.4	2,483.4	3,418.5	2,348.4	2,962.4
445.3	420.8	395.8	459.8	523.8	587.8	651.8	714.7	778.7	842.7	906.7	970.6	1,347.5	1,347.5	1,347.5
1,607.5	1,758.2	1,866.3	1,842.3	2,015.3	1,352.2	1,355.2	1,509.2	1,550.2	2,172.3	2,330.3	1,769.2	2,042.3	2,345.3	1,988.3
190.0	203.0	128.0	154.0	191.0	207.0	205.0	202.0	206.0	142.0	180.0	155.0	142.0	155.0	132.0
14.0	15.0	9.0	11.0	14.0	15.0	15.0	15.0	16.0	11.0	14.0	12.0	11.0	12.0	10.0
226.2	259.0	165.0	191.0	299.0	319.0	315.0	310.0	317.0	290.0	292.0	211.0	251.0	209.0	222.0

Table C-1. Livestock Total Pumpage (ac-ft/yr)

Total 1998	Total 1999	Total 2000	Total 2001	Total 2002	Total 2003	Total 2004	Total 2005	Total 2006	Total 2007	Total 2008	Total 2009	Total 2010	Total 2011	Total 2012
289.9	289.9	287.3	284.7	282.1	279.5	276.9	274.4	271.8	269.2	266.6	264.0	264.0	264.0	264.0
65.0	65.0	65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
513.0	513.0	513.0	497.5	499.6	501.8	504.0	506.1	508.3	510.4	512.6	514.8	516.9	521.2	525.5
1,555.8	1,555.8	1,555.8	1538.9	1522.0	1505.1	1488.2	1471.4	1454.5	1437.6	1420.7	1403.8	1387.0	1409.2	1431.4
1.0	1.0	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.3	4.3
27.0	27.0	27.0	22.2	20.1	17.9	15.8	13.6	11.4	9.3	7.1	5.0	2.8	2.8	2.8
161.0	161.0	161.0	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5
3,978.0	3,978.0	3,978.0	3854.7	3731.4	3608.1	3484.8	3361.5	3238.2	3114.9	2991.6	2868.3	2745.0	2789.1	2833.2
3,656.9	3,656.9	3,656.9	3679.3	3701.7	3724.1	3746.5	3769.0	3791.4	3813.8	3836.2	3858.6	3881.0	3943.3	4005.6
242.0	242.0	242.0	291.2	340.4	389.6	438.8	488.0	537.2	586.4	635.6	684.8	734.0	745.8	757.6
440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1
162.0	162.0	162.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0
7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
2,355.9	2,355.9	2,355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
186.1	186.1	186.1	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6
962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0
16,530.3	16,530.3	16,530.3	15830.0	15129.8	14429.6	13729.3	13029.1	12328.8	11628.6	10928.3	10228.1	9527.8	9680.9	9834.0
15.0	15.0	15.0	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
10.0	10.0	10.0	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0
486.0	486.0	486.0	508.8	531.6	554.4	577.2	600.0	622.8	645.6	668.4	691.2	714.0	725.4	736.8
1,032.8	1,032.8	1,032.8	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2
1,505.6	1,505.6	1,505.6	1426.4	1347.2	1268.1	1188.9	1109.8	1030.6	951.5	872.3	793.2	714.0	725.4	736.8
44.0	44.0	44.0	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4
154.0	154.0	154.0	141.8	129.6	117.4	105.2	93.0	80.8	68.6	56.4	44.2	32.0	32.0	32.0
2,097.9	2,097.9	2,097.9	2057.3	2016.7	1976.1	1935.6	1895.0	1854.4	1813.8	1773.2	1732.6	1692.0	1719.2	1746.4
373.9	373.9	373.9	369.1	364.4	359.6	354.8	350.0	345.2	340.4	335.6	330.8	326.0	331.3	336.6
60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
293.0	293.0	293.0	281.5	275.8	270.0	264.3	258.6	252.9	247.2	241.4	235.7	230.0	230.0	230.0
2,962.4	2,962.4	2,962.4	2870.5	2787.2	2703.9	2620.7	2537.4	2454.1	2370.8	2287.6	2204.3	2121.0	2155.0	2189.0
1,347.5	1,347.5	1,347.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5
1,988.3	1,988.3	1,988.3	1887.3	1786.4	1685.5	1584.6	1483.6	1382.7	1281.8	1180.9	1079.9	979.0	994.7	1010.4
132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
222.0	222.0	222.0	235.5	249.0	262.5	276.0	289.5	303.0	316.5	330.0	343.5	357.0	357.0	357.0

Table C-1. Livestock Total Pumpage (ac-ft/yr)

Total 2013	Total 2014	Total 2015	Total 2016	Total 2017	Total 2018	Total 2019	Total 2020	Total 2021	Total 2022	Total 2023	Total 2024	Total 2025	Total 2026	Total 2027
264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
529.7	534.0	538.3	542.5	546.8	551.1	555.3	559.6	563.9	568.2	572.5	576.8	581.1	585.5	589.8
1453.6	1475.8	1498.0	1520.2	1542.4	1564.6	1586.8	1609.0	1625.8	1642.6	1659.4	1676.2	1693.0	1709.8	1726.6
4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5
2877.3	2921.4	2965.5	3009.6	3053.7	3097.8	3141.9	3186.0	3219.3	3252.6	3285.9	3319.2	3352.5	3385.8	3419.1
4067.9	4130.2	4192.5	4254.8	4317.1	4379.4	4441.7	4504.0	4551.1	4598.2	4645.3	4692.4	4739.5	4786.6	4833.7
769.4	781.2	793.0	804.8	816.6	828.4	840.2	852.0	860.9	869.8	878.7	887.6	896.5	905.4	914.3
440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1
159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0
7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6
962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0
9987.1	10140.2	10293.3	10446.4	10599.5	10752.6	10905.7	11058.8	11174.5	11290.2	11405.9	11521.6	11637.3	11753.0	11868.7
12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0
748.2	759.6	771.0	782.4	793.8	805.2	816.6	828.0	836.6	845.1	853.6	862.2	870.7	879.3	887.8
1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2
748.2	759.6	771.0	782.4	793.8	805.2	816.6	828.0	836.7	845.4	854.1	862.8	871.5	880.2	888.9
42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4
32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
1773.6	1800.8	1828.0	1855.2	1882.4	1909.6	1936.8	1964.0	1984.5	2005.0	2025.5	2046.0	2066.5	2087.0	2107.5
341.9	347.2	352.5	357.8	363.1	368.4	373.7	379.0	382.9	386.8	390.7	394.6	398.5	402.4	406.3
60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
2223.0	2257.0	2291.0	2325.0	2359.0	2393.0	2427.0	2461.0	2486.7	2512.4	2538.1	2563.8	2589.5	2615.2	2640.9
1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5
1026.1	1041.8	1057.5	1073.2	1088.9	1104.6	1120.3	1136.0	1147.9	1159.8	1171.7	1183.6	1195.5	1207.4	1219.3
132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0

Table C-1. Livestock Total Pumpage (ac-ft/yr)

Total 2028	Total 2029	Total 2030	Total 2031	Total 2032	Total 2033	Total 2034	Total 2035	Total 2036	Total 2037	Total 2038	Total 2039	Total 2040	Total 2041	Total 2042
264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0	264.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
594.1	598.4	602.7	607.4	612.1	616.8	621.5	626.2	631.0	635.7	640.4	645.1	649.8	655.1	660.3
1743.4	1760.2	1777.0	1795.6	1814.2	1832.8	1851.4	1870.0	1888.6	1907.2	1925.8	1944.4	1963.0	1983.6	2004.2
4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5
3452.4	3485.7	3519.0	3555.9	3592.8	3629.7	3666.6	3703.5	3740.4	3777.3	3814.2	3851.1	3888.0	3928.6	3969.2
4880.8	4927.9	4975.0	5027.1	5079.2	5131.3	5183.4	5235.5	5287.6	5339.7	5391.8	5443.9	5496.0	5553.5	5611.0
923.2	932.1	941.0	950.8	960.6	970.4	980.2	990.0	999.8	1009.6	1019.4	1029.2	1039.0	1049.9	1060.8
440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1
159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0
7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6
962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0
11984.4	12100.1	12215.8	12343.4	12471.0	12598.6	12726.2	12853.8	12981.4	13109.0	13236.6	13364.2	13491.8	13632.9	13774.0
12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0
896.4	904.9	913.5	923.2	933.0	942.7	952.5	962.2	972.0	981.7	991.5	1001.3	1011.0	1021.5	1032.0
1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2
897.6	906.3	915.0	924.6	934.2	943.8	953.4	963.0	972.6	982.2	991.8	1001.4	1011.0	1021.5	1032.0
42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4
32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
2128.0	2148.5	2169.0	2191.7	2214.4	2237.1	2259.8	2282.5	2305.2	2327.9	2350.6	2373.3	2396.0	2421.1	2446.2
410.2	414.1	418.0	422.4	426.8	431.2	435.6	440.0	444.4	448.8	453.2	457.6	462.0	466.8	471.6
60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
2666.6	2692.3	2718.0	2746.5	2775.0	2803.5	2832.0	2860.5	2889.0	2917.5	2946.0	2974.5	3003.0	3034.4	3065.8
1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5
1231.2	1243.1	1255.0	1268.1	1281.2	1294.3	1307.4	1320.5	1333.6	1346.7	1359.8	1372.9	1386.0	1400.5	1415.0
132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0

Table C-1. Livestock Total Pumpage (ac-ft/yr)

Total 2043	Total 2044	Total 2045	Total 2046	Total 2047	Total 2048	Total 2049	Total 2050
264.0	264.0	264.0	264.0	264.0	264.0	264.0	101.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
665.6	670.9	676.1	681.4	686.7	691.9	697.2	702.5
2024.8	2045.4	2065.9	2086.5	2107.1	2127.7	2148.3	2168.9
4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
160.5	160.5	160.5	160.5	160.5	160.5	160.5	160.5
4009.8	4050.4	4091.0	4131.6	4172.2	4212.8	4253.4	4294.0
5668.5	5726.0	5783.5	5841.0	5898.5	5956.0	6013.5	6071.0
1071.7	1082.6	1093.5	1104.4	1115.3	1126.2	1137.1	1148.0
440.1	440.1	440.1	440.1	440.1	440.1	440.1	440.1
159.0	159.0	159.0	159.0	159.0	159.0	159.0	159.0
7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9	2355.9
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
185.6	185.6	185.6	185.6	185.6	185.6	185.6	185.6
962.0	962.0	962.0	962.0	962.0	962.0	962.0	962.0
13915.1	14056.2	14197.3	14338.3	14479.4	14620.5	14761.6	14902.7
12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
194.0	194.0	194.0	194.0	194.0	194.0	194.0	194.0
1042.5	1053.0	1063.5	1074.0	1084.5	1095.0	1105.5	1116.0
1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2	1030.2
1042.5	1053.0	1063.5	1074.0	1084.5	1095.0	1105.5	1116.0
42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4
32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
2471.3	2496.4	2521.5	2546.6	2571.7	2596.8	2621.9	2647.0
476.4	481.2	486.0	490.8	495.6	500.4	505.2	510.0
60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
3097.2	3128.6	3160.0	3191.4	3222.8	3254.2	3285.6	3317.0
1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5
1429.5	1444.0	1458.5	1473.0	1487.5	1502.0	1516.5	1531.0
132.0	132.0	132.0	132.0	132.0	132.0	132.0	132.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
357.0	357.0	357.0	357.0	357.0	357.0	357.0	357.0

Table C-1. Agricultural Total Pumpage (ac-ft/yr)

County	Basin	Total 1940	Total 1941	Total 1942	Total 1943	Total 1944	Total 1945	Total 1946	Total 1947	Total 1948	Total 1949	Total 1950	Total 1951	Total 1952	Total 1953	Total 1954
ANDREWS	COLORADO	0.0	45.3	90.6	135.9	220.9	305.8	390.8	475.7	560.7	696.6	832.5	968.4	1,104.4	1,240.3	1,332.0
ARMSTRONG	RED	0.0	5.7	11.5	17.2	28.0	38.7	49.5	60.2	71.0	88.2	105.4	122.6	139.8	157.0	168.6
BAILEY	BRAZOS	0.0	6,850.3	13,700.6	20,551.0	33,395.3	46,239.7	59,084.0	71,928.4	84,772.7	105,323.7	125,874.6	146,425.6	166,976.6	187,527.5	201,399.4
BORDEN	BRAZOS	0.0	21.5	43.1	64.6	105.0	145.4	185.8	226.2	266.6	331.3	395.9	460.6	525.2	589.8	633.5
BORDEN	COLORADO															
BRISCOE	RED	0.0	621.1	1,242.1	1,863.2	3,027.7	4,192.2	5,356.7	6,521.3	7,685.8	9,549.0	11,412.2	13,275.4	15,138.6	17,001.8	18,259.5
CASTRO	BRAZOS	0.0	9,452.7	18,905.3	28,358.0	46,081.8	63,805.5	81,529.3	99,253.0	116,976.8	145,334.8	173,692.8	202,050.8	230,408.8	258,766.8	277,908.4
CASTRO	RED															
COCHRAN	BRAZOS	0.0	1,399.5	2,798.9	4,198.4	6,822.4	9,446.4	12,070.4	14,694.4	17,318.4	21,516.8	25,715.2	29,913.6	34,112.0	38,310.4	41,144.3
COCHRAN	COLORADO															
CROSBY	BRAZOS	0.0	3,710.6	7,421.2	11,131.8	18,089.2	25,046.6	32,004.0	38,961.4	45,918.8	57,050.7	68,182.5	79,314.4	90,446.2	101,578.0	109,092.0
CROSBY	RED															
CURRY	NM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5,985.0	41,200.0	102,600.0
DAWSON	BRAZOS	0.0	2,803.1	5,606.2	8,409.3	13,665.1	18,920.9	24,176.7	29,432.5	34,688.3	43,097.6	51,506.8	59,916.1	68,325.4	76,734.7	82,410.9
DAWSON	COLORADO															
DEAFSMITH	RED	0.0	10,861.1	21,722.3	32,583.4	52,948.1	73,312.7	93,677.4	114,042.0	134,406.7	166,990.1	199,573.6	232,157.0	264,740.5	297,323.9	319,317.7
DICKENS	BRAZOS	0.0	140.1	280.1	420.2	682.8	945.4	1,208.0	1,470.6	1,733.2	2,153.3	2,573.5	2,993.6	3,413.8	3,834.0	4,117.6
DICKENS	RED															
ECTOR	COLORADO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOYD	BRAZOS	0.0	4,878.2	9,756.5	14,634.7	23,781.5	32,928.2	42,074.9	51,221.6	60,368.3	75,003.0	89,637.8	104,272.5	118,907.3	133,542.0	143,420.4
FLOYD	RED															
GAINES	COLORADO	0.0	0.0	0.0	0.0	0.0	313.0	2,500.0	6,875.0	7,500.0	12,500.0	14,375.0	20,625.0	28,750.0	35,000.0	42,500.0
GARZA	BRAZOS	0.0	400.0	800.0	1,200.0	1,950.0	2,700.0	3,450.0	4,200.0	4,950.0	6,150.0	7,350.0	8,550.0	9,750.0	10,950.0	11,760.0
GLASSCOCK	COLORADO	0.0	24.7	49.5	74.2	120.6	167.0	213.4	259.8	306.2	380.4	454.6	528.8	603.0	677.3	727.4
HALE	BRAZOS	0.0	15,353.4	30,706.8	46,060.2	74,847.8	103,635.4	132,423.0	161,210.6	189,998.2	236,058.3	282,118.5	328,178.6	374,238.8	420,299.0	451,389.6
HALE	RED															
HOCKLEY	BRAZOS	0.0	4,400.4	8,800.7	13,201.1	21,451.8	29,702.5	37,953.2	46,203.9	54,454.6	67,655.7	80,856.9	94,058.0	107,259.1	120,460.2	129,371.0
HOCKLEY	COLORADO															
HOWARD	COLORADO	0.0	40.9	81.8	122.6	199.3	275.9	352.6	429.2	505.9	628.5	751.2	873.8	996.5	1,119.1	1,201.9
LAMB	BRAZOS	0.0	10,559.5	21,119.0	31,678.6	51,477.7	71,276.8	91,075.9	110,875.0	130,674.1	162,352.6	194,031.2	225,709.7	257,388.3	289,066.9	310,449.9
LEA	NM	3,200.0	1,550.0	3,500.0	6,000.0	3,500.0	6,500.0	3,500.0	19,000.0	39,000.0	60,000.0	95,000.0	153,000.0	166,000.0	165,000.0	163,000.0
LUBBOCK	BRAZOS	0.0	7,767.0	15,534.1	23,301.1	37,864.3	52,427.5	66,990.7	81,553.9	96,117.1	119,418.2	142,719.4	166,020.5	189,321.6	212,622.7	228,351.0
LYNN	BRAZOS	0.0	2,120.0	4,240.1	6,360.1	10,335.1	14,310.2	18,285.2	22,260.3	26,235.3	32,595.4	38,955.5	45,315.6	51,675.7	58,035.7	62,328.8
LYNN	COLORADO															
MARTIN	COLORADO	0.0	1,084.7	2,169.3	3,254.0	5,287.8	7,321.5	9,355.3	11,389.0	13,422.8	16,676.8	19,930.8	23,184.8	26,438.8	29,692.8	31,889.2
MIDLAND	COLORADO	0.0	198.9	397.9	596.8	969.8	1,342.8	1,715.8	2,088.7	2,461.7	3,058.5	3,655.3	4,252.1	4,848.9	5,445.7	5,848.5
MOTLEY	RED	0.0	4.5	9.0	13.4	21.8	30.3	38.7	47.1	55.5	68.9	82.4	95.8	109.2	122.7	131.8
OLDHAM	CANADIAN	0.0	642.9	1,285.9	1,928.8	3,134.3	4,339.8	5,545.3	6,750.8	7,956.3	9,885.1	11,813.9	13,742.7	15,671.5	17,600.3	18,902.2
OLDHAM	RED															
PARMER	BRAZOS	0.0	20,638.3	41,276.6	61,914.9	100,611.7	139,308.5	178,005.3	216,702.1	255,398.9	317,313.8	379,228.6	441,143.5	503,058.4	564,973.3	606,765.8
PARMER	RED															
POTTER	CANADIAN	0.0	266.7	533.3	800.0	1,300.0	1,800.0	2,300.0	2,800.0	3,300.0	4,100.0	4,900.0	5,700.0	6,500.0	7,300.0	7,840.0
POTTER	RED															
QUAY	NM	1,570.0	580.0	2,500.0	3,300.0	2,500.0	4,250.0	6,600.0	7,750.0	4,300.0	2,300.0	6,600.0	8,000.0	5,300.0	5,700.0	5,000.0
RANDALL	CANADIAN	0.0	1,855.7	3,711.4	5,567.1	9,046.5	12,526.0	16,005.4	19,484.9	22,964.3	28,531.4	34,098.5	39,665.6	45,232.7	50,799.8	54,557.6
RANDALL	RED															
ROOSEVELT	NM	25,800.0	9,750.0	23,500.0	45,000.0	23,500.0	37,500.0	37,000.0	45,000.0	37,000.0	37,000.0	52,000.0	84,000.0	82,000.0	101,000.0	117,250.0
SWISHER	BRAZOS	0.0	7,067.4	14,134.7	21,202.1	34,453.4	47,704.7	60,956.0	74,207.3	87,458.6	108,660.7	129,862.7	151,064.8	172,266.9	193,469.0	207,780.4
SWISHER	RED															
TERRY	BRAZOS	0.0	3,615.6	7,231.3	10,846.9	17,626.2	24,405.5	31,184.8	37,964.1	44,743.4	55,590.3	66,437.1	77,284.0	88,130.9	98,977.8	106,299.4
TERRY	COLORADO															
YOAKUM	COLORADO	0.0	1,267.7	2,535.3	3,803.0	6,179.8	8,556.7	10,933.5	13,310.4	15,687.2	19,490.2	23,293.1	27,096.1	30,899.1	34,702.0	37,269.0

Table C-1. Agricultural Total Pumpage (ac-ft/yr)

Total 1955	Total 1956	Total 1957	Total 1958	Total 1959	Total 1960	Total 1961	Total 1962	Total 1963	Total 1964	Total 1965	Total 1966	Total 1967	Total 1968	Total 1969	Total 1970	Total 1971
1,423.8	1,515.5	1,607.3	1,699.0	4,148.0	6,597.0	9,046.0	11,495.0	13,944.0	16,393.0	13,354.0	10,315.0	7,276.0	4,237.0	1,198.0	2,014.0	2,830.0
180.2	191.9	203.5	215.1	252.2	289.3	326.5	363.6	400.7	437.8	418.2	398.6	378.9	359.3	339.7	332.4	325.0
215,271.3	229,143.2	243,015.1	256,887.0	273,157.2	289,427.3	305,697.5	321,967.7	338,237.8	354,508.0	320,583.0	286,658.0	252,733.0	218,808.0	184,883.0	223,081.2	261,279.4
677.1	720.7	764.4	808.0	791.5	775.0	758.5	742.0	725.5	709.0	710.4	711.8	713.2	714.6	716.0	698.4	680.8
19,517.2	20,774.9	22,032.5	23,290.2	30,543.3	37,796.4	45,049.5	52,302.6	59,555.7	66,808.8	64,975.3	63,141.8	61,308.4	59,474.9	57,641.4	58,478.5	59,315.6
297,050.1	316,191.7	335,333.4	354,475.0	401,112.5	447,750.0	494,387.5	541,025.0	587,662.5	634,300.0	617,166.8	600,033.6	582,900.4	565,767.2	548,634.0	548,139.2	547,644.4
43,978.2	46,812.2	49,646.1	52,480.0	55,546.7	58,613.3	61,680.0	64,746.7	67,813.3	70,880.0	69,766.4	68,652.8	67,539.2	66,425.6	65,312.0	69,362.4	73,412.8
116,606.0	124,120.0	131,634.0	139,148.0	147,364.7	155,581.3	163,798.0	172,014.7	180,231.3	188,448.0	193,920.2	199,392.4	204,864.6	210,336.8	215,809.0	219,207.2	222,605.4
138,380.0	156,000.0	140,000.0	105,490.0	95,000.0	70,000.0	95,977.8	121,955.6	147,933.3	173,911.1	199,888.9	225,866.7	251,844.4	277,822.2	227,850.0	228,030.0	228,210.0
88,087.2	93,763.5	99,439.7	105,116.0	112,393.8	119,671.7	126,949.5	134,227.3	141,505.2	148,783.0	127,464.8	106,146.6	84,828.4	63,510.2	42,192.0	40,002.6	37,813.2
341,311.5	363,305.4	385,299.2	407,293.0	417,601.7	427,910.3	438,219.0	448,527.7	458,836.3	469,145.0	471,621.0	474,097.0	476,573.0	479,049.0	481,525.0	488,179.8	494,834.6
4,401.2	4,684.8	4,968.4	5,252.0	5,376.2	5,500.3	5,624.5	5,748.7	5,872.8	5,997.0	6,489.2	6,981.4	7,473.6	7,965.8	8,458.0	8,295.2	8,132.4
0.0	0.0	0.0	0.0	952.0	1,904.0	2,856.0	3,808.0	4,760.0	5,712.0	5,311.2	4,910.4	4,509.6	4,108.8	3,708.0	3,687.8	3,667.6
153,298.9	163,177.3	173,055.8	182,934.2	193,836.1	204,737.9	215,639.7	226,541.6	237,443.4	248,345.2	260,299.5	272,253.8	284,208.1	296,162.3	308,116.6	302,248.9	296,381.2
50,000.0	59,375.0	72,500.0	80,625.0	95,000.0	112,500.0	108,750.0	142,500.0	182,000.0	199,558.8	180,210.9	160,863.1	141,515.2	122,167.4	102,819.5	125,771.2	148,723.0
12,570.0	13,380.0	14,190.0	15,000.0	15,502.3	16,004.7	16,507.0	17,009.3	17,511.7	18,014.0	17,708.0	17,402.0	17,096.0	16,790.0	16,484.0	16,320.6	16,157.2
777.5	827.6	877.7	927.8	1,100.8	1,273.9	1,447.0	1,620.0	1,793.1	1,966.2	2,119.9	2,273.6	2,427.3	2,581.1	2,734.8	3,069.5	3,404.2
482,480.2	513,570.8	544,661.4	575,752.0	664,062.7	752,373.3	840,684.0	928,994.7	1,017,305.3	1,105,616.0	1,020,526.2	935,436.4	850,346.6	765,256.8	680,167.0	709,405.0	738,643.0
138,281.7	147,192.5	156,103.2	165,014.0	203,842.2	242,670.3	281,498.5	320,326.7	359,154.8	397,983.0	361,325.6	324,668.2	288,010.8	251,353.4	214,696.0	240,857.2	267,018.4
1,284.7	1,367.4	1,450.2	1,533.0	1,638.7	1,744.3	1,850.0	1,955.7	2,061.3	2,167.0	2,009.4	1,851.8	1,694.2	1,536.6	1,379.0	1,604.0	1,829.0
331,832.9	353,215.9	374,599.0	395,982.0	443,860.3	491,738.7	539,617.0	587,495.3	635,373.7	683,252.0	624,376.6	565,501.2	506,625.8	447,750.4	388,875.0	393,874.4	398,873.8
170,000.0	160,000.0	140,000.0	107,000.0	149,000.0	105,000.0	107,052.4	109,104.9	111,157.3	113,209.8	115,262.2	117,314.7	119,367.1	121,419.6	123,472.0	123,113.5	122,755.0
244,079.2	259,807.5	275,535.7	291,264.0	278,269.7	265,275.3	252,281.0	239,286.7	226,292.3	213,298.0	208,608.4	203,918.8	199,229.2	194,539.6	189,850.0	207,561.8	225,273.6
66,621.8	70,914.9	75,207.9	79,501.0	79,428.7	79,356.3	79,284.0	79,211.7	79,139.3	79,067.0	67,949.0	56,831.0	45,713.0	34,595.0	23,477.0	33,258.0	43,039.0
34,085.7	36,282.1	38,478.6	40,675.0	41,506.7	42,338.3	43,170.0	44,001.7	44,833.3	45,665.0	42,369.4	39,073.8	35,778.2	32,482.6	29,187.0	29,314.6	29,442.2
6,251.3	6,654.1	7,057.0	7,459.8	6,958.9	6,457.9	5,957.0	5,456.0	4,955.1	4,454.1	5,569.0	6,683.9	7,798.9	8,913.8	10,028.7	10,270.4	10,512.1
140.8	149.9	159.0	168.1	187.2	206.3	225.4	244.5	263.6	282.7	326.0	369.3	412.6	455.9	499.2	491.2	483.2
20,204.2	21,506.1	22,808.1	24,110.0	26,520.2	28,930.3	31,340.5	33,750.7	36,160.8	38,571.0	36,873.6	35,176.2	33,478.8	31,781.4	30,084.0	30,404.8	30,725.6
648,558.4	690,350.9	732,143.5	773,936.0	740,616.7	707,297.3	673,978.0	640,658.7	607,339.3	574,020.0	557,875.0	541,730.0	525,585.0	509,440.0	493,295.0	515,775.4	538,255.8
8,380.0	8,920.0	9,460.0	10,000.0	12,091.3	14,182.7	16,274.0	18,365.3	20,456.7	22,548.0	22,207.2	21,866.4	21,525.6	21,184.8	20,844.0	21,540.6	22,237.2
5,400.0	3,400.0	3,200.0	3,000.0	4,500.0	2,000.0	2,620.1	3,240.2	3,860.3	4,480.4	5,100.6	5,720.7	6,340.8	6,960.9	5,685.8	6,971.5	8,257.3
58,315.4	62,073.2	65,831.0	69,588.8	77,686.3	85,783.7	93,881.2	101,978.7	110,076.1	118,173.6	108,546.1	98,918.6	89,291.0	79,663.5	70,036.0	71,530.1	73,024.2
104,250.0	109,250.0	98,250.0	79,250.0	98,500.0	85,000.0	94,144.4	103,288.9	112,433.3	121,577.8	130,722.2	139,866.7	149,011.1	158,155.6	125,475.0	134,420.0	143,365.0
222,091.8	236,403.2	250,714.6	265,026.0	299,458.8	333,891.7	368,324.5	402,757.3	437,190.2	471,623.0	451,225.8	430,828.6	410,431.4	390,034.2	369,637.0	390,685.2	411,733.4
113,621.1	120,942.7	128,264.4	135,586.0	141,373.8	147,161.7	152,949.5	158,737.3	164,525.2	170,313.0	147,861.8	125,410.6	102,959.4	80,508.2	58,057.0	59,611.0	61,165.0
39,836.0	42,403.0	44,970.0	47,537.0	46,827.1	46,117.2	45,407.3	44,697.3	43,987.4	43,277.5	45,023.3	46,769.1	48,514.9	50,260.7	52,006.5	54,500.0	56,993.6

Table C-1. Agricultural Total Pumpage (ac-ft/yr)

Total 1972	Total 1973	Total 1974	Total 1975	Total 1976	Total 1977	Total 1978	Total 1979	Total 1980	Total 1981	Total 1982	Total 1983	Total 1984	Total 1985	Total 1986	Total 1987	Total 1988
3,646.0	4,462.0	5,278.0	6,048.8	6,819.6	7,590.4	8,361.2	9,132.0	11,890.3	14,648.6	17,407.0	34,008.8	11,563.4	9,801.9	8,040.5	6,279.0	6,567.3
317.7	310.4	303.1	268.1	233.2	198.3	163.3	128.4	86.0	43.7	133.7	98.3	125.5	109.3	93.2	77.0	90.1
299,477.6	337,675.8	375,874.0	351,136.2	326,398.4	301,660.6	276,922.8	252,185.0	241,234.2	230,283.4	219,332.6	162,323.8	131,750.5	116,946.3	102,142.0	87,337.8	92,800.2
663.2	645.6	628.0	563.0	498.0	433.0	368.0	303.0	565.1	827.2	1,089.3	0.0	167.5	427.3	687.2	947.0	1,376.8
60,152.8	60,989.9	61,827.0	60,903.6	59,980.2	59,056.8	58,133.4	57,210.0	46,065.6	34,921.1	39,627.8	34,207.7	28,312.4	26,387.6	24,462.8	22,538.0	24,182.1
547,149.6	546,654.8	546,160.0	519,274.2	492,388.4	465,502.6	438,616.8	411,731.0	432,544.6	453,358.2	474,171.8	401,773.6	416,520.4	362,757.3	308,994.1	255,231.0	264,961.7
77,463.2	81,513.6	85,564.0	74,070.2	62,576.4	51,082.6	39,588.8	28,095.0	58,467.5	88,839.9	119,212.4	82,606.9	90,149.0	72,809.7	55,470.5	38,131.2	43,969.6
226,003.6	229,401.8	232,800.0	194,857.6	156,915.2	118,972.8	81,030.4	43,088.0	70,192.8	97,297.6	124,402.4	158,592.6	163,162.6	132,632.4	102,102.2	71,572.0	87,991.9
228,390.0	228,570.0	228,750.0	228,930.0	221,455.5	213,981.0	206,506.5	199,032.0	191,557.5	195,052.0	134,694.1	96,176.5	102,397.2	94,997.8	87,598.4	80,199.0	85,875.7
35,623.8	33,434.4	31,245.0	26,936.0	22,627.0	18,318.0	14,009.0	9,700.0	20,920.2	32,140.4	43,360.7	41,474.7	38,078.5	33,128.6	28,178.8	23,229.0	24,835.7
501,489.4	508,144.2	514,799.0	474,980.4	435,161.8	395,343.2	355,524.6	315,706.0	310,276.3	304,846.7	299,417.0	259,145.6	220,633.0	203,274.6	185,916.3	168,558.0	175,326.8
7,969.6	7,806.8	7,644.0	6,443.1	5,242.2	4,041.3	2,840.4	1,639.5	2,206.6	2,773.6	6,681.4	3,578.1	4,951.7	3,710.4	2,469.2	1,228.0	1,390.2
3,647.4	3,627.2	3,607.0	3,624.2	3,641.4	3,658.6	3,675.8	3,693.0	3,502.8	3,312.5	3,122.3	0.0	0.0	941.0	1,882.0	2,823.0	2,258.4
290,513.4	284,645.7	278,778.0	257,354.2	235,930.4	214,506.6	193,082.8	171,659.0	219,025.3	266,391.6	323,461.7	233,128.4	255,234.5	220,680.0	186,125.5	151,571.0	164,022.8
171,674.7	194,626.5	217,578.2	231,887.0	246,195.9	260,504.7	274,813.6	289,122.4	291,851.9	294,581.5	382,257.0	289,983.9	229,689.2	221,556.1	213,423.1	205,290.0	221,903.7
15,993.8	15,830.4	15,667.0	14,912.4	14,157.8	13,403.2	12,648.6	11,894.0	9,939.0	7,983.9	6,028.9	6,587.3	7,352.7	6,044.1	4,735.6	3,427.0	3,598.6
3,738.9	4,073.6	4,408.2	4,149.9	3,891.5	3,633.2	3,374.8	3,116.5	2,215.1	1,313.7	5,153.5	5,515.3	5,167.3	4,486.2	3,805.1	3,124.0	3,354.1
767,881.0	797,119.0	826,357.0	732,475.4	638,593.8	544,712.2	450,830.6	356,949.0	393,384.2	429,819.4	466,254.7	408,155.2	423,736.1	368,185.4	312,634.7	257,084.0	280,884.2
293,179.6	319,340.8	345,502.0	285,405.0	225,308.0	165,211.0	105,114.0	45,017.0	101,948.4	158,879.8	215,811.3	185,115.1	152,676.1	125,876.8	99,077.4	72,278.1	88,764.4
2,054.0	2,279.0	2,504.0	2,174.4	1,844.8	1,515.2	1,185.6	856.0	4,449.9	8,043.8	11,637.7	3,104.3	3,812.1	3,163.7	2,515.4	1,867.0	2,939.5
403,873.2	408,872.6	413,872.0	395,104.2	376,336.4	357,568.6	338,800.8	320,033.0	350,218.8	380,404.7	410,590.5	337,142.1	289,552.1	267,541.5	245,531.0	223,520.4	231,752.6
122,396.5	122,038.0	121,679.5	121,321.0	117,708.8	114,096.6	110,484.4	106,872.2	103,260.0	75,046.4	46,832.7	26,548.0	23,083.1	29,932.4	36,781.7	43,631.0	46,344.1
242,985.4	260,697.2	278,409.0	227,923.2	177,437.4	126,951.6	76,465.8	25,980.0	101,133.1	176,286.2	251,439.3	218,825.4	253,455.8	214,953.2	176,450.6	137,948.0	153,652.0
52,820.0	62,601.0	72,382.0	65,563.6	58,745.2	51,926.8	45,108.4	38,290.0	38,142.8	37,995.6	37,848.4	48,882.4	53,493.5	45,285.0	37,076.5	28,868.0	36,917.9
29,569.8	29,697.4	29,825.0	26,985.0	24,145.0	21,305.0	18,465.0	15,625.0	14,365.2	13,105.5	11,845.7	13,504.7	9,508.6	7,879.4	6,250.2	4,621.0	6,337.1
10,753.7	10,995.4	11,237.1	10,463.9	9,690.8	8,917.6	8,144.5	7,371.3	5,660.7	3,950.1	7,464.8	2,692.6	2,898.3	3,308.9	3,719.4	4,130.0	4,304.4
475.1	467.1	459.1	409.0	358.8	308.6	258.4	208.3	152.8	97.3	597.7	433.3	555.2	518.5	481.7	445.0	431.5
31,046.4	31,367.2	31,688.0	28,694.8	25,701.6	22,708.4	19,715.2	16,722.0	21,286.0	25,850.0	30,414.1	26,994.7	24,084.7	22,358.4	20,632.2	18,906.0	18,729.8
560,736.2	583,216.6	605,697.0	603,118.8	600,540.6	597,962.4	595,384.2	592,806.0	545,252.6	497,699.1	450,145.7	369,519.7	349,416.2	303,510.1	257,604.1	211,698.0	221,608.3
22,933.8	23,630.4	24,327.0	23,604.6	22,882.2	22,159.8	21,437.4	20,715.0	17,653.3	14,591.7	11,530.0	25,691.6	37,689.2	29,737.2	21,785.1	13,833.0	13,590.0
9,543.0	10,828.8	12,114.5	13,400.3	12,596.7	11,793.2	10,989.6	10,186.1	9,382.5	6,489.6	3,284.6	2,092.2	2,175.8	2,159.8	2,143.9	2,128.0	2,176.6
74,518.2	76,012.3	77,506.4	74,797.9	72,089.4	69,381.0	66,672.5	63,964.0	43,583.6	23,203.2	3,528.4	31,438.2	48,628.9	42,072.6	35,516.3	28,960.0	30,031.4
152,310.0	161,255.0	170,200.0	179,145.0	168,658.5	158,172.0	147,685.5	137,199.0	126,712.5	146,244.5	123,539.1	62,508.7	62,394.1	64,003.1	65,612.0	67,221.0	74,362.0
432,781.6	453,829.8	474,878.0	411,492.8	348,107.6	284,722.4	221,337.2	157,952.0	208,864.7	259,777.4	310,690.1	269,198.0	306,589.2	248,572.5	190,555.7	132,539.0	138,235.2
62,719.0	64,273.0	65,827.0	64,204.0	62,581.0	60,958.0	59,335.0	57,712.0	75,337.5	92,963.0	110,588.4	166,634.9	137,173.9	115,615.5	94,057.0	72,498.6	85,395.6
59,487.1	61,980.7	64,474.2	68,787.0	73,099.9	77,412.7	81,725.6	86,038.4	84,204.9	82,371.5	103,548.9	71,398.3	63,702.3	46,573.1	29,443.9	12,314.7	27,290.2

Table C-1. Agricultural Total Pumpage (ac-ft/yr)

Total 1989	Total 1990	Total 1991	Total 1992	Total 1993	Total 1994	Total 1995	Total 1996	Total 1997	Total 1998	Total 1999	Total 2000	Total 2001	Total 2002	Total 2003	Total 2004	Total 2005
6,855.6	7,143.9	7,432.2	7,720.5	5,135.5	5,962.9	9,745.0	13,527.0	17,309.0	17,012.0	16,715.0	16,418.0	16,445.0	16,472.0	16,499.1	16,526.1	16,553.1
103.2	116.4	129.5	142.6	116.5	129.5	107.3	85.2	63.0	2,290.9	4,518.8	6,746.6	6,746.6	6,746.6	6,746.6	6,746.6	6,746.6
98,262.7	103,725.1	109,187.5	114,649.9	126,044.3	112,431.7	102,866.4	93,301.2	83,736.0	116,760.3	140,480.7	164,201.0	163,869.2	163,537.4	163,205.6	162,873.8	162,542.0
1,806.6	2,236.4	2,666.2	3,096.0	0.0	2,803.3	3,823.5	4,843.8	5,864.0	4,182.3	2,500.7	819.0	92.0	92.0	92.0	92.0	92.0
												727.4	727.8	728.2	728.6	729.0
25,826.3	27,470.4	29,114.5	30,758.7	36,299.4	33,584.4	27,208.0	20,831.5	14,455.0	19,110.3	23,765.7	28,421.0	28,302.7	28,184.4	28,066.1	27,947.8	27,829.5
274,692.4	284,423.2	294,153.9	303,884.6	368,551.8	160,445.1	200,976.4	241,507.7	282,039.0	273,988.6	265,938.1	257,887.7	156,285.0	155,858.4	155,431.8	155,005.1	154,578.5
												100,788.1	100,400.2	100,012.3	99,624.4	99,236.5
49,808.0	55,646.4	61,484.8	67,323.1	71,774.3	72,110.0	70,040.5	67,971.1	65,901.6	61,325.3	49,426.7	37,528.0	19,188.6	19,176.2	19,163.8	19,151.4	19,139.0
												18,256.1	18,185.2	18,114.3	18,043.4	17,972.5
104,411.9	120,831.8	137,251.7	153,671.6	193,050.3	154,332.3	139,207.8	124,083.4	108,959.0	101,561.3	94,163.6	86,765.8	85,107.9	84,759.8	84,411.7	84,063.6	83,715.5
												1,307.9	1,306.0	1,304.1	1,302.1	1,300.2
91,552.5	97,229.2	102,905.9	108,582.6	115,349.8	138,782.2	123,489.8	108,197.4	92,905.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0
26,442.4	28,049.1	29,655.8	31,262.5	53,333.0	54,051.4	67,834.3	81,617.1	95,400.0	75,758.3	56,116.7	36,475.0	362.9	360.8	358.7	356.6	354.5
												35,906.4	35,702.8	35,499.2	35,295.6	35,092.0
182,095.5	188,864.3	195,633.0	202,401.8	240,950.6	221,385.9	205,099.6	188,813.3	172,527.0	197,727.0	222,927.0	248,127.0	247,331.4	246,535.8	245,740.2	244,944.6	244,149.0
1,552.3	1,714.5	1,876.7	2,038.9	1,279.4	2,059.9	3,547.9	5,036.0	6,524.0	5,613.3	4,702.7	3,792.0	2,155.6	2,149.2	2,142.8	2,136.4	2,130.0
												1,625.1	1,620.2	1,615.3	1,610.4	1,605.5
1,693.8	1,129.2	564.6	0.0	0.0	0.0	1,180.7	2,361.3	3,542.0	4,236.9	4,931.8	5,626.7	5,619.6	5,612.4	5,605.3	5,598.2	5,591.1
176,474.6	188,926.4	201,378.2	213,830.0	231,136.1	215,910.5	190,141.7	164,372.8	138,604.0	127,998.1	117,392.3	106,786.4	39,966.6	39,883.8	39,801.1	39,718.3	39,635.5
												66,471.2	66,205.4	65,939.6	65,673.8	65,408.0
238,517.4	255,131.1	271,744.9	288,358.6	273,428.9	290,207.8	285,229.6	280,251.3	275,273.1	322,347.0	338,835.0	355,323.0	353,472.4	351,621.8	349,771.2	347,920.6	346,070.0
3,770.1	3,941.7	4,113.2	4,284.8	5,389.7	8,998.1	10,914.7	12,831.4	14,748.0	10,385.2	6,022.5	1,659.7	1,666.0	1,672.3	1,678.6	1,684.9	1,691.2
3,584.1	3,814.2	4,044.3	4,274.3	4,073.1	5,324.3	5,681.2	6,038.1	6,395.0	5,562.0	4,729.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0
304,684.4	328,484.7	352,284.9	376,085.1	398,524.3	385,000.6	333,003.4	281,006.2	229,009.0	255,398.6	281,788.2	308,177.8	306,017.9	305,280.1	304,542.2	303,804.3	303,066.5
												1,415.0	1,408.0	1,401.0	1,394.0	1,387.0
105,250.7	121,737.0	138,223.2	154,709.5	157,773.7	167,340.8	156,014.8	144,688.9	133,362.9	126,688.6	105,196.1	83,703.7	73,951.8	73,771.9	73,592.0	73,412.1	73,232.2
												9,534.0	9,496.0	9,458.0	9,420.0	9,382.0
4,012.0	5,084.5	6,157.1	7,229.6	3,836.9	2,473.4	2,893.3	3,313.1	3,733.0	4,055.3	4,377.7	4,700.0	4,694.7	4,689.4	4,684.1	4,678.8	4,673.5
239,984.7	248,216.9	256,449.0	264,681.2	290,859.2	271,772.7	250,205.2	228,637.7	207,070.2	247,625.0	265,172.0	282,719.0	281,606.4	280,493.8	279,381.2	278,268.6	277,156.0
49,057.3	51,770.4	54,483.6	57,196.7	32,846.9	34,536.7	38,664.8	42,792.9	46,921.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0
169,356.0	185,059.9	200,763.9	216,467.9	243,639.4	208,500.4	199,146.0	189,791.5	180,437.0	168,726.7	157,016.3	145,306.0	144,384.9	143,463.8	142,542.7	141,621.6	140,700.5
44,967.8	53,017.6	61,067.5	69,117.4	54,540.9	54,445.4	52,036.2	49,627.1	47,218.0	40,965.7	34,713.3	28,461.0	27,973.9	27,832.8	27,691.7	27,550.6	27,409.5
												344.1	342.2	340.3	338.4	336.5
8,053.3	9,769.4	11,485.5	13,201.7	14,165.7	12,567.9	11,773.2	10,978.6	10,184.0	11,418.7	12,653.3	13,888.0	13,784.1	13,680.2	13,576.3	13,472.4	13,368.5
4,478.8	4,653.1	4,827.5	5,001.9	2,530.3	3,686.2	4,507.8	5,329.4	6,151.0	5,235.3	4,319.7	3,404.0	3,413.4	3,422.8	3,432.2	3,441.6	3,451.0
418.0	404.5	390.9	377.4	237.8	441.8	429.9	417.9	406.0	811.3	1,216.7	1,622.0	1,617.2	1,612.4	1,607.6	1,602.8	1,598.0
18,553.6	18,377.4	18,201.2	18,025.0	11,775.7	18,144.0	21,200.7	24,257.3	27,314.0	26,858.7	26,403.3	25,948.0	7,314.3	6,928.6	6,542.9	6,157.2	5,771.5
												18,206.3	18,164.5	18,122.8	18,081.0	18,039.3
231,518.6	241,428.9	251,339.2	261,249.5	327,375.2	300,227.5	271,614.3	243,001.2	214,388.0	239,046.7	263,705.3	288,364.0	195,230.1	194,178.2	193,126.3	192,074.4	191,022.5
												91,981.9	91,881.8	91,781.7	91,681.6	91,581.5
13,347.1	13,104.1	12,861.1	12,618.1	11,275.2	12,037.6	13,541.1	15,044.5	16,548.0	16,862.0	17,176.0	17,490.0	8,610.3	8,269.7	7,929.0	7,588.3	7,247.6
												8,468.9	8,398.8	8,328.7	8,258.6	8,188.5
2,225.2	2,273.8	2,322.4	2,370.9	1,104.3	1,285.7	1,783.5	2,281.2	2,779.0	3,493.0	3,493.0	3,493.0	499.2	499.2	499.2	499.2	499.2
31,102.8	32,174.1	33,245.5	34,316.9	36,215.7	37,553.8	37,765.9	37,977.9	38,190.0	43,034.0	47,878.0	52,722.0	500.0	447.0	394.0	341.1	288.1
												52,065.8	51,962.6	51,859.3	51,756.1	51,652.9
81,503.0	88,644.0	95,785.0	102,926.0	95,995.6	103,045.9	101,731.6	100,417.3	99,103.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0
143,931.3	149,627.5	155,323.6	161,019.8	184,368.4	185,382.0	157,949.7	130,517.3	103,085.0	102,958.3	102,831.7	102,705.0	18,321.5	18,314.0	18,306.5	18,299.0	18,291.5
												84,327.8	84,279.6	84,231.4	84,183.2	84,135.0
98,292.5	111,189.5	124,086.5	136,983.4	150,510.6	142,004.6	145,810.1	149,615.7	153,421.2	148,647.0	126,826.0	105,005.0	3,468.9	3,449.8	3,430.7	3,411.6	3,392.5
												100,996.5	100,476.0	99,955.5	99,435.0	98,914.5
42,265.6	57,241.1	72,216.6	87,192.0	68,849.6	89,215.7	98,970.0	108,724.4	118,478.7	116,070.3	100,497.7	84,925.0	84,518.6	84,112.2	83,705.8	83,299.4	82,893.0

Table C-1. Agricultural Total Pumpage (ac-ft/yr)

Total 2006	Total 2007	Total 2008	Total 2009	Total 2010	Total 2011	Total 2012	Total 2013	Total 2014	Total 2015	Total 2016	Total 2017	Total 2018	Total 2019	Total 2020	Total 2021	Total 2022
16,580.1	16,607.1	16,634.1	16,661.2	16,688.2	16,517.5	16,346.9	16,176.2	16,005.5	15,834.9	15,664.2	15,493.6	15,322.9	15,152.3	14,981.6	14,968.6	14,955.6
6,746.6	6,746.6	6,746.6	6,746.6	6,746.6	6,746.7	6,746.7	6,746.8	6,746.8	6,746.8	6,746.9	6,746.9	6,746.9	6,747.0	6,747.0	6,747.0	6,747.0
162,210.2	161,878.4	161,546.6	161,214.8	160,883.0	160,591.0	160,299.0	160,007.0	159,715.0	159,423.0	159,131.0	158,839.0	158,547.0	158,255.0	157,963.0	157,702.9	157,442.8
92.0	92.0	92.0	92.0	92.0	92.1	92.2	92.3	92.4	92.5	92.6	92.7	92.8	92.9	93.0	93.1	93.2
729.4	729.8	730.2	730.6	731.0	731.5	732.0	732.5	733.0	733.5	734.0	734.5	735.0	735.5	736.0	736.6	737.2
27,711.2	27,592.9	27,474.6	27,356.3	27,238.0	27,124.1	27,010.2	26,896.3	26,782.4	26,668.5	26,554.6	26,440.7	26,326.8	26,212.9	26,099.0	26,213.4	26,327.8
154,151.8	153,725.2	153,298.5	152,871.9	152,445.2	152,008.6	151,572.0	151,135.4	150,698.7	150,262.1	149,825.5	149,388.9	148,952.2	148,515.6	148,079.0	147,578.5	147,078.0
98,848.6	98,460.7	98,072.8	97,684.9	97,297.0	96,924.0	96,551.0	96,178.0	95,805.0	95,432.0	95,059.0	94,686.0	94,313.0	93,940.0	93,567.0	93,208.2	92,849.4
19,126.6	19,114.2	19,101.8	19,089.4	19,077.0	19,133.1	19,189.2	19,245.3	19,301.4	19,357.5	19,413.6	19,469.7	19,525.8	19,581.9	19,638.0	19,637.4	19,636.8
17,901.6	17,830.7	17,759.8	17,688.9	17,618.0	17,550.0	17,482.0	17,414.0	17,346.0	17,278.0	17,210.0	17,142.0	17,074.0	17,006.0	16,938.0	16,872.5	16,807.0
83,367.4	83,019.3	82,671.2	82,323.1	81,975.0	81,640.9	81,306.8	80,972.7	80,638.6	80,304.5	79,970.4	79,636.3	79,302.2	78,968.1	78,634.0	78,314.2	77,994.4
1,298.3	1,296.4	1,294.4	1,292.5	1,290.6	1,288.2	1,285.9	1,283.5	1,281.2	1,278.8	1,276.5	1,274.1	1,271.7	1,269.4	1,267.0	1,264.4	1,261.8
118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0
352.4	350.3	348.2	346.1	344.0	342.1	340.2	338.3	336.4	334.5	332.6	330.7	328.8	326.9	325.0	323.2	321.4
34,888.4	34,684.8	34,481.2	34,277.6	34,074.0	33,881.9	33,689.8	33,497.7	33,305.6	33,113.5	32,921.4	32,729.3	32,537.2	32,345.1	32,153.0	31,971.7	31,790.4
243,353.4	242,557.8	241,762.2	240,966.6	240,171.0	239,400.8	238,630.6	237,860.4	237,090.2	236,320.0	235,549.8	234,779.6	234,009.4	233,239.2	232,469.0	231,723.0	230,977.0
2,123.6	2,117.2	2,110.8	2,104.4	2,098.0	2,091.7	2,085.4	2,079.1	2,072.8	2,066.5	2,060.2	2,053.9	2,047.6	2,041.3	2,035.0	2,029.0	2,023.0
1,600.6	1,595.7	1,590.8	1,585.9	1,581.0	1,576.3	1,571.6	1,566.9	1,562.2	1,557.5	1,552.8	1,548.1	1,543.4	1,538.7	1,534.0	1,529.4	1,524.8
5,583.9	5,576.8	5,569.7	5,562.6	5,555.4	5,548.7	5,542.0	5,535.2	5,528.5	5,521.8	5,515.1	5,508.3	5,501.6	5,494.9	5,488.1	5,481.4	5,474.7
39,552.7	39,470.0	39,387.2	39,304.4	39,221.6	39,144.3	39,066.9	38,989.5	38,912.2	38,834.8	38,757.5	38,680.1	38,602.7	38,525.4	38,448.0	38,388.7	38,329.5
65,142.2	64,876.4	64,610.6	64,344.8	64,079.0	63,823.8	63,568.6	63,313.4	63,058.2	62,803.0	62,547.8	62,292.6	62,037.4	61,782.2	61,527.0	61,281.9	61,036.8
344,219.4	342,368.8	340,518.2	338,667.6	336,817.0	335,062.8	333,308.6	331,554.4	329,800.2	328,046.0	326,291.8	324,537.6	322,783.4	321,029.2	319,275.0	317,612.2	315,949.4
1,697.4	1,703.7	1,710.0	1,716.3	1,722.6	1,717.8	1,713.1	1,708.3	1,703.5	1,698.8	1,694.0	1,689.2	1,684.4	1,679.7	1,674.9	1,667.9	1,660.8
3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0
302,328.6	301,590.8	300,852.9	300,115.0	299,377.2	298,619.4	297,861.7	297,103.9	296,346.2	295,588.4	294,830.7	294,072.9	293,315.2	292,557.4	291,799.7	291,019.1	290,238.6
1,380.0	1,373.0	1,366.0	1,359.0	1,352.0	1,345.8	1,339.6	1,333.4	1,327.2	1,321.0	1,314.8	1,308.6	1,302.4	1,296.2	1,290.0	1,284.3	1,278.6
73,052.3	72,872.4	72,692.4	72,512.5	72,332.6	72,100.3	71,867.9	71,635.5	71,403.1	71,170.8	70,938.4	70,706.0	70,473.7	70,241.3	70,008.9	69,780.6	69,552.3
9,344.0	9,306.0	9,268.0	9,230.0	9,192.0	9,155.4	9,118.8	9,082.2	9,045.6	9,009.0	8,972.4	8,935.8	8,899.2	8,862.6	8,826.0	8,790.9	8,755.8
4,668.2	4,662.9	4,657.6	4,652.3	4,647.0	4,641.7	4,636.4	4,631.1	4,625.8	4,620.5	4,615.2	4,609.9	4,604.6	4,599.3	4,594.0	4,588.7	4,583.4
276,043.4	274,930.8	273,818.2	272,705.6	271,593.0	270,523.2	269,453.4	268,383.6	267,313.8	266,244.0	265,174.2	264,104.4	263,034.6	261,964.8	260,895.0	259,866.5	258,838.0
46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0
139,779.4	138,858.3	137,937.2	137,016.1	136,095.0	135,241.4	134,387.8	133,534.2	132,680.6	131,827.0	130,973.4	130,119.8	129,266.2	128,412.6	127,559.0	126,733.9	125,908.8
27,268.4	27,127.3	26,986.2	26,845.1	26,704.0	26,559.8	26,415.6	26,271.4	26,127.2	25,983.0	25,838.8	25,694.6	25,550.4	25,406.2	25,262.0	25,138.9	25,015.8
334.6	332.7	330.8	328.9	327.0	325.3	323.6	321.9	320.2	318.5	316.8	315.1	313.4	311.7	310.0	308.3	306.6
13,264.5	13,160.6	13,056.7	12,952.8	12,848.9	12,825.5	12,802.1	12,778.7	12,755.3	12,731.8	12,708.4	12,685.0	12,661.6	12,638.2	12,614.8	12,590.4	12,566.1
3,460.4	3,469.8	3,479.2	3,488.6	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0
1,593.2	1,588.4	1,583.6	1,578.8	1,574.0	1,569.3	1,564.6	1,559.9	1,555.2	1,550.5	1,545.8	1,541.1	1,536.4	1,531.7	1,527.0	1,522.5	1,518.0
5,385.8	5,000.1	4,614.4	4,228.7	3,843.0	3,761.6	3,680.2	3,598.7	3,517.3	3,435.9	3,354.5	3,273.1	3,191.7	3,110.2	3,028.8	3,028.8	3,028.8
17,997.5	17,955.8	17,914.1	17,872.3	17,830.6	17,809.3	17,788.0	17,766.7	17,745.4	17,724.2	17,702.9	17,681.6	17,660.3	17,639.0	17,617.8	17,617.8	17,617.8
189,970.6	188,918.7	187,866.8	186,814.9	185,763.0	184,892.2	184,021.4	183,150.6	182,279.8	181,409.0	180,538.2	179,667.4	178,796.6	177,925.8	177,055.0	176,205.0	175,355.0
91,481.4	91,381.3	91,281.2	91,181.1	91,081.0	90,982.0	90,883.0	90,784.0	90,685.0	90,586.0	90,487.0	90,388.0	90,289.0	90,190.0	90,091.0	89,993.1	89,895.2
6,907.0	6,566.3	6,225.6	5,884.9	5,544.3	5,440.0	5,335.8	5,231.5	5,127.2	5,023.0	4,918.7	4,814.5	4,710.2	4,605.9	4,501.7	4,478.3	4,455.0
8,118.4	8,048.3	7,978.2	7,908.2	7,838.1	7,792.1	7,746.1	7,700.1	7,654.1	7,608.1	7,562.2	7,516.2	7,470.2	7,424.2	7,378.2	6,877.8	6,377.4
499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2
235.1	182.1	129.1	76.1	23.2	22.4	21.6	20.8	20.0	19.2	18.4	17.7	16.9	16.1	15.3	15.0	14.6
51,549.7	51,446.5	51,343.3	51,240.0	51,136.8	51,046.6	50,956.3	50,866.1	50,775.8	50,685.5	50,595.3	50,505.0	50,414.8	50,324.5	50,234.2	50,129.5	50,024.7
98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0
18,284.0	18,276.5	18,269.0	18,261.5	18,254.0	18,247.3	18,240.6	18,233.9	18,227.2	18,220.5	18,213.8	18,207.1	18,200.4	18,193.7	18,187.0	18,180.8	18,174.6
84,086.8	84,038.6	83,990.4	83,942.2	83,894.0	83,542.3	83,190.6	82,838.9	82,487.2	82,135.5	81,783.8	81,432.1	81,080.4	80,728.7	80,377.0	80,633.2	80,889.4
3,373.4	3,354.3	3,335.2	3,316.1	3,297.0	3,279.2	3,261.4	3,243.6	3,225.8	3,208.0	3,190.2	3,172.4	3,154.6	3,136.8	3,119.0	3,101.9	3,084.8
98,394.0	97,873.5	97,353.0	96,832.5	96,312.0	95,818.2	95,324.4	94,830.6	94,336.8	93,843.0	93,349.2	92,855.4	92,361.6	91,867.8	91,374.0	90,905.5	90,437.0
82,486.6	82,080.2	81,673.8	81,267.4	80,861.0	80,473.9	80,086.8	79,699.7	79,312.6	78,925.5	78,538.4	78,151.3	77,764.2	77,377.1	76,990.0	76,621.5	76,253.0

Table C-1. Agricultural Total Pumpage (ac-ft/yr)

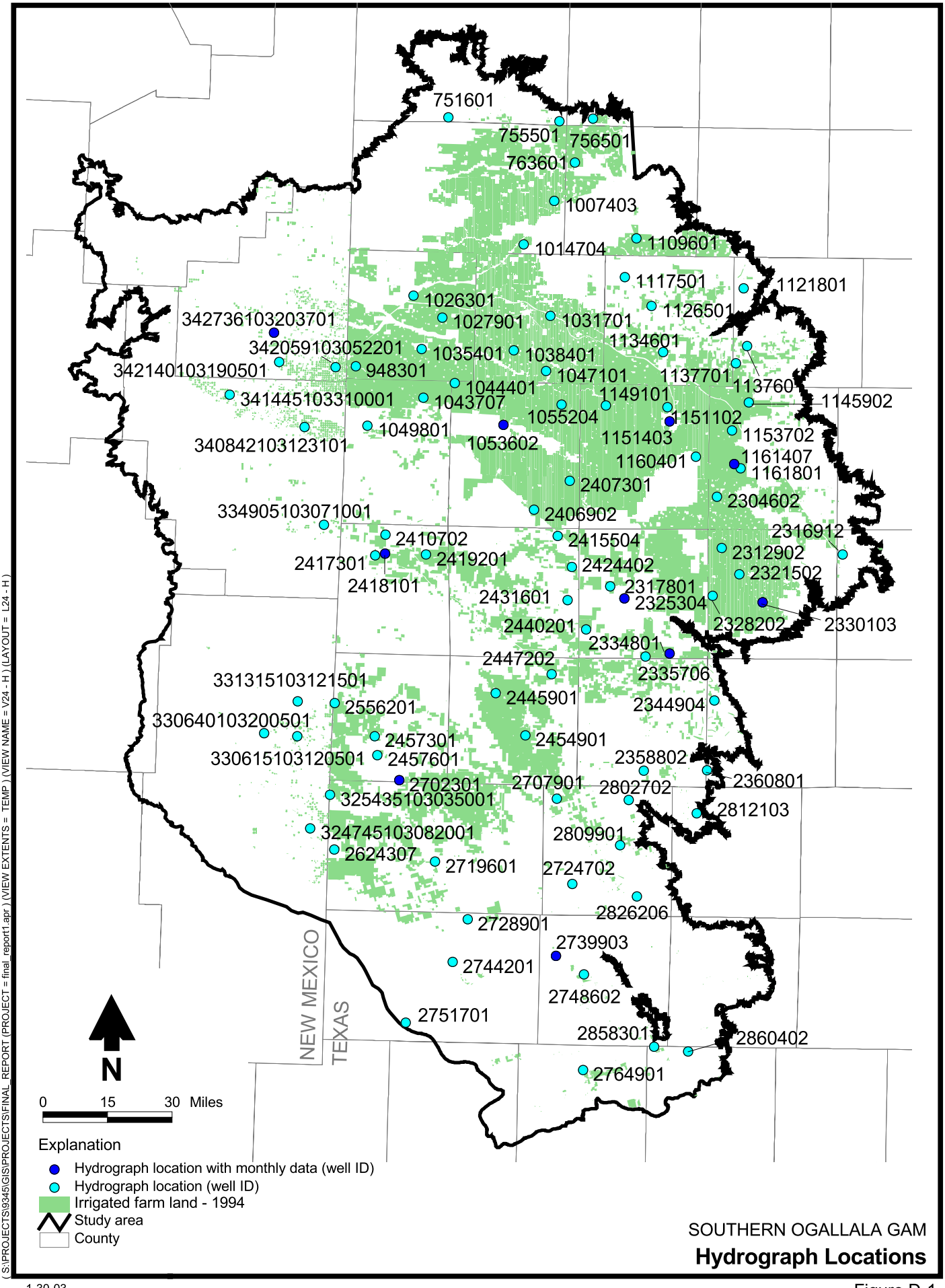
Total 2023	Total 2024	Total 2025	Total 2026	Total 2027	Total 2028	Total 2029	Total 2030	Total 2031	Total 2032	Total 2033
14,942.6	14,929.6	14,916.6	14,903.6	14,890.6	14,877.6	14,864.6	14,851.6	14,838.9	14,826.2	14,813.5
6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0
157,182.7	156,922.6	156,662.5	156,402.4	156,142.3	155,882.2	155,622.1	155,362.0	155,136.1	154,910.2	154,684.3
93.3	93.4	93.5	93.6	93.7	93.8	93.9	94.0	94.0	94.0	94.0
737.8	738.4	739.0	739.6	740.2	740.8	741.4	742.0	742.5	743.0	743.5
26,442.2	26,556.6	26,671.0	26,785.4	26,899.8	27,014.2	27,128.6	27,243.0	27,137.1	27,031.2	26,925.3
146,577.5	146,077.0	145,576.5	145,076.0	144,575.5	144,075.0	143,574.5	143,074.0	142,518.5	141,963.0	141,407.5
92,490.6	92,131.8	91,773.0	91,414.2	91,055.4	90,696.6	90,337.8	89,979.0	89,634.0	89,289.0	88,944.0
19,636.2	19,635.6	19,635.0	19,634.4	19,633.8	19,633.2	19,632.6	19,632.0	19,622.1	19,612.2	19,602.3
16,741.5	16,676.0	16,610.5	16,545.0	16,479.5	16,414.0	16,348.5	16,283.0	16,220.0	16,157.0	16,094.0
77,674.6	77,354.8	77,035.0	76,715.2	76,395.4	76,075.6	75,755.8	75,436.0	75,128.3	74,820.6	74,512.9
1,259.1	1,256.5	1,253.9	1,251.2	1,248.6	1,245.9	1,243.3	1,240.7	1,237.2	1,233.7	1,230.2
118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0
319.6	317.8	316.0	314.2	312.4	310.6	308.8	307.0	305.2	303.4	301.6
31,609.1	31,427.8	31,246.5	31,065.2	30,883.9	30,702.6	30,521.3	30,340.0	30,169.0	29,998.0	29,827.0
230,231.0	229,485.0	228,739.0	227,993.0	227,247.0	226,501.0	225,755.0	225,009.0	224,286.7	223,564.4	222,842.1
2,017.0	2,011.0	2,005.0	1,999.0	1,993.0	1,987.0	1,981.0	1,975.0	1,969.1	1,963.2	1,957.3
1,520.2	1,515.6	1,511.0	1,506.4	1,501.8	1,497.2	1,492.6	1,488.0	1,483.6	1,479.2	1,474.8
5,468.0	5,461.2	5,454.5	5,447.8	5,441.0	5,434.3	5,427.6	5,420.9	5,414.0	5,407.0	5,400.1
38,270.2	38,210.9	38,151.6	38,092.4	38,033.1	37,973.8	37,914.5	37,855.3	37,786.9	37,718.6	37,650.3
60,791.7	60,546.6	60,301.5	60,056.4	59,811.3	59,566.2	59,321.1	59,076.0	58,840.7	58,605.4	58,370.1
314,286.6	312,623.8	310,961.0	309,298.2	307,635.4	305,972.6	304,309.8	302,647.0	301,070.8	299,494.6	297,918.4
1,653.8	1,646.8	1,639.7	1,632.7	1,625.7	1,618.7	1,611.6	1,604.6	1,597.8	1,591.1	1,584.3
3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0
289,458.0	288,677.5	287,896.9	287,116.4	286,335.8	285,555.3	284,774.7	283,994.2	283,237.7	282,481.1	281,724.6
1,272.9	1,267.2	1,261.5	1,255.8	1,250.1	1,244.4	1,238.7	1,233.0	1,227.9	1,222.8	1,217.7
69,323.9	69,095.6	68,867.3	68,639.0	68,410.6	68,182.3	67,954.0	67,725.7	67,501.7	67,277.8	67,053.8
8,720.7	8,685.6	8,650.5	8,615.4	8,580.3	8,545.2	8,510.1	8,475.0	8,441.2	8,407.4	8,373.6
4,578.1	4,572.8	4,567.5	4,562.2	4,556.9	4,551.6	4,546.3	4,541.0	4,535.7	4,530.4	4,525.1
257,809.5	256,781.0	255,752.5	254,724.0	253,695.5	252,667.0	251,638.5	250,610.0	249,621.2	248,632.4	247,643.6
46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0
125,083.7	124,258.6	123,433.5	122,608.4	121,783.3	120,958.2	120,133.1	119,308.0	118,539.0	117,770.0	117,001.0
24,892.7	24,769.6	24,646.5	24,523.4	24,400.3	24,277.2	24,154.1	24,031.0	23,892.5	23,754.0	23,615.5
304.9	303.2	301.5	299.8	298.1	296.4	294.7	293.0	291.4	289.8	288.2
12,541.8	12,517.4	12,493.1	12,468.8	12,444.4	12,420.1	12,395.8	12,371.4	12,347.1	12,322.8	12,298.4
3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,498.0	3,493.3	3,488.6	3,483.9
1,513.5	1,509.0	1,504.5	1,500.0	1,495.5	1,491.0	1,486.5	1,482.0	1,477.6	1,473.2	1,468.8
3,028.8	3,028.8	3,028.8	3,028.8	3,028.8	3,028.8	3,028.8	3,028.8	3,006.9	2,985.0	2,963.1
17,617.8	17,617.8	17,617.8	17,617.8	17,617.8	17,617.8	17,617.8	17,617.8	17,522.6	17,427.4	17,332.2
174,505.0	173,655.0	172,805.0	171,955.0	171,105.0	170,255.0	169,405.0	168,555.0	167,782.4	167,009.8	166,237.2
89,797.3	89,699.4	89,601.5	89,503.6	89,405.7	89,307.8	89,209.9	89,112.0	89,015.1	88,918.2	88,821.3
4,431.6	4,408.2	4,384.9	4,361.5	4,338.2	4,314.8	4,291.4	4,268.1	3,927.5	3,587.0	3,246.5
5,877.0	5,376.5	4,876.1	4,375.7	3,875.3	3,374.8	2,874.4	2,374.0	2,136.6	1,899.2	1,661.8
499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2
14.2	13.9	13.5	13.2	12.8	12.4	12.1	11.7	10.5	9.4	8.2
49,920.0	49,815.2	49,710.4	49,605.7	49,500.9	49,396.1	49,291.4	49,186.6	45,049.9	40,913.1	36,776.3
98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0
18,168.4	18,162.2	18,156.0	18,149.8	18,143.6	18,137.4	18,131.2	18,125.0	18,119.4	18,113.8	18,108.2
81,145.6	81,401.8	81,658.0	81,914.2	82,170.4	82,426.6	82,682.8	82,939.0	82,891.6	82,844.2	82,796.8
3,067.7	3,050.6	3,033.5	3,016.4	2,999.3	2,982.2	2,965.1	2,948.0	2,931.9	2,915.8	2,899.7
89,968.5	89,500.0	89,031.5	88,563.0	88,094.5	87,626.0	87,157.5	86,689.0	86,244.6	85,800.2	85,355.8
75,884.5	75,516.0	75,147.5	74,779.0	74,410.5	74,042.0	73,673.5	73,305.0	72,954.2	72,603.4	72,252.6

Table C-1. Agricultural Total Pumpage (ac-ft/yr)

Total 2034	Total 2035	Total 2036	Total 2037	Total 2038	Total 2039	Total 2040	Total 2041	Total 2042	Total 2043	Total 2044	Total 2045	Total 2046	Total 2047	Total 2048	Total 2049	Total 2050
14,800.8	14,788.1	14,775.4	14,762.7	14,750.0	14,737.3	14,724.6	14,712.0	14,699.4	14,686.8	14,674.2	14,661.6	14,649.0	14,636.4	14,623.8	14,611.2	14,598.6
6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0	6,747.0
154,458.4	154,232.5	154,006.6	153,780.7	153,554.8	153,328.9	153,103.0	152,878.5	152,654.0	152,429.5	152,205.0	151,980.5	151,756.0	151,531.5	151,307.0	151,082.5	150,858.0
94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.1	94.2	94.3	94.4	94.5	94.6	94.7	94.8	94.9	95.0
744.0	744.5	745.0	745.5	746.0	746.5	747.0	747.4	747.8	748.2	748.6	749.0	749.4	749.8	750.2	750.6	751.0
26,819.4	26,713.5	26,607.6	26,501.7	26,395.8	26,289.9	26,184.0	26,082.0	25,980.0	25,878.0	25,776.0	25,674.0	25,572.0	25,470.0	25,368.0	25,266.0	25,164.0
140,852.0	140,296.5	139,741.0	139,185.5	138,630.0	138,074.5	137,519.0	136,982.0	136,445.0	135,908.0	135,371.0	134,834.0	134,297.0	133,760.0	133,223.0	132,686.0	132,149.0
88,599.0	88,254.0	87,909.0	87,564.0	87,219.0	86,874.0	86,529.0	86,197.3	85,865.6	85,533.9	85,202.2	84,870.5	84,538.8	84,207.1	83,875.4	83,543.7	83,212.0
19,592.4	19,582.5	19,572.6	19,562.7	19,552.8	19,542.9	19,533.0	19,522.3	19,511.6	19,500.9	19,490.2	19,479.5	19,468.8	19,458.1	19,447.4	19,436.7	19,426.0
16,031.0	15,968.0	15,905.0	15,842.0	15,779.0	15,716.0	15,653.0	15,592.5	15,532.0	15,471.5	15,411.0	15,350.5	15,290.0	15,229.5	15,169.0	15,108.5	15,048.0
74,205.2	73,897.5	73,589.8	73,282.1	72,974.4	72,666.7	72,359.0	72,063.8	71,768.6	71,473.4	71,178.2	70,883.0	70,587.8	70,292.6	69,997.4	69,702.2	69,407.0
1,226.7	1,223.3	1,219.8	1,216.3	1,212.8	1,209.3	1,205.8	1,202.4	1,199.0	1,195.6	1,192.2	1,188.7	1,185.3	1,181.9	1,178.5	1,175.1	1,171.6
118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0	118,523.0
299.8	298.0	296.2	294.4	292.6	290.8	289.0	287.4	285.8	284.2	282.6	281.0	279.4	277.8	276.2	274.6	273.0
29,656.0	29,485.0	29,314.0	29,143.0	28,972.0	28,801.0	28,630.0	28,468.6	28,307.2	28,145.8	27,984.4	27,823.0	27,661.6	27,500.2	27,338.8	27,177.4	27,016.0
222,119.8	221,397.5	220,675.2	219,952.9	219,230.6	218,508.3	217,786.0	217,086.6	216,387.2	215,687.8	214,988.4	214,289.0	213,589.6	212,890.2	212,190.8	211,491.4	210,792.0
1,951.4	1,945.5	1,939.6	1,933.7	1,927.8	1,921.9	1,916.0	1,910.2	1,904.4	1,898.6	1,892.8	1,887.0	1,881.2	1,875.4	1,869.6	1,863.8	1,858.0
1,470.4	1,466.0	1,461.6	1,457.2	1,452.8	1,448.4	1,444.0	1,439.7	1,435.4	1,431.1	1,426.8	1,422.5	1,418.2	1,413.9	1,409.6	1,405.3	1,401.0
5,393.2	5,386.3	5,379.4	5,372.5	5,365.6	5,358.7	5,351.8	5,345.0	5,338.2	5,331.4	5,324.6	5,317.9	5,311.1	5,304.3	5,297.5	5,290.7	5,284.0
37,582.0	37,513.7	37,445.3	37,377.0	37,308.7	37,240.4	37,172.1	37,106.1	37,040.1	36,974.0	36,908.0	36,842.0	36,776.0	36,710.0	36,644.0	36,578.0	36,512.0
58,134.8	57,899.5	57,664.2	57,428.9	57,193.6	56,958.3	56,723.0	56,497.0	56,271.0	56,045.0	55,819.0	55,593.0	55,367.0	55,141.0	54,915.0	54,689.0	54,463.0
296,342.2	294,766.0	293,189.8	291,613.6	290,037.4	288,461.2	286,885.0	285,390.8	283,896.6	282,402.4	280,908.2	279,414.0	277,919.8	276,425.6	274,931.4	273,437.2	271,943.0
1,577.6	1,570.8	1,564.0	1,557.3	1,550.5	1,543.8	1,537.0	1,530.4	1,523.9	1,517.3	1,510.8	1,504.2	1,497.7	1,491.1	1,484.6	1,478.0	1,471.5
3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0	3,896.0
280,968.1	280,211.6	279,455.1	278,698.6	277,942.0	277,185.5	276,429.0	275,669.6	274,910.2	274,150.8	273,391.4	272,632.0	271,872.7	271,113.3	270,353.9	269,594.5	268,835.1
1,212.6	1,207.5	1,202.4	1,197.3	1,192.2	1,187.1	1,182.0	1,177.4	1,172.8	1,168.2	1,163.6	1,159.0	1,154.4	1,149.8	1,145.2	1,140.6	1,136.0
66,829.9	66,605.9	66,382.0	66,158.0	65,934.1	65,710.1	65,486.2	65,266.9	65,047.7	64,828.4	64,609.2	64,389.9	64,170.7	63,951.4	63,732.2	63,512.9	63,293.7
8,339.8	8,306.0	8,272.2	8,238.4	8,204.6	8,170.8	8,137.0	8,104.6	8,072.2	8,039.8	8,007.4	7,975.0	7,942.6	7,910.2	7,877.8	7,845.4	7,813.0
4,519.8	4,514.5	4,509.2	4,503.9	4,498.6	4,493.3	4,488.0	4,482.7	4,477.4	4,472.1	4,466.8	4,461.5	4,456.2	4,450.9	4,445.6	4,440.3	4,435.0
246,654.8	245,666.0	244,677.2	243,688.4	242,699.6	241,710.8	240,722.0	239,771.4	238,820.8	237,870.2	236,919.6	235,969.0	235,018.4	234,067.8	233,117.2	232,166.6	231,216.0
46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0	46,745.0
116,232.0	115,463.0	114,694.0	113,925.0	113,156.0	112,387.0	111,618.0	110,876.0	110,134.0	109,392.0	108,650.0	107,908.0	107,166.0	106,424.0	105,682.0	104,940.0	104,198.0
23,477.0	23,338.5	23,200.0	23,061.5	22,923.0	22,784.5	22,646.0	22,489.7	22,333.4	22,177.1	22,020.8	21,864.5	21,708.2	21,551.9	21,395.6	21,239.3	21,083.0
286.6	285.0	283.4	281.8	280.2	278.6	277.0	275.5	274.0	272.5	271.0	269.5	268.0	266.5	265.0	263.5	262.0
12,274.1	12,249.8	12,225.4	12,201.1	12,176.8	12,152.4	12,128.1	12,103.9	12,079.7	12,055.4	12,031.2	12,007.0	11,982.8	11,958.5	11,934.3	11,910.1	11,885.9
3,479.2	3,474.5	3,469.8	3,465.1	3,460.4	3,455.7	3,451.0	3,465.6	3,480.2	3,494.8	3,509.4	3,524.0	3,538.6	3,553.2	3,567.8	3,582.4	3,597.0
1,464.4	1,460.0	1,455.6	1,451.2	1,446.8	1,442.4	1,438.0	1,433.6	1,429.2	1,424.8	1,420.4	1,416.0	1,411.6	1,407.2	1,402.8	1,398.4	1,394.0
2,941.2	2,919.3	2,897.5	2,875.6	2,853.7	2,831.8	2,809.9	2,528.9	2,247.9	1,966.9	1,685.9	1,404.9	1,123.9	843.0	562.0	281.0	0.0
17,237.1	17,141.9	17,046.7	16,951.5	16,856.4	16,761.2	16,666.0	14,999.4	13,332.8	11,666.2	9,999.6	8,333.0	6,666.4	4,999.8	3,333.2	1,666.6	0.0
165,464.6	164,692.0	163,919.4	163,146.8	162,374.2	161,601.6	160,829.0	160,122.9	159,416.8	158,710.7	158,004.6	157,298.5	156,592.4	155,886.3	155,180.2	154,474.1	153,768.0
88,724.4	88,627.5	88,530.6	88,433.7	88,336.8	88,239.9	88,143.0	88,047.1	87,951.2	87,855.3	87,759.4	87,663.5	87,567.6	87,471.7	87,375.8	87,279.9	87,184.0
2,906.0	2,565.4	2,224.9	1,884.4	1,543.8	1,203.3	862.8	776.5	690.2	603.9	517.7	431.4	345.1	258.8	172.6	86.3	0.0
1,424.4	1,187.0	949.6	712.2	474.8	237.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2	499.2
7.0	5.9	4.7	3.5	2.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32,639.6	28,502.8	24,366.1	20,229.3	16,092.5	11,955.8	7,819.0	7,037.1	6,255.2	5,473.3	4,691.4	3,909.5	3,127.6	2,345.7	1,563.8	781.9	0.0
98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0	98,687.0
18,102.6	18,097.0	18,091.4	18,085.8	18,080.2	18,074.6	18,069.0	18,063.9	18,058.8	18,053.7	18,048.6	18,043.5	18,038.4	18,033.3	18,028.2	18,023.1	18,018.0
82,749.4	82,702.0	82,654.6	82,607.2	82,559.8	82,512.4	82,465.0	82,417.9	82,370.8	82,323.7	82,276.6	82,229.5	82,182.4	82,135.3	82,088.2	82,041.1	81,994.0
2,883.6	2,867.5	2,851.4	2,835.3	2,819.2	2,803.1	2,787.0	2,778.4	2,769.8	2,761.2	2,752.6	2,744.0	2,735.4	2,726.8	2,718.2	2,709.6	2,701.0
84,911.4	84,467.0	84,022.6	83,578.2	83,133.8	82,689.4	82,245.0	81,823.3	81,401.6	80,979.9	80,558.2	80,136.5	79,714.8	79,293.1	78,871.4	78,449.7	78,028.0
71,901.8	71,551.0	71,200.2	70,849.4	70,498.6	70,147.8	69,797.0	69,462.9	69,128.8	68,794.7	68,460.6	68,126.5	67,792.4	67,458.3	67,124.2	66,790.1	66,456.0

Appendix D

Simulated and Observed Hydrographs for Transient Model Calibration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1027901
1031701
1134601
342059103052201
1035401
1038401
342140103190501
948301
1047101
1137701
113760
1044401
1149101
1145902
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1043707
1055204
1151102
1049801
1153702
340842103123101
1053602
1151403
1160401
1161407
1161801
2407301
2304602
334905103071001
2406902
2316912
2410702
2415504
2312902
2417301
2419201
2424402
2321502
2418101
2317801
2431601
2325304
2328202
2330103
2440201
2334801
2447202
2335706
331315103121501
2445901
2344904
2556201
330640103200501
2457301
2454901
330615103120501
2457601
2358802
2702301
2707901
2802702
2360801
325435103035001
2812103
324745103082001
2809901
2624307
2719601
2724702
2826206
2728901
2739903
2744201
2748602
2751701
2858301
2860402
2764901
NEW MEXICO
TEXAS
N
0
15
30 Miles
Explanation
Hydrograph location with monthly data (well ID)
Hydrograph location (well ID)
Irrigated farm land - 1994
Study area
County
SOUTHERN OGALLALA GAM
Hydrograph Locations
(S:\PROJECTS\9345\GIS\PROJECTS\FINAL_REPORT (PROJECT = final_report1.apr) (VIEW EXTENTS = TEMP) (VIEW NAME = V24 - H) (LAYOUT = L24 - H)
1-30-03

Figure D-1

Table D-1. Well Locations
Page 1 of 2

Name	Well ID	X-Coordinate	Y-Coordinate
ANDREWS1	2728901	4151430.44	20150514.67
ANDREWS2	2744201	4133013.62	20098137.35
ANDREWS3	2751701	4075341.60	20023780.13
BAILEY1	1043707	4096906.53	20790090.92
BAILEY2	1049801	4028543.99	20755921.39
BORDEN1	2812103	4432587.56	20280676.80
BRISCOE1	1121801	4490034.68	20924412.34
BRISCOE2	1137601	4494481.77	20853670.96
BRISCOE3	1137701	4480884.20	20832578.24
CASTRO1	1031701	4253131.03	20890595.60
CASTRO2	1038401	4208299.29	20848326.49
CASTRO3	1047101	4247580.17	20822922.64
COCHRAN1	2410702	4050544.96	20622511.52
COCHRAN2	2417301	4037974.81	20597035.28
COCHRAN3	2419201	4100515.60	20597782.14
COCHRAN4	2418101	4050265.001	20598828.43
CROSBY1	2312902	4463317.10	20605637.39
CROSBY2	2321502	4484910.85	20573575.80
CROSBY3	2328202	4452393.40	20547193.30
CROSBY4	2330103	4513456.675	20539510.7
CURRY1	342736103203701	3914051.53	20870087.99
CURRY2	342140103190501	3920413.12	20833972.53
CURRY3	342059103052201	3989482.84	20827709.58
DAWSON1	2802702	4349389.98	20296887.27
DAWSON2	2809901	4338417.61	20241370.66
DAWSON3	2724702	4279696.94	20193831.08
DAWSON4	2707901	4260900	20298678
DAWSON5	2826206	4358922	20178429
DEAFSMITH1	1007403	4257942.46	21031823.64
DEAFSMITH2	1014704	4220354.00	20978161.94
DICKENS1	2316912	4611569.84	20597895.30
FLOYD1	1145902	4496281.90	20784336.69
FLOYD2	1153702	4475863.26	20749888.19
FLOYD3	1161801	4486416.36	20703593.45
FLOYD4	2304602	4457513.08	20668896.60
FLOYD5	1161407	4478435.862	20708980.47
GAINES1	325435103035001	3982648.90	20303015.94
GAINES2	2624307	3988041.65	20236028.94
GAINES3	2719601	4111466.79	20221121.46
GARZA1	2344904	4454058.42	20419104.22
GARZA2	2360801	4445065.68	20333172.58
GLASSCOCK1	2858301	4380174.94	19994188.07
GLASSCOCK2	2860402	4422010.72	19988593.48
HALE1	1149101	4321156.00	20780757.27
HALE2	1151102	4396539.39	20778578.02

Table D-1. Well Locations
Page 2 of 2

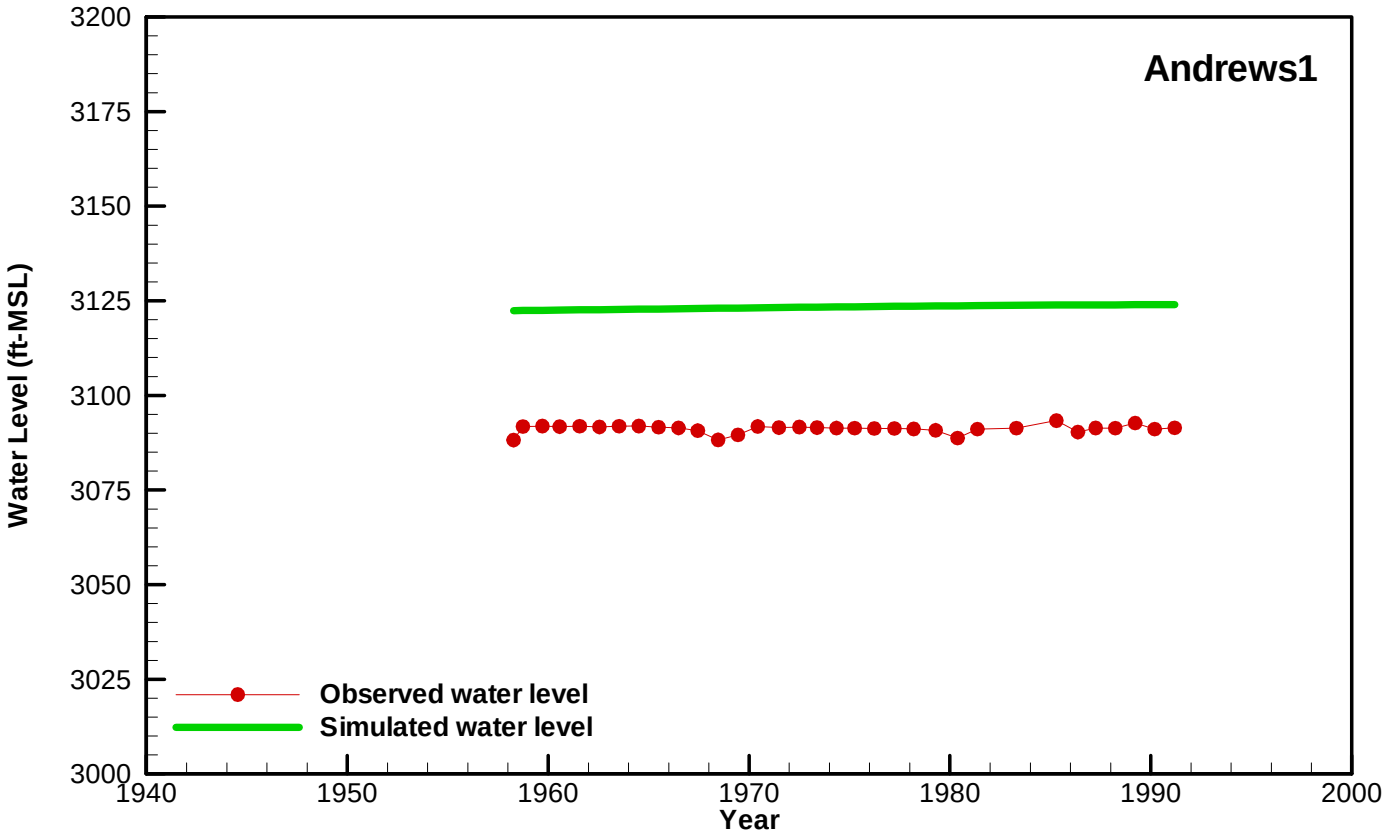
Name	Well ID	X-Coordinate	Y-Coordinate
HALE3	1160401	4431650.61	20717610.15
HALE4	1151403	4399199.536	20761306.13
HOCKLEY1	2415504	4262136.77	20620825.59
HOCKLEY2	2424402	4279348.81	20582848.26
HOCKLEY3	2431601	4274274.16	20541727.70
LAMB1	1044401	4135509.78	20808177.93
LAMB2	1055204	4266898.33	20781848.48
LAMB3	2407301	4277001.63	20688348.37
LAMB4	2406902	4233110.83	20652892.21
LAMB5	1053602	4195280.898	20756914.4
LEA1	331315103121501	3942962.99	20417571.69
LEA2	330640103200501	3901926.92	20378786.14
LEA3	330615103120501	3942588.62	20375069.27
LEA4	324745103082001	3958502.08	20262160.34
LUBBOCK1	2317801	4326383.19	20558805.86
LUBBOCK2	2440201	4297100.77	20506163.37
LUBBOCK3	2334801	4369821.60	20472713.22
LUBBOCK4	2325304	4344096.97	20543920.14
LUBBOCK5	2335706	4399079.298	20476402.39
LYNN1	2358802	4367780.98	20332925.80
MARTIN1	2748602	4293982.91	20083165.95
MARTIN2	2739903	4259729.408	20105689.38
MIDLAND1	2764901	4293030.03	19965706.41
OLDHAM1	751601	4127901.53	21133994.17
OLDHAM2	755501	4263992.75	21129589.64
PARMER1	1026301	4084857.98	20915230.69
PARMER2	1027901	4120326.66	20888570.57
PARMER3	1035401	4094885.36	20849923.87
PARMER4	948301	4014049.37	20828963.65
POTTER1	756501	4305150.83	21132728.06
RANDALL1	763601	4283251.28	21078835.35
RANDALL2	1109601	4358426.29	20985658.08
ROOSEVELT1	341445103310001	3859447.17	20793733.46
ROOSEVELT2	340842103123101	3951380.75	20754207.50
ROOSEVELT3	334905103071001	3974980.21	20634397.03
SWISHER1	1117501	4344278.05	20938382.60
SWISHER2	1126501	4377181.37	20902614.23
SWISHER3	1134601	4391479.50	20846042.98
TERRY1	2447202	4254567.38	20451211.87
TERRY2	2445901	4185937.28	20427740.73
TERRY3	2454901	4222271.07	20376336.29
YOAKUM1	2556201	3988154.13	20415782.85
YOAKUM2	2457301	4037313.88	20375268.62
YOAKUM3	2457601	4040806.32	20351989.58
YOAKUM4	2702301	4067382.065	20320938.14

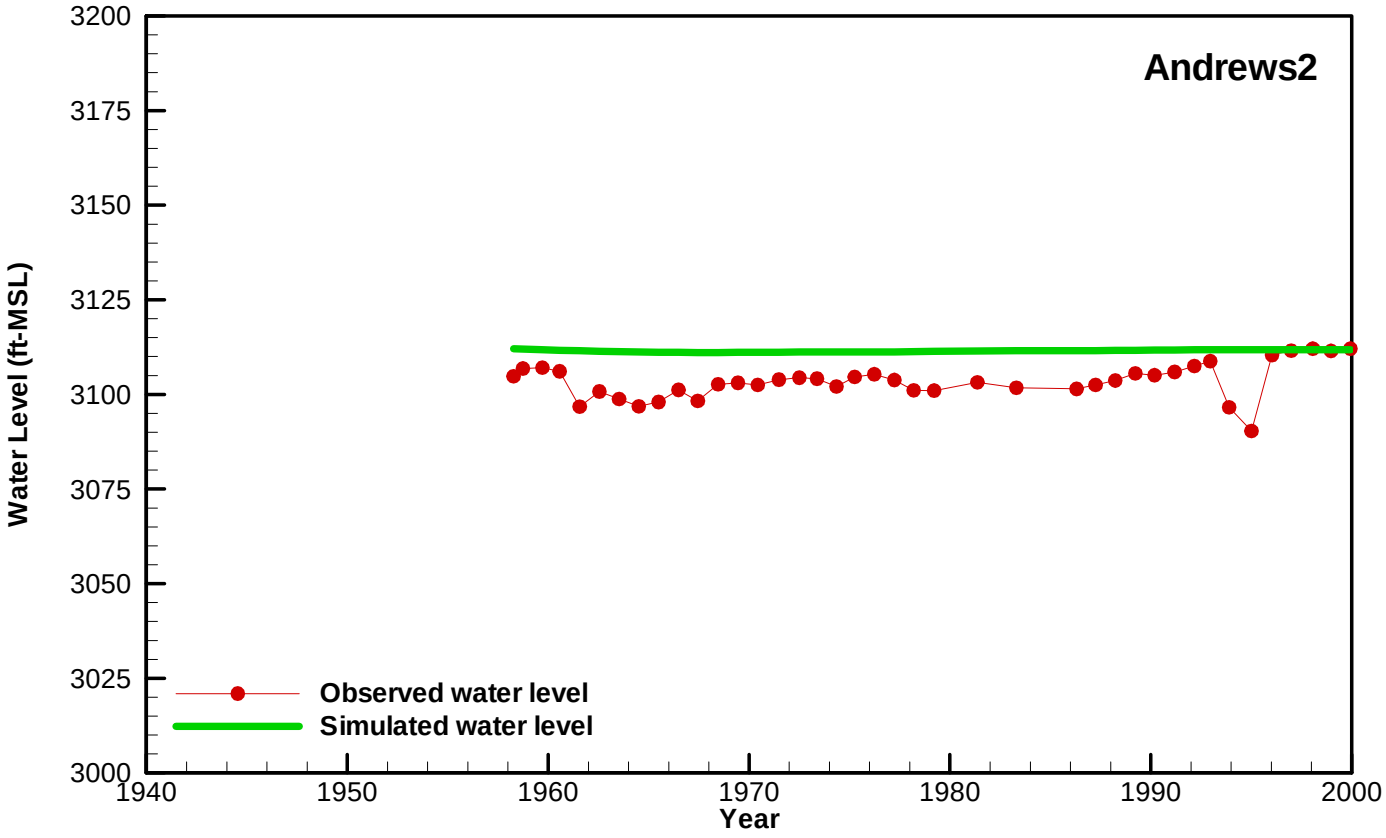
Table D-2. Root Mean Squared Error for Each Hydrograph for the Transient Model Calibration

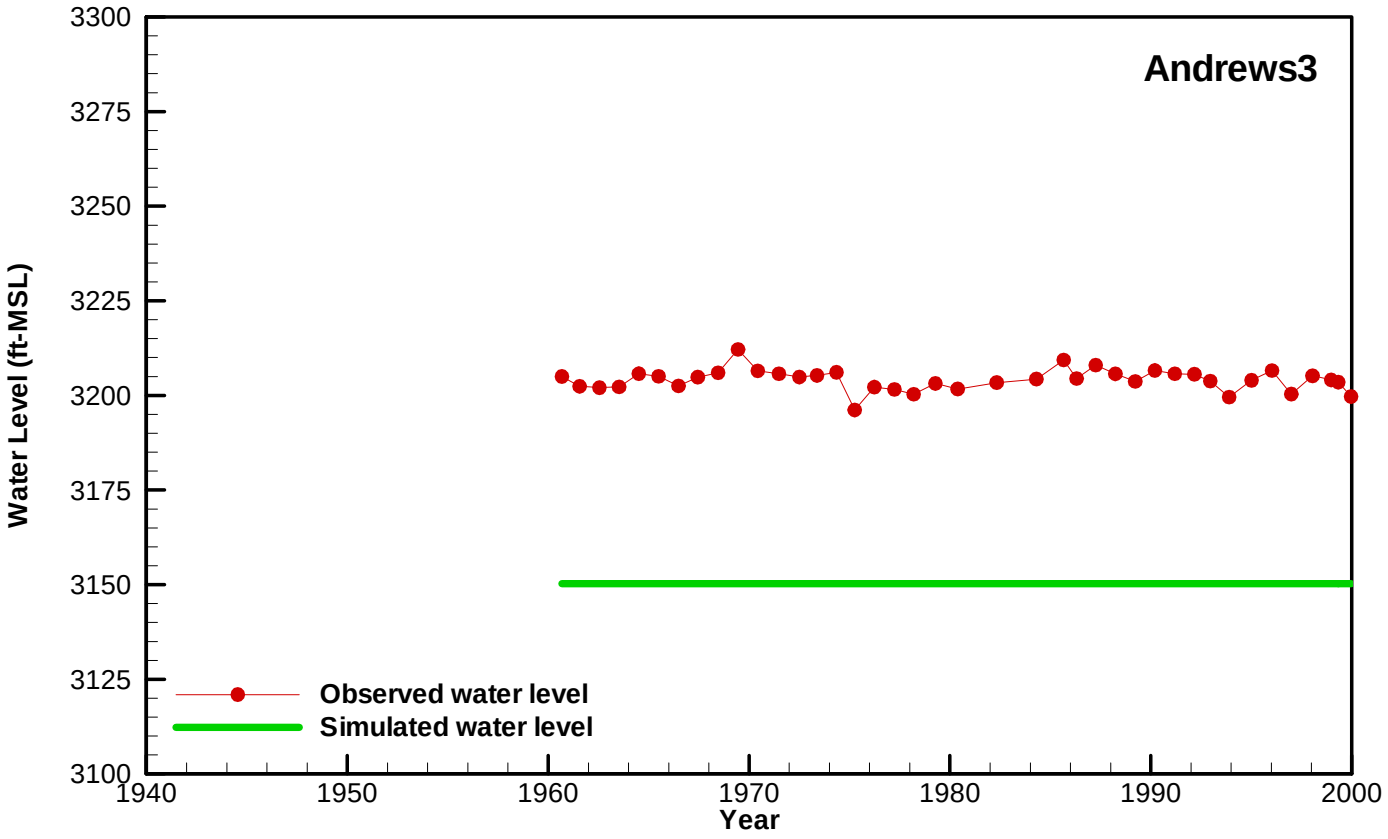
Well	$RMSE_{hyd}$ (feet)
ANDREWS1	2.4
ANDREWS2	4.5
ANDREWS3	2.9
BAILEY1	53.1
BAILEY2	2.0
BORDEN1	5.0
BRISCOE1	12.0
BRISCOE2	3.8
BRISCOE3	27.2
CASTRO1	62.1
CASTRO2	5.7
CASTRO3	10.7
COCHRAN1	5.0
COCHRAN2	11.2
COCHRAN3	20.5
COCHRAN4	8.8
CROSBY1	69.4
CROSBY2	95.7
CROSBY3	24.0
CROSBY4	19.3
CURRY1	6.3
CURRY2	13.1
CURRY3	36.8
DAWSON1	3.4
DAWSON2	21.4
DAWSON3	3.6
DAWSON4	29.4
DAWSON5	12.6
DEAFSMITH1	7.7
DEAFSMITH2	18.7
DICKENS1	12.1
FLOYD1	19.2
FLOYD2	63.7
FLOYD3	89.4
FLOYD4	63.7
FLOYD5	25.2
GAINES1	20.3
GAINES2	15.3
GAINES3	13.9
GARZA1	10.9
GARZA2	6.6
GLASSCOCK1	17.5
GLASSCOCK2	18.2
HALE1	13.9
HALE2	21.3

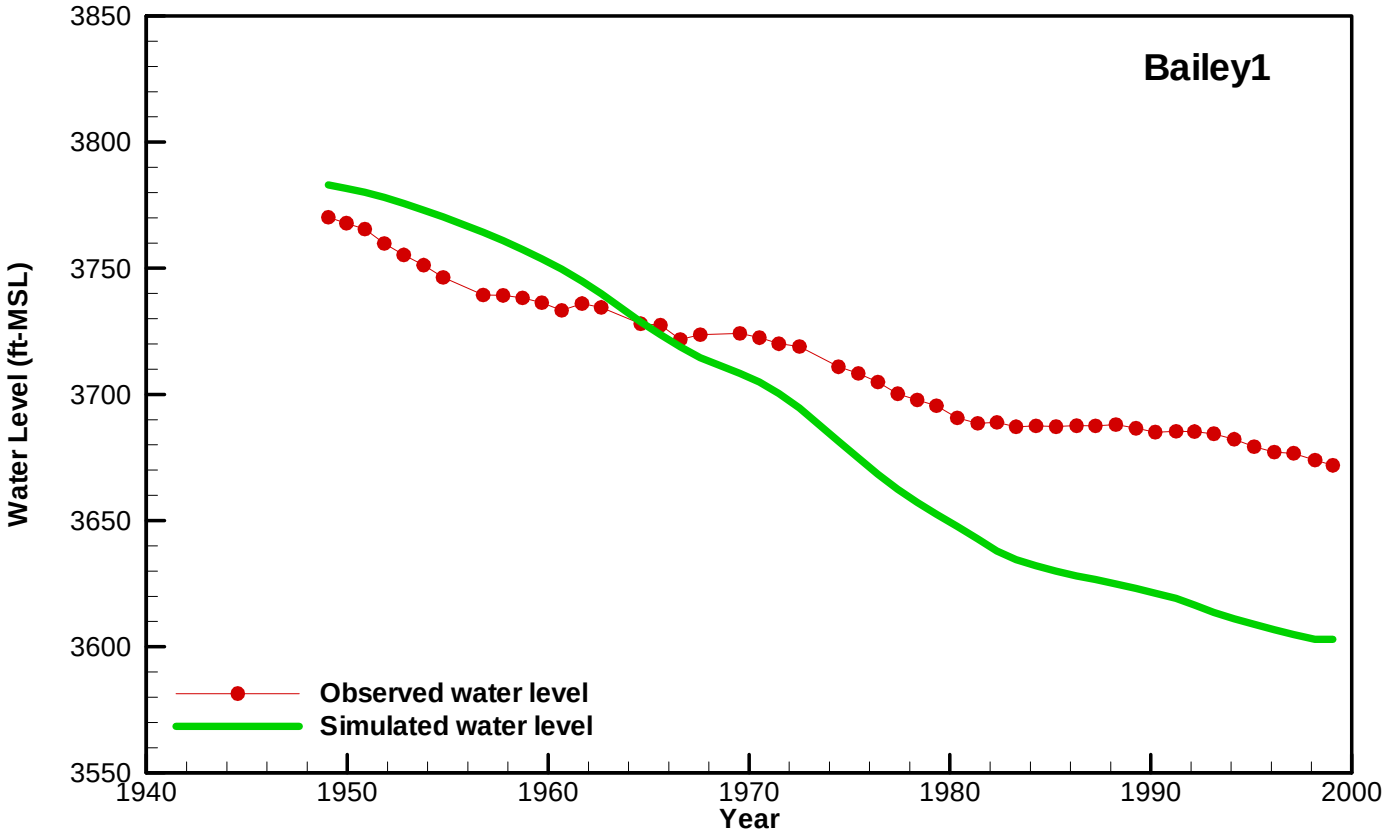
Table D-2. Root Mean Squared Error for Each Hydrograph for the Transient Model Calibration

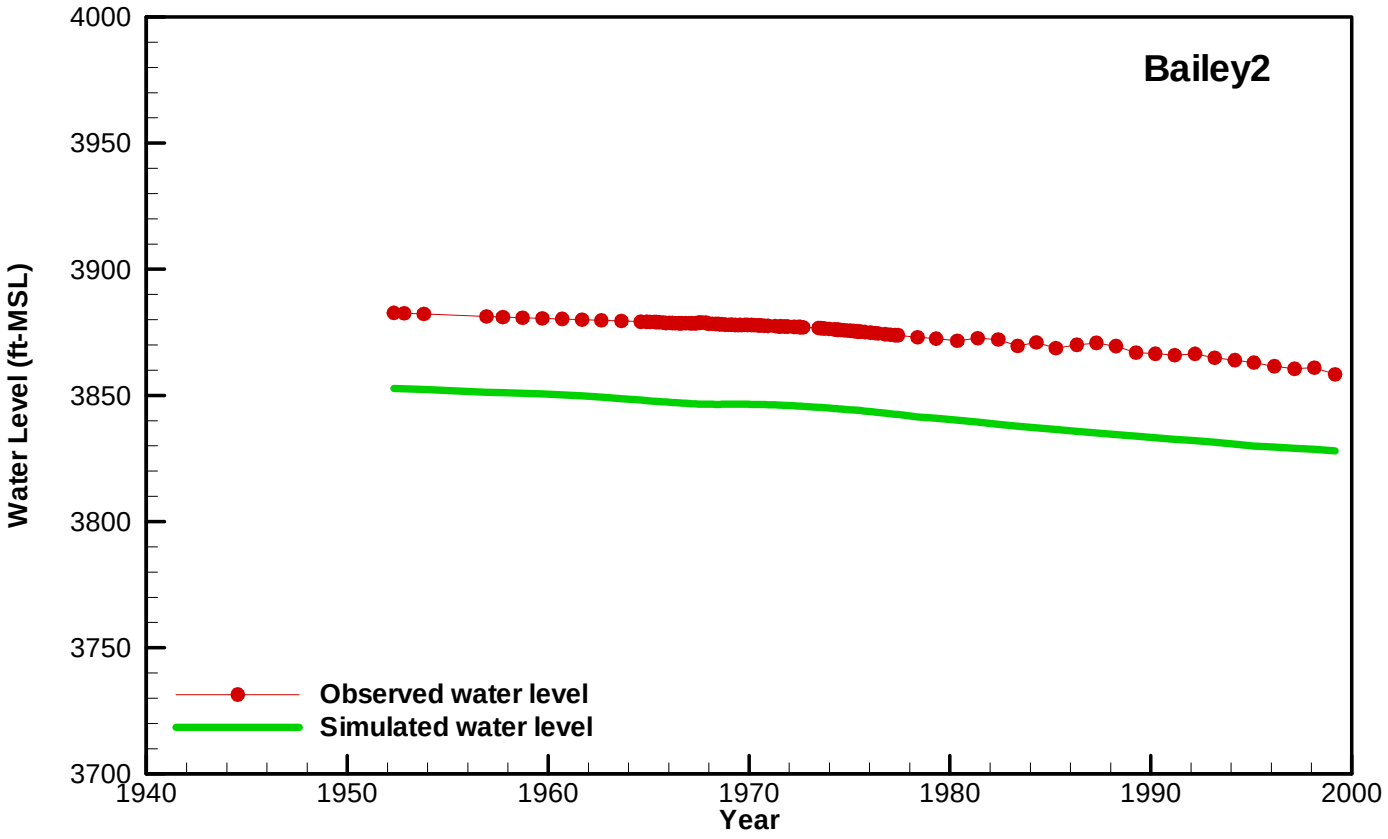
Well	$RMSE_{hyd}$ (feet)
HALE3	21.8
HALE4	15.9
HOCKLEY1	13.8
HOCKLEY2	28.9
HOCKLEY3	12.6
LAMB1	15.5
LAMB2	38.2
LAMB3	33.1
LAMB4	15.9
LAMB5	13.4
LEA1	2.3
LEA2	21.6
LEA3	10.3
LEA4	5.3
LUBBOCK1	14.4
LUBBOCK2	15.9
LUBBOCK3	21.8
LUBBOCK4	78.1
LUBBOCK5	4.5
LYNN1	6.2
MARTIN1	20.5
MARTIN2	21.9
MIDLAND1	9.2
OLDHAM1	2.9
OLDHAM2	17.5
PARMER1	49.3
PARMER2	13.2
PARMER3	3.8
PARMER4	11.2
POTTER1	31.9
RANDALL1	12.7
RANDALL2	39.9
ROOSEVELT1	21.2
ROOSEVELT2	11.3
ROOSEVELT3	8.3
SWISHER1	18.2
SWISHER2	39.4
SWISHER3	17.6
TERRY1	14.8
TERRY2	6.0
TERRY3	10.1
YOAKUM1	17.2
YOAKUM2	7.6
YOAKUM3	5.9
YOAKUM4	4.2

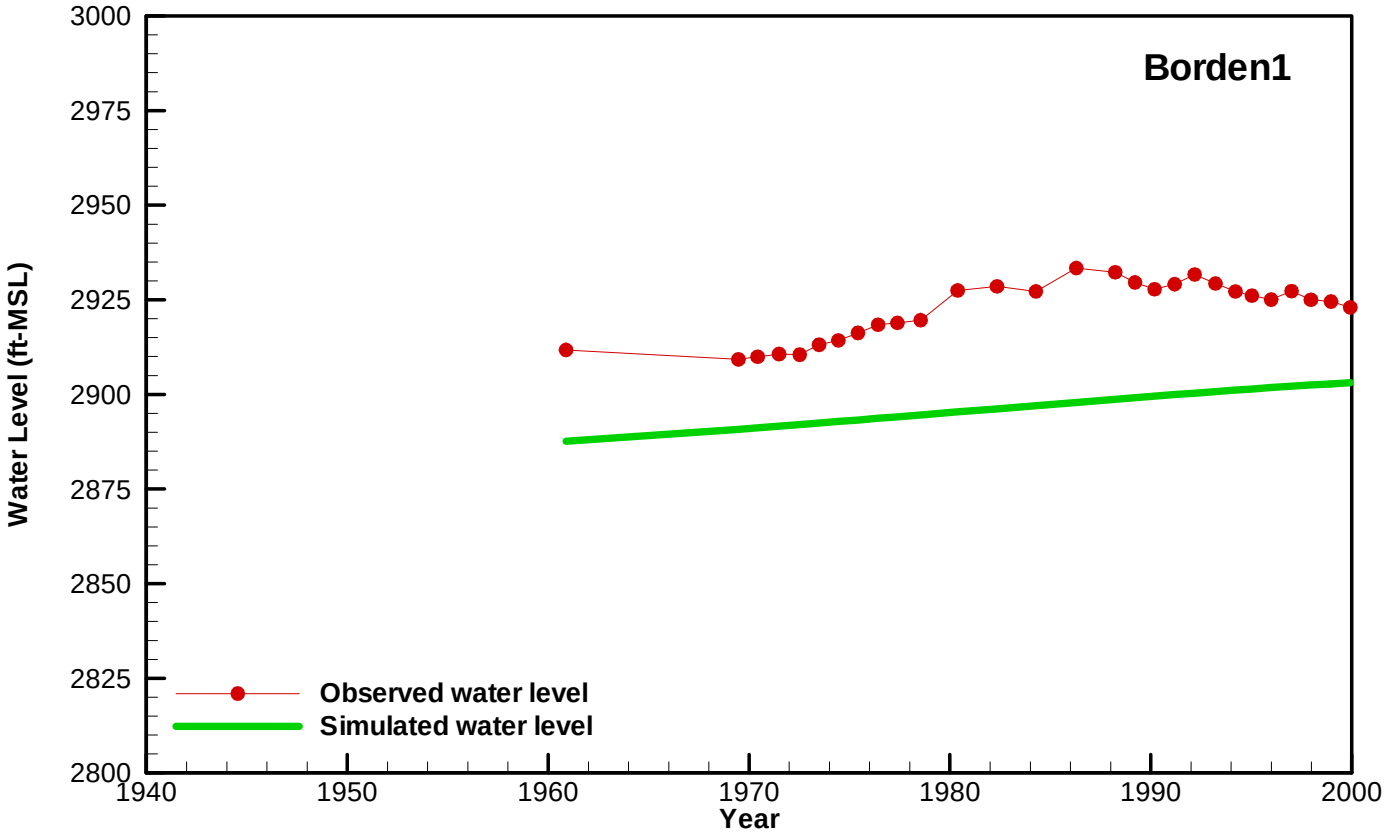

Andrews1
Water Level (ft-MSL)
3200
3175
3150
3125
3100
3075
3050
3025
3000
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

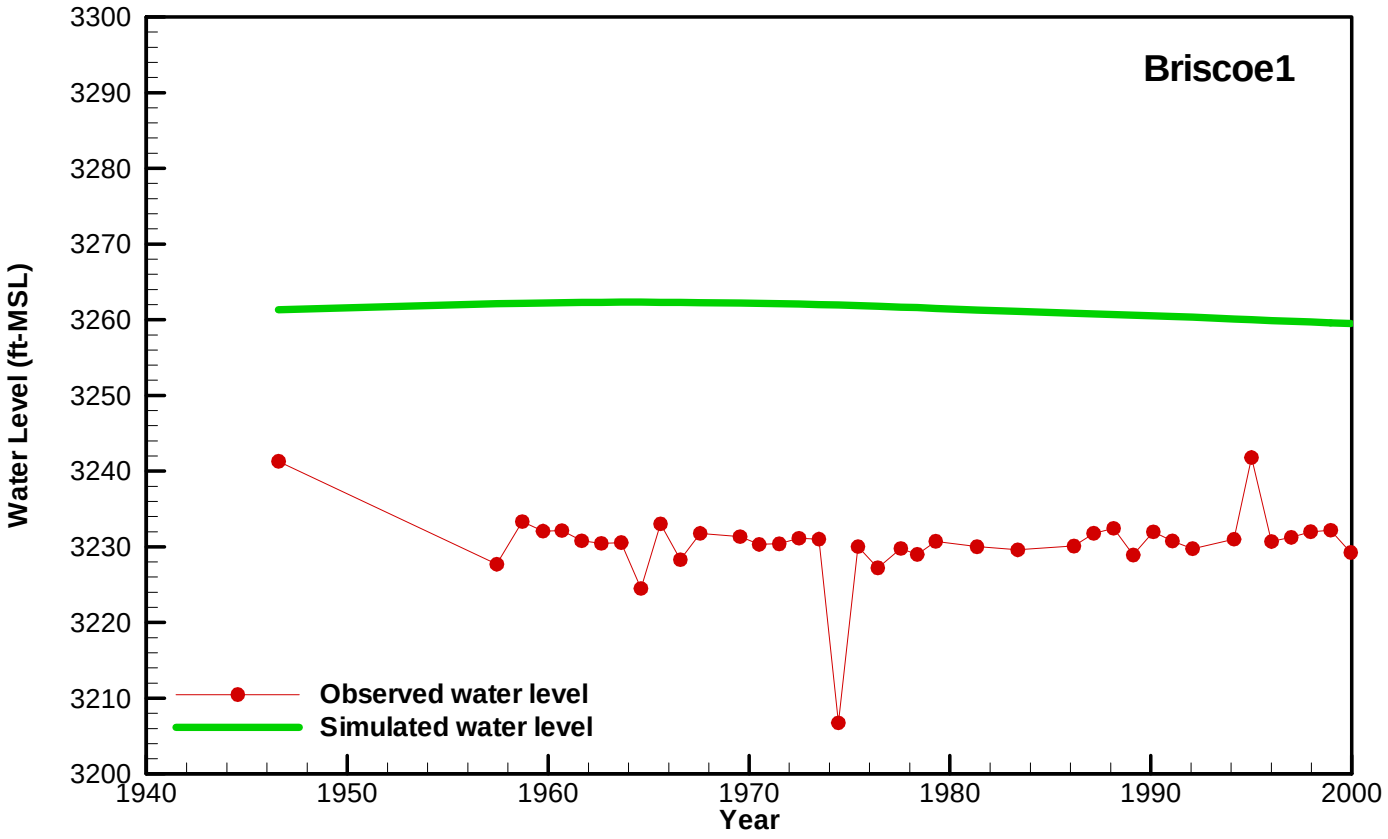

Andrews2
Water Level (ft-MSL)
3200
3175
3150
3125
3100
3075
3050
3025
3000
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

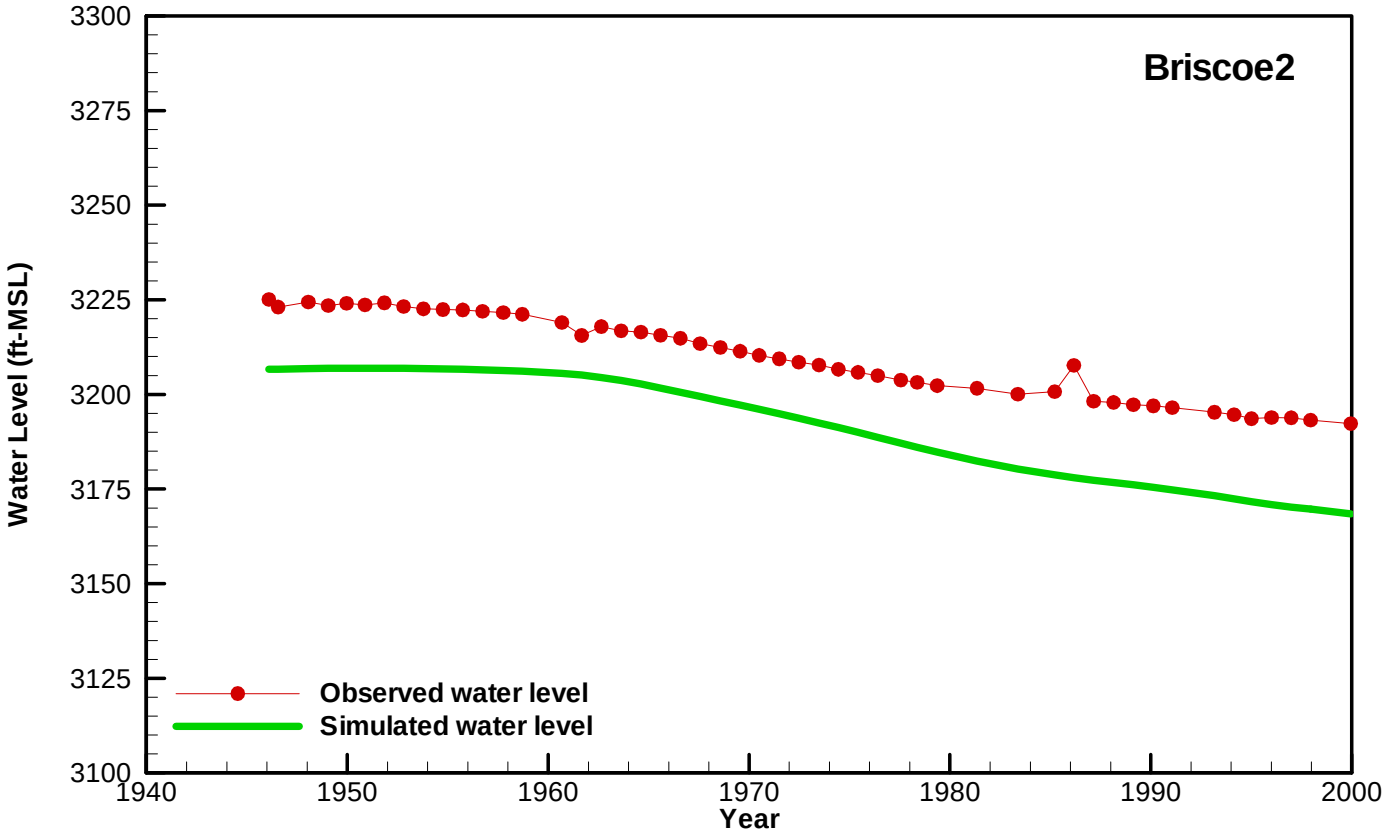

Andrews3
Water Level (ft-MSL)
3300
3275
3250
3225
3200
3175
3150
3125
3100
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

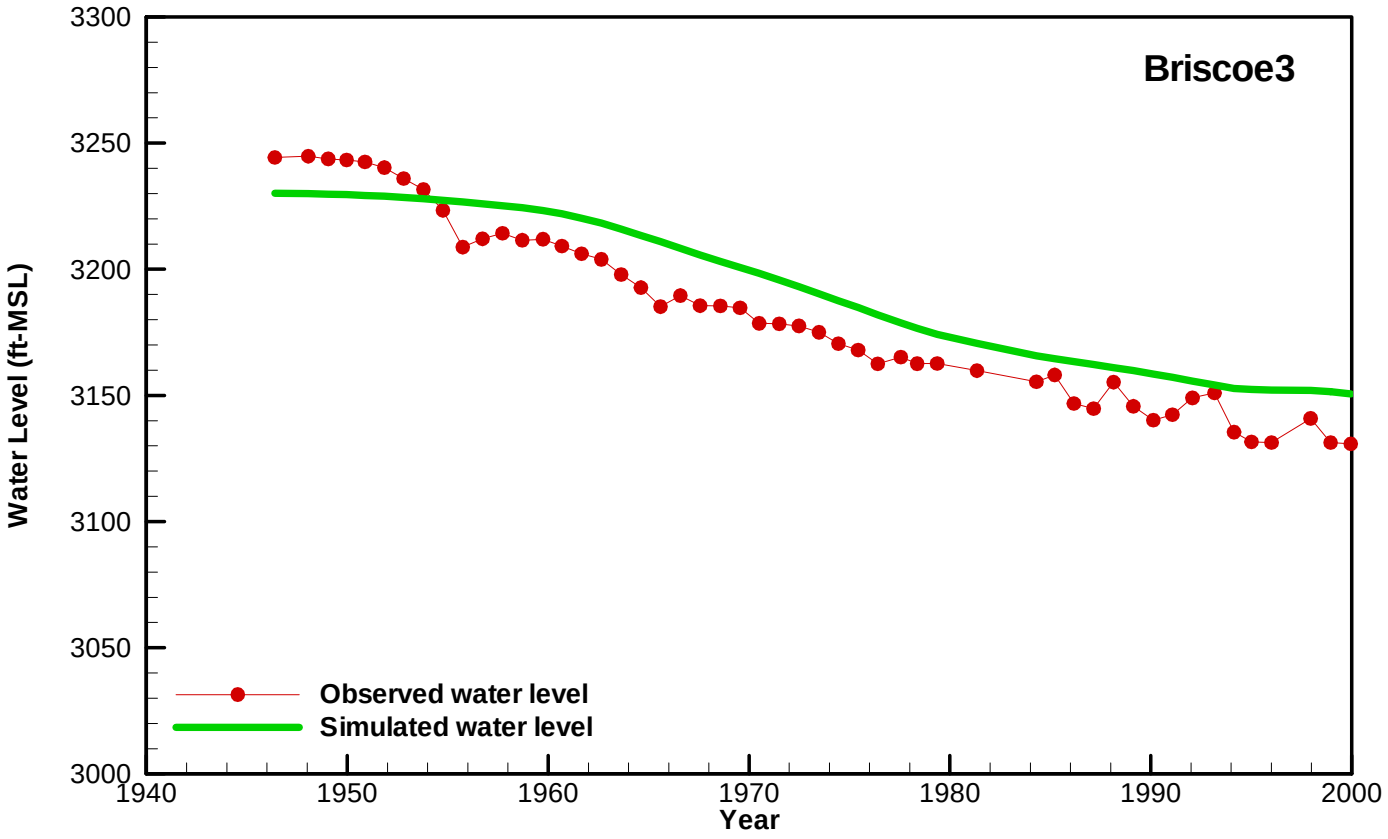

Bailey1
Water Level (ft-MSL)
3850
3800
3750
3700
3650
3600
3550
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

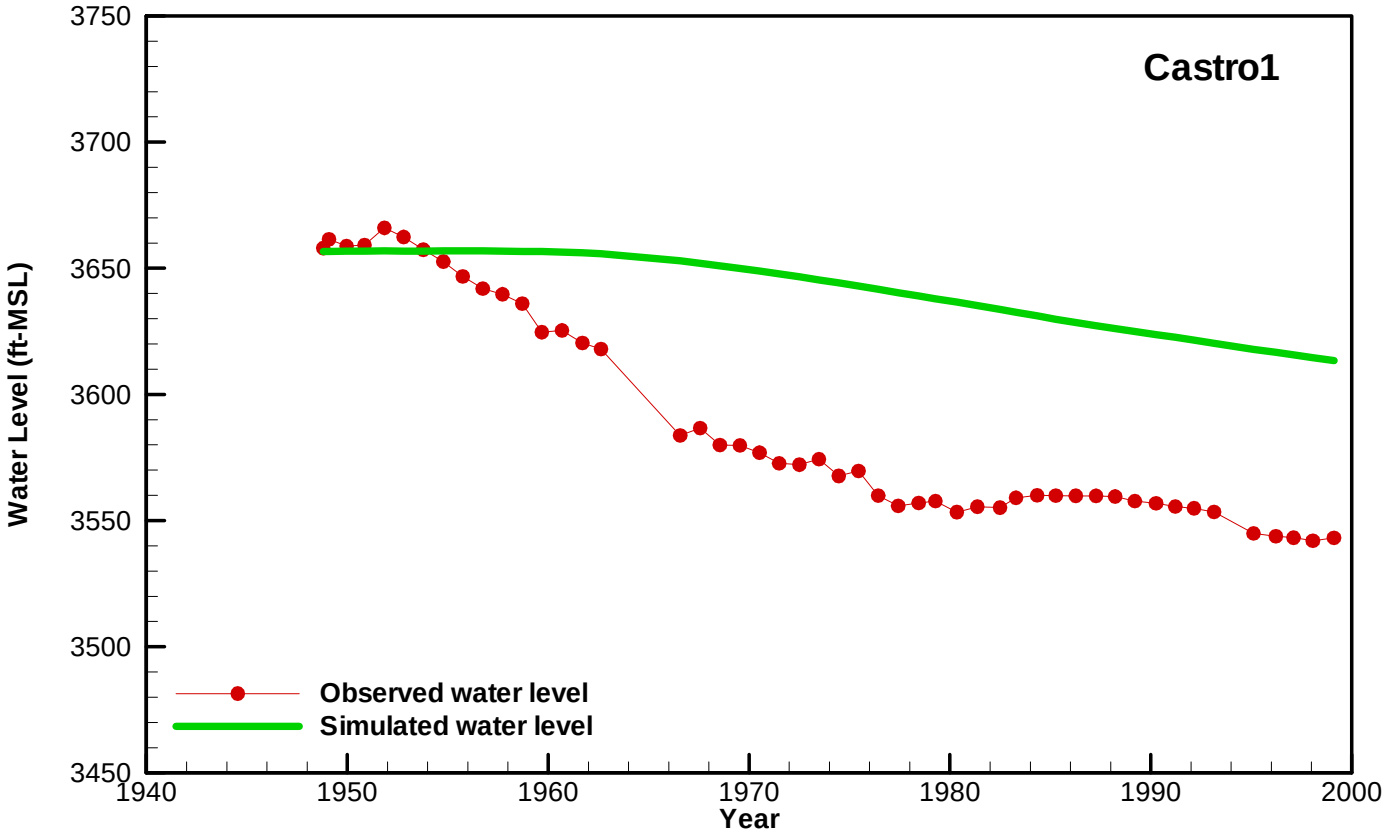

Bailey2
Water Level (ft-MSL)
4000
3950
3900
3850
3800
3750
3700
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

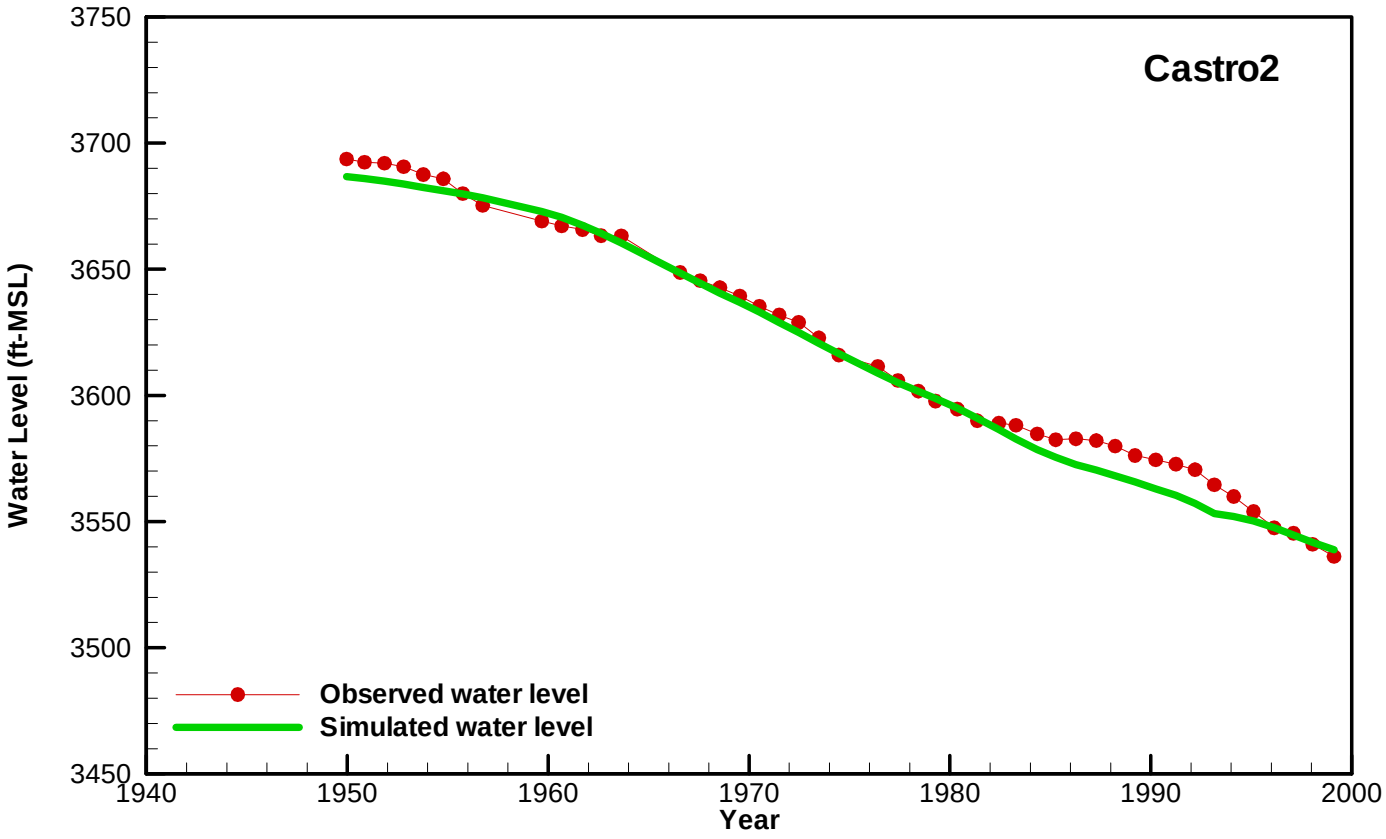

Borden1
Water Level (ft-MSL)
3000
2975
2950
2925
2900
2875
2850
2825
2800
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

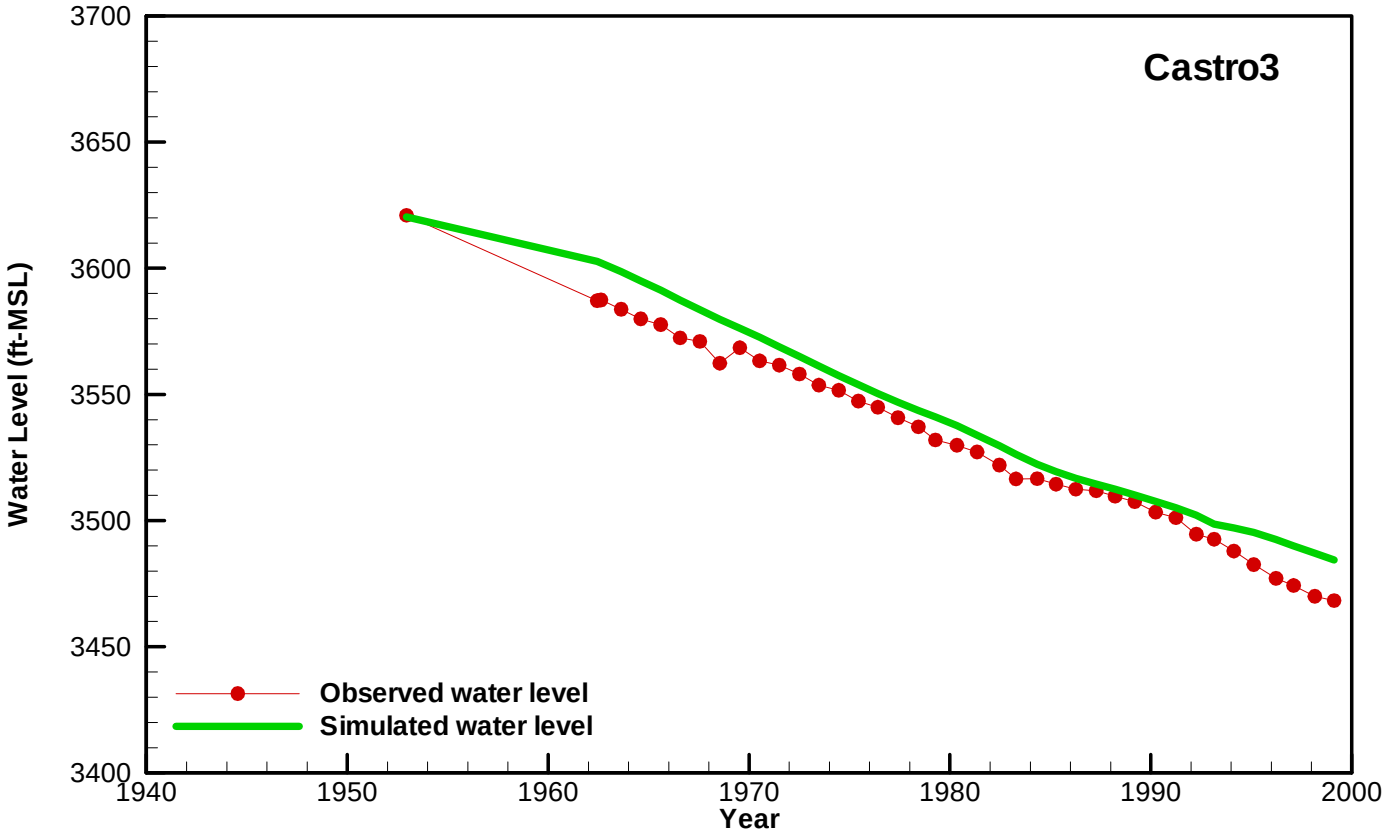

Briscoe1
Water Level (ft-MSL)
3300
3290
3280
3270
3260
3250
3240
3230
3220
3210
3200
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

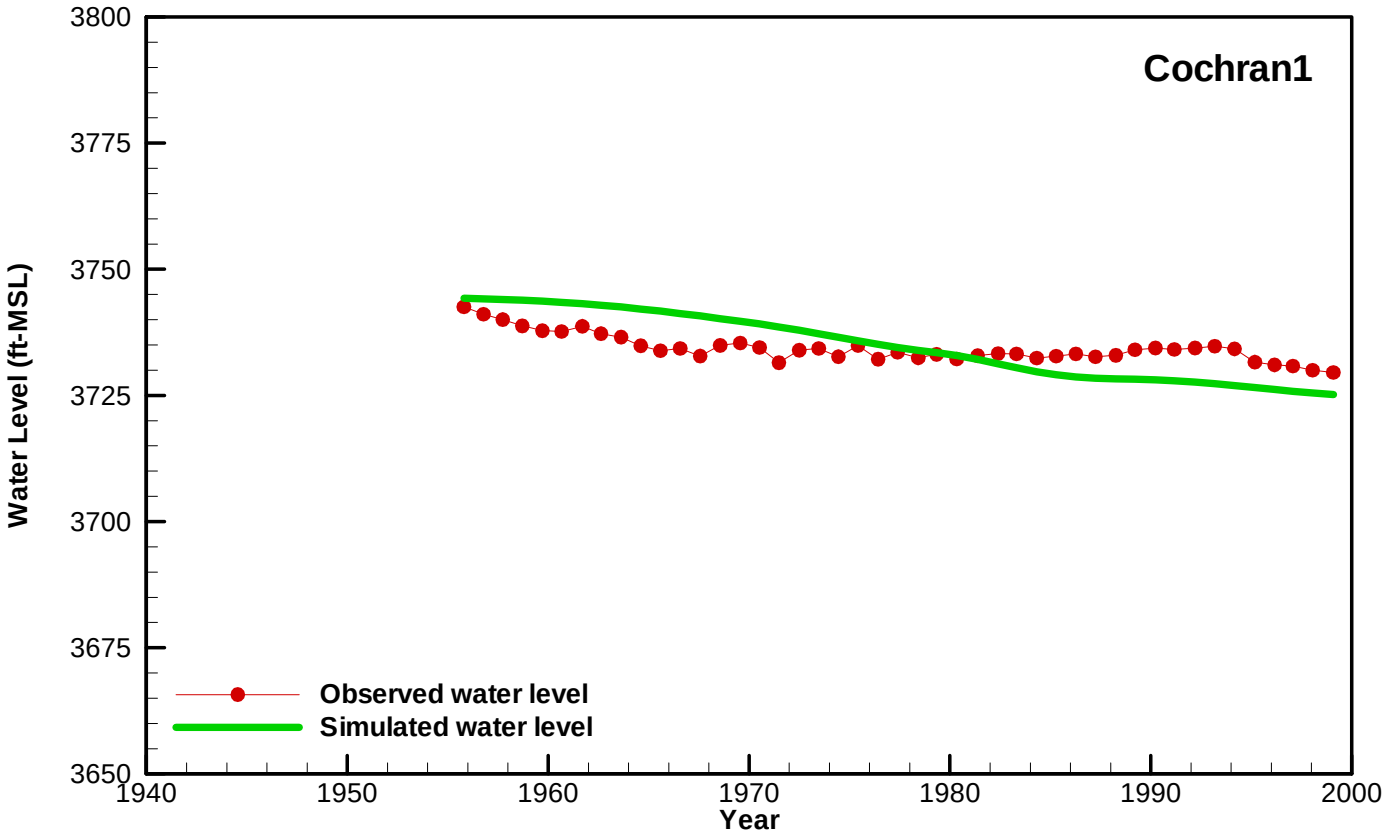

Briscoe2
Water Level (ft-MSL)
3300
3275
3250
3225
3200
3175
3150
3125
3100
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

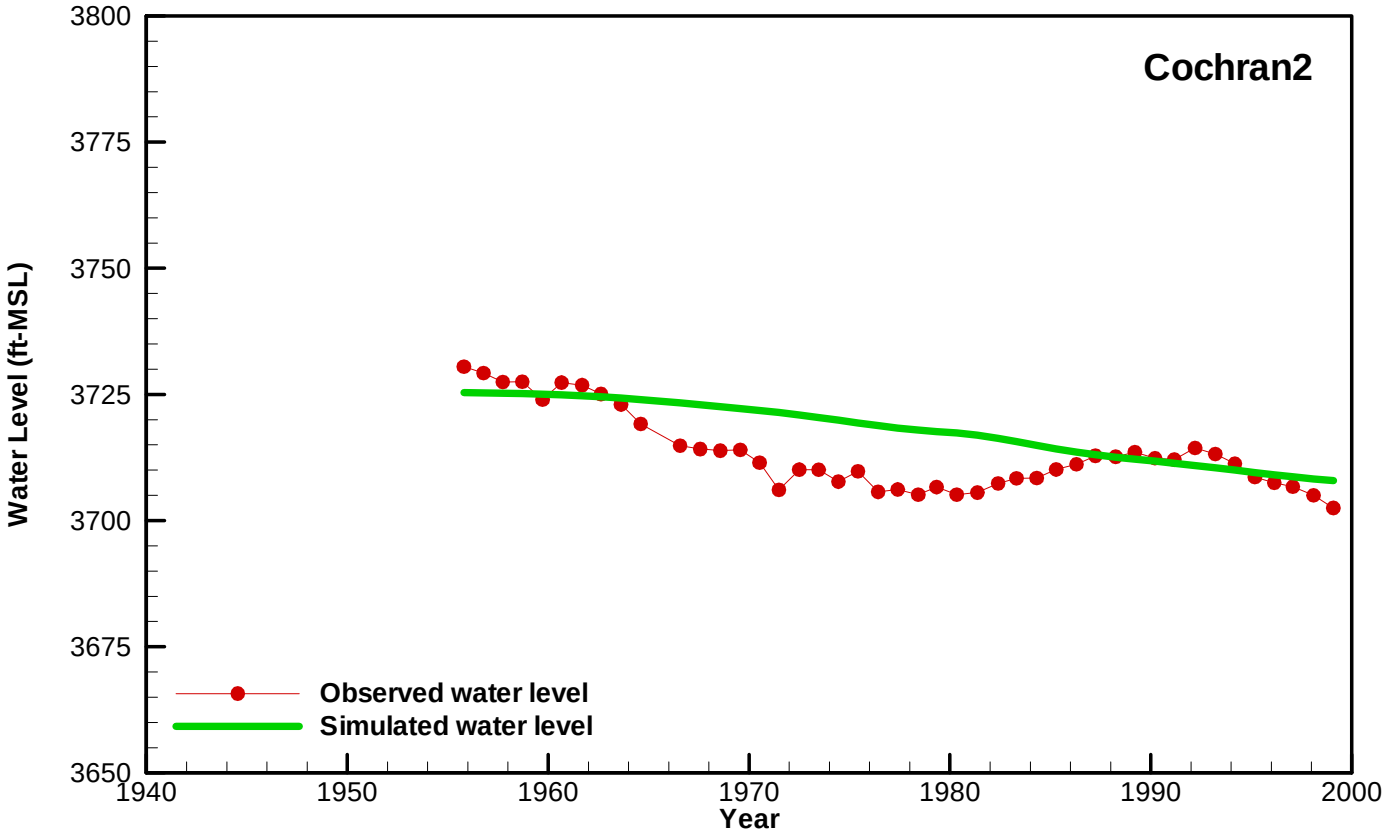

Briscoe3
Water Level (ft-MSL)
3300
3250
3200
3150
3100
3050
3000
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

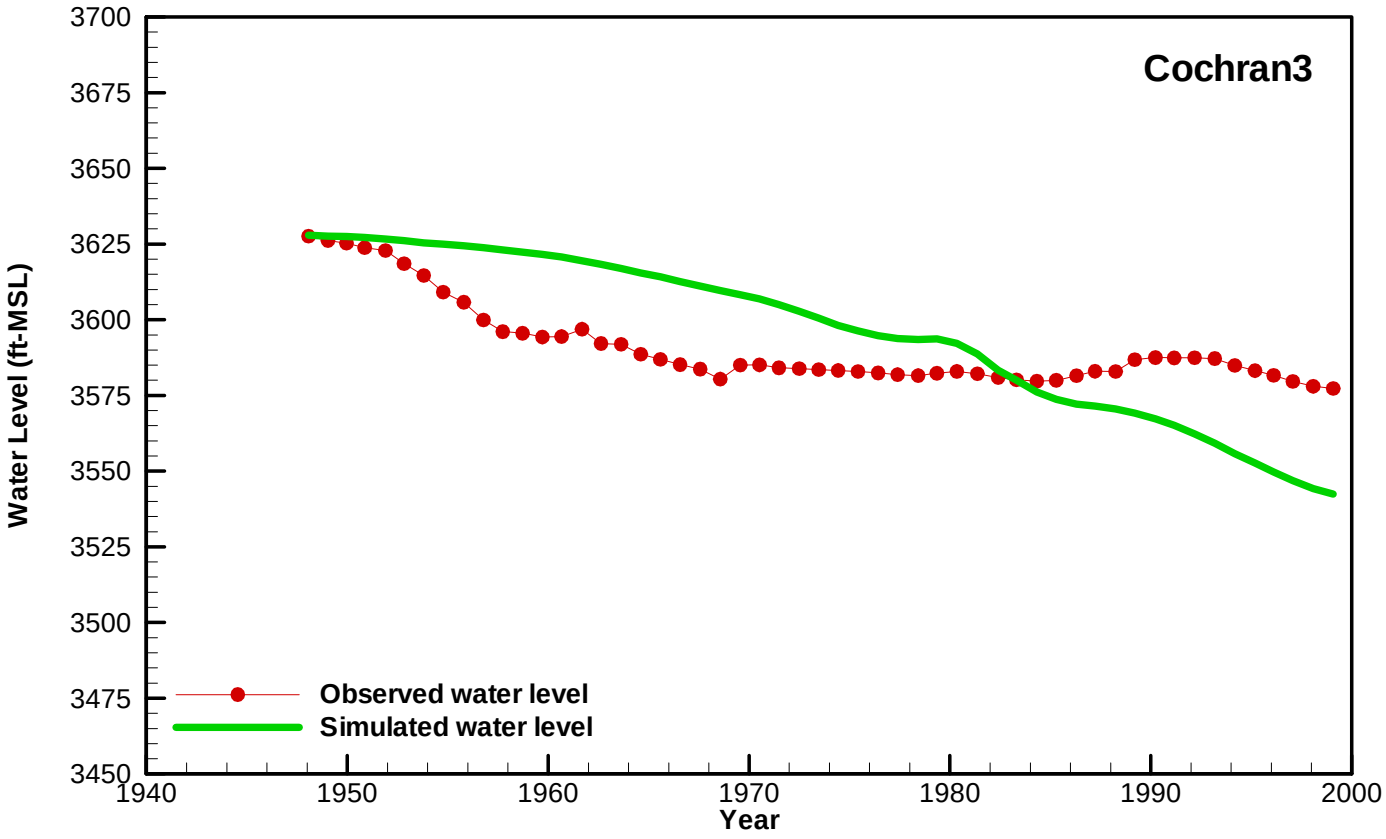

Castro1
Water Level (ft-MSL)
3750
3700
3650
3600
3550
3500
3450
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

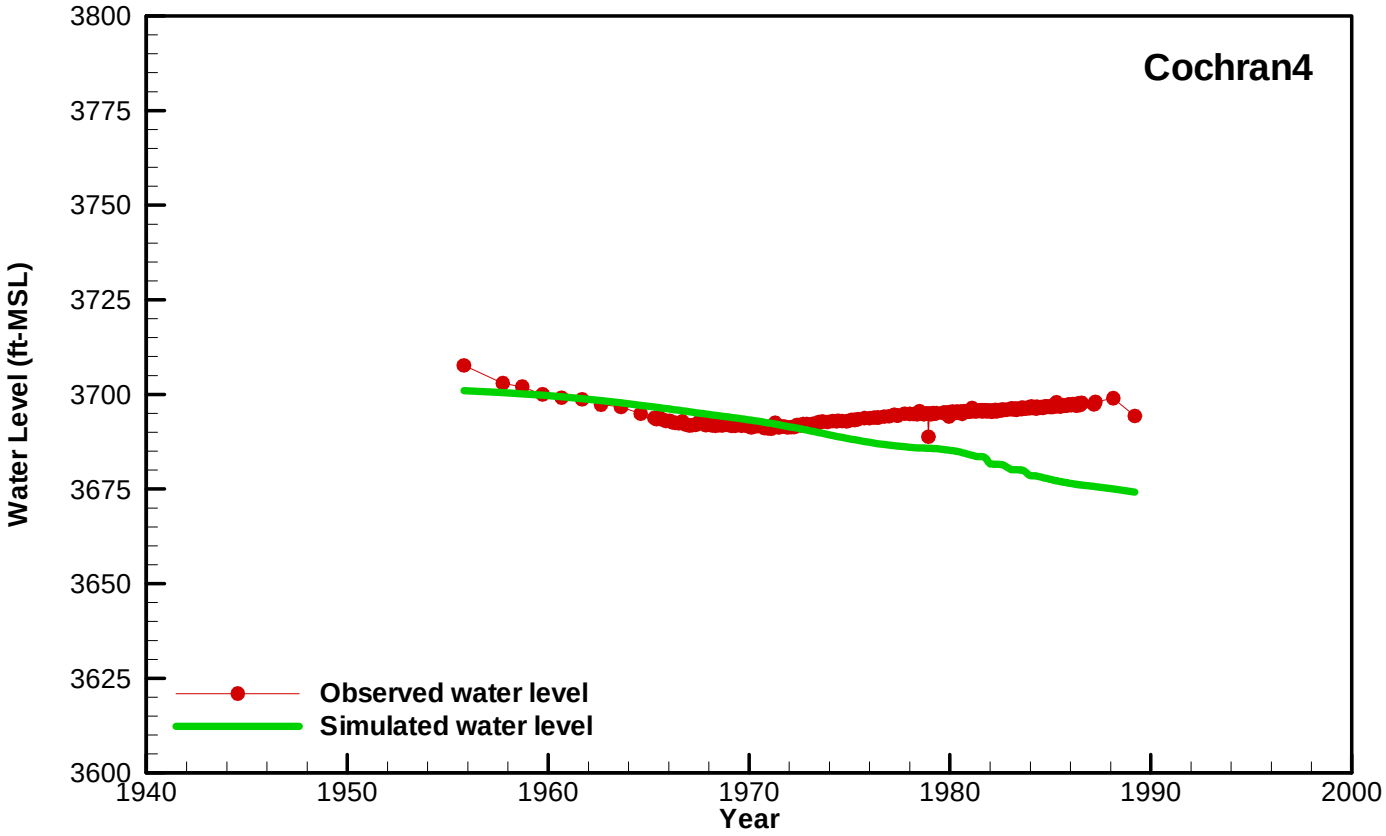

Castro2
Water Level (ft-MSL)
3750
3700
3650
3600
3550
3500
3450
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

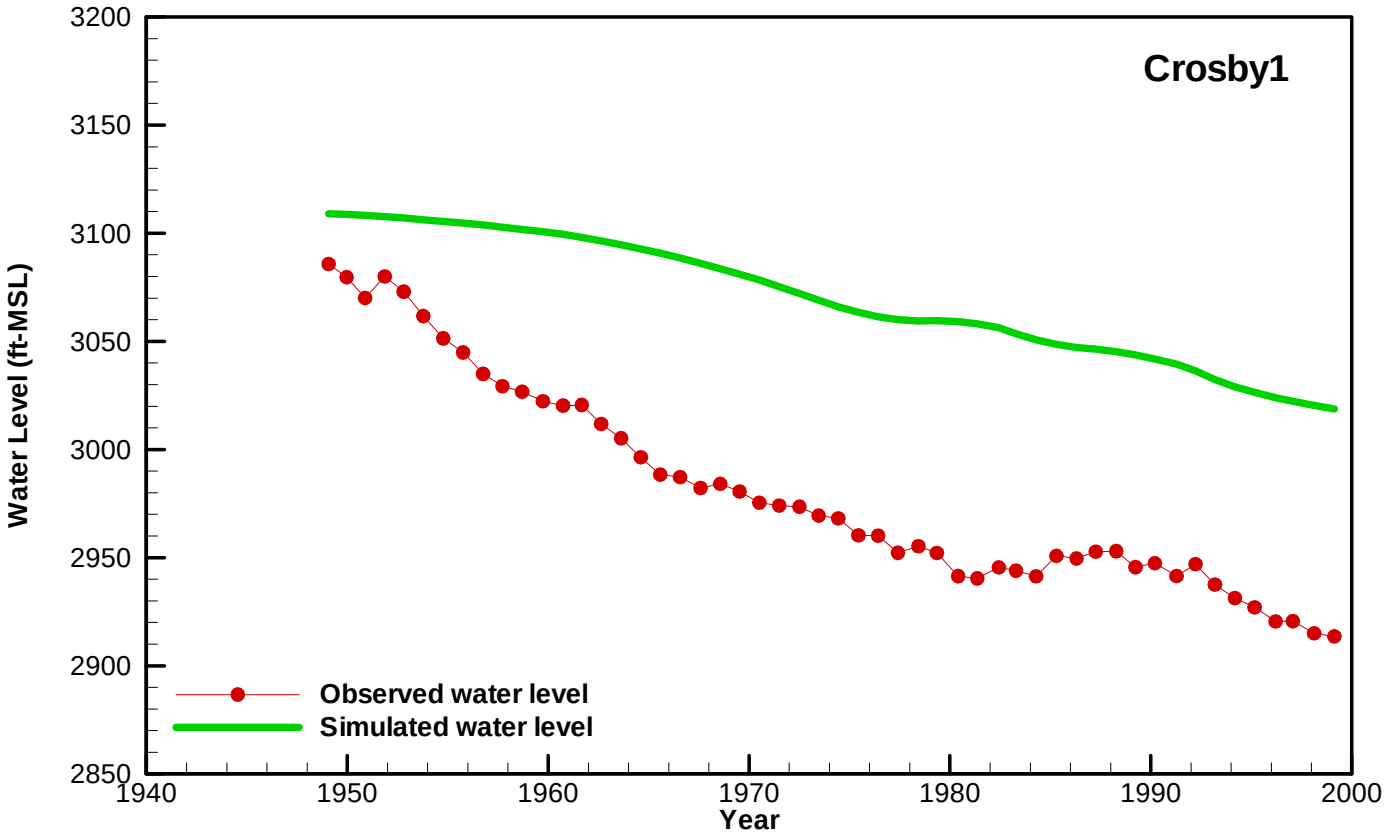

Castro3
Water Level (ft-MSL)
3700
3650
3600
3550
3500
3450
3400
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

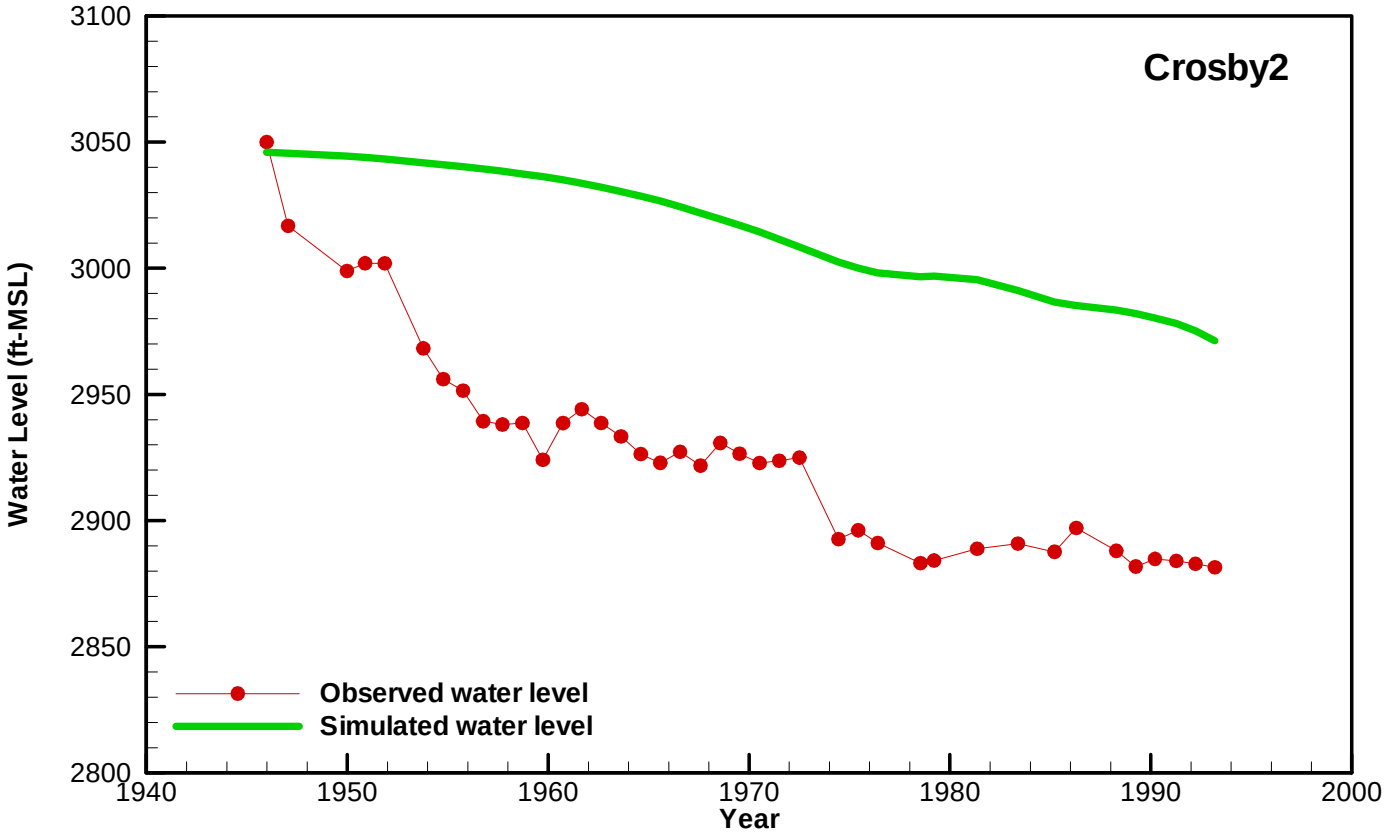

Cochran1
Water Level (ft-MSL)
3800
3775
3750
3725
3700
3675
3650
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

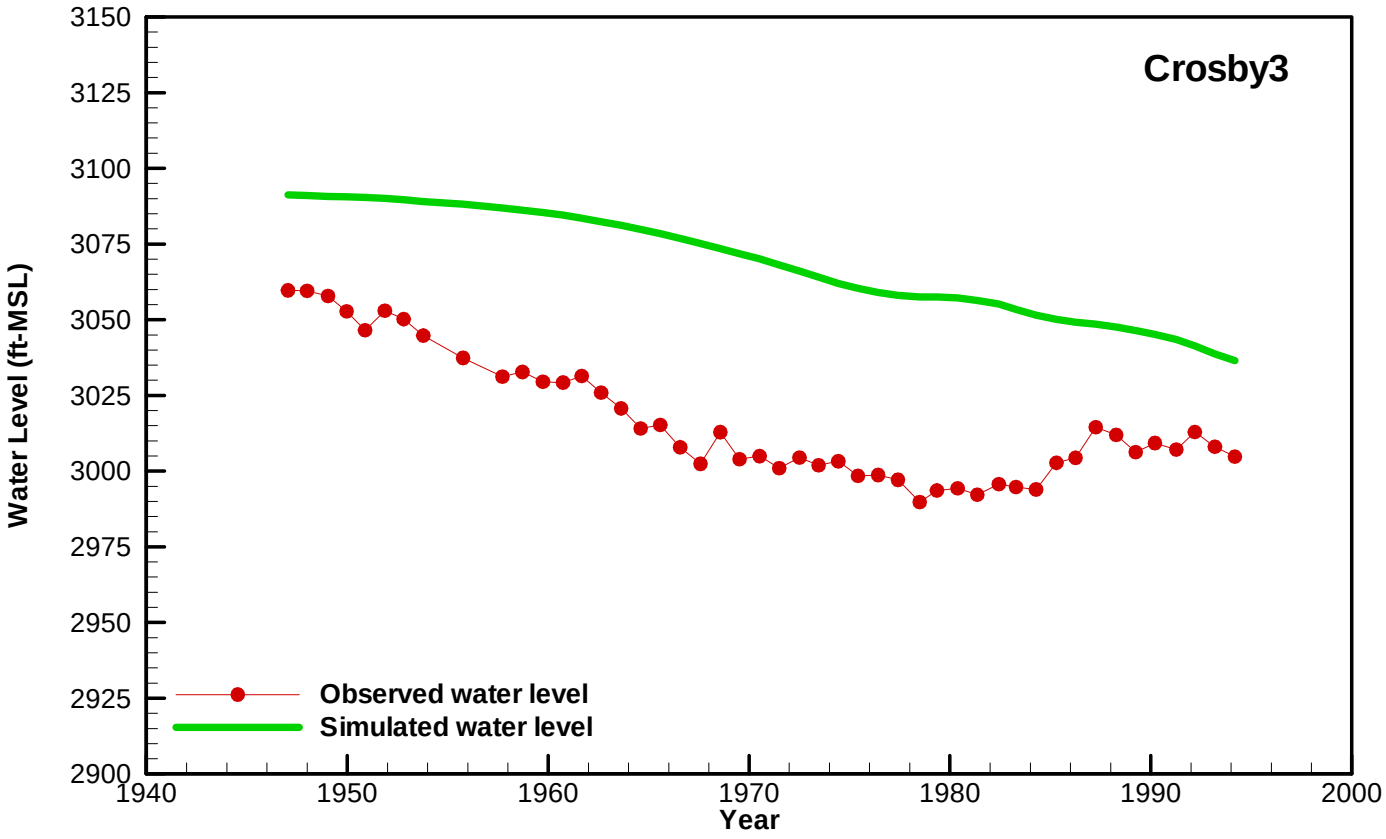

Cochran2
Water Level (ft-MSL)
3800
3775
3750
3725
3700
3675
3650
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

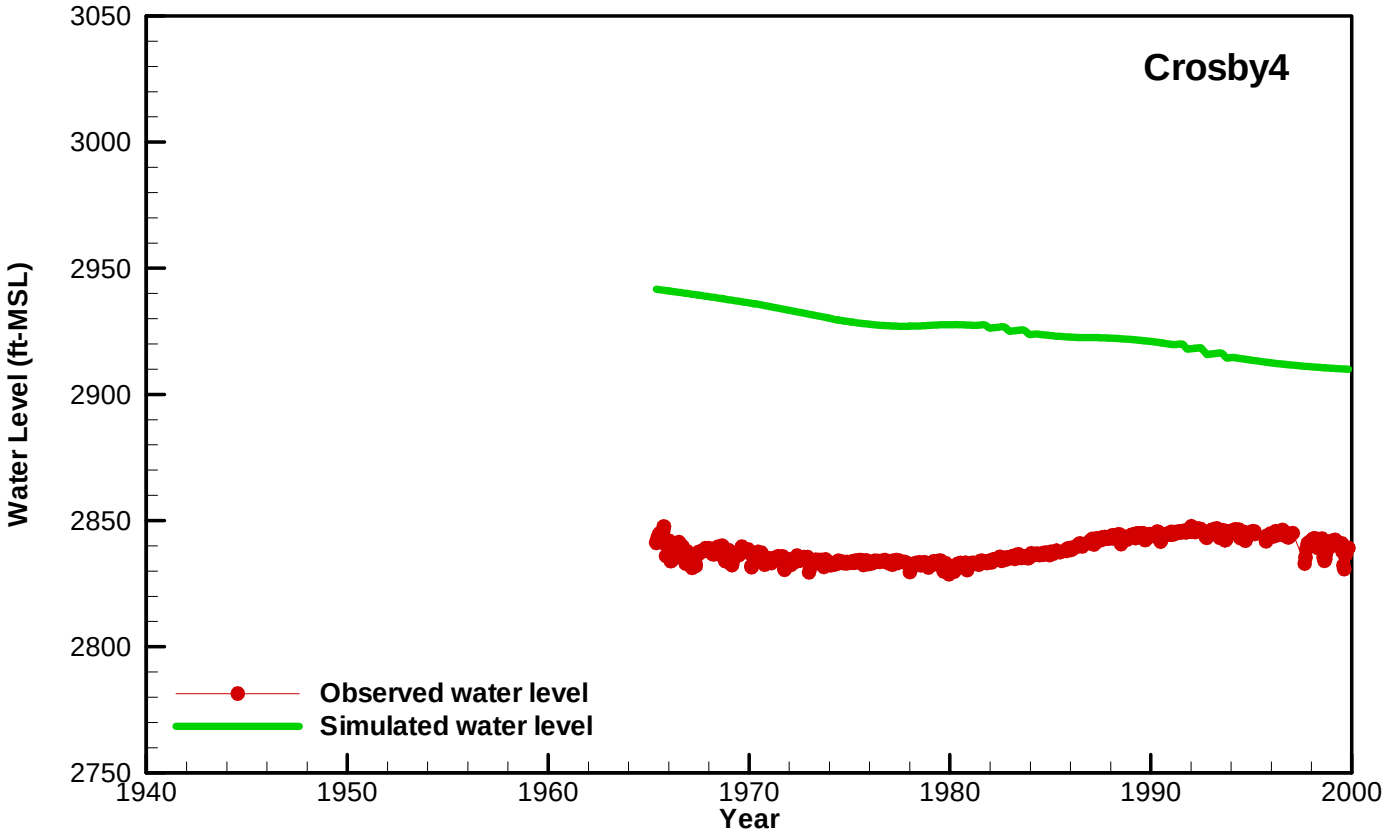

Cochran3
Water Level (ft-MSL)
3700
3675
3650
3625
3600
3575
3550
3525
3500
3475
3450
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

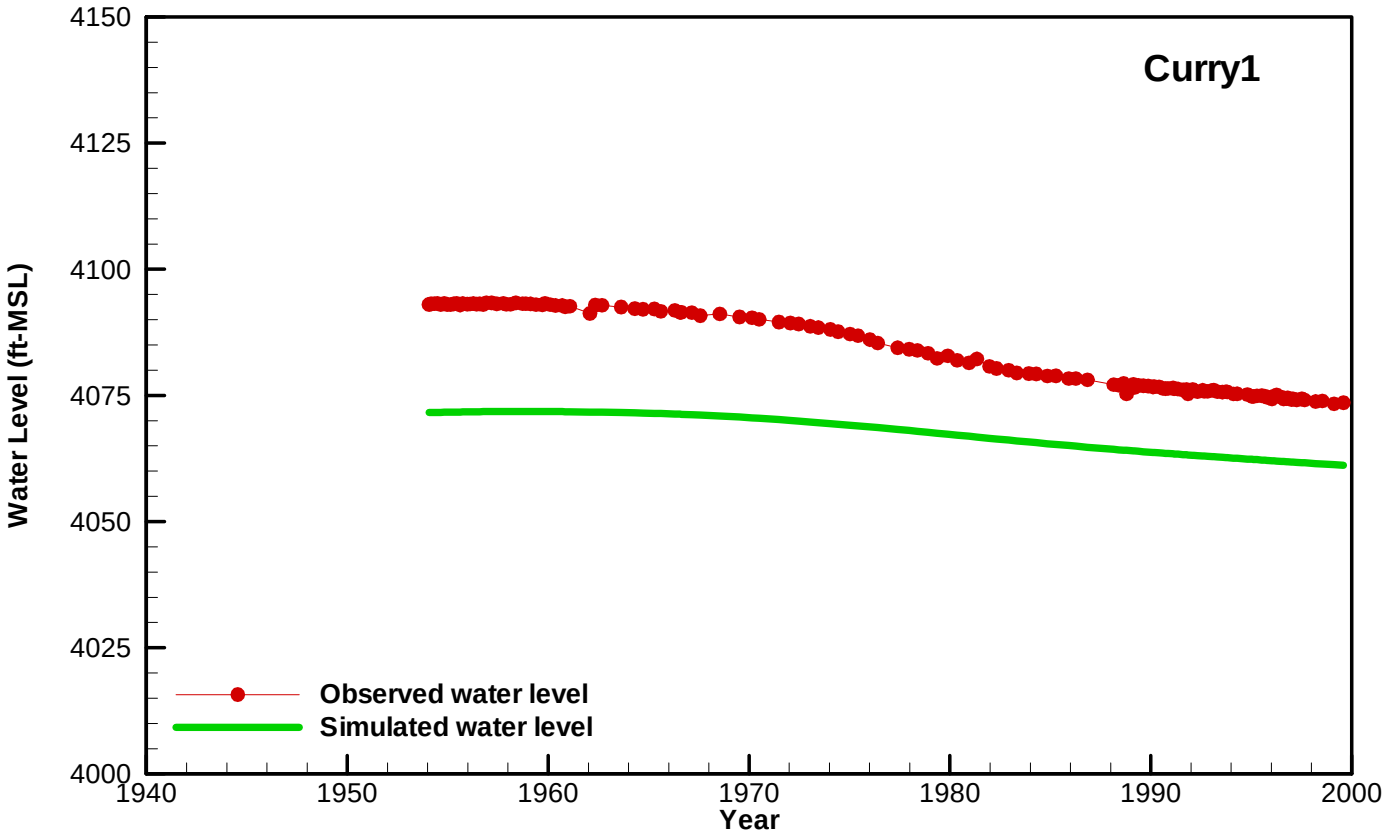

Cochran4
Water Level (ft-MSL)
3800
3775
3750
3725
3700
3675
3650
3625
3600
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

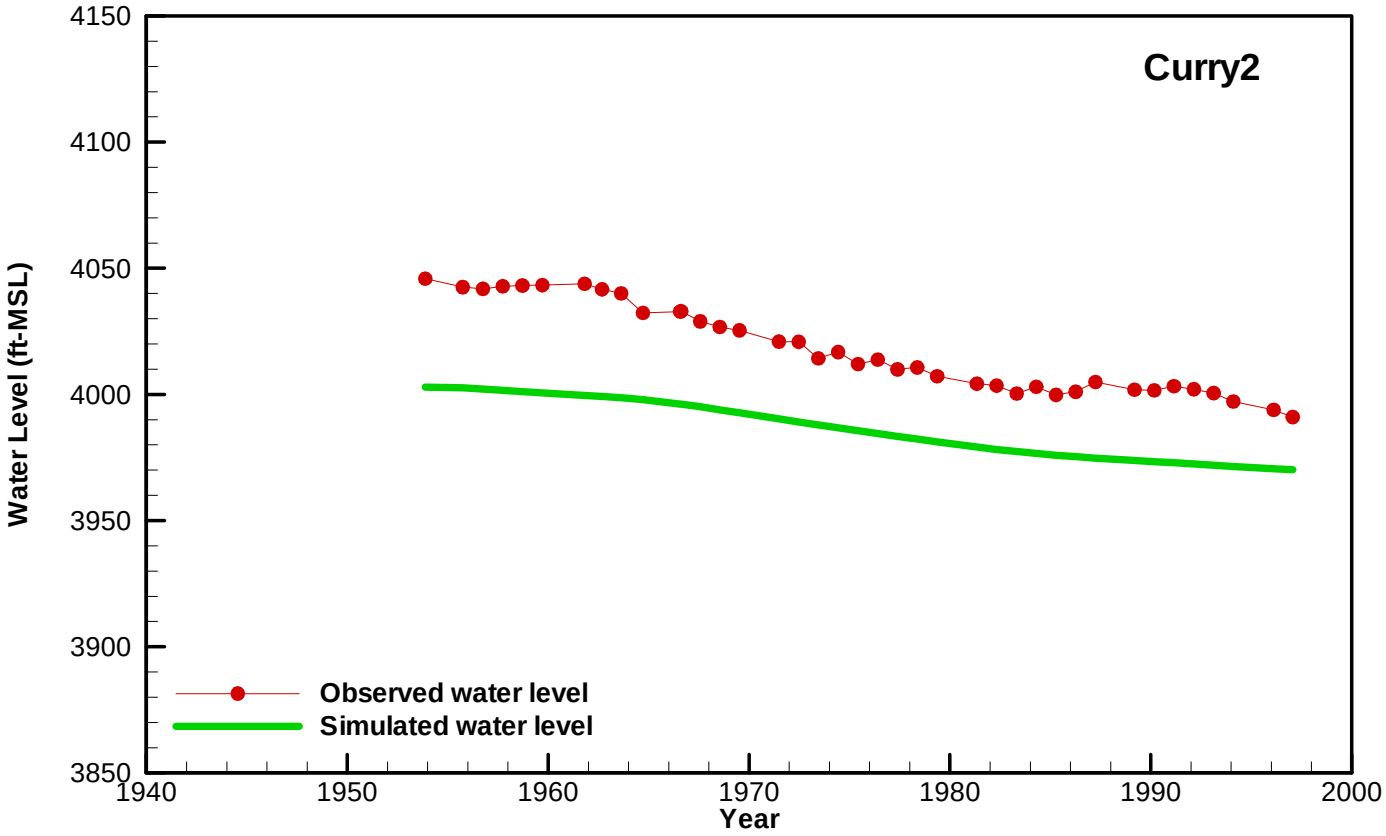

Crosby1
Water Level (ft-MSL)
3200
3150
3100
3050
3000
2950
2900
2850
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

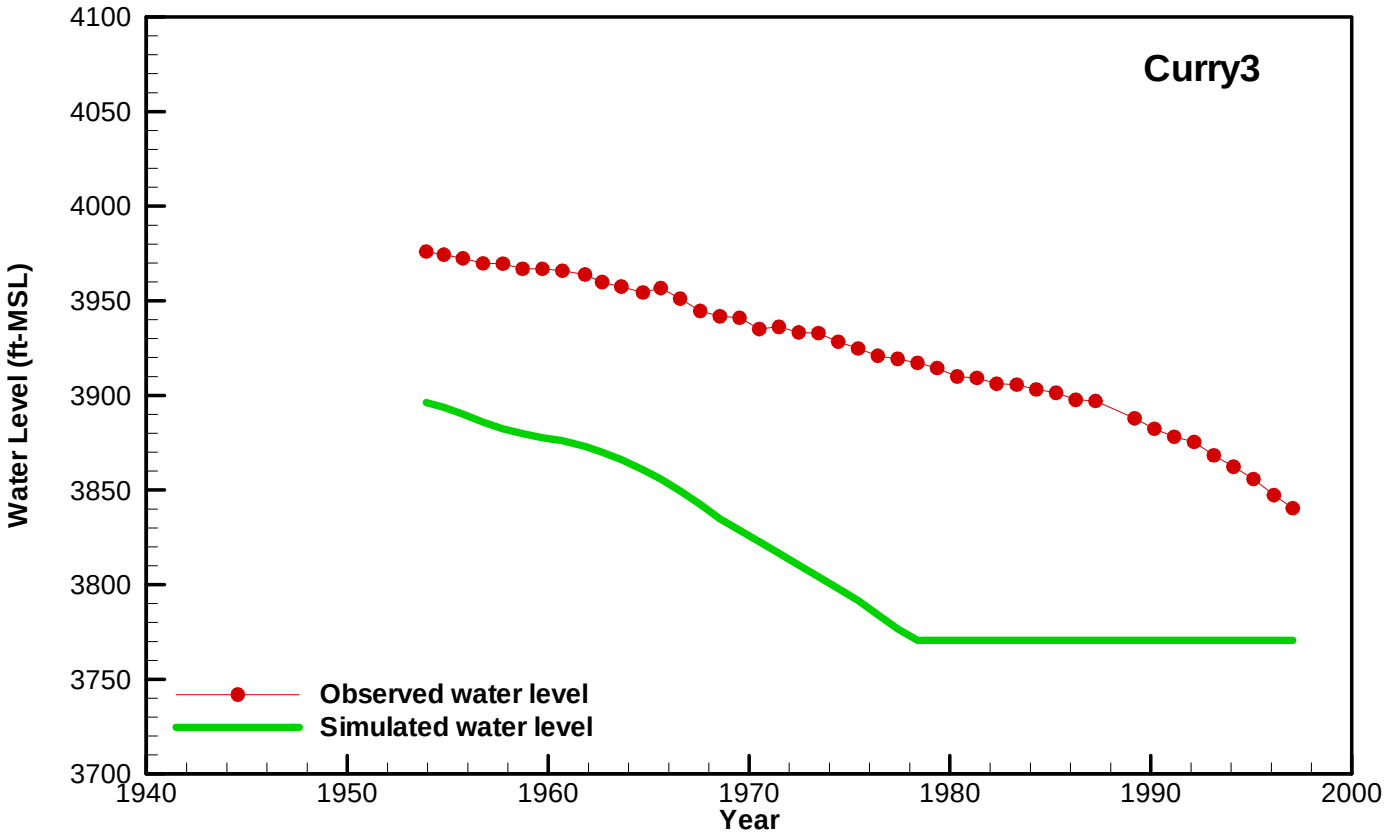

Crosby2
Water Level (ft-MSL)
3100
3050
3000
2950
2900
2850
2800
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

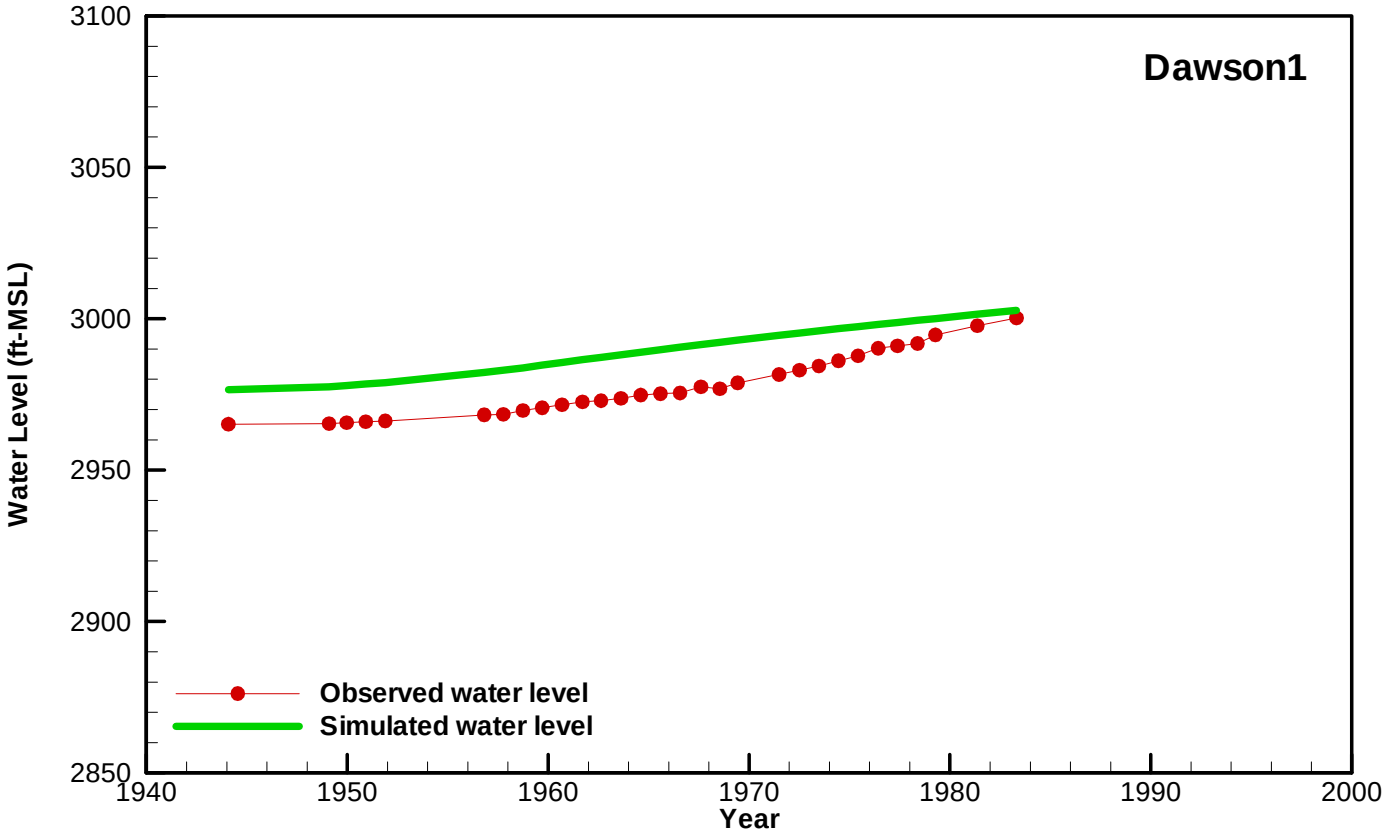

Crosby3
Water Level (ft-MSL)
3150
3125
3100
3075
3050
3025
3000
2975
2950
2925
2900
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

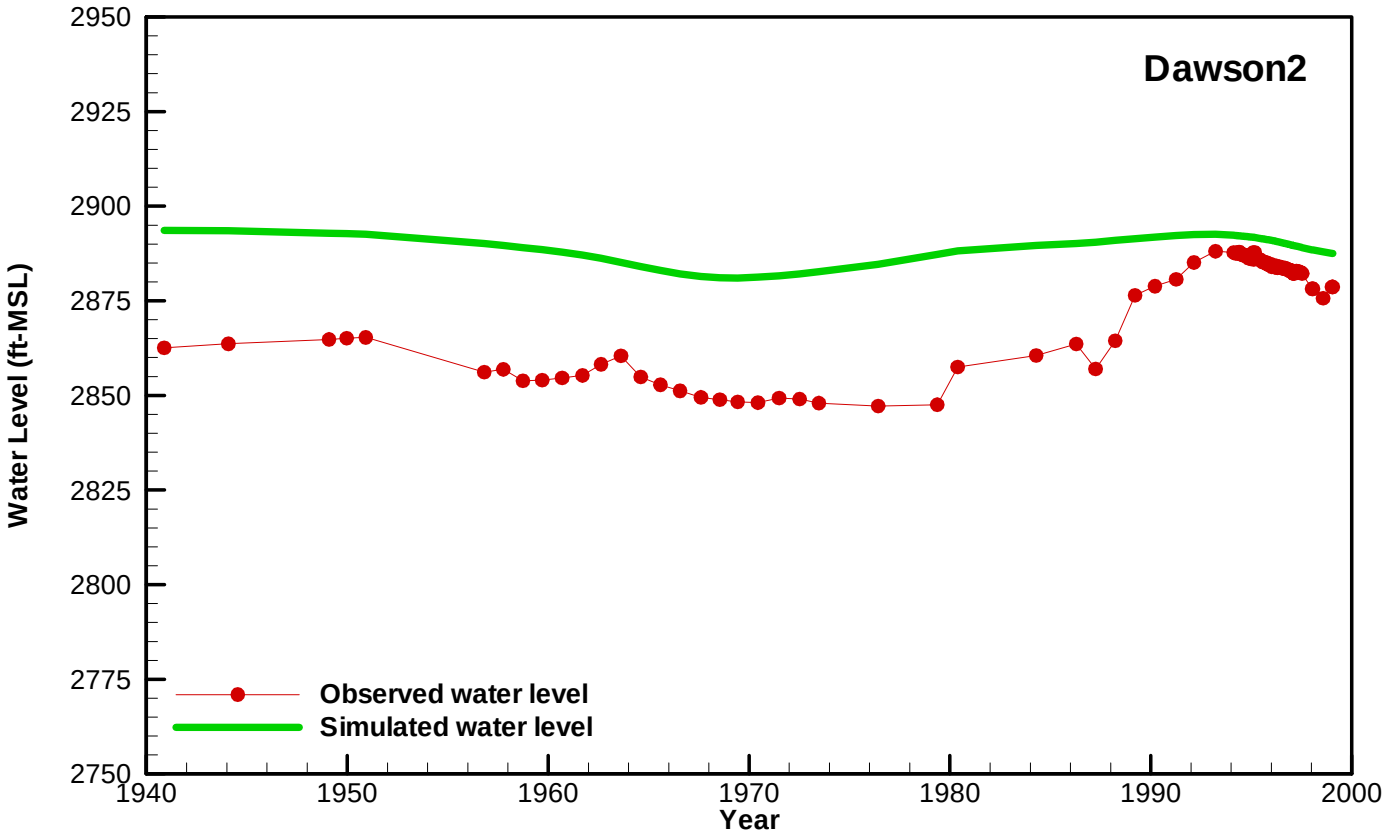

Crosby4
Water Level (ft-MSL)
3050
3000
2950
2900
2850
2800
2750
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

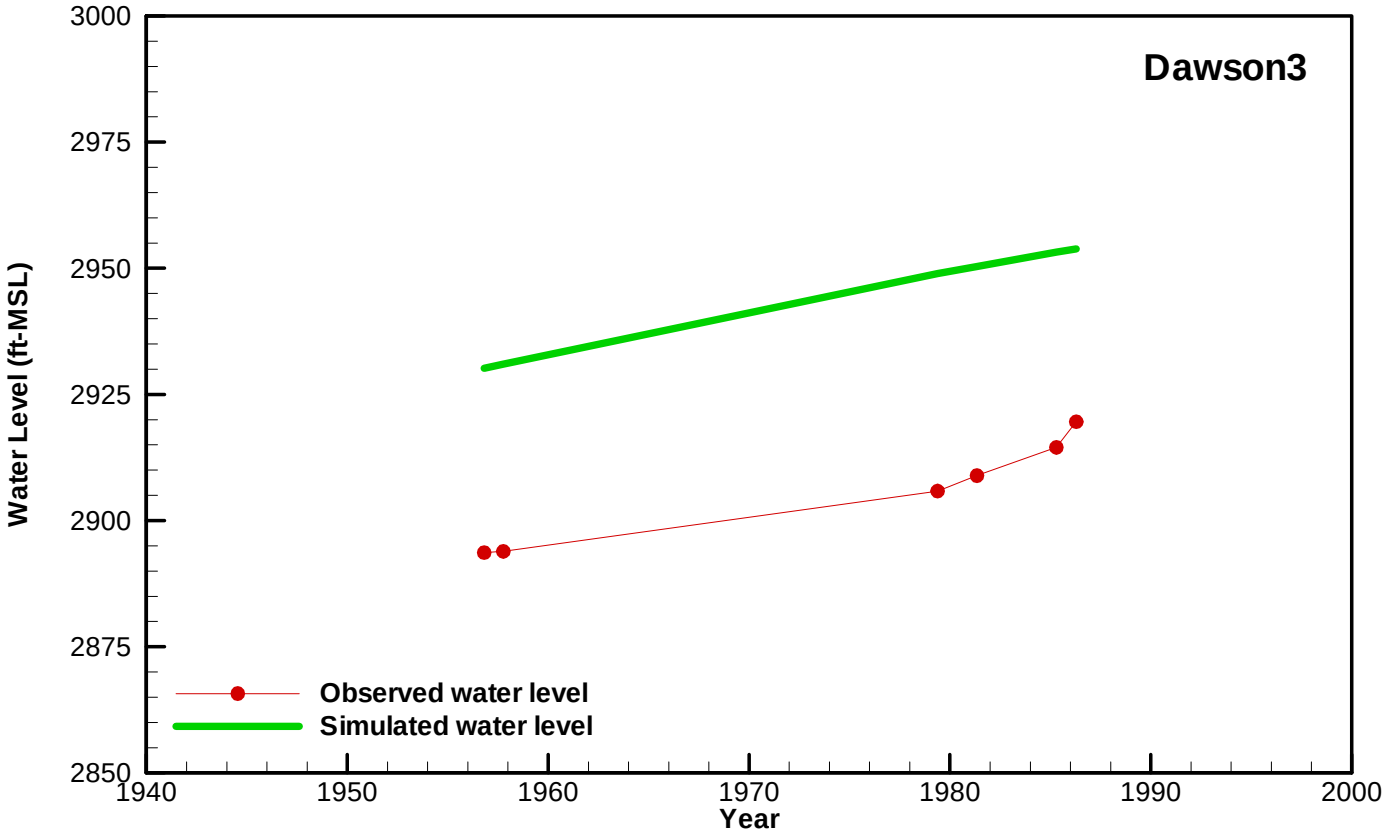

Curry1
Water Level (ft-MSL)
4150
4125
4100
4075
4050
4025
4000
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

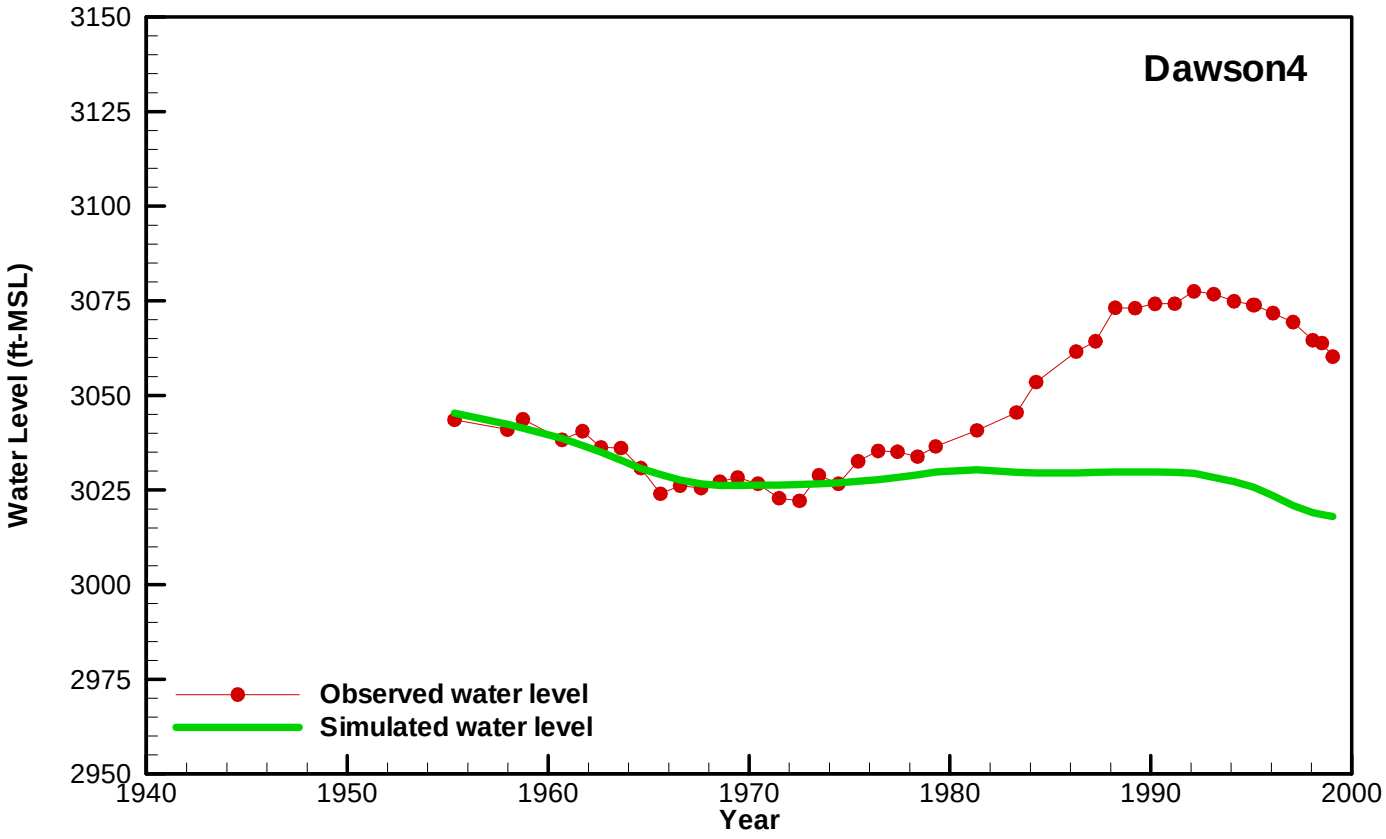

Curry2
Water Level (ft-MSL)
4150
4100
4050
4000
3950
3900
3850
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

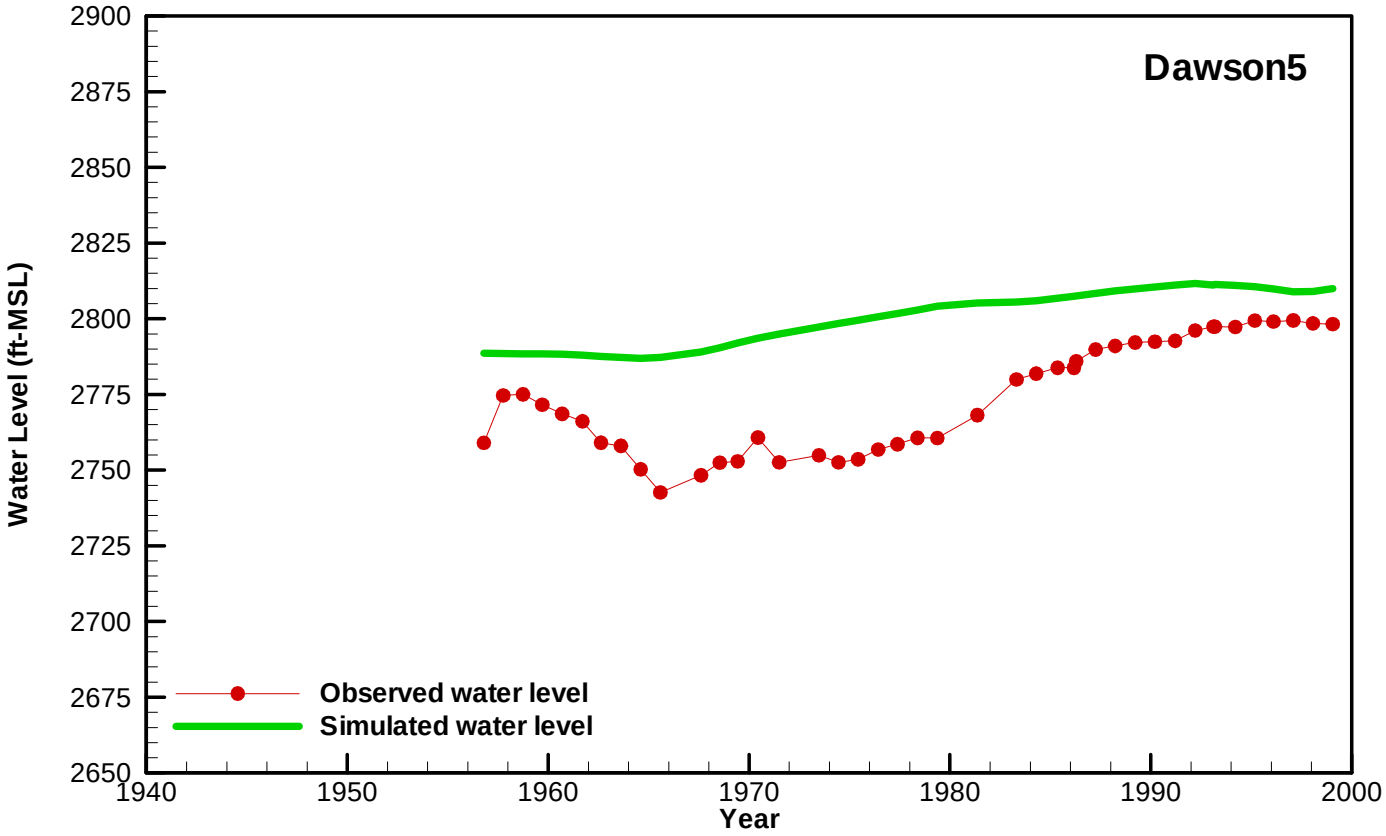

Curry3
Water Level (ft-MSL)
4100
4050
4000
3950
3900
3850
3800
3750
3700
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

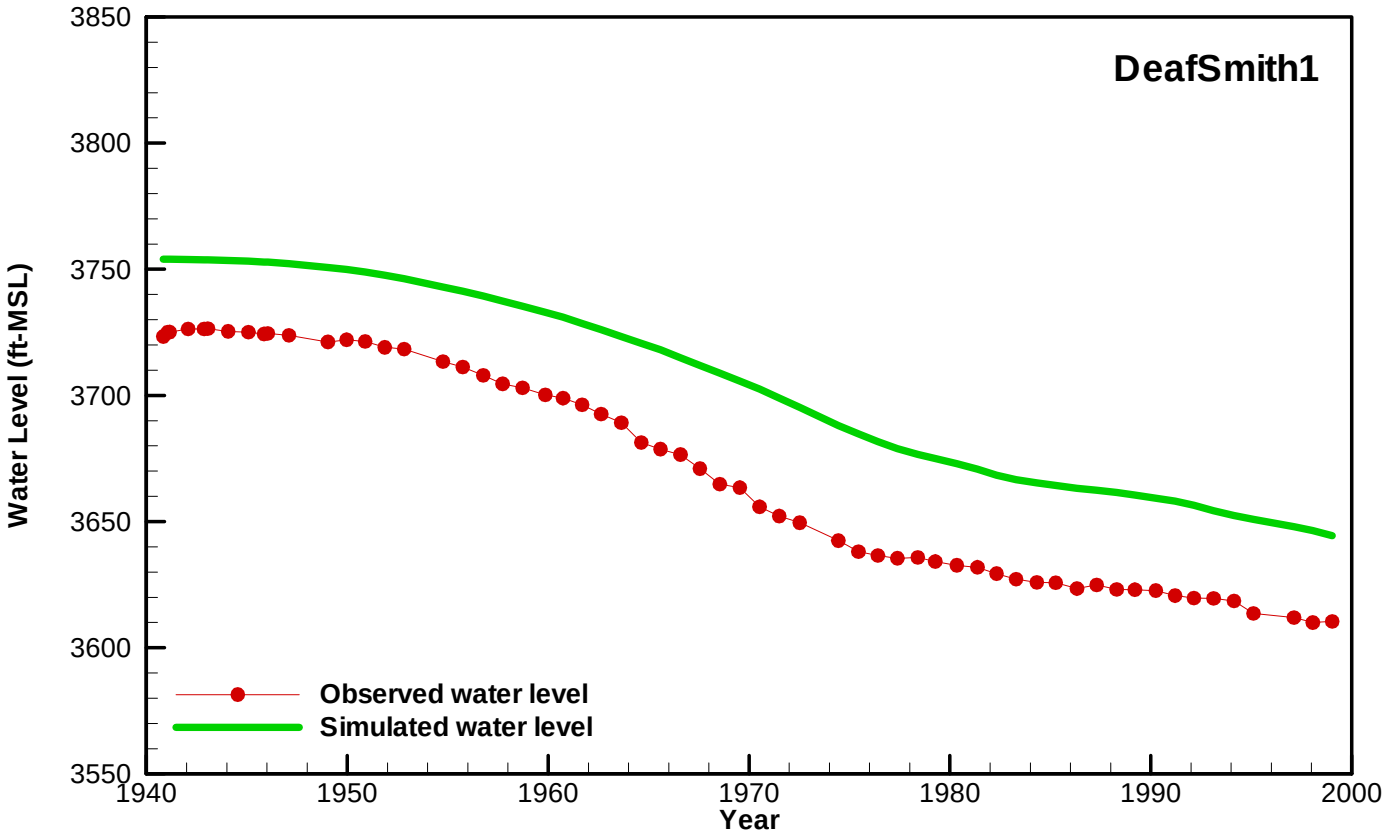

Dawson1
Water Level (ft-MSL)
3100
3050
3000
2950
2900
2850
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

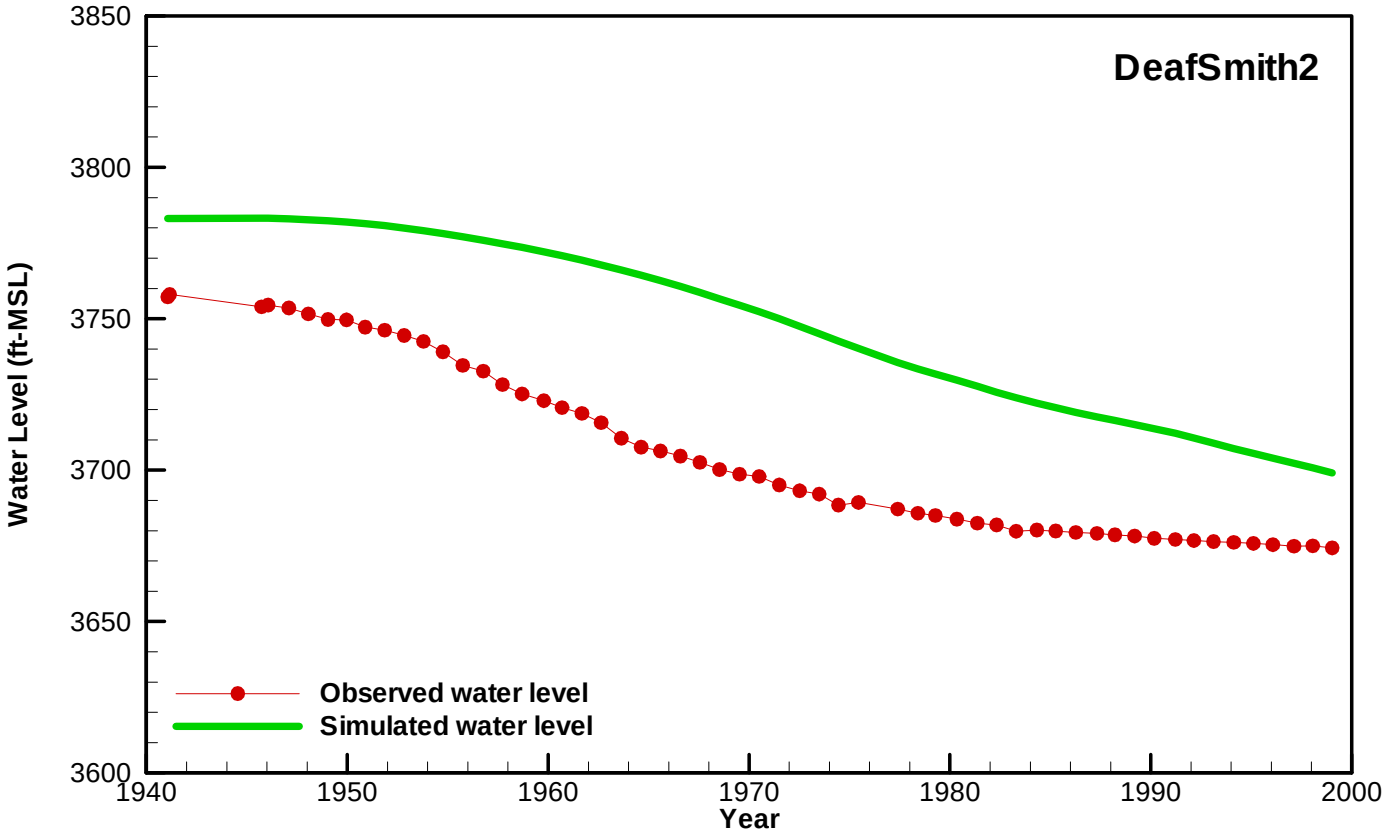

Dawson2
Water Level (ft-MSL)
2950
2925
2900
2875
2850
2825
2800
2775
2750
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

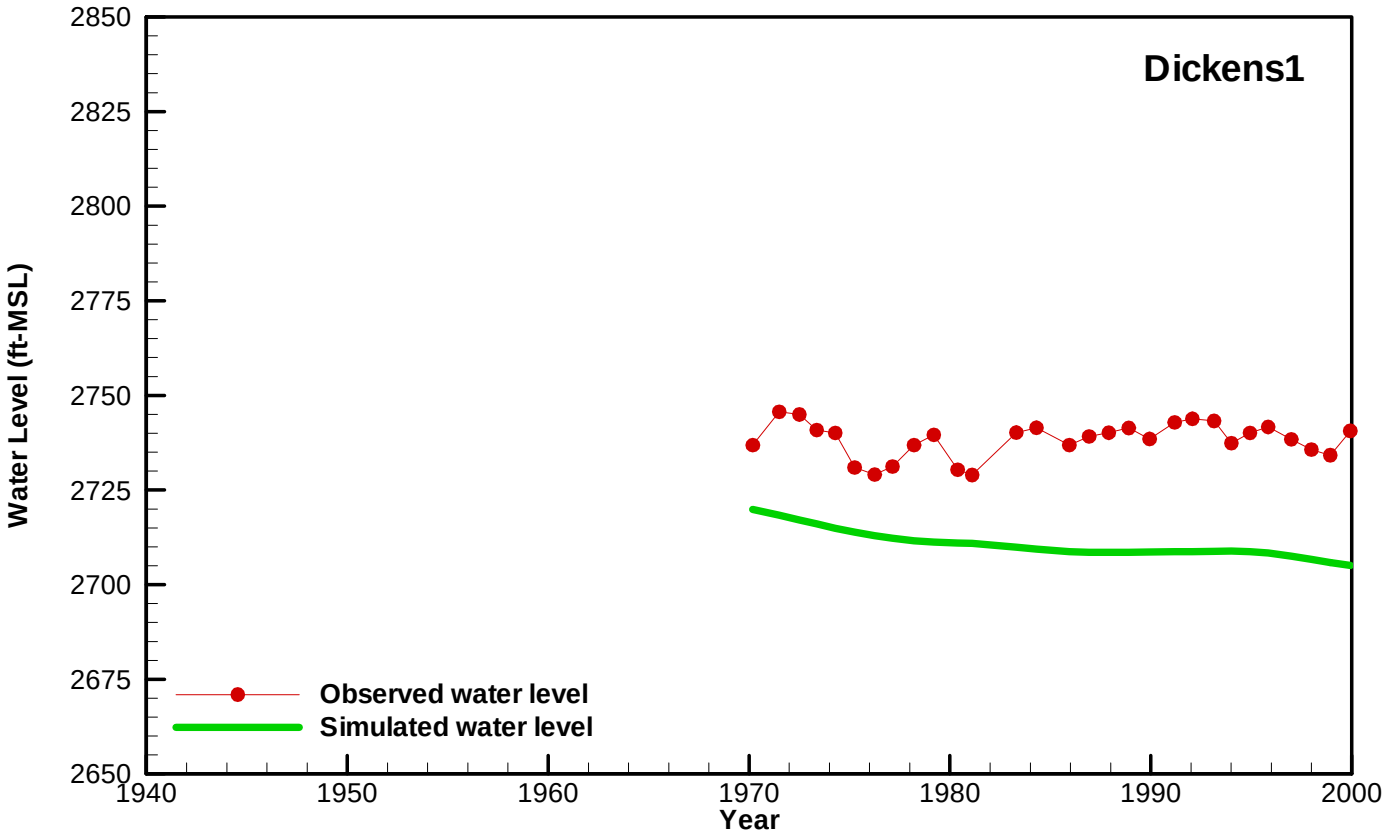

Dawson3
Water Level (ft-MSL)
3000
2975
2950
2925
2900
2875
2850
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

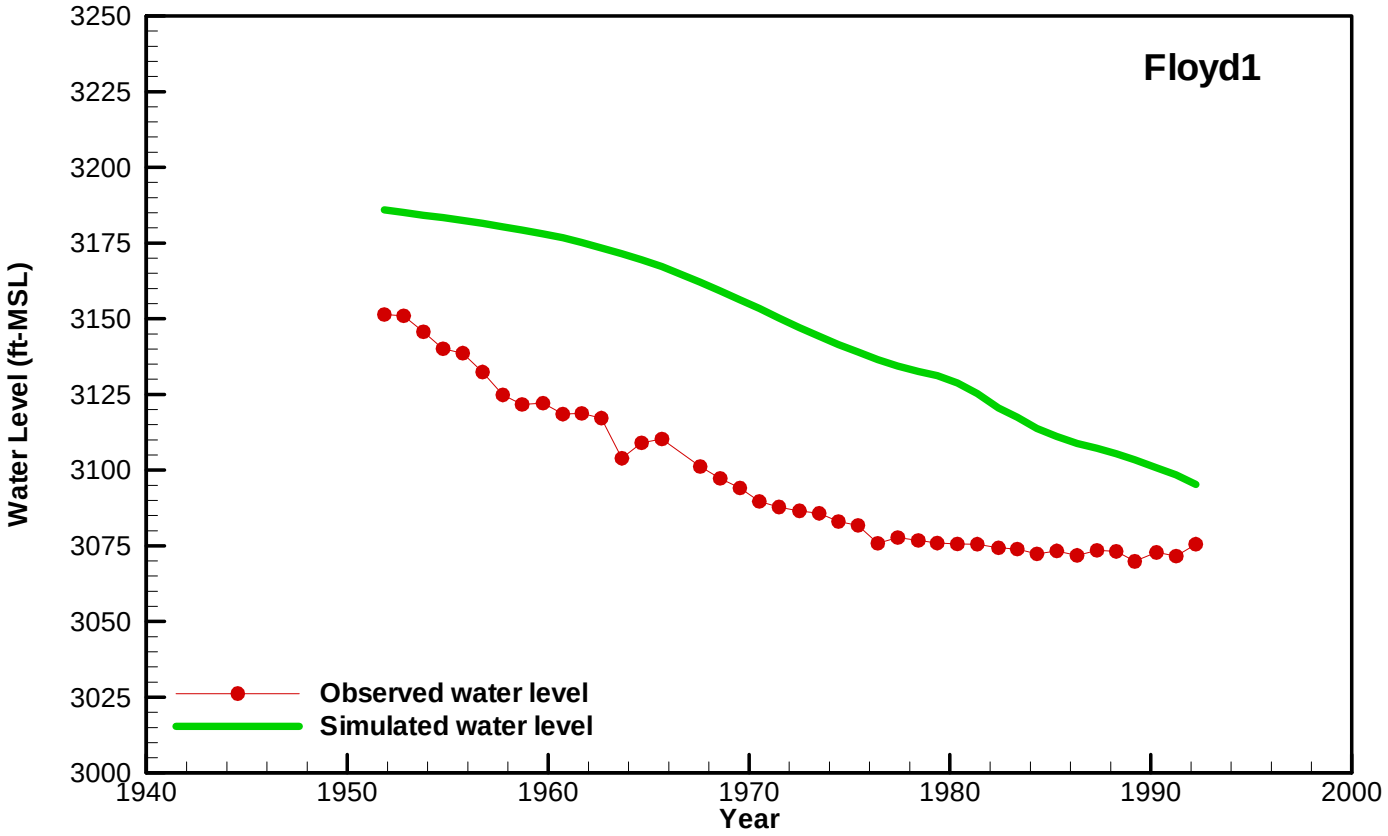

Dawson4
Water Level (ft-MSL)
3150
3125
3100
3075
3050
3025
3000
2975
2950
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

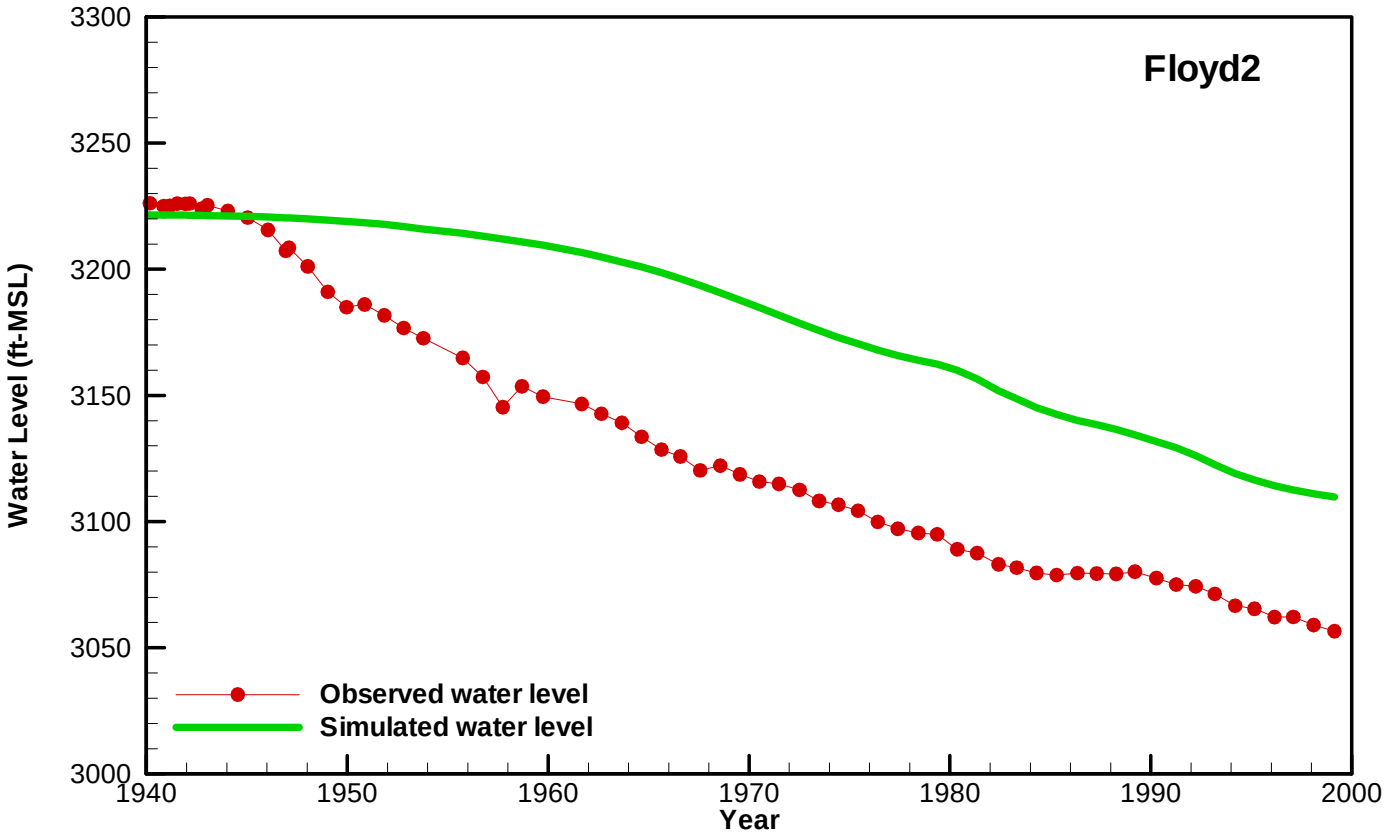

Dawson5
Water Level (ft-MSL)
2900
2875
2850
2825
2800
2775
2750
2725
2700
2675
2650
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

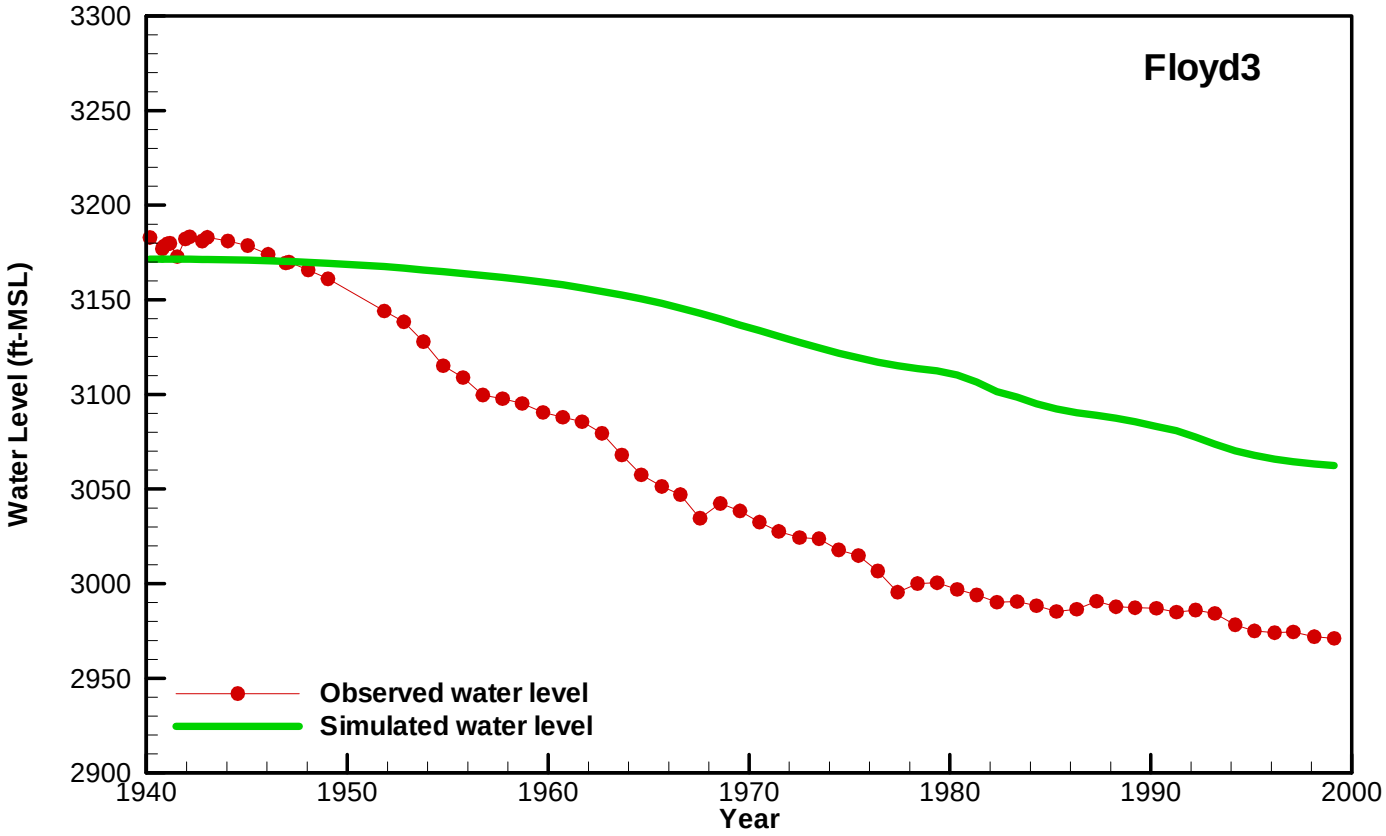

DeafSmith1
Water Level (ft-MSL)
3850
3800
3750
3700
3650
3600
3550
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

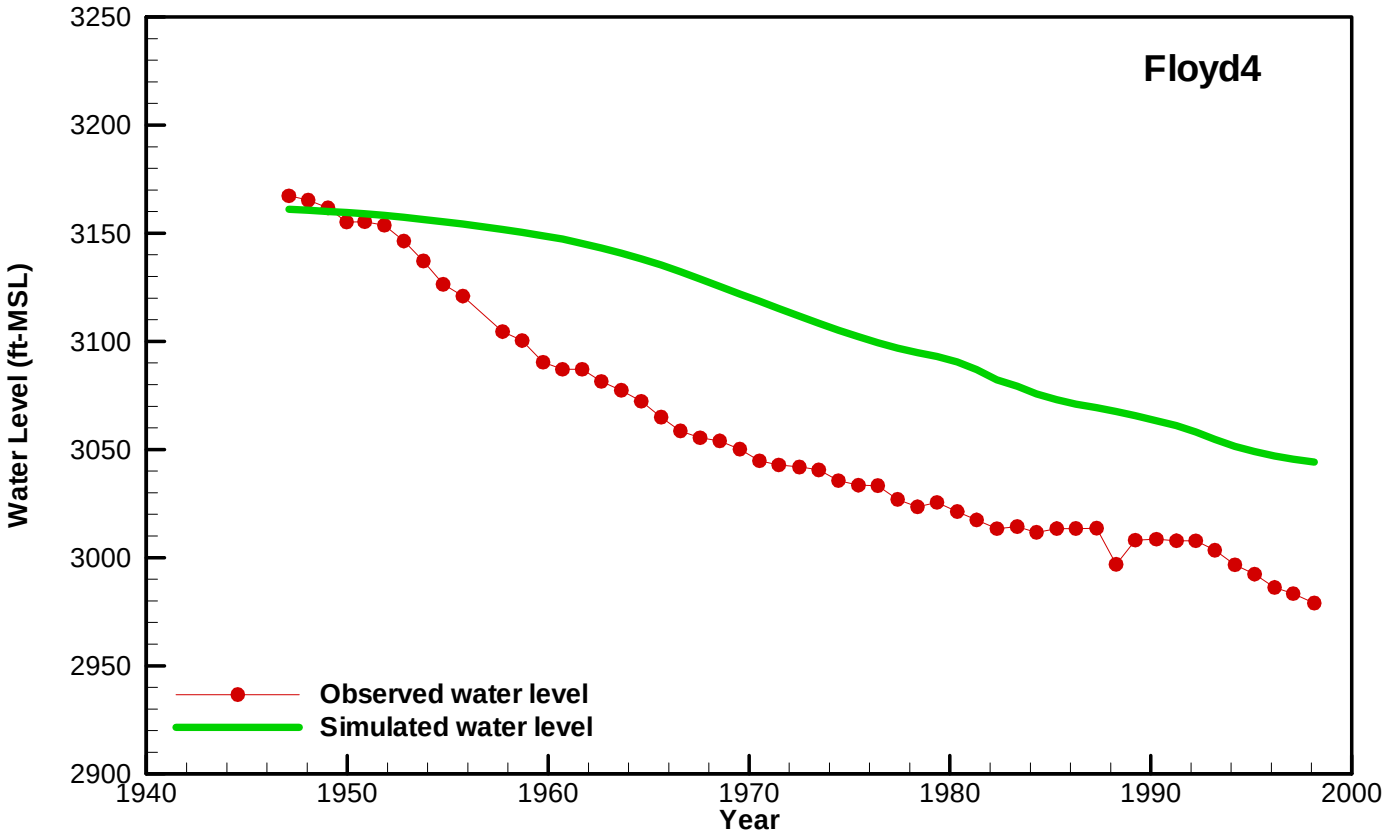

DeafSmith2
Water Level (ft-MSL)
3850
3800
3750
3700
3650
3600
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

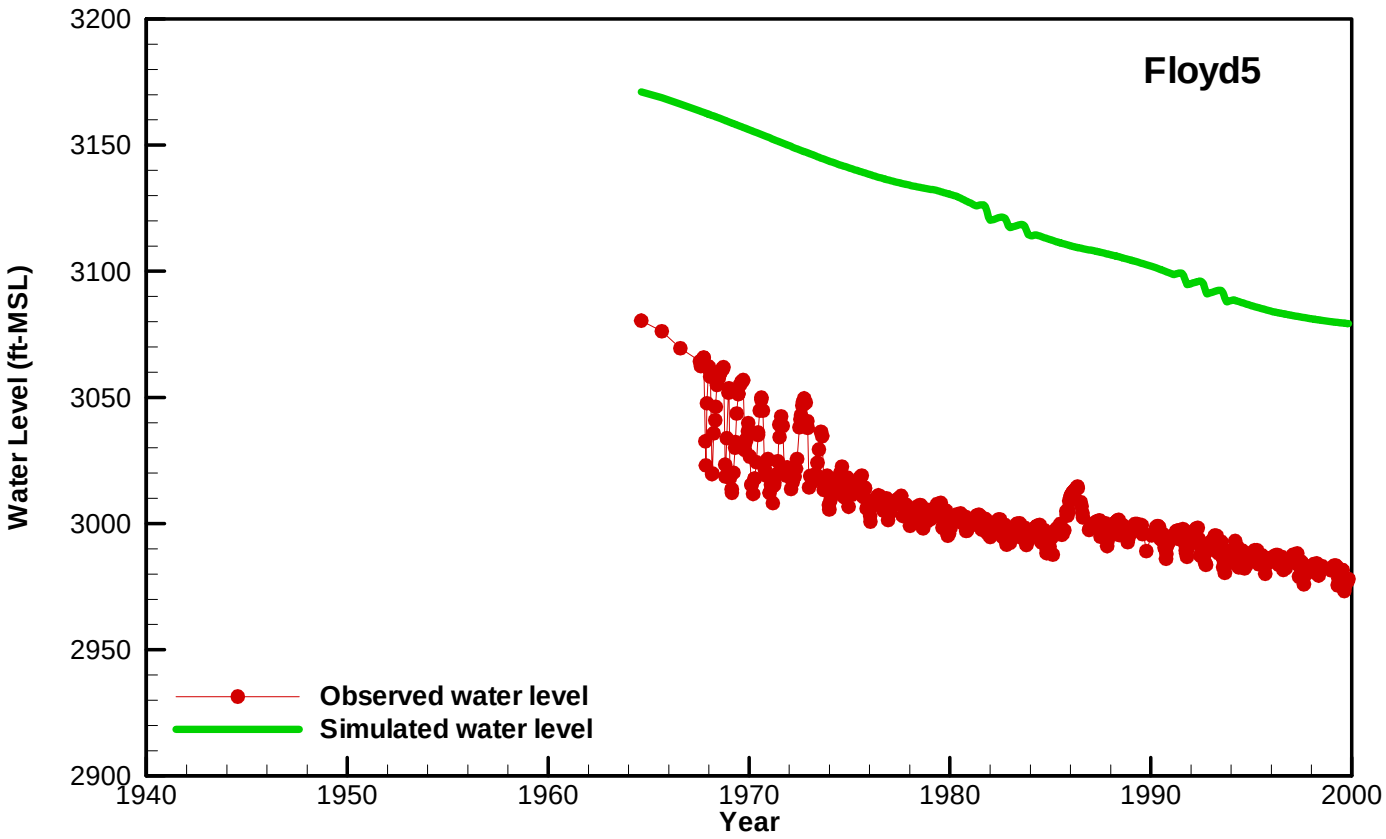

Dickens1
Water Level (ft-MSL)
2850
2825
2800
2775
2750
2725
2700
2675
2650
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

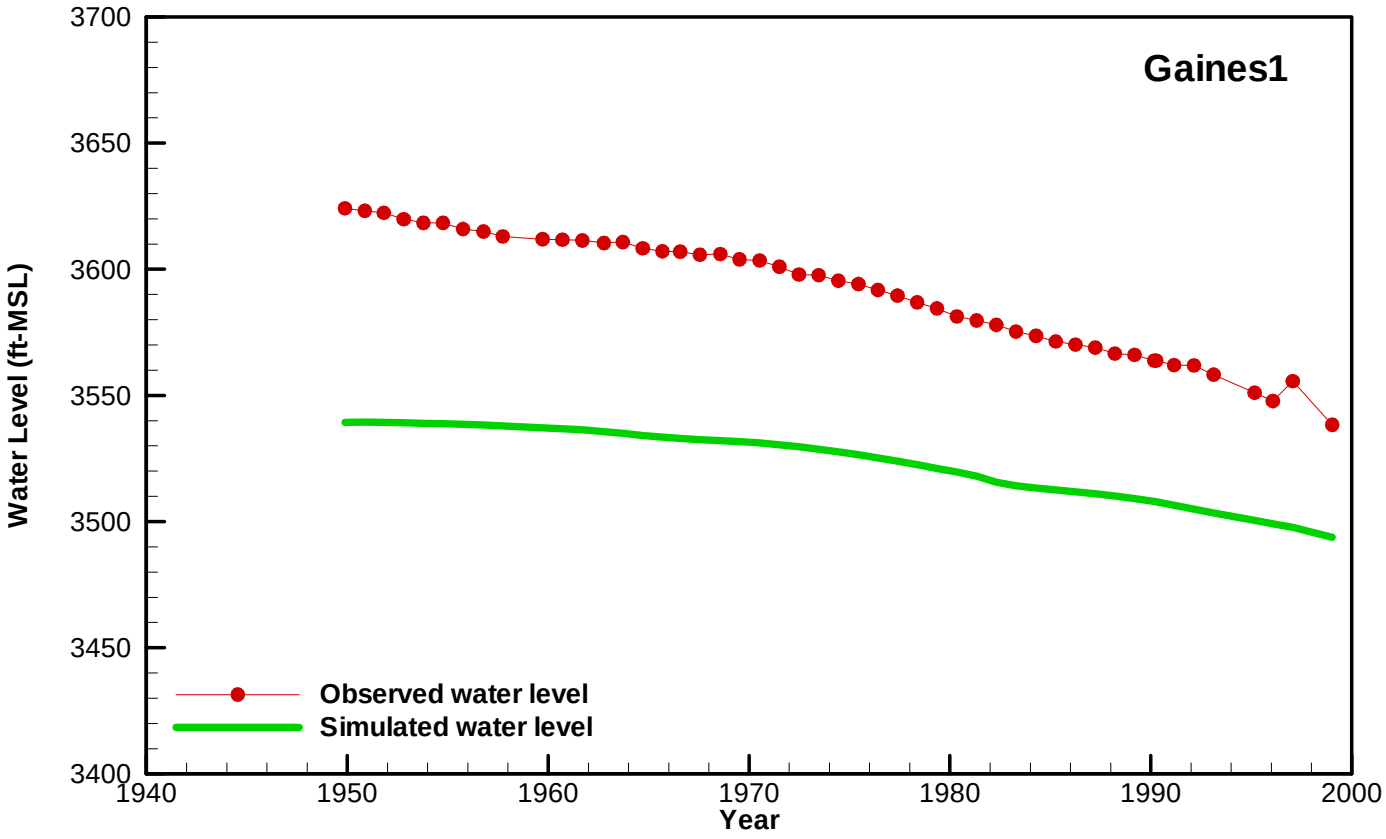

Floyd1
Water Level (ft-MSL)
3250
3225
3200
3175
3150
3125
3100
3075
3050
3025
3000
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

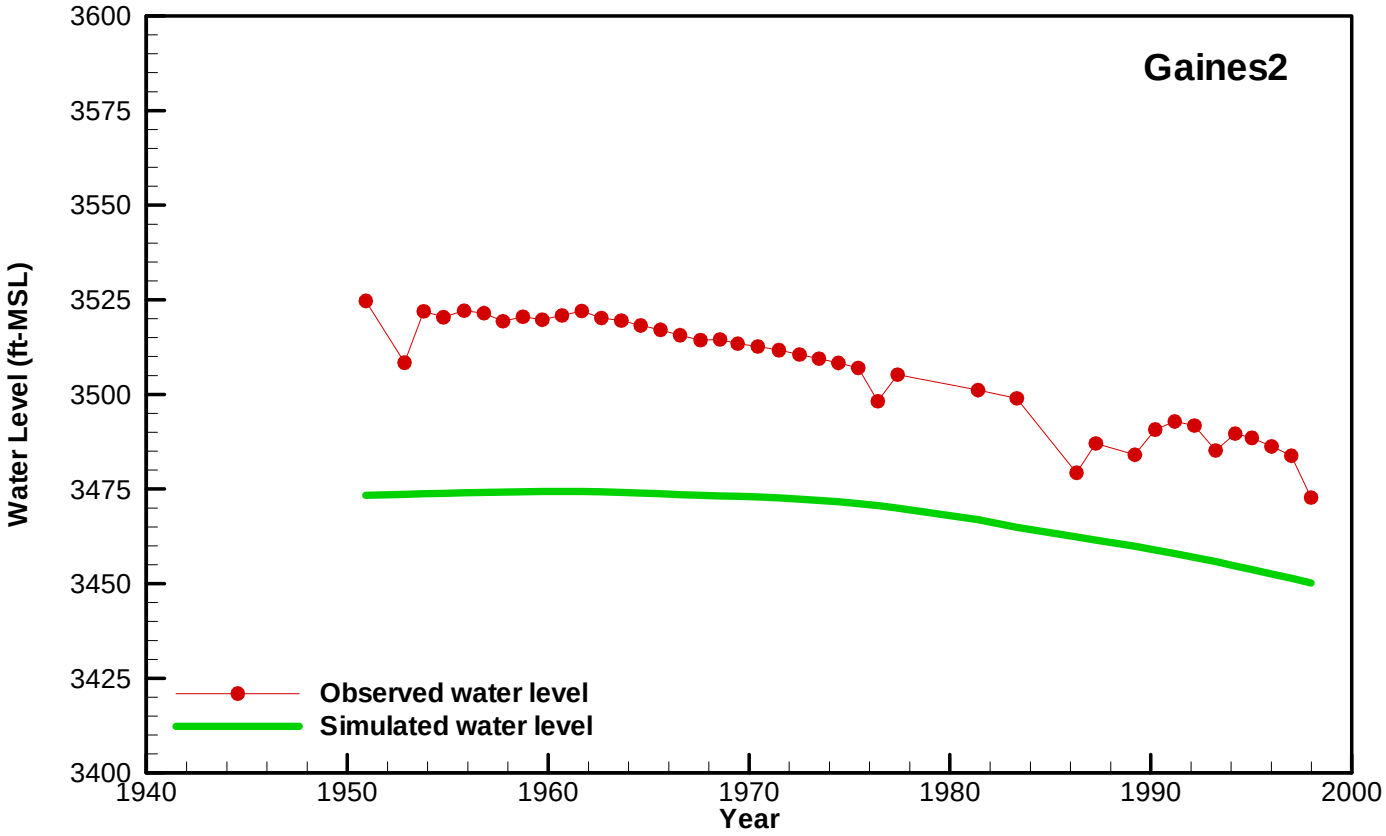

Floyd2
Water Level (ft-MSL)
3300
3250
3200
3150
3100
3050
3000
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

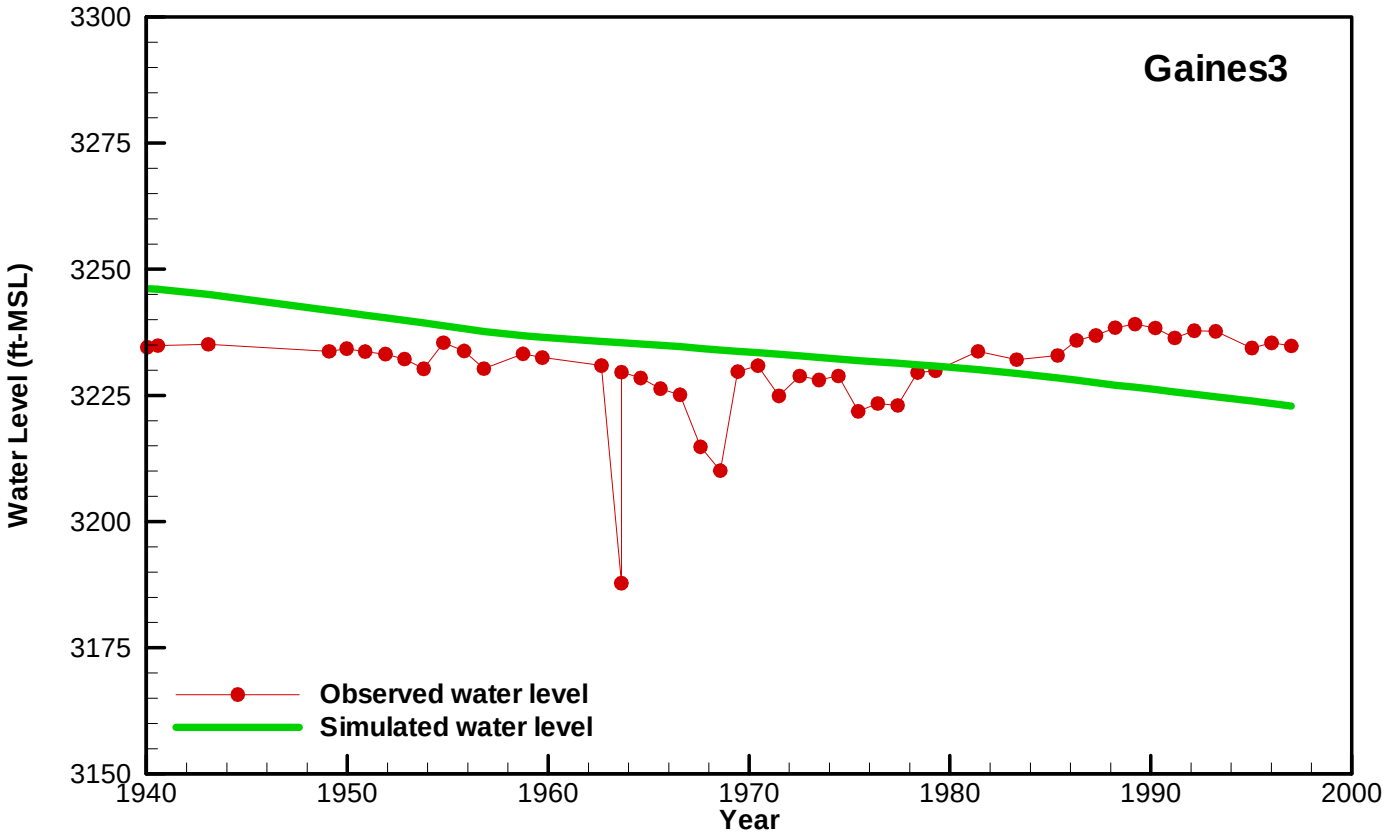

Floyd3
Water Level (ft-MSL)
3300
3250
3200
3150
3100
3050
3000
2950
2900
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

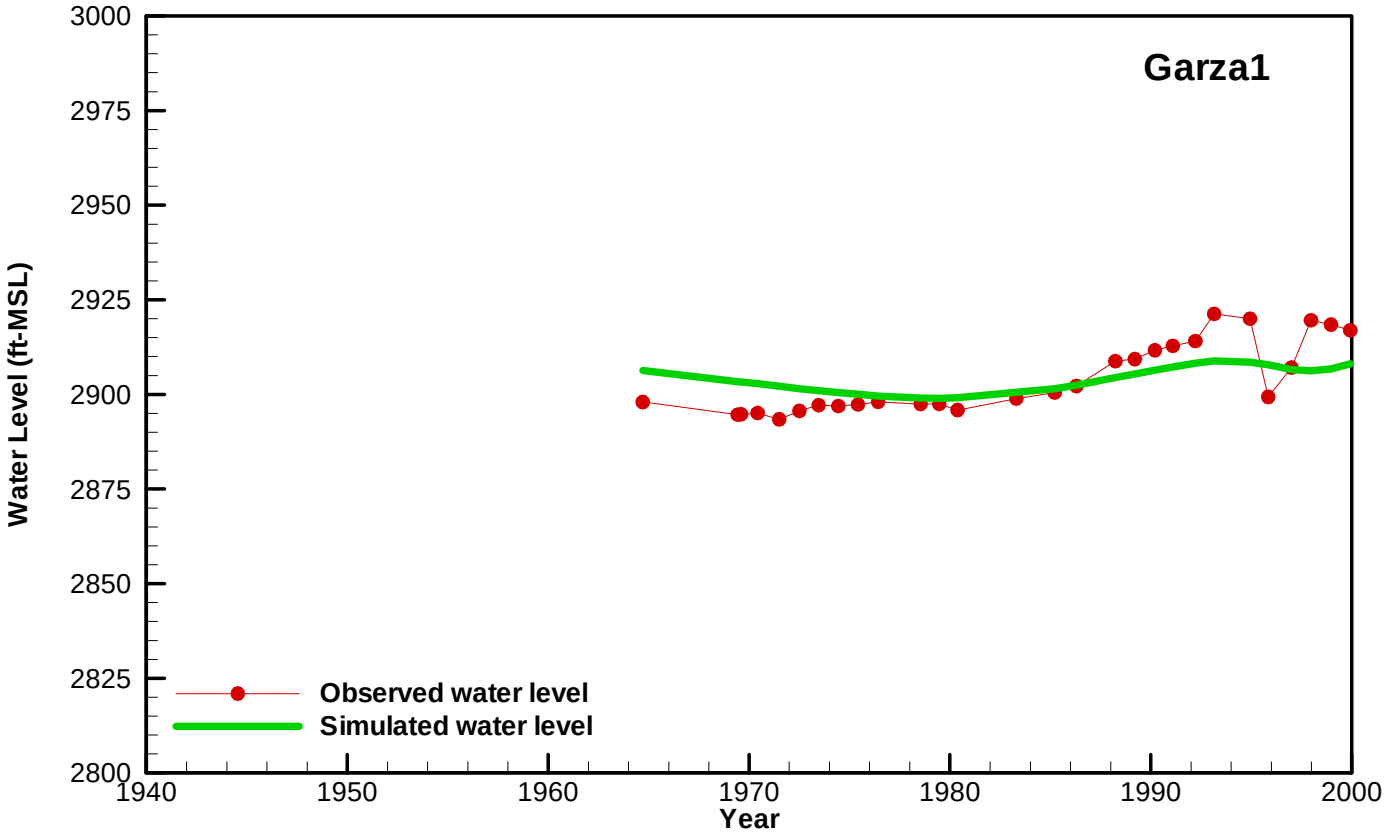

Floyd4
Water Level (ft-MSL)
3250
3200
3150
3100
3050
3000
2950
2900
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

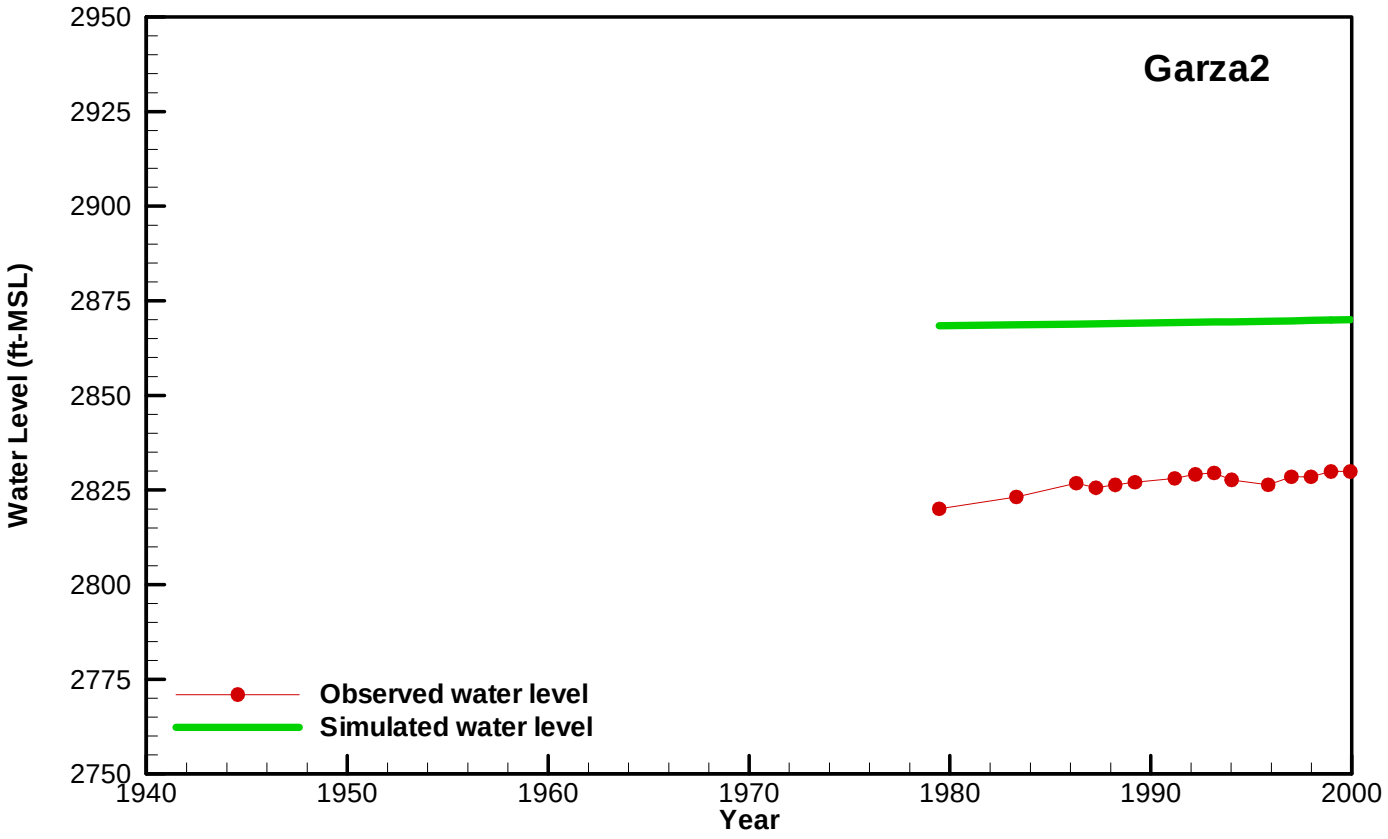

Floyd5
Water Level (ft-MSL)
3200
3150
3100
3050
3000
2950
2900
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

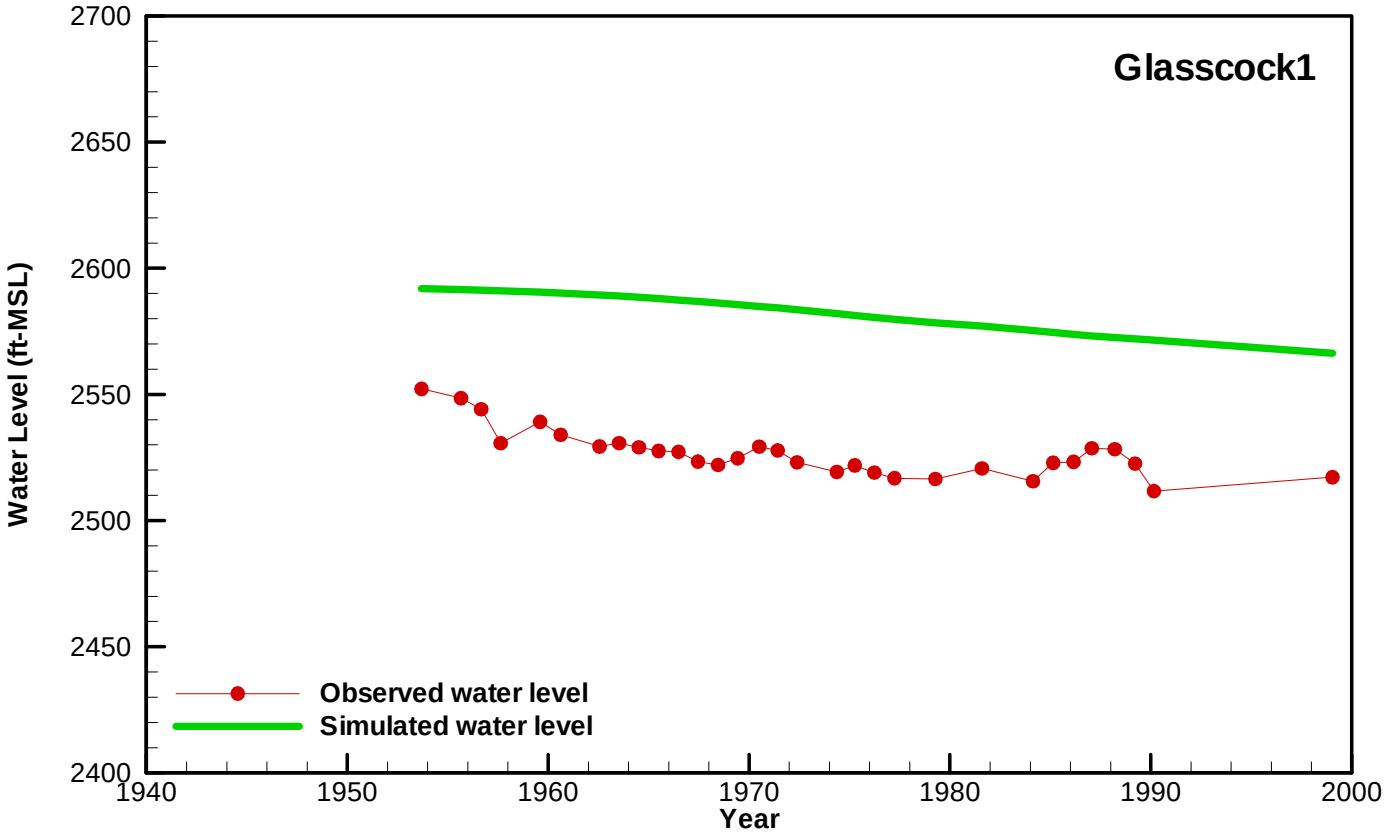

Gaines1
Water Level (ft-MSL)
3700
3650
3600
3550
3500
3450
3400
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

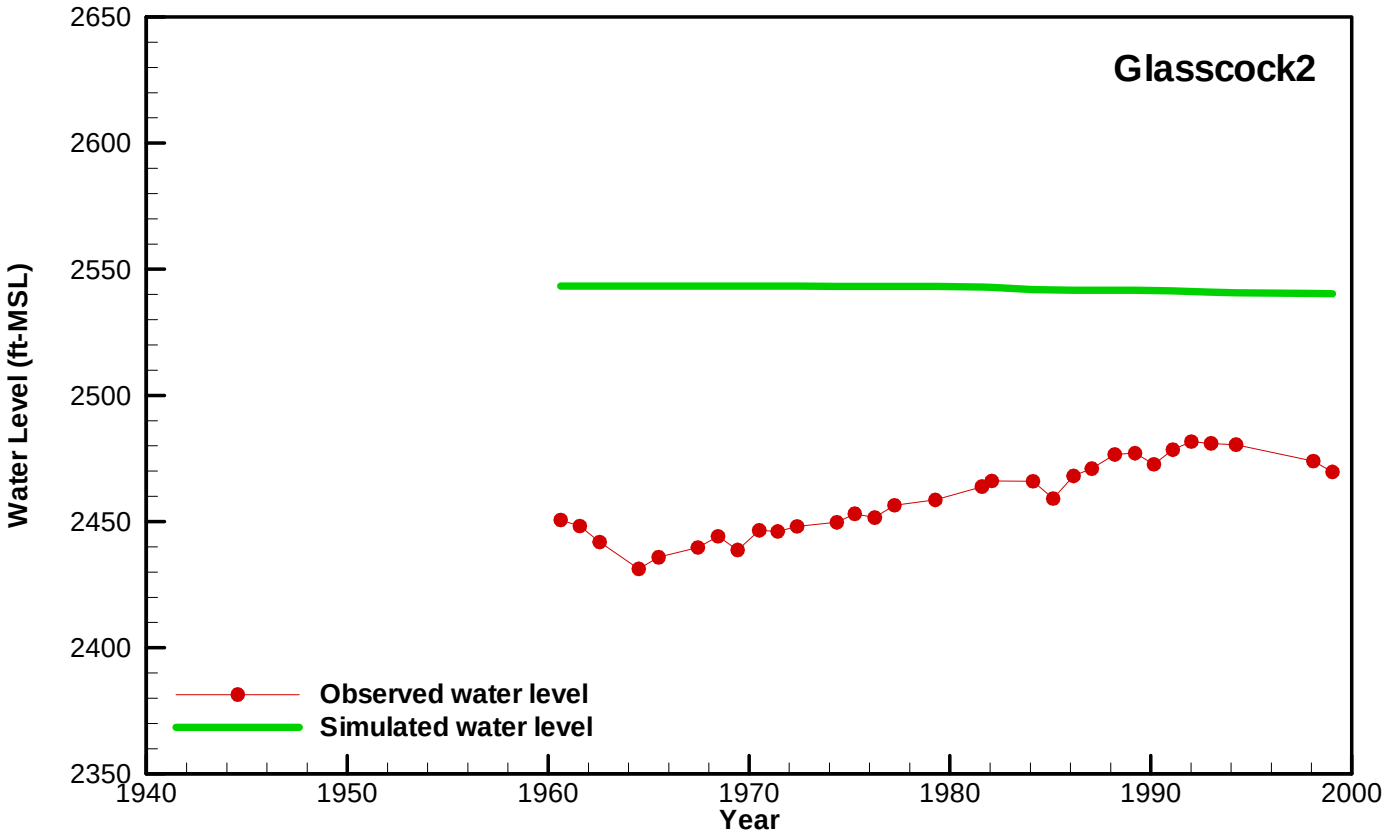

Gaines2
Water Level (ft-MSL)
3600
3575
3550
3525
3500
3475
3450
3425
3400
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

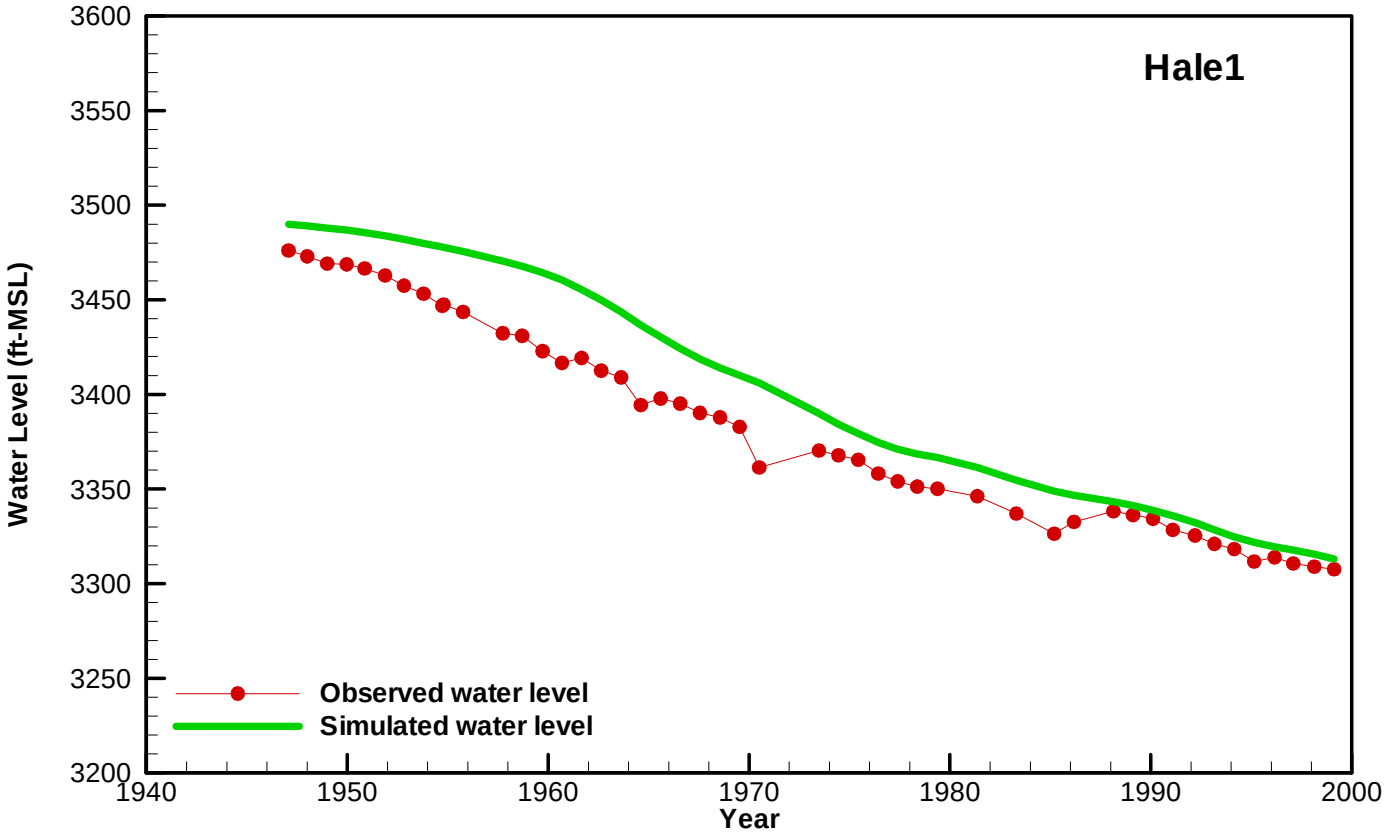

Gaines3
Water Level (ft-MSL)
3300
3275
3250
3225
3200
3175
3150
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

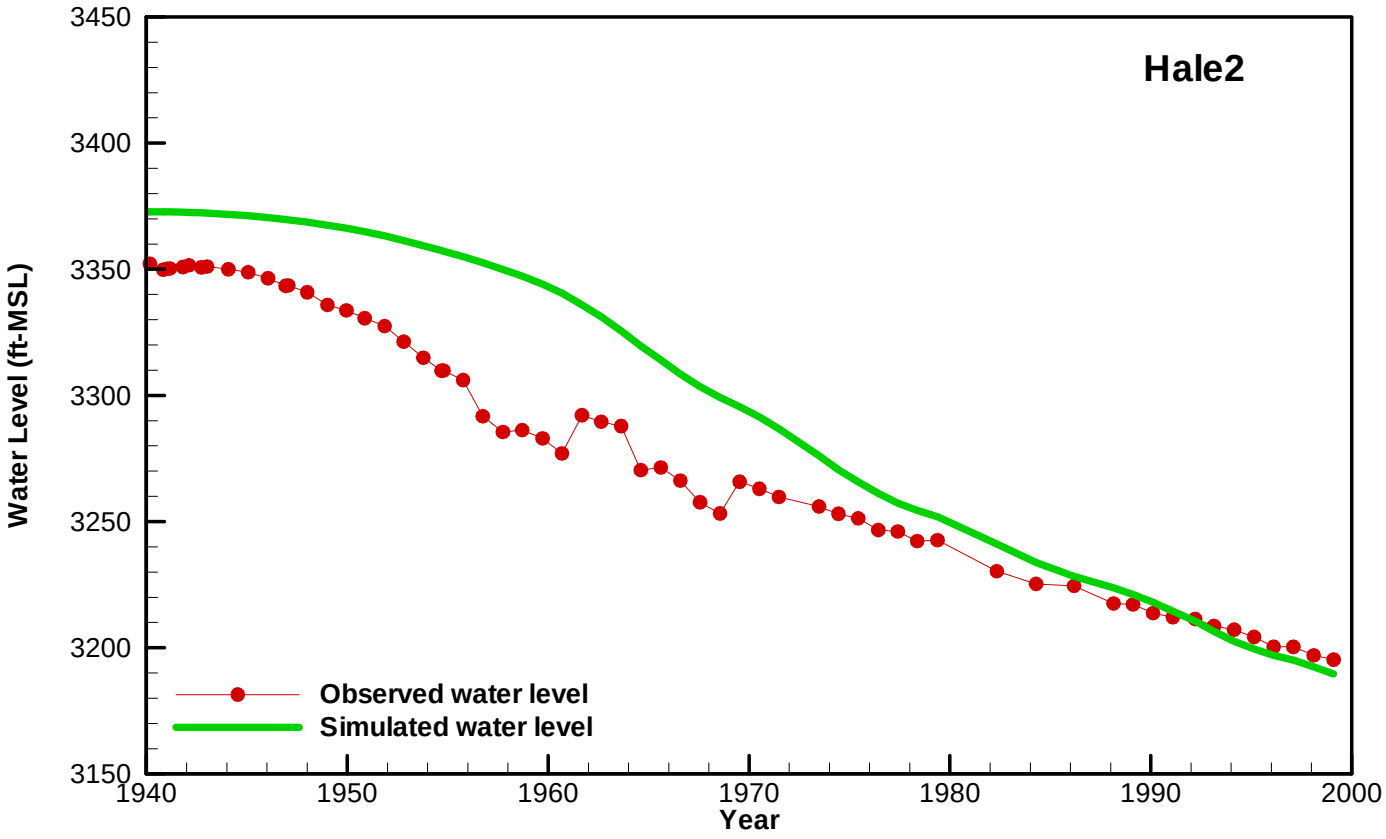

Garza1
Water Level (ft-MSL)
3000
2975
2950
2925
2900
2875
2850
2825
2800
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

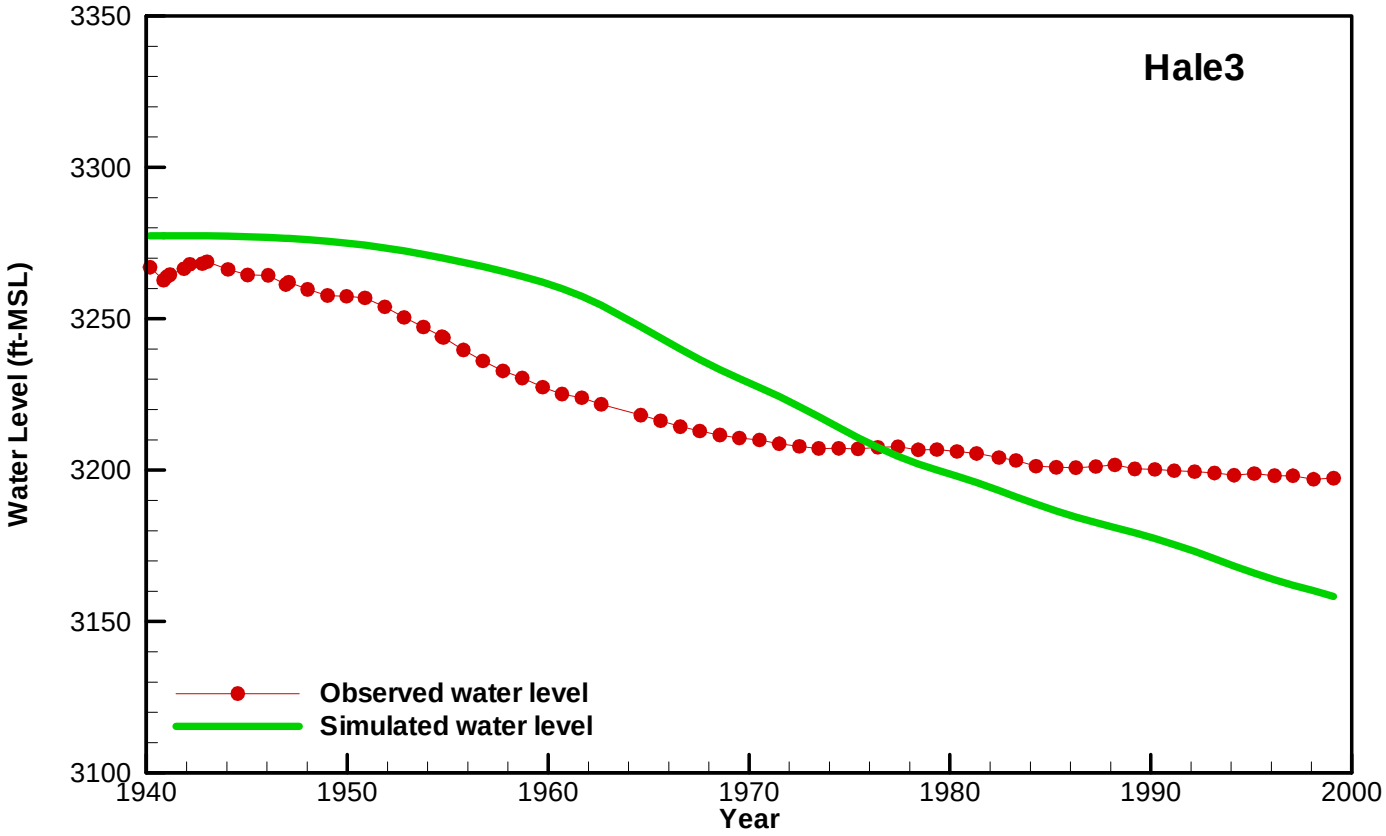

Garza2
Water Level (ft-MSL)
2950
2925
2900
2875
2850
2825
2800
2775
2750
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

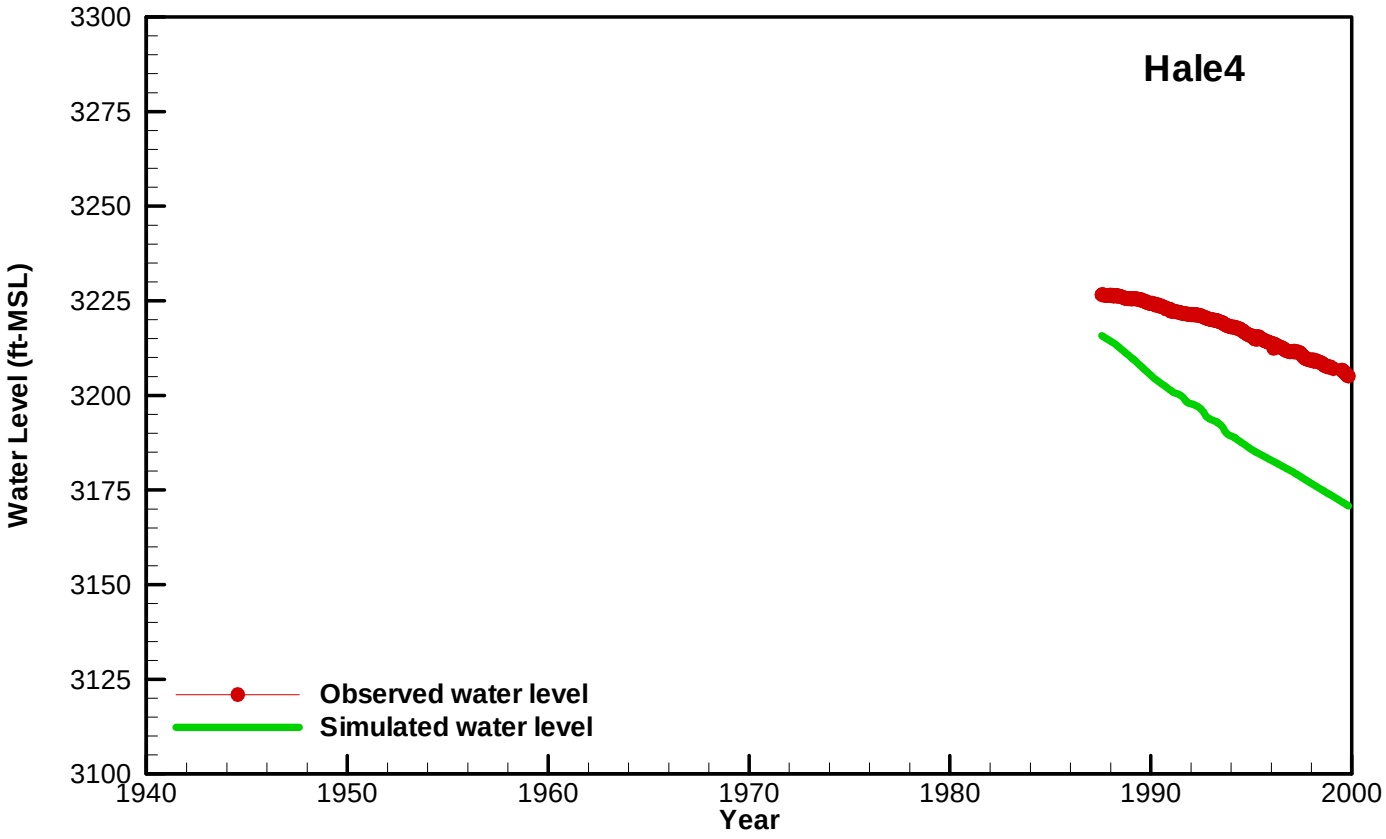

Glasscock1
Water Level (ft-MSL)
2700
2650
2600
2550
2500
2450
2400
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

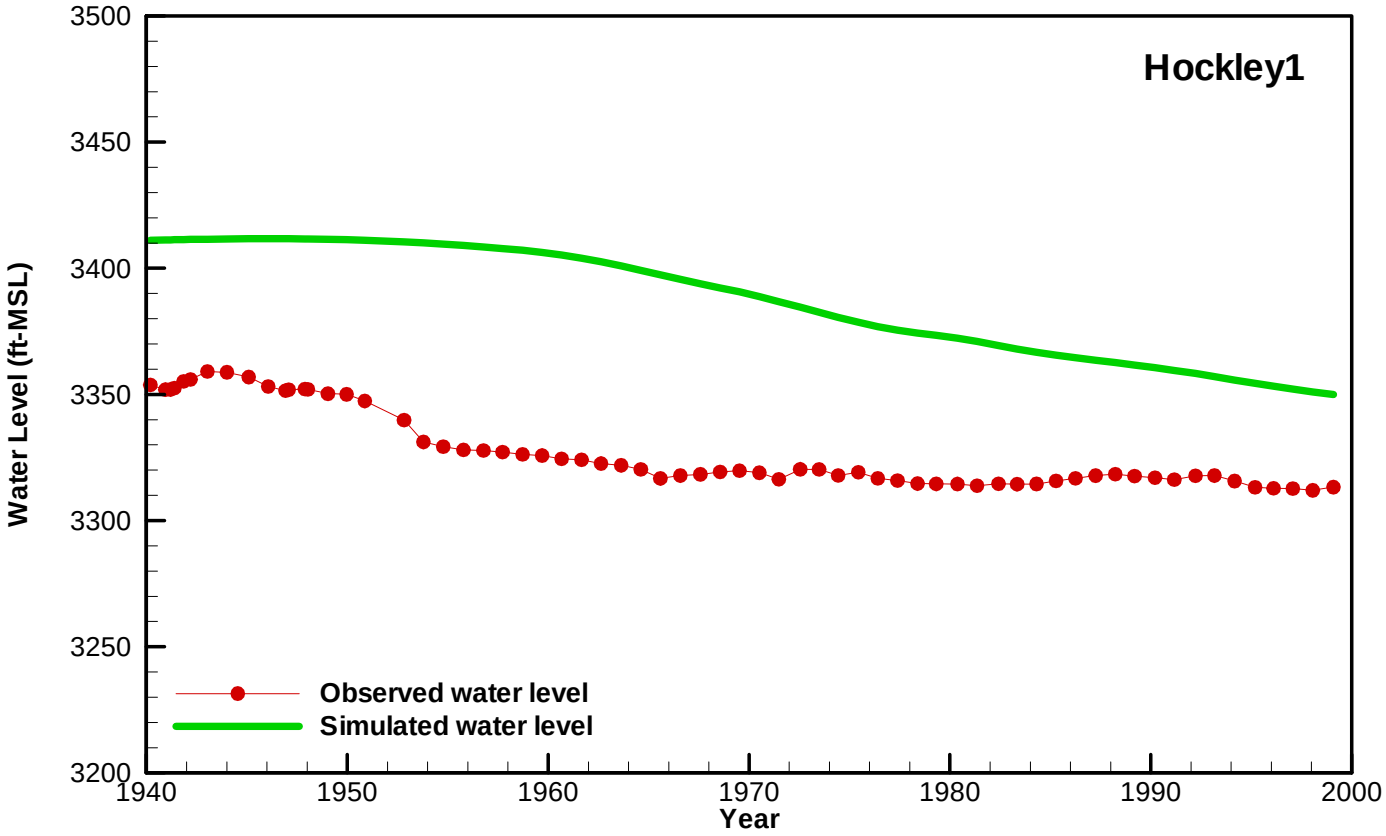

Glasscock2
Water Level (ft-MSL)
2650
2600
2550
2500
2450
2400
2350
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

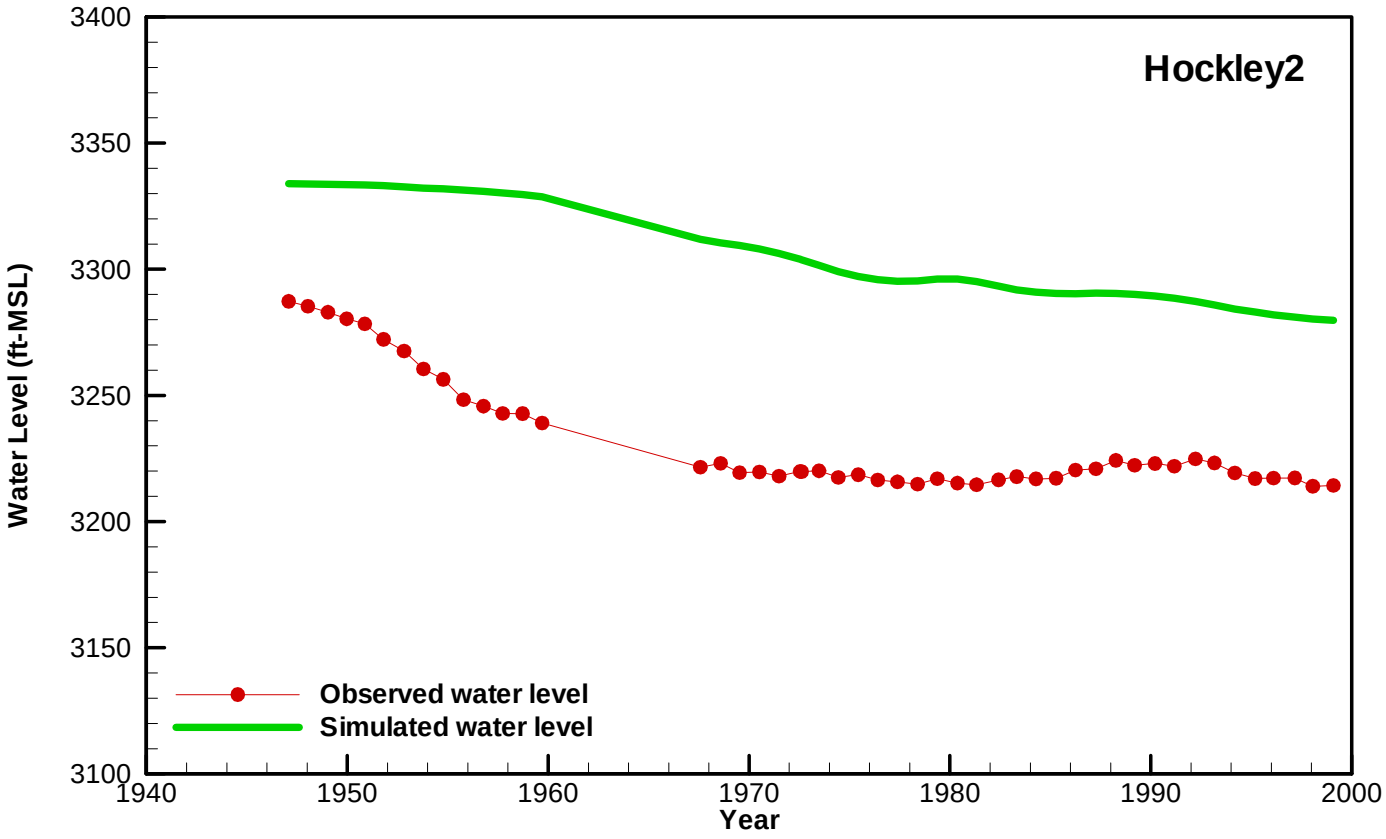

Hale1
Water Level (ft-MSL)
3600
3550
3500
3450
3400
3350
3300
3250
3200
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

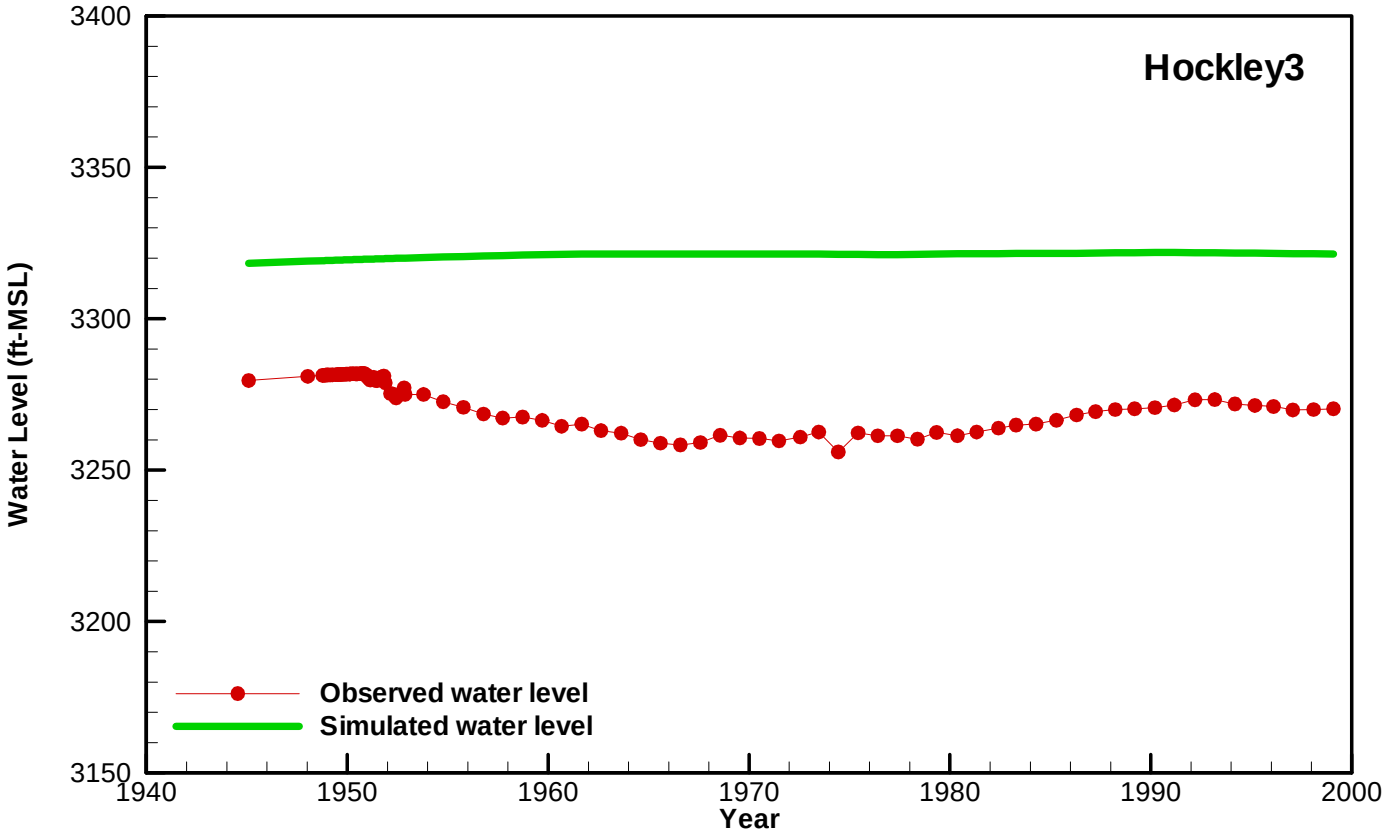

Hale2
Water Level (ft-MSL)
3450
3400
3350
3300
3250
3200
3150
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

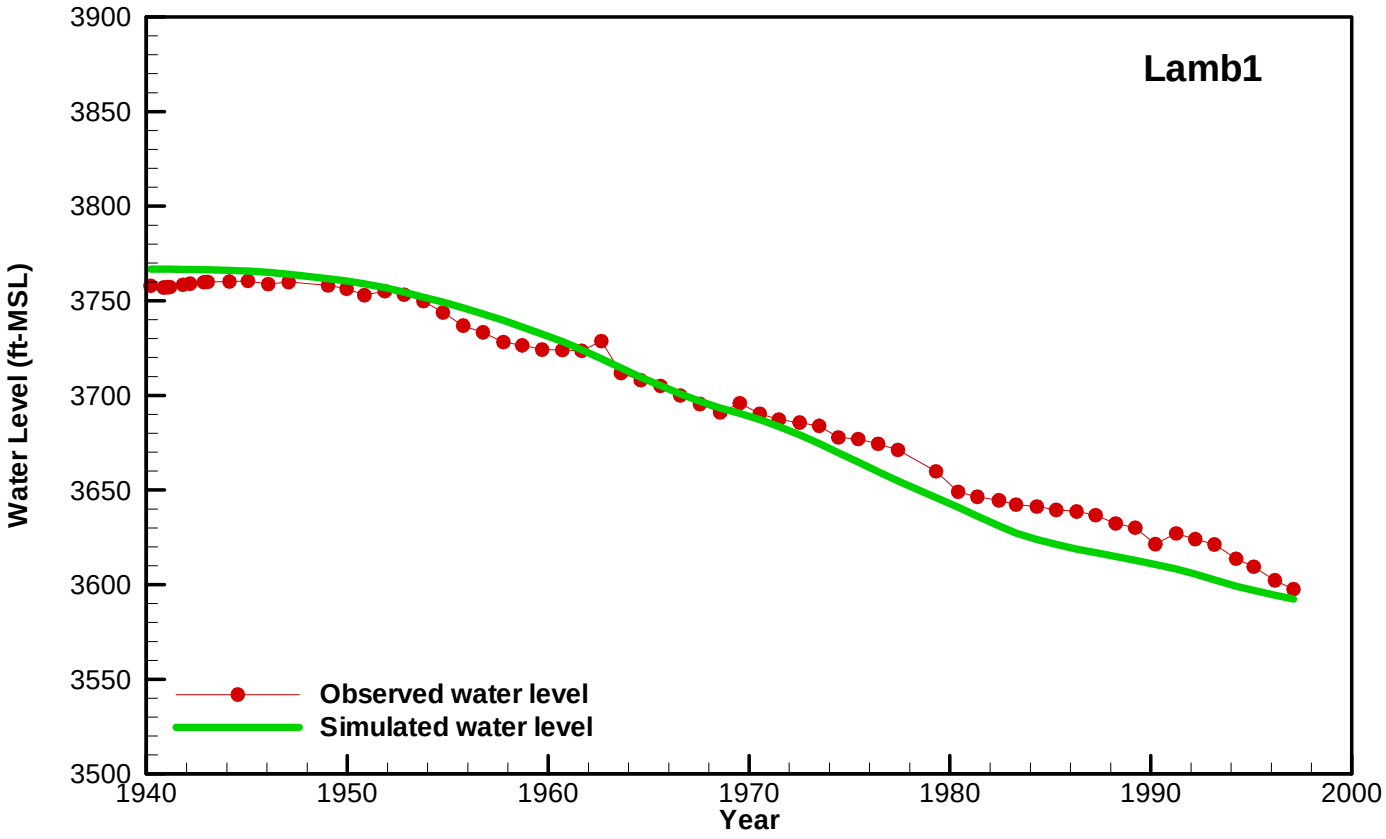

Hale3
Water Level (ft-MSL)
3350
3300
3250
3200
3150
3100
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

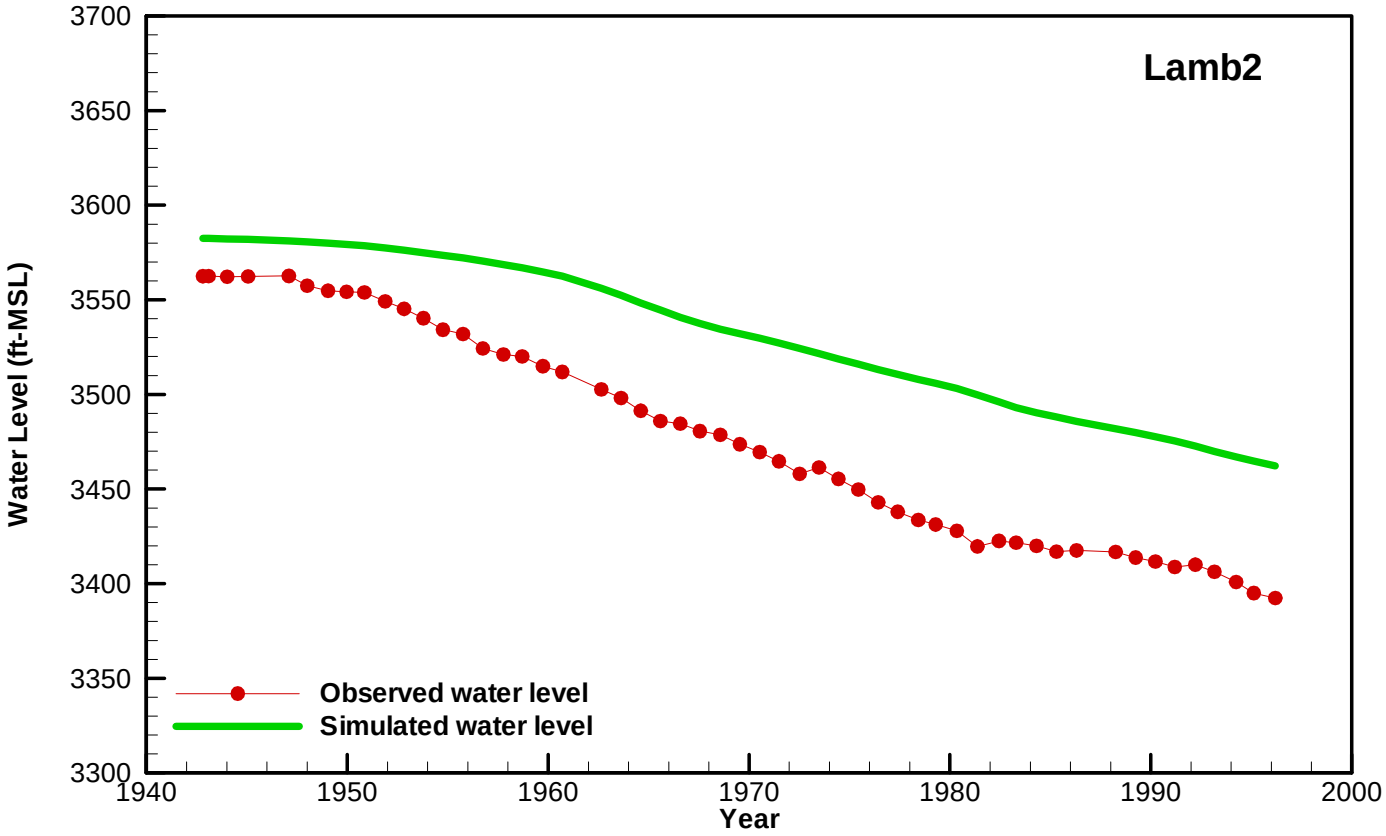

Hale4
Water Level (ft-MSL)
3300
3275
3250
3225
3200
3175
3150
3125
3100
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

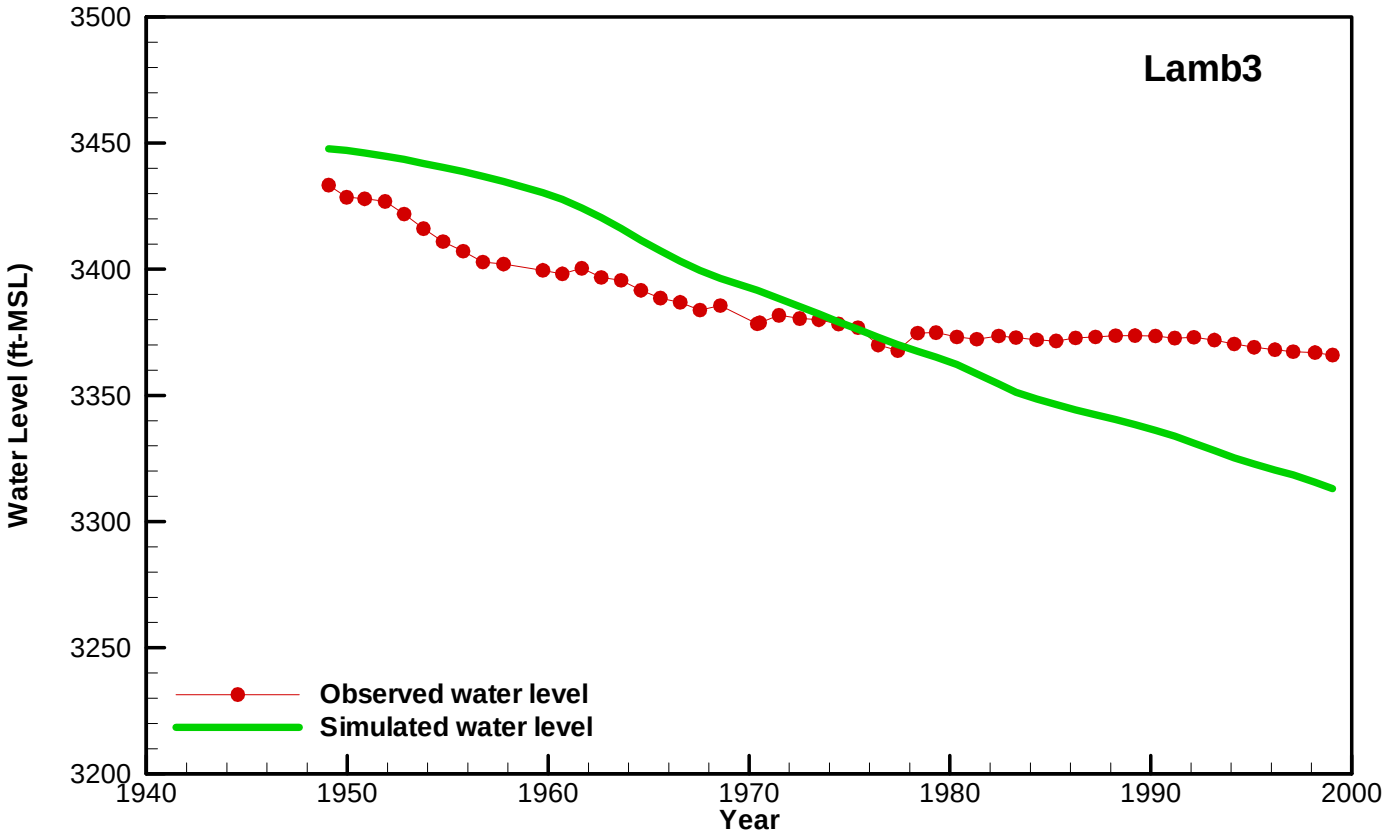

Hockley1
Water Level (ft-MSL)
3500
3450
3400
3350
3300
3250
3200
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

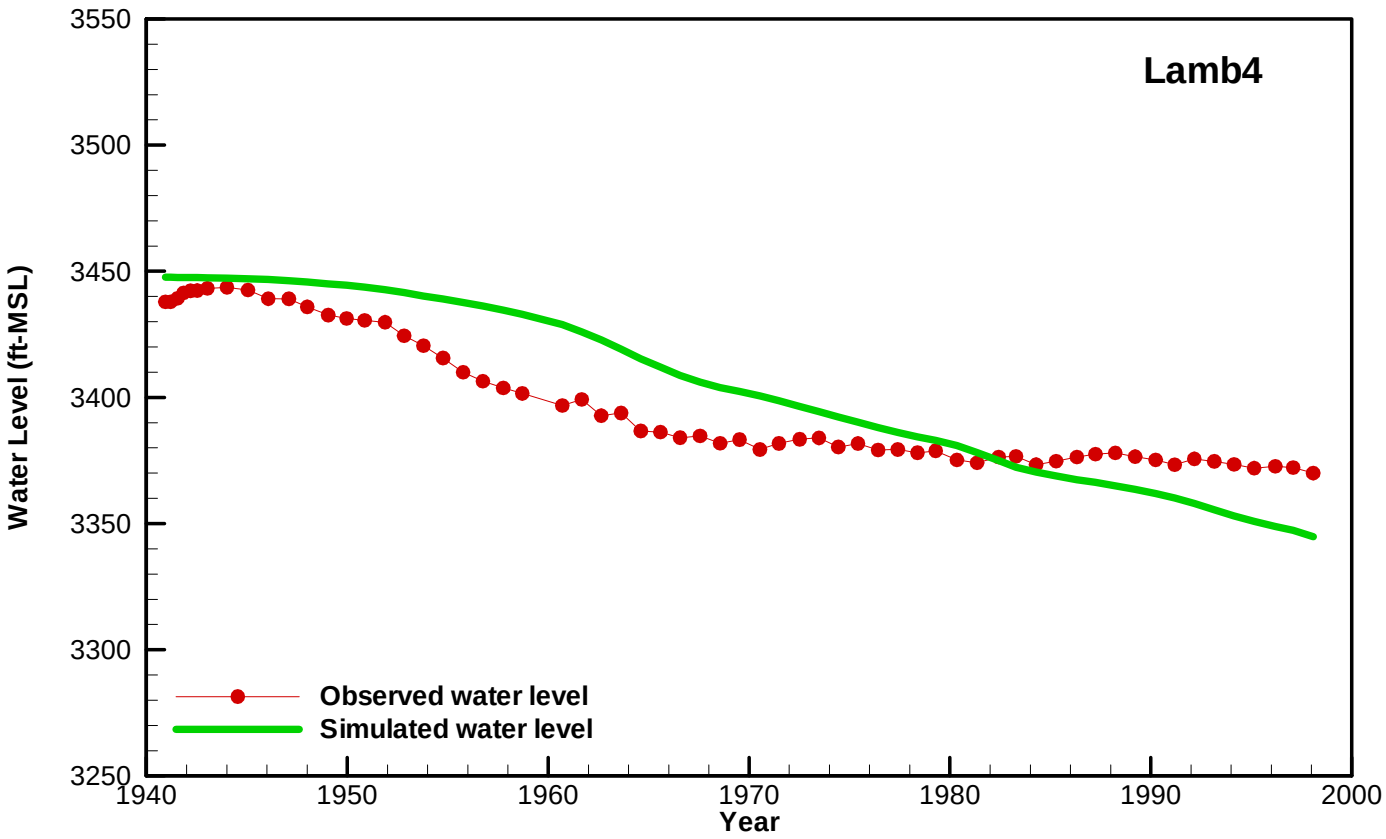

Hockley2
Water Level (ft-MSL)
3400
3350
3300
3250
3200
3150
3100
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

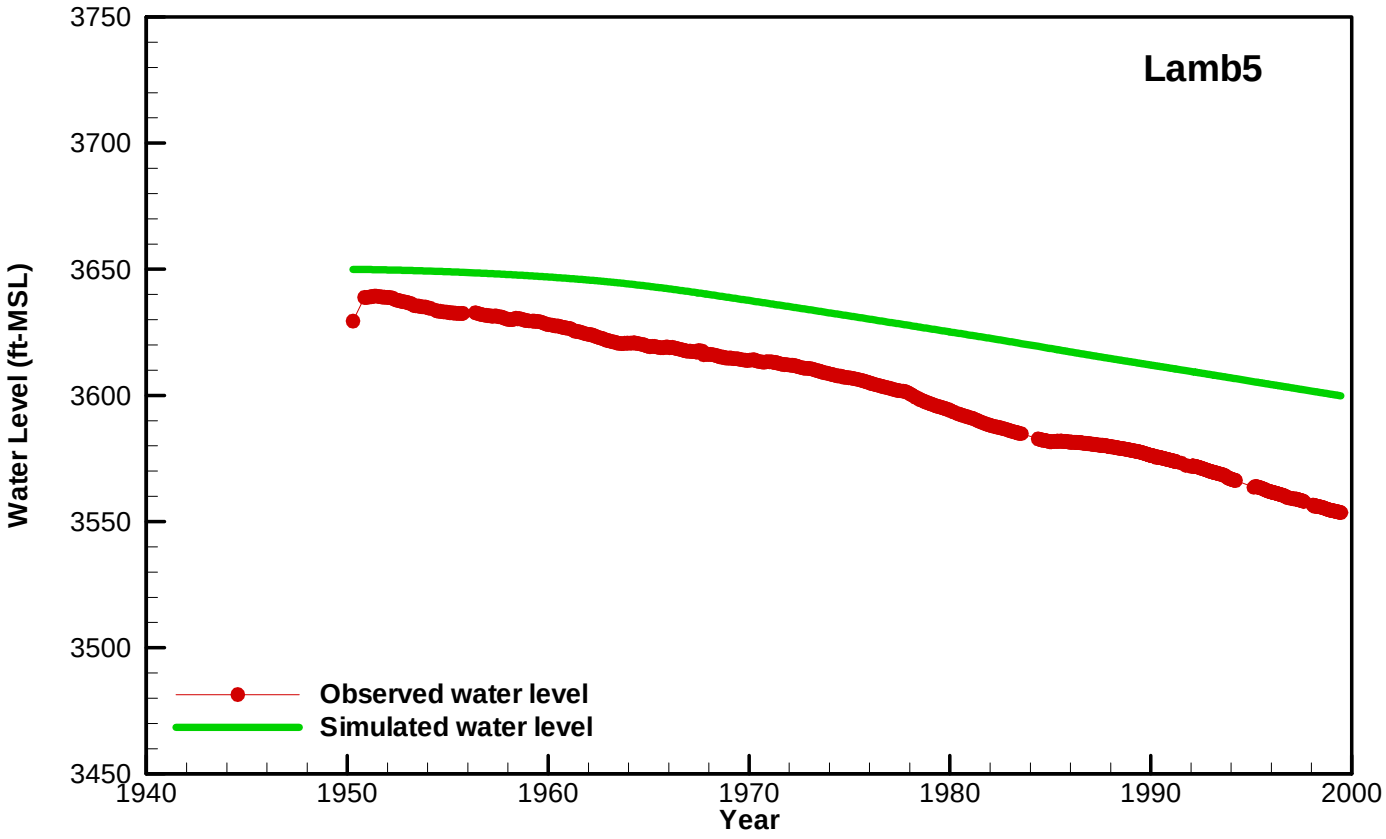

Hockley3
Water Level (ft-MSL)
3400
3350
3300
3250
3200
3150
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

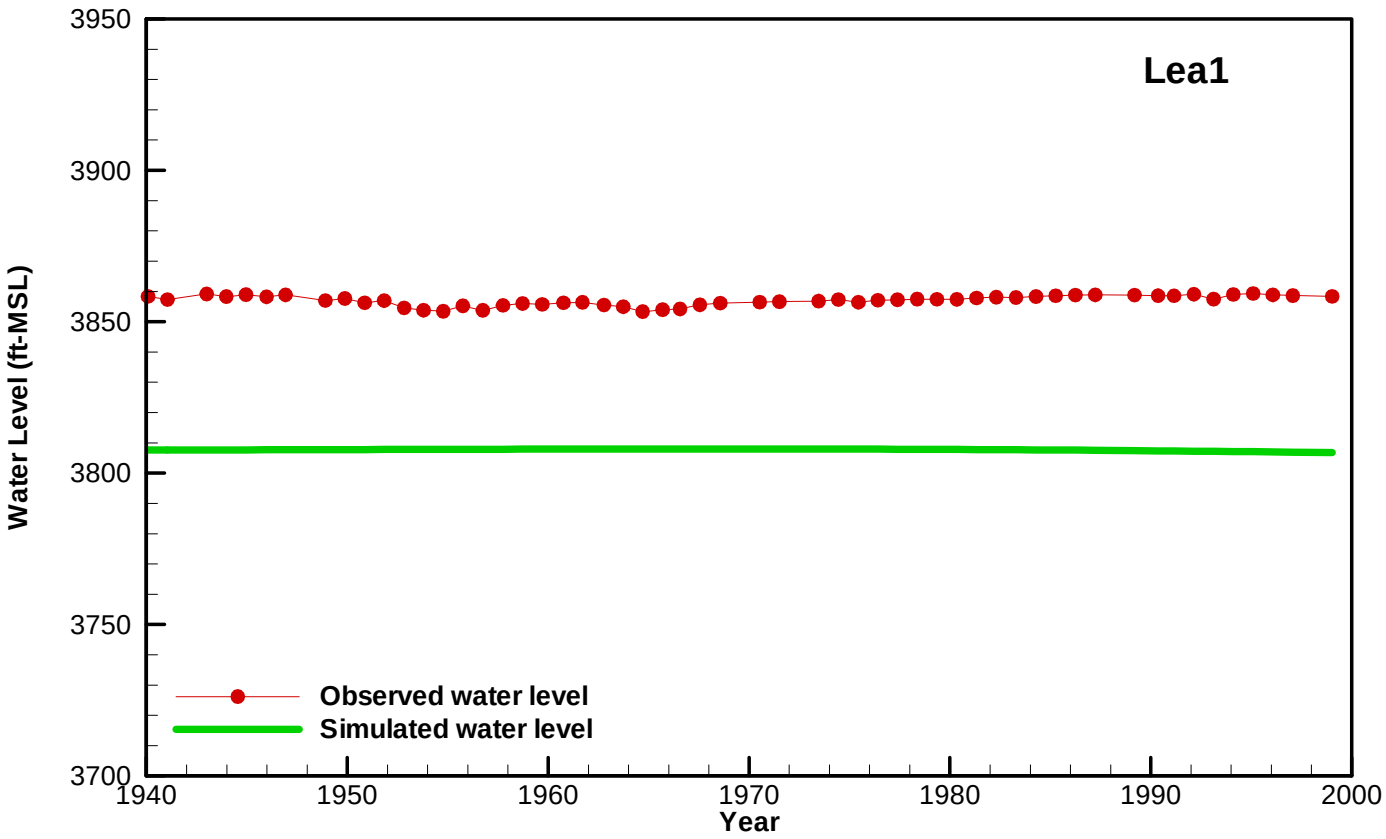

Lamb1
Water Level (ft-MSL)
3900
3850
3800
3750
3700
3650
3600
3550
3500
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

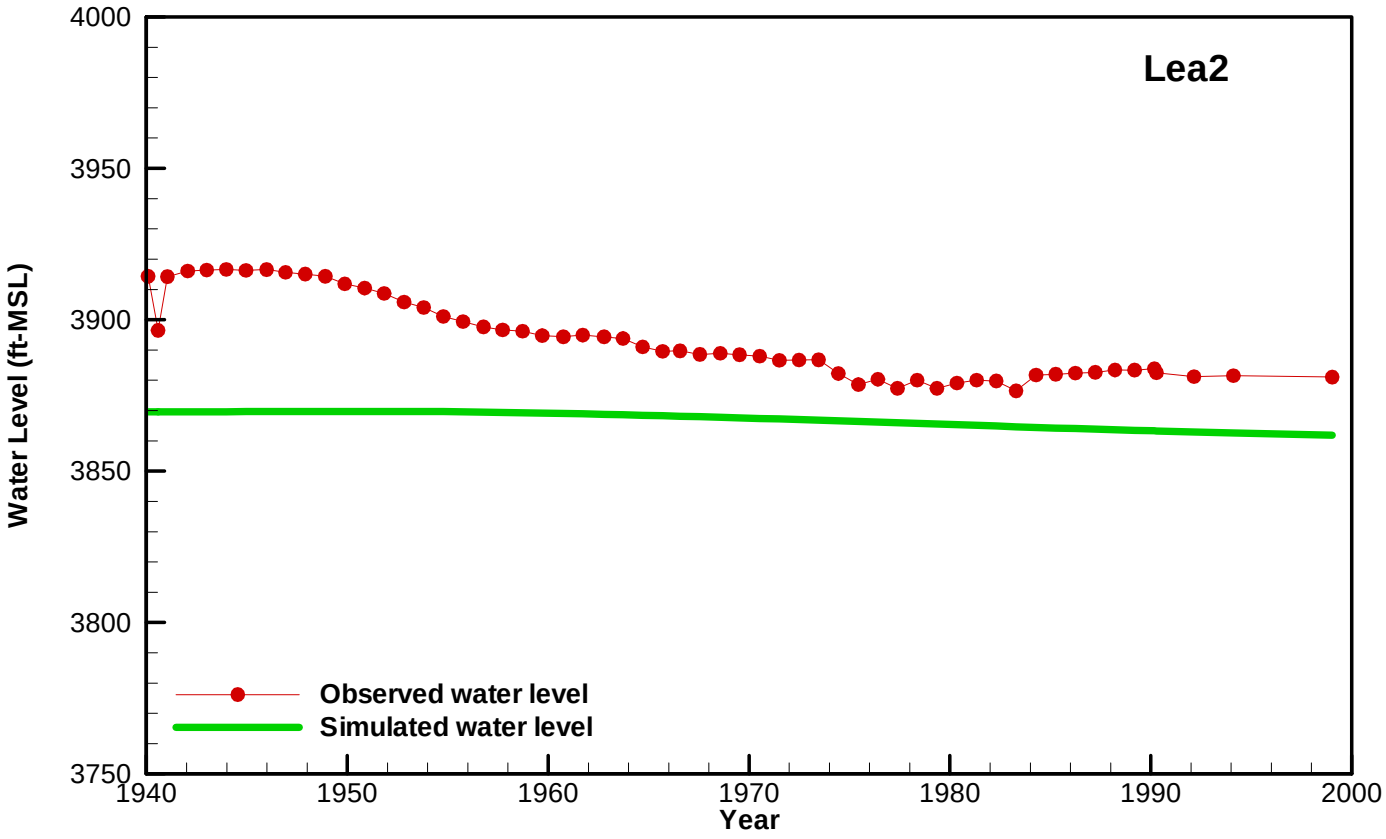

Lamb2
Water Level (ft-MSL)
3700
3650
3600
3550
3500
3450
3400
3350
3300
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

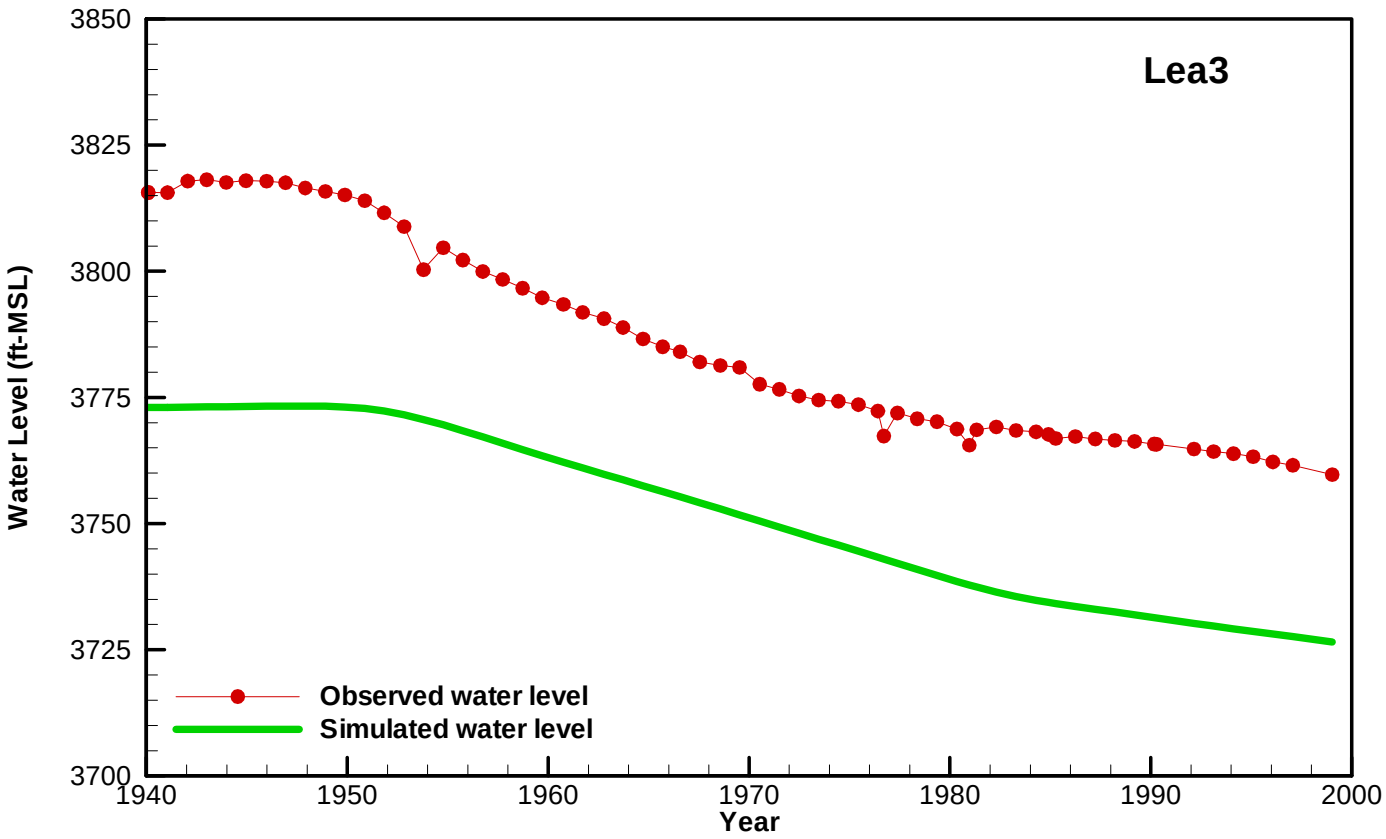

Lamb3
Water Level (ft-MSL)
3500
3450
3400
3350
3300
3250
3200
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

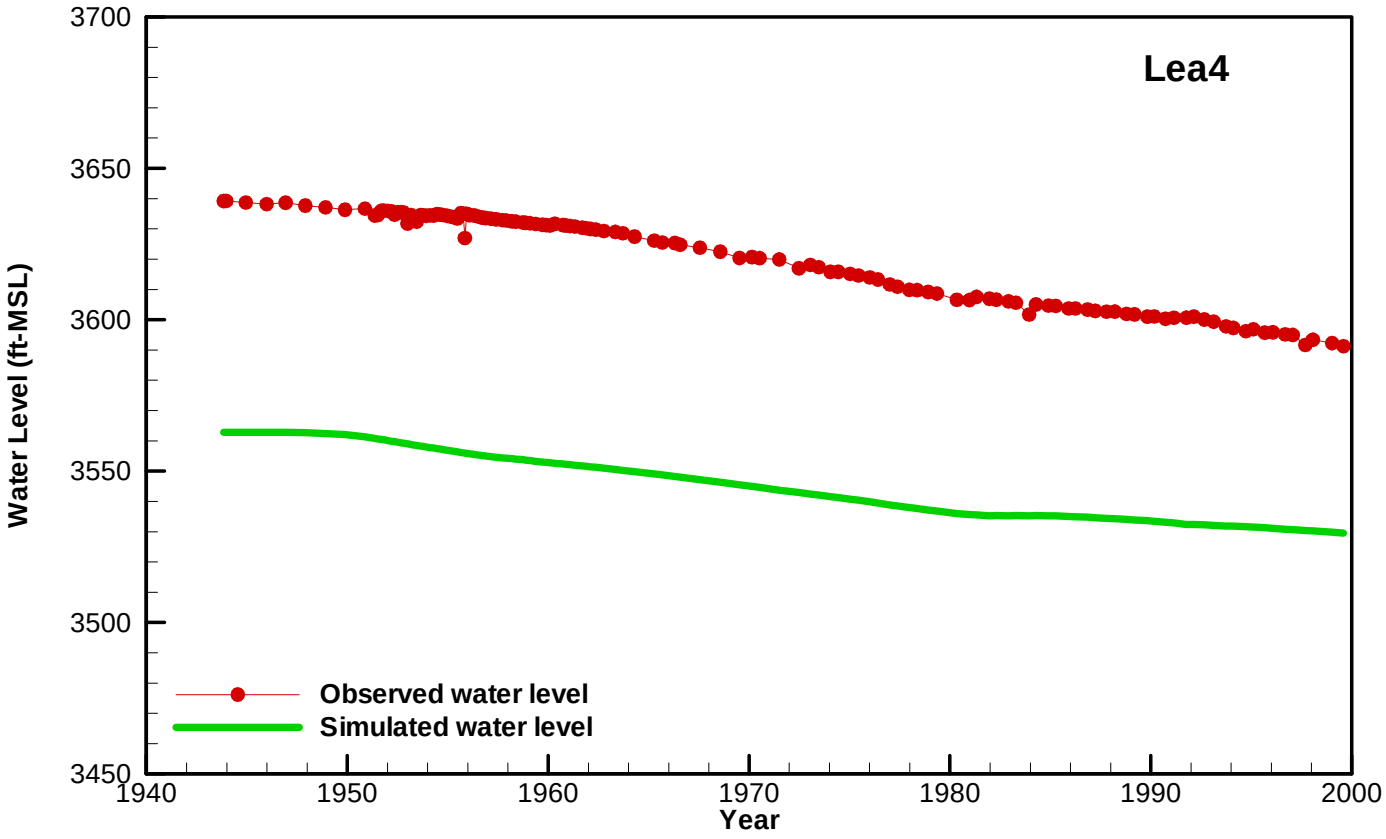

Lamb4
Water Level (ft-MSL)
3550
3500
3450
3400
3350
3300
3250
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

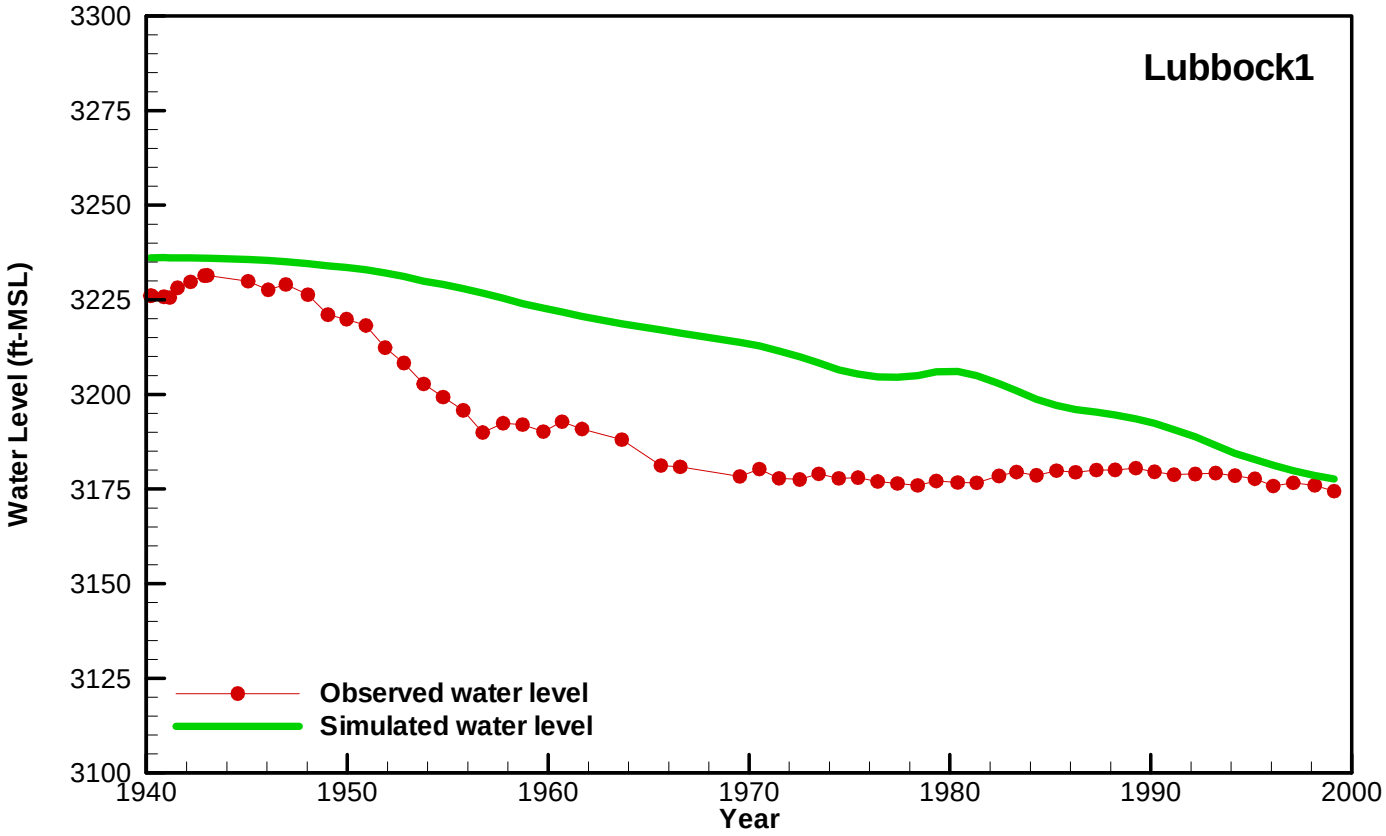

Lamb5
Water Level (ft-MSL)
3750
3700
3650
3600
3550
3500
3450
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

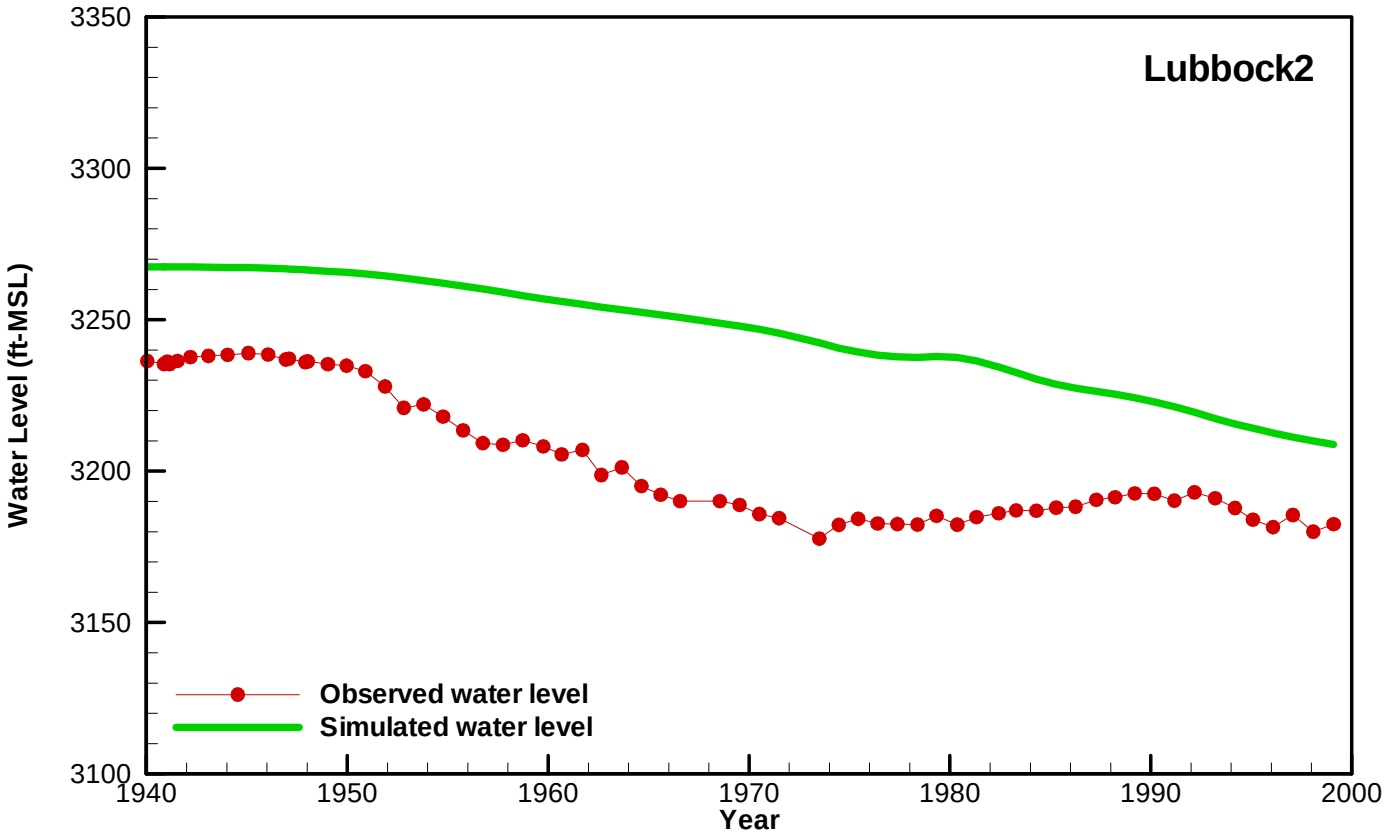

Lea1
Water Level (ft-MSL)
3950
3900
3850
3800
3750
3700
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

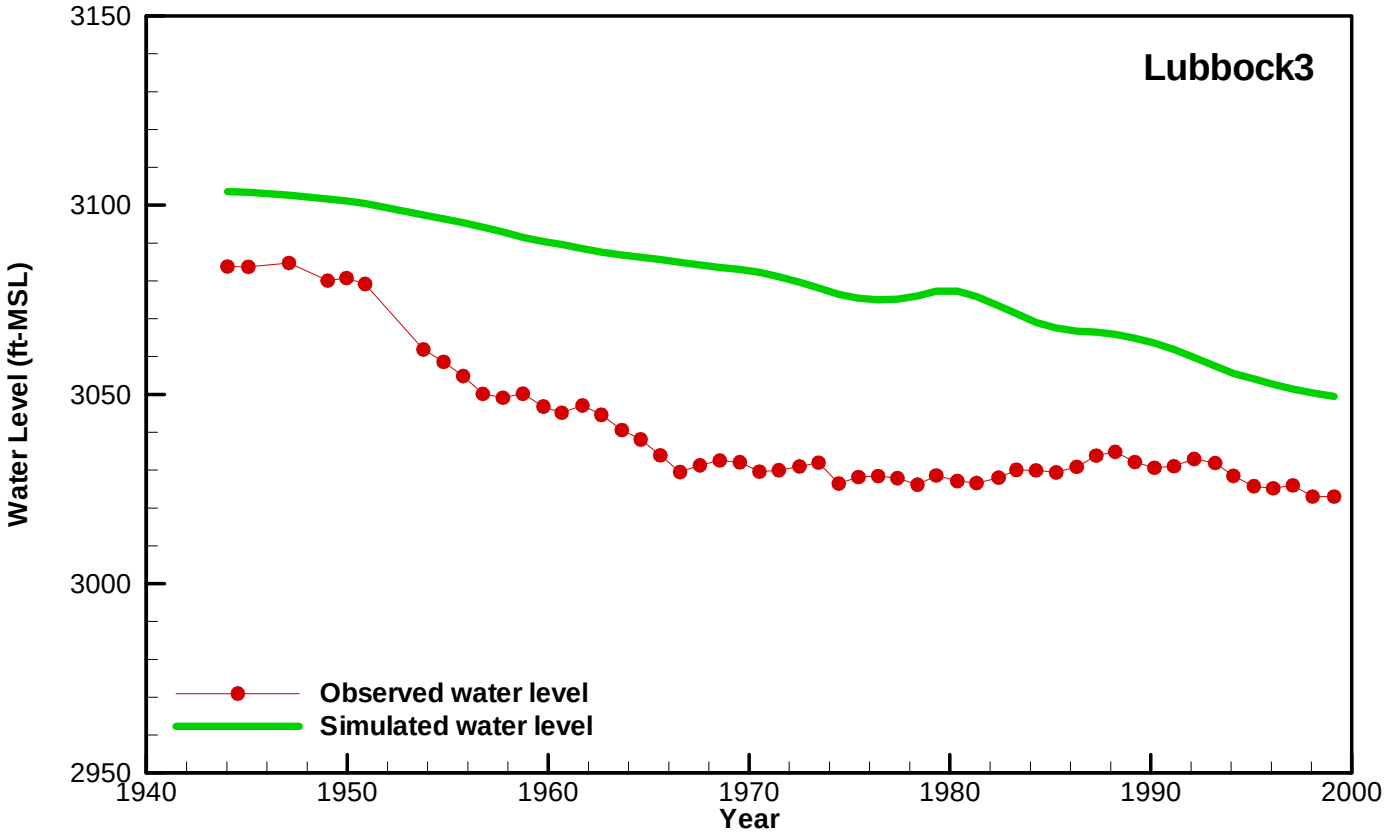

Lea2
Water Level (ft-MSL)
4000
3950
3900
3850
3800
3750
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

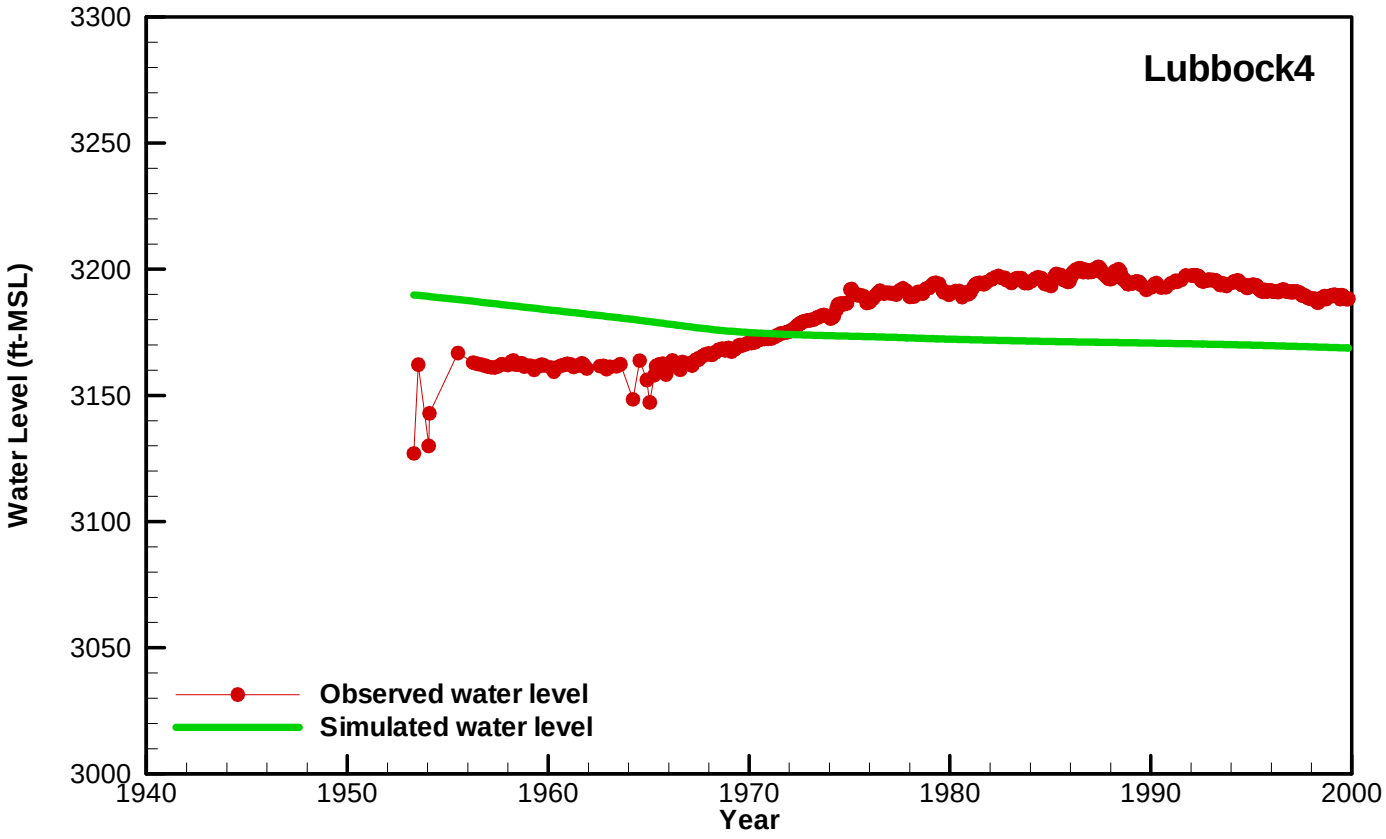

Lea3
Water Level (ft-MSL)
3850
3825
3800
3775
3750
3725
3700
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

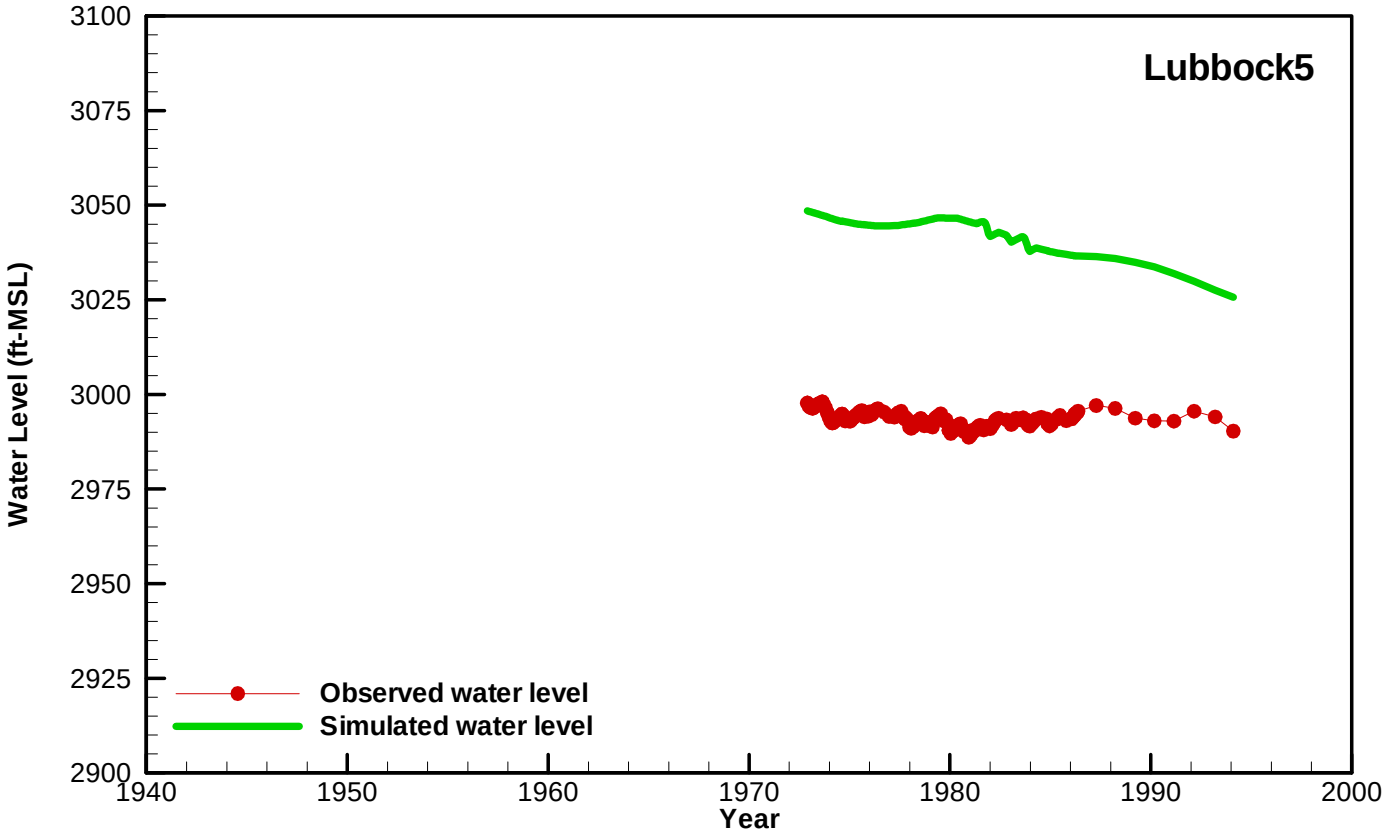

Lea4
Water Level (ft-MSL)
3700
3650
3600
3550
3500
3450
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

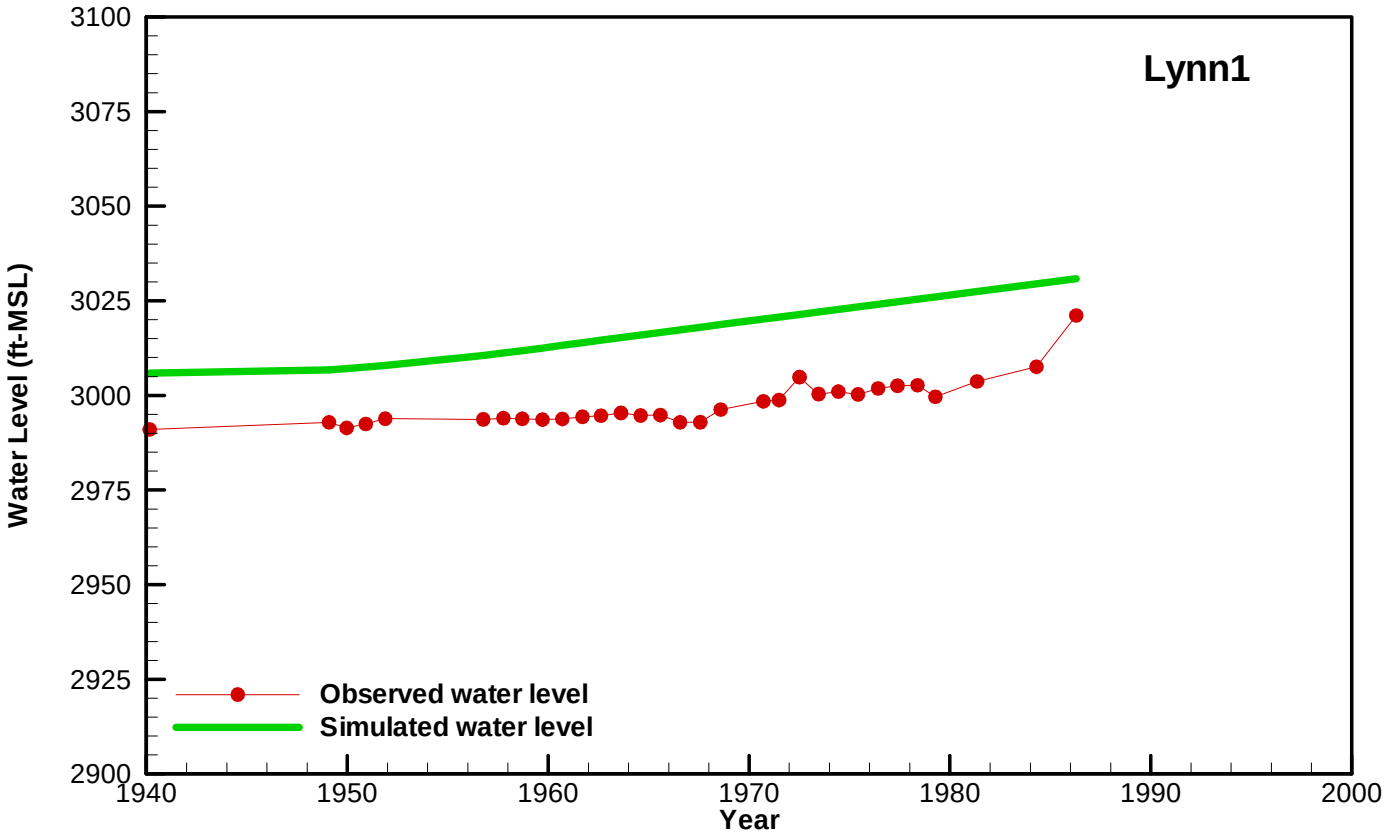

Lubbock1
Water Level (ft-MSL)
3300
3275
3250
3225
3200
3175
3150
3125
3100
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

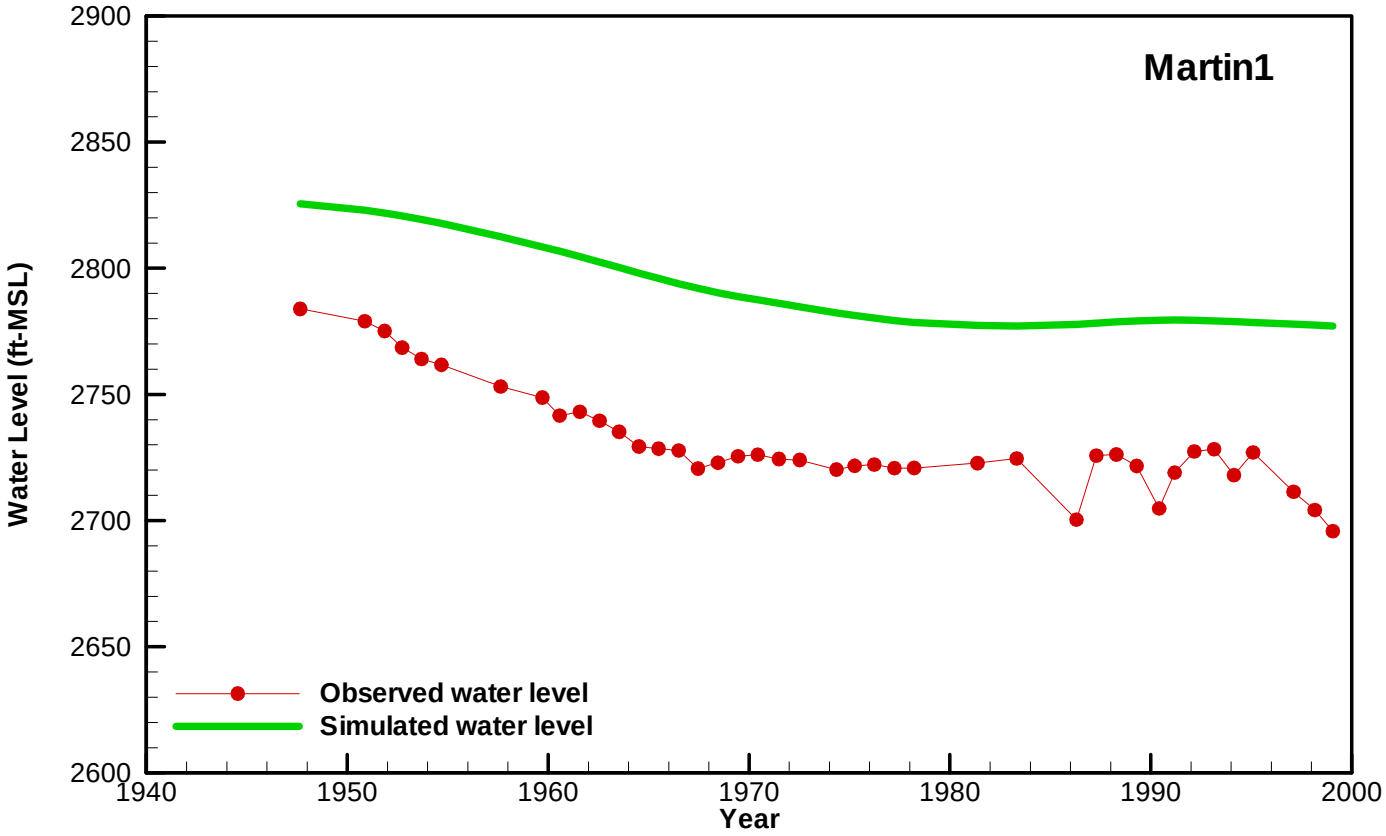

Lubbock2
Water Level (ft-MSL)
3350
3300
3250
3200
3150
3100
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

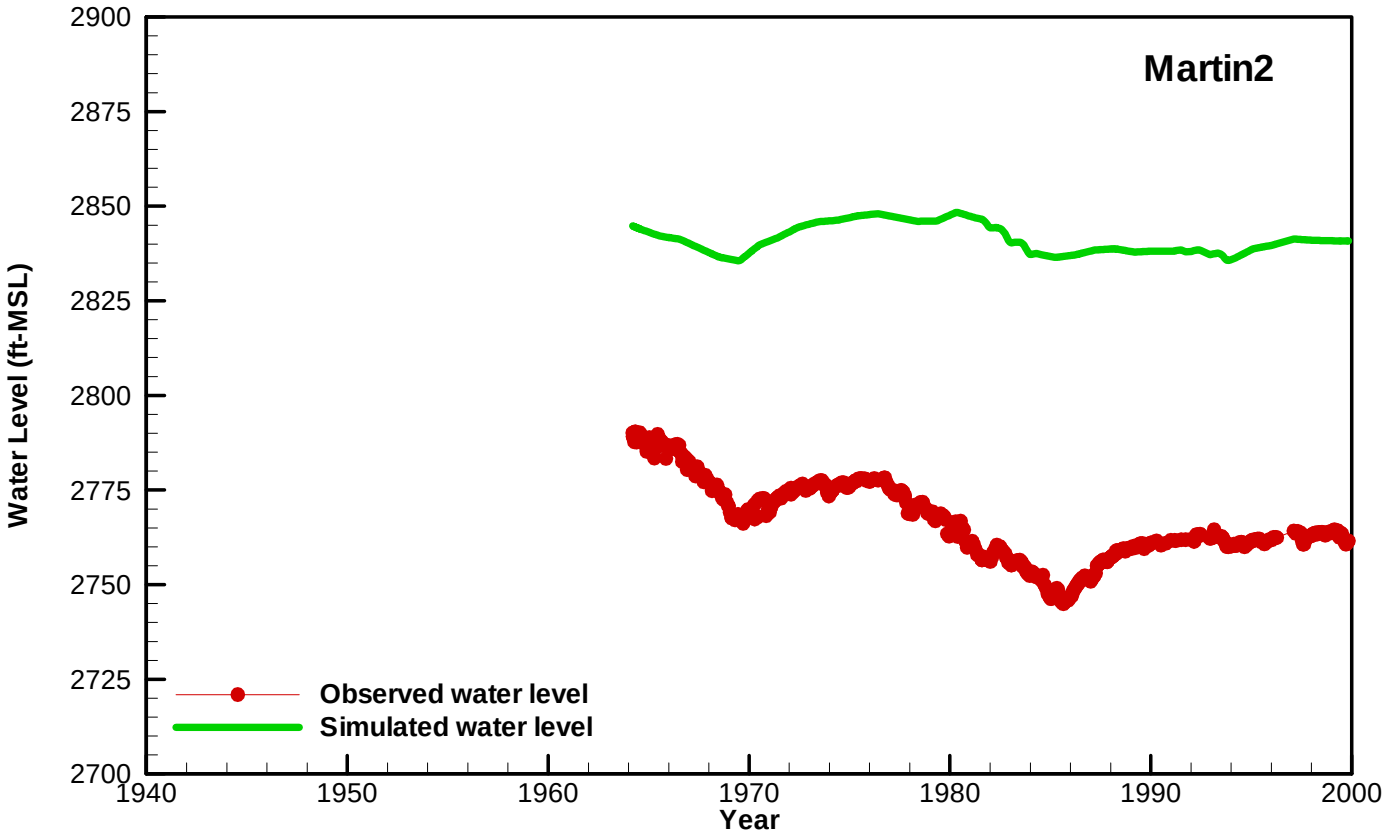

Lubbock3
Water Level (ft-MSL)
3150
3100
3050
3000
2950
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

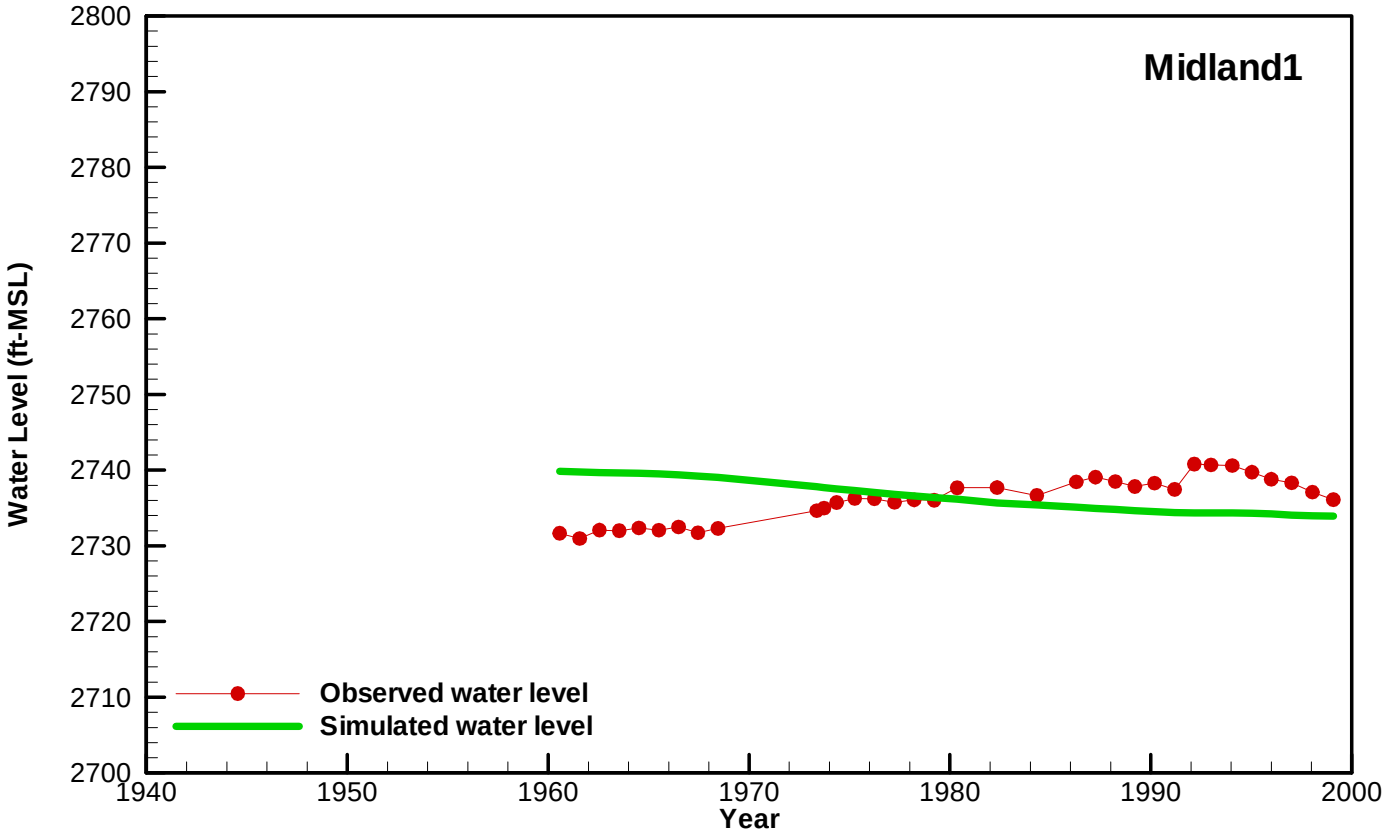

Lubbock4
Water Level (ft-MSL)
3300
3250
3200
3150
3100
3050
3000
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

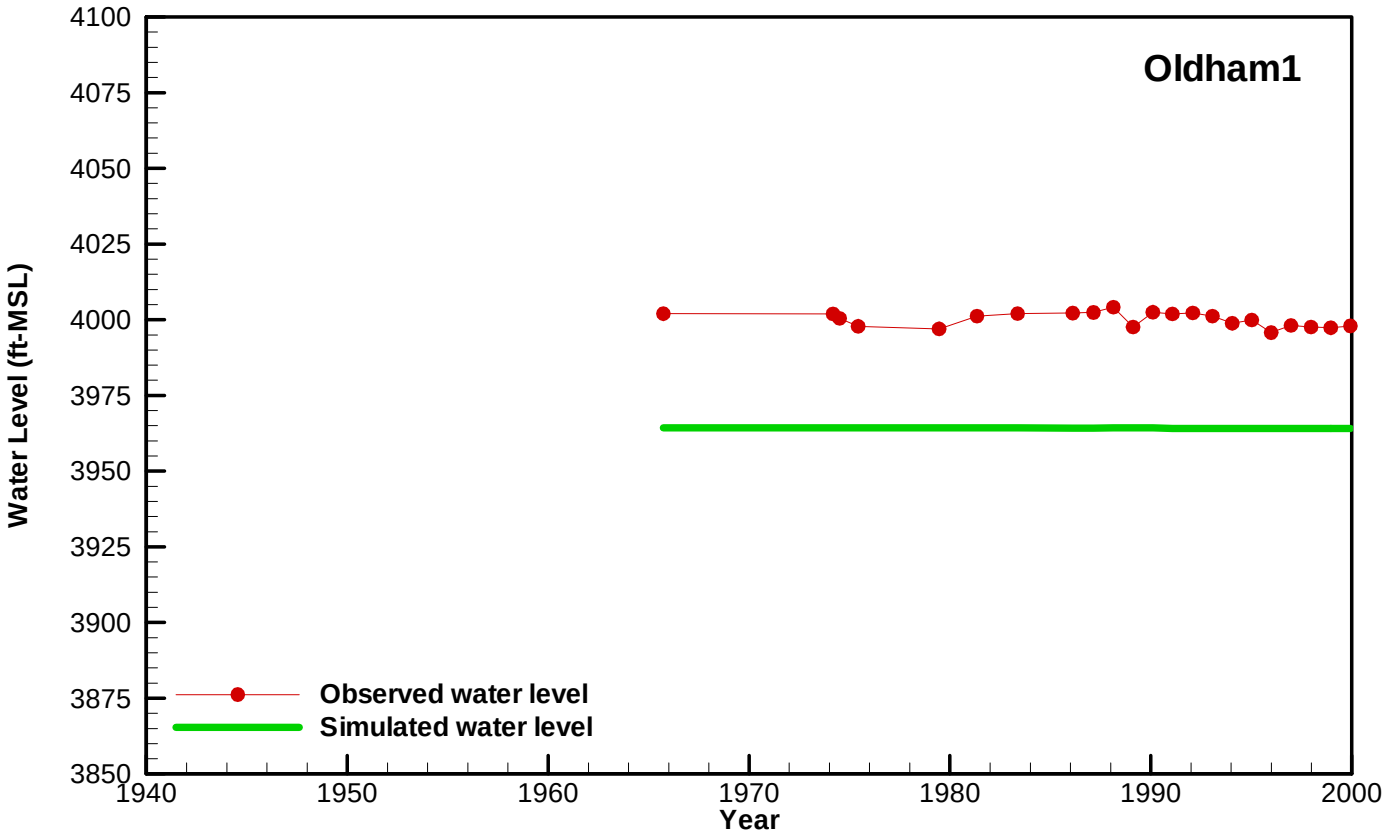

Lubbock5
Water Level (ft-MSL)
3100
3075
3050
3025
3000
2975
2950
2925
2900
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

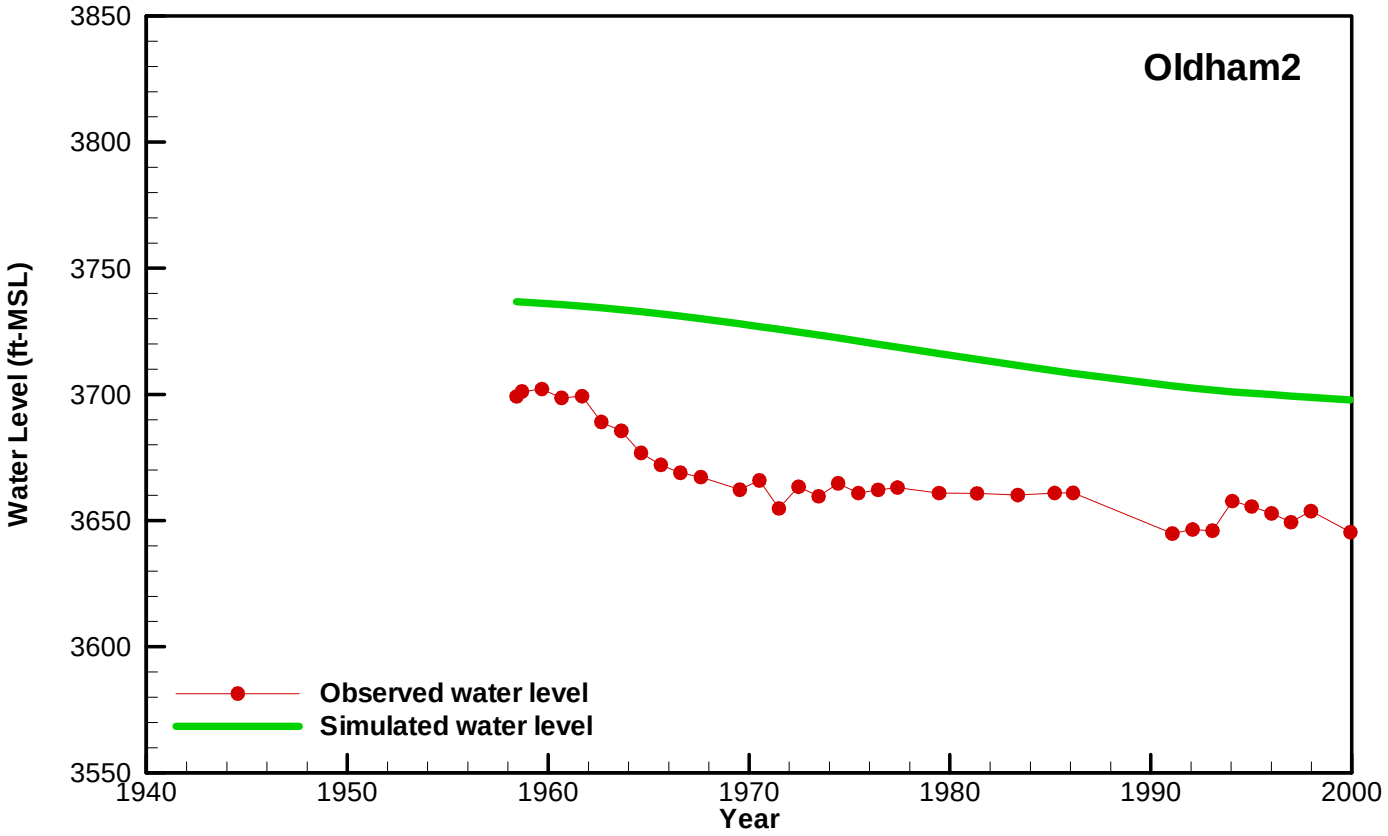

Lynn1
Water Level (ft-MSL)
3100
3075
3050
3025
3000
2975
2950
2925
2900
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

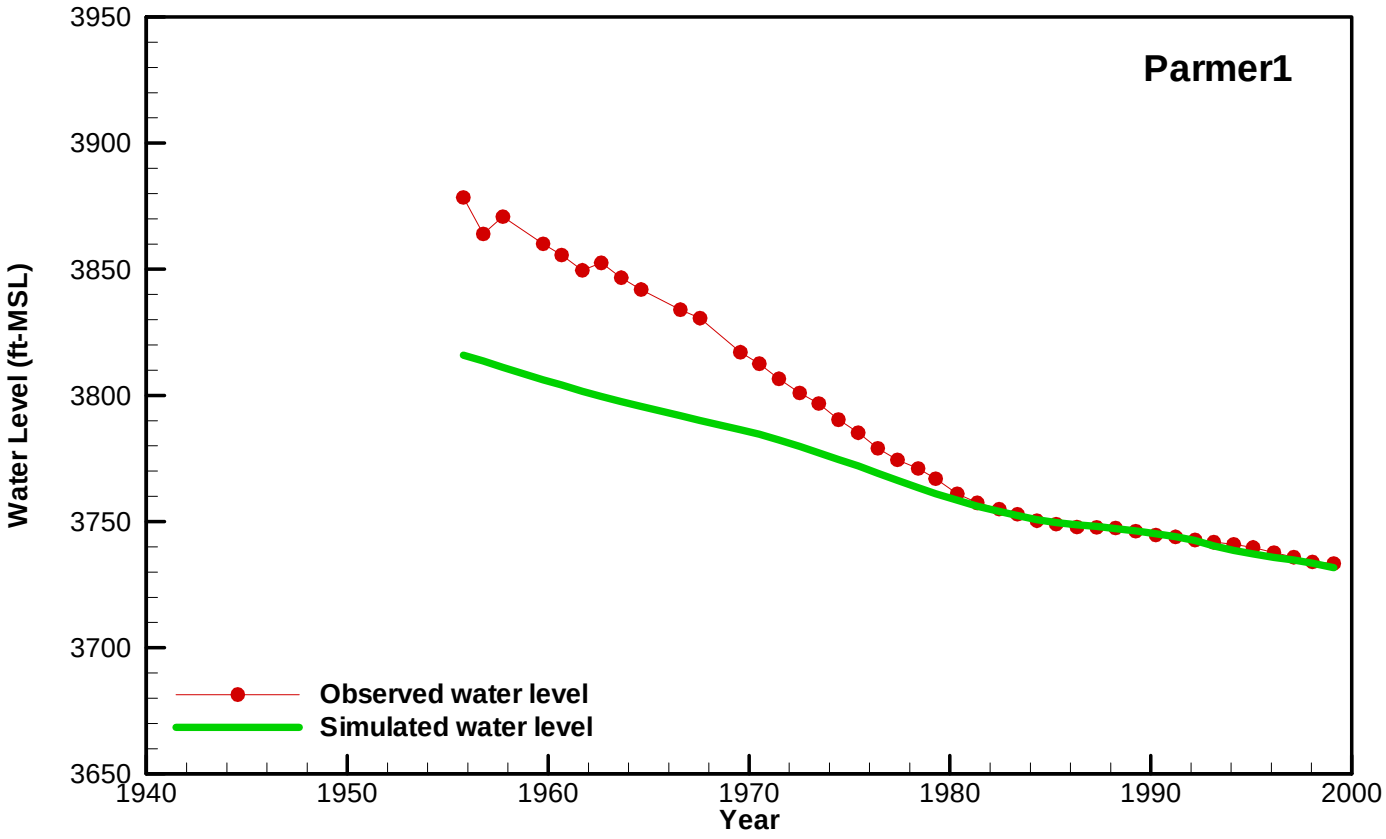

Martin1
Water Level (ft-MSL)
2900
2850
2800
2750
2700
2650
2600
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

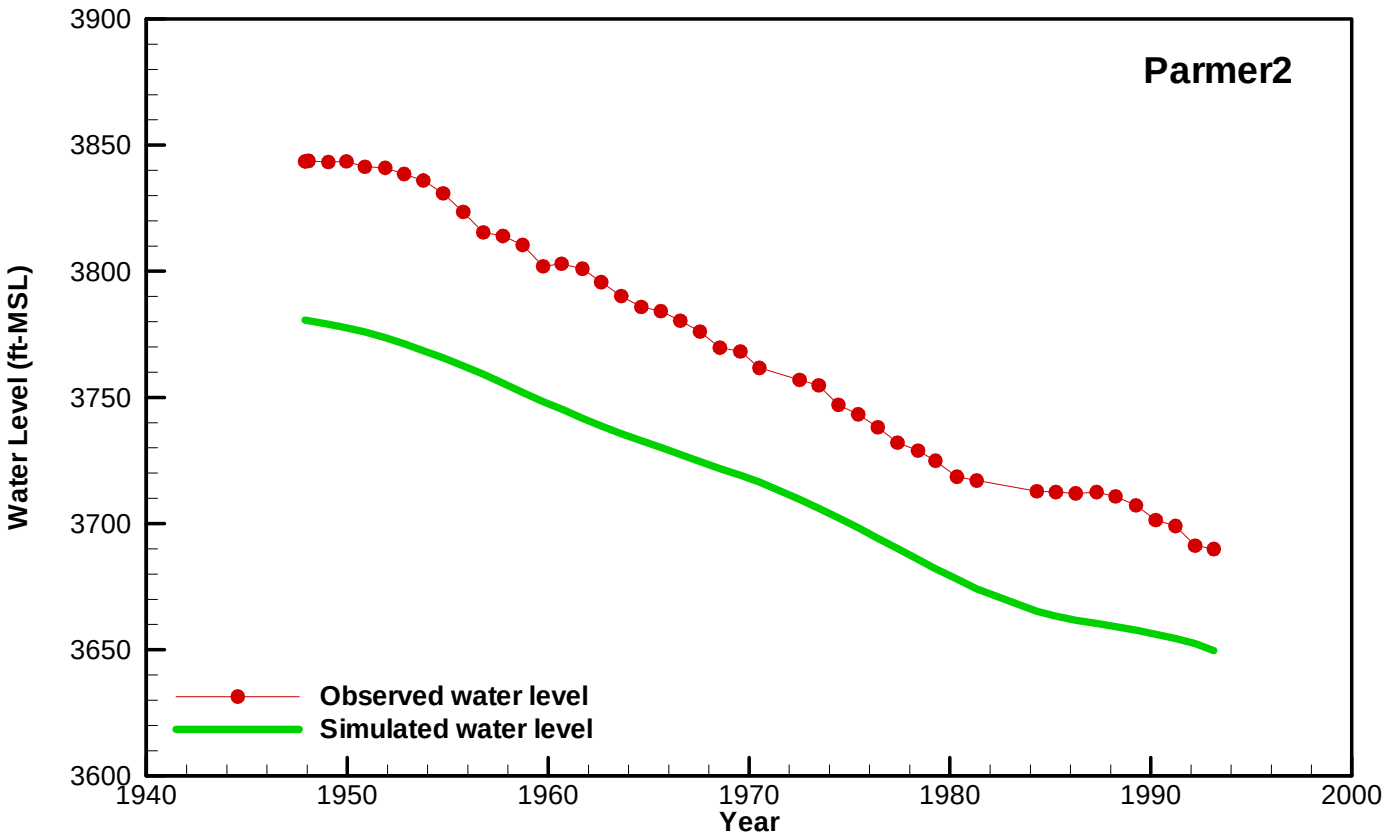

Martin2
Water Level (ft-MSL)
2900
2875
2850
2825
2800
2775
2750
2725
2700
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

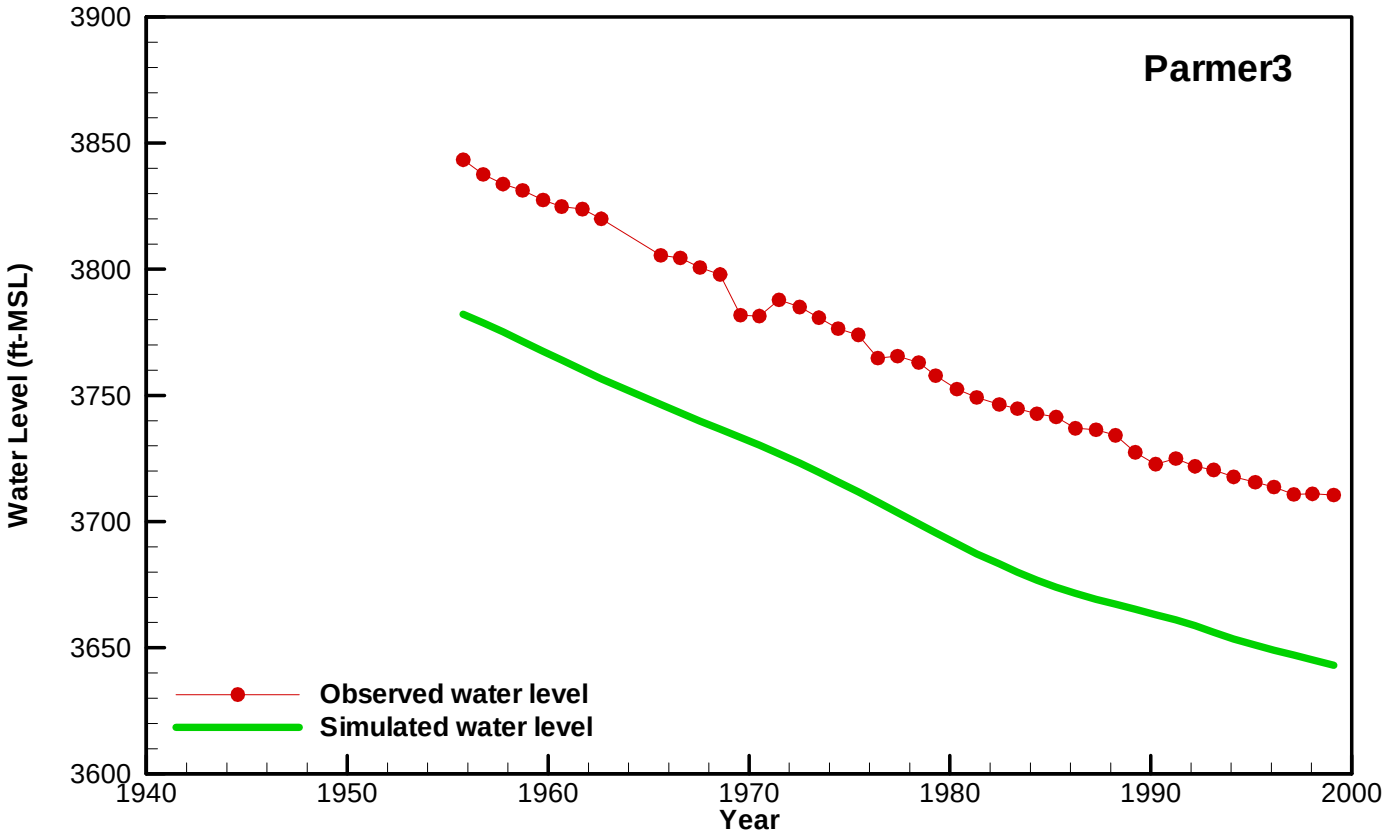

Midland1
Water Level (ft-MSL)
2800
2790
2780
2770
2760
2750
2740
2730
2720
2710
2700
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

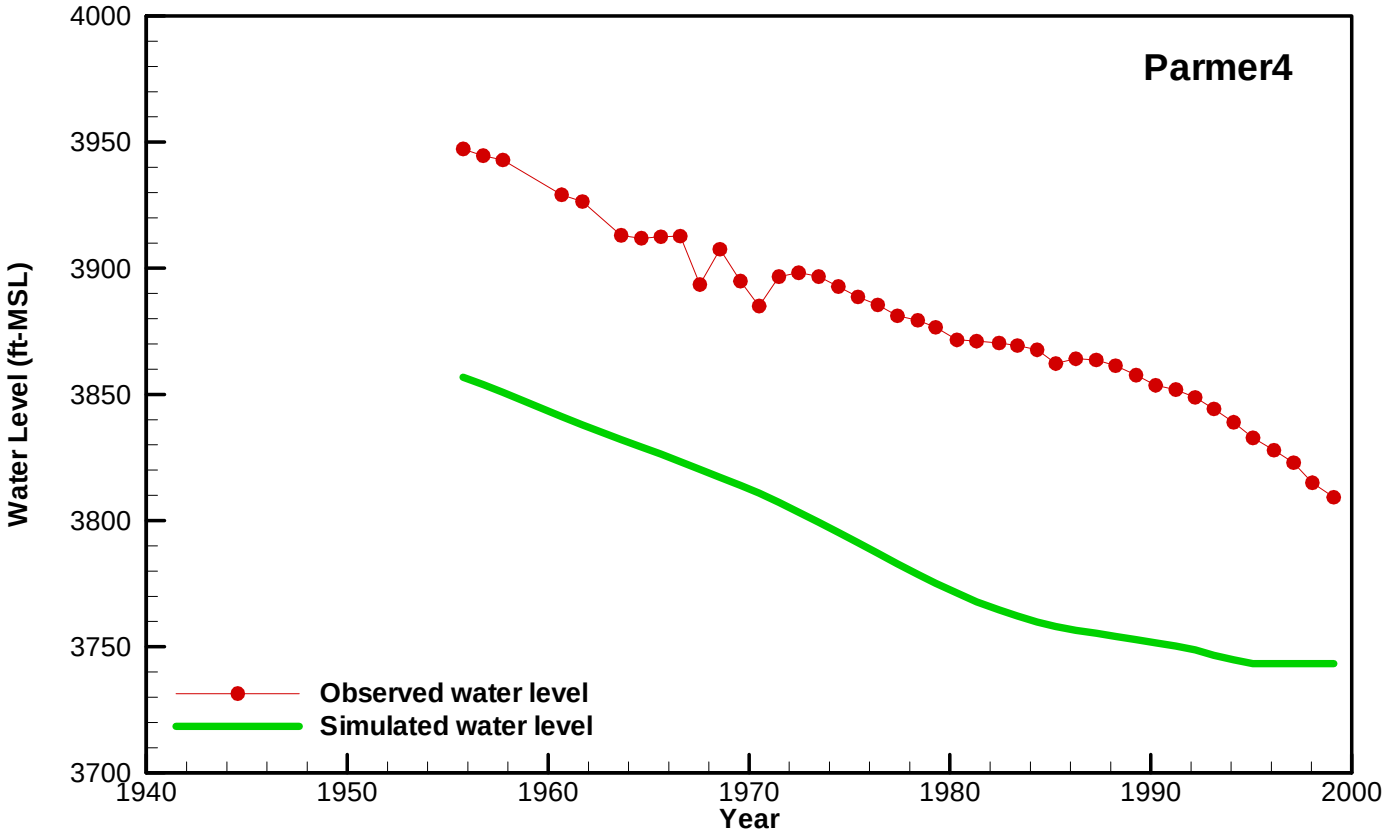

Oldham1
Water Level (ft-MSL)
4100
4075
4050
4025
4000
3975
3950
3925
3900
3875
3850
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

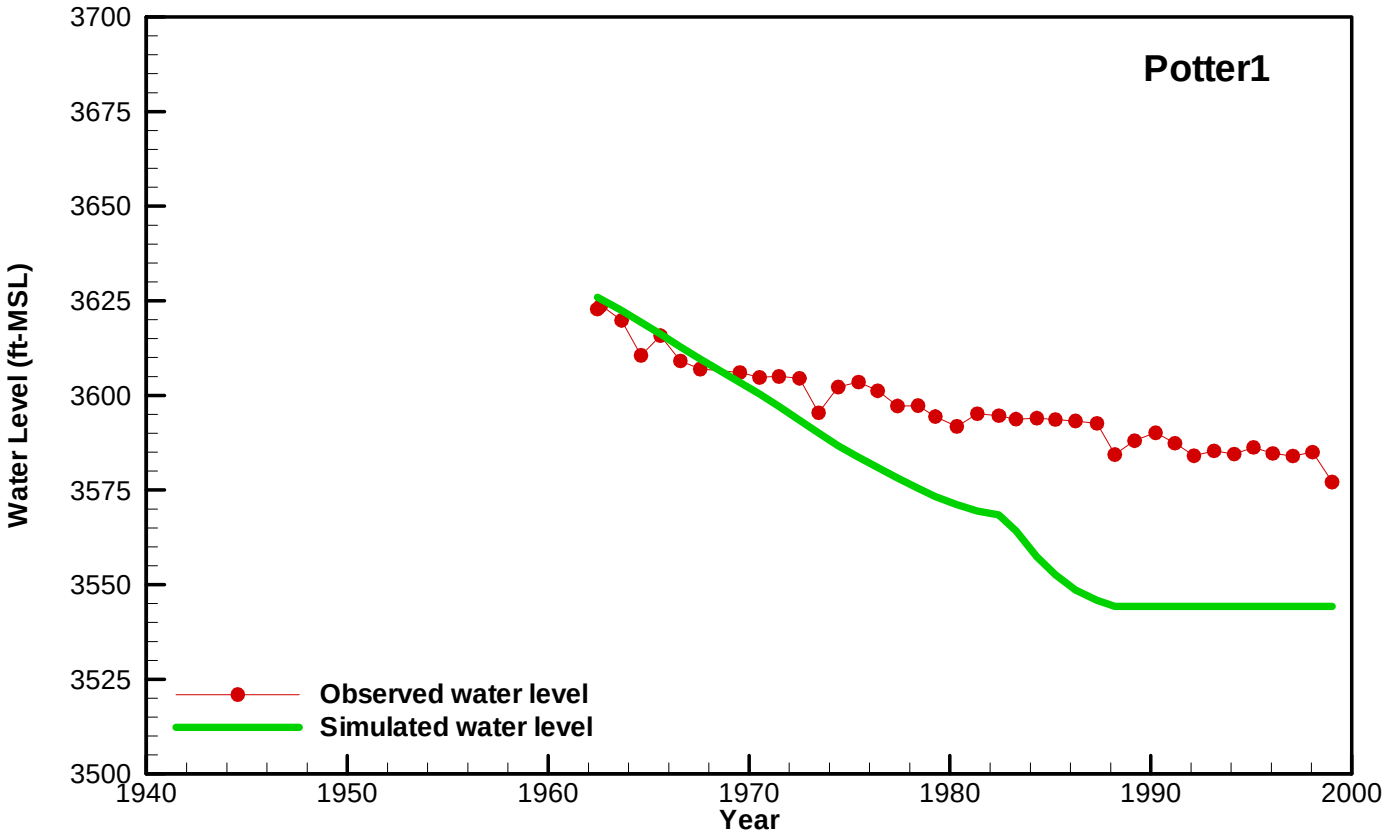

Oldham2
Water Level (ft-MSL)
3850
3800
3750
3700
3650
3600
3550
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

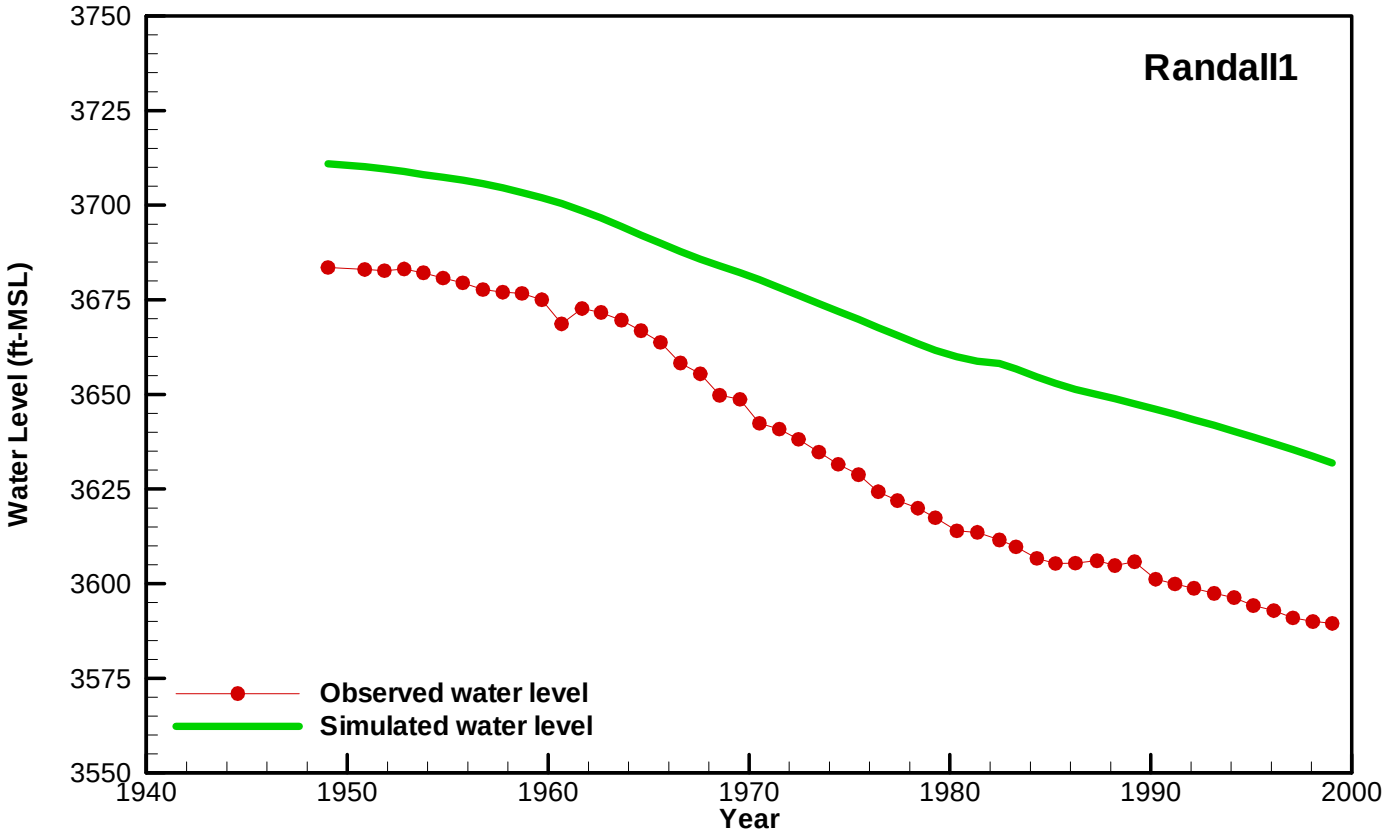

Parmer1
Water Level (ft-MSL)
3950
3900
3850
3800
3750
3700
3650
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

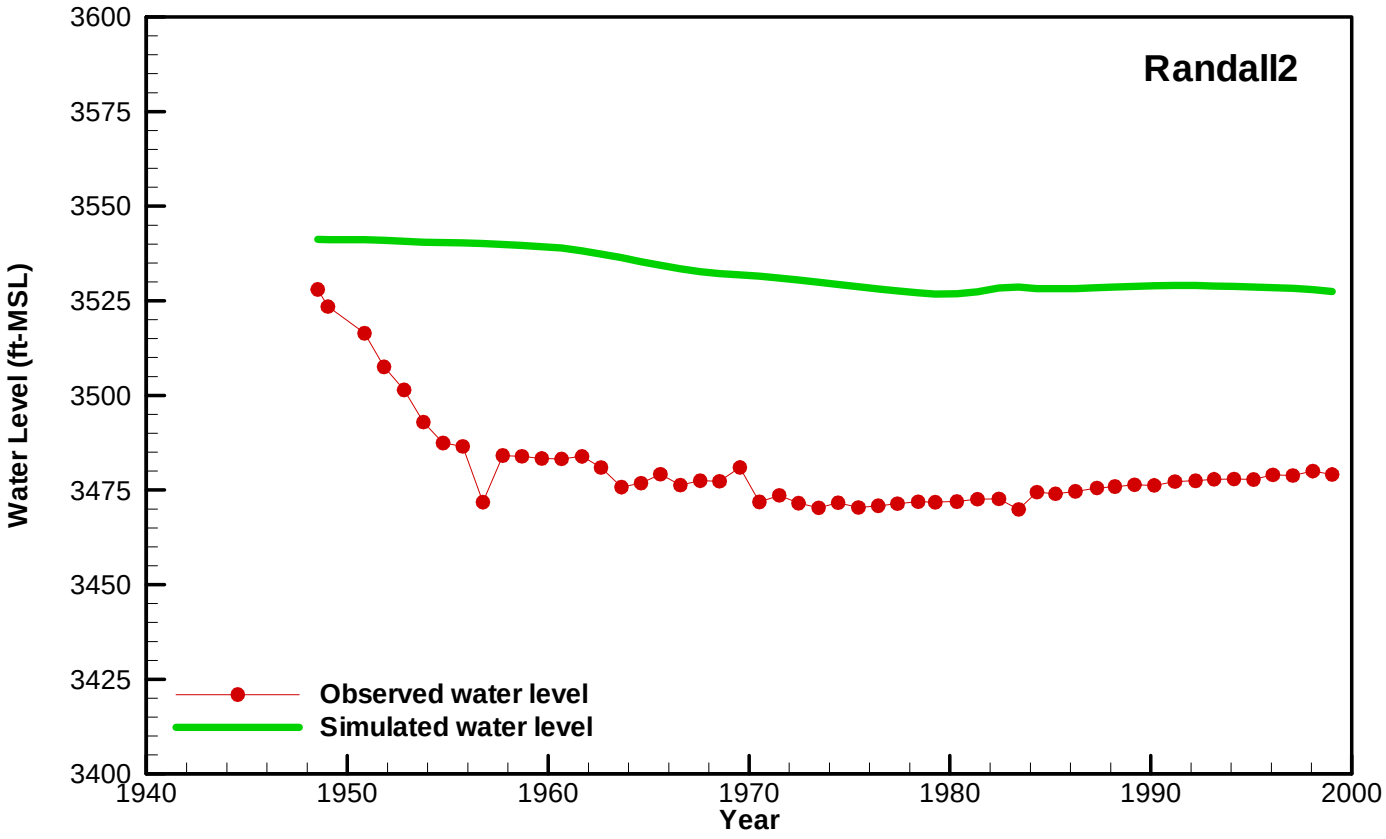

Parmer2
Water Level (ft-MSL)
3900
3850
3800
3750
3700
3650
3600
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

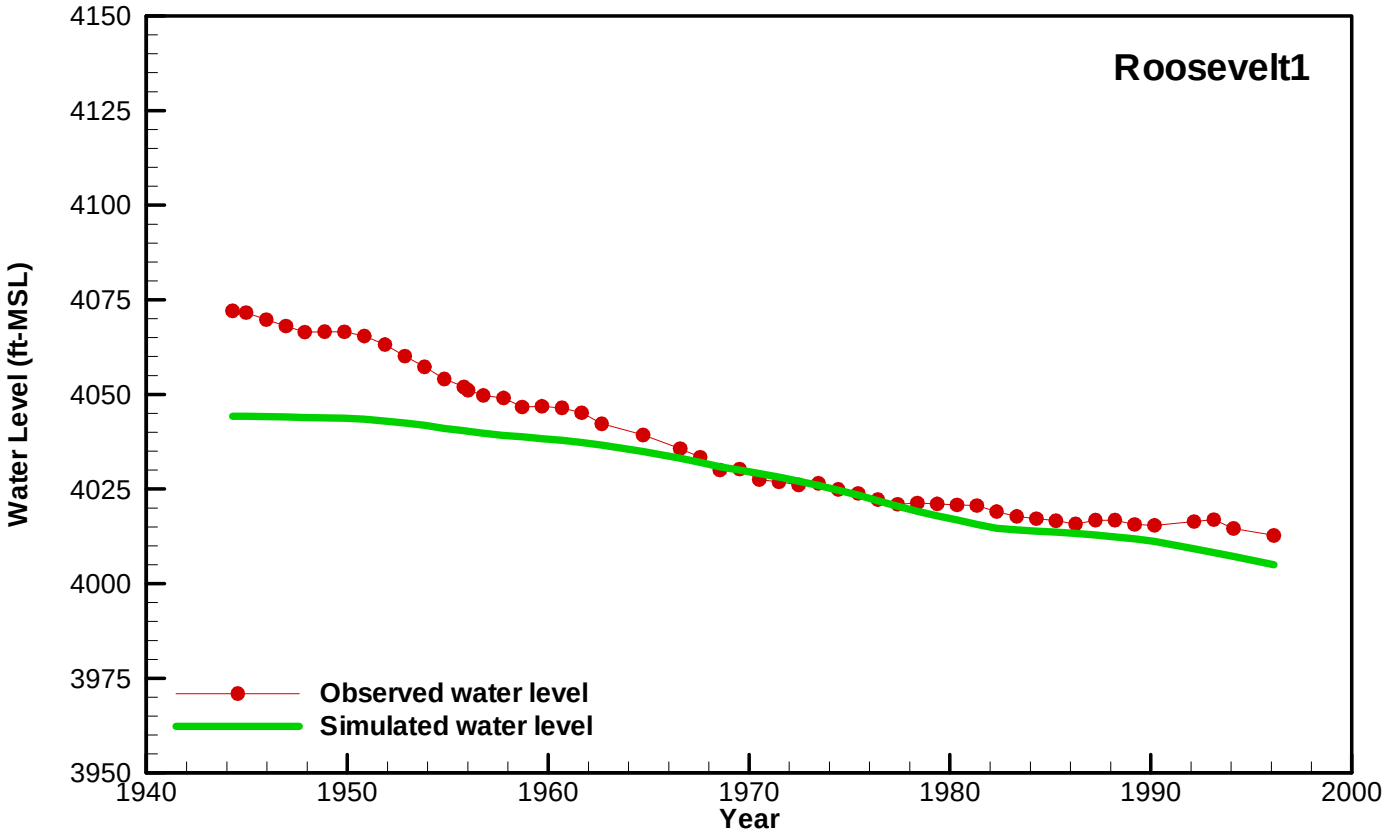

Parmer3
Water Level (ft-MSL)
3900
3850
3800
3750
3700
3650
3600
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

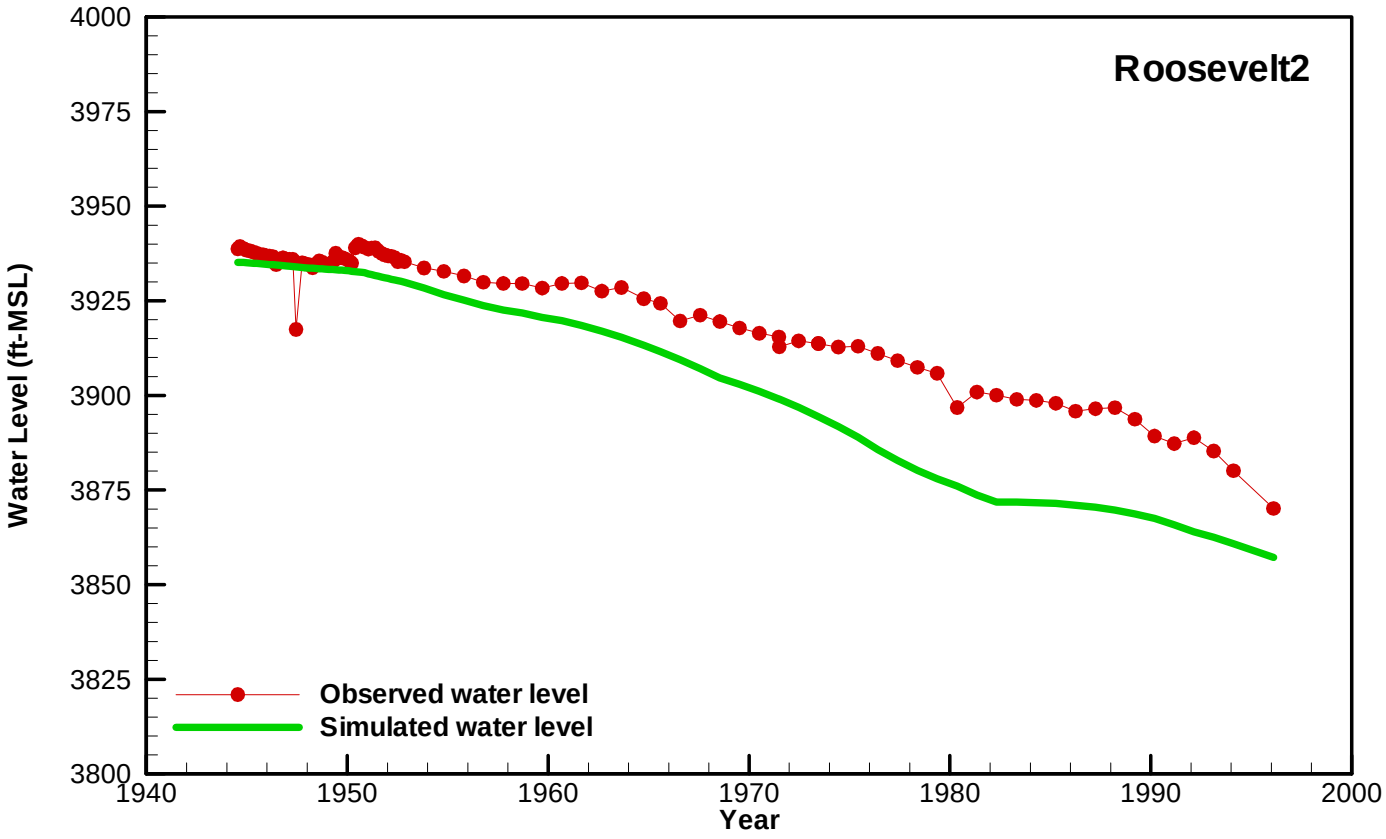

Parmer4
Water Level (ft-MSL)
4000
3950
3900
3850
3800
3750
3700
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

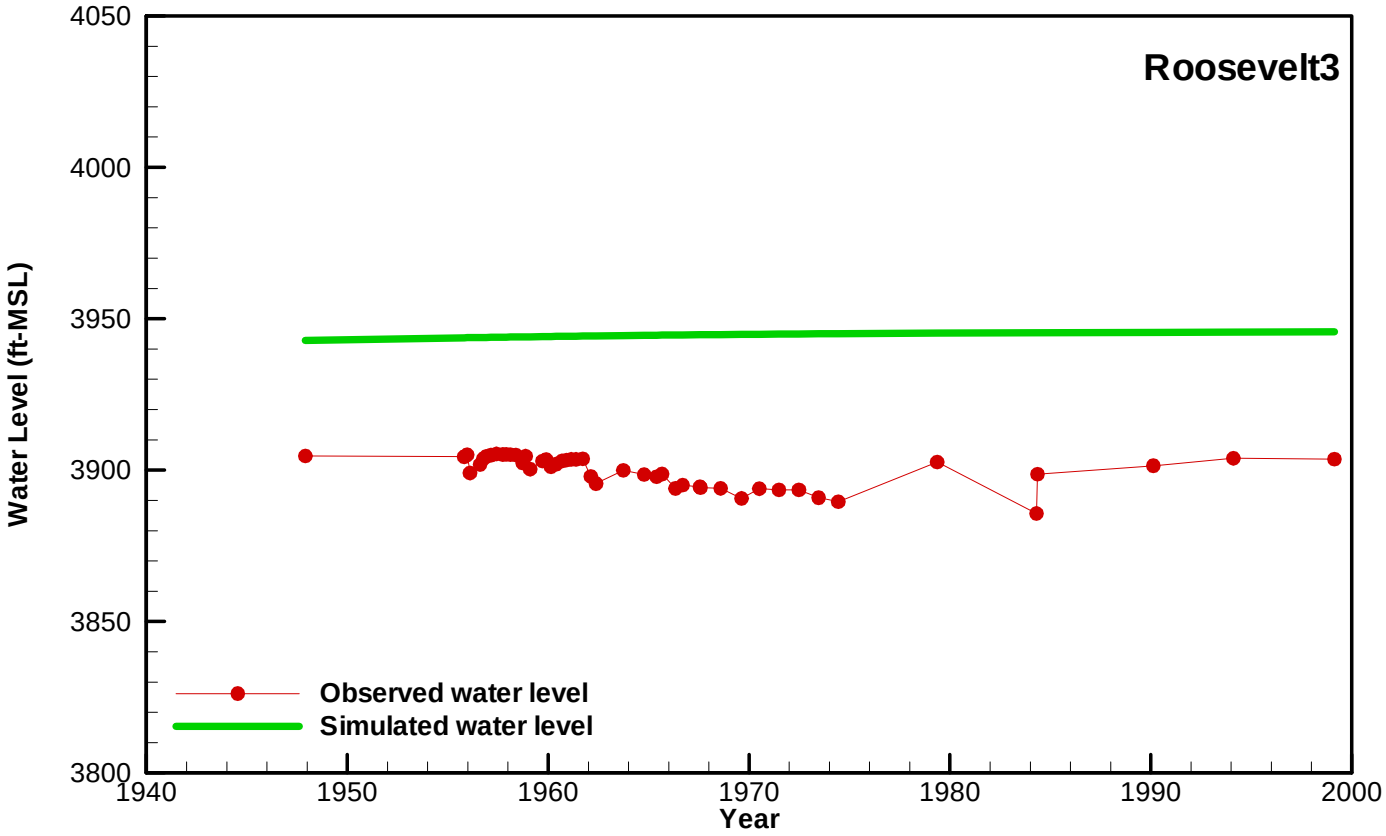

Potter1
Water Level (ft-MSL)
3700
3675
3650
3625
3600
3575
3550
3525
3500
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

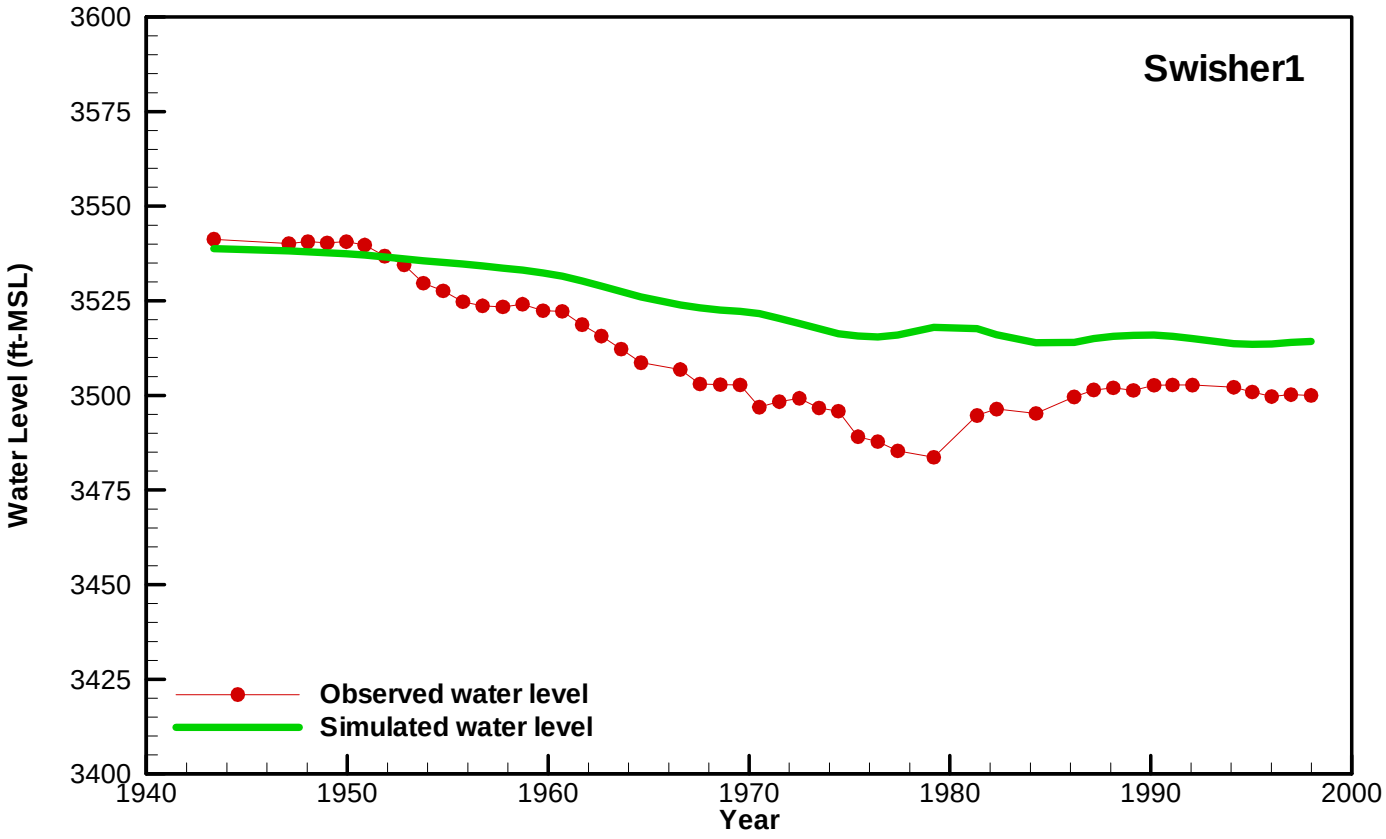

Randall1
Water Level (ft-MSL)
3750
3725
3700
3675
3650
3625
3600
3575
3550
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

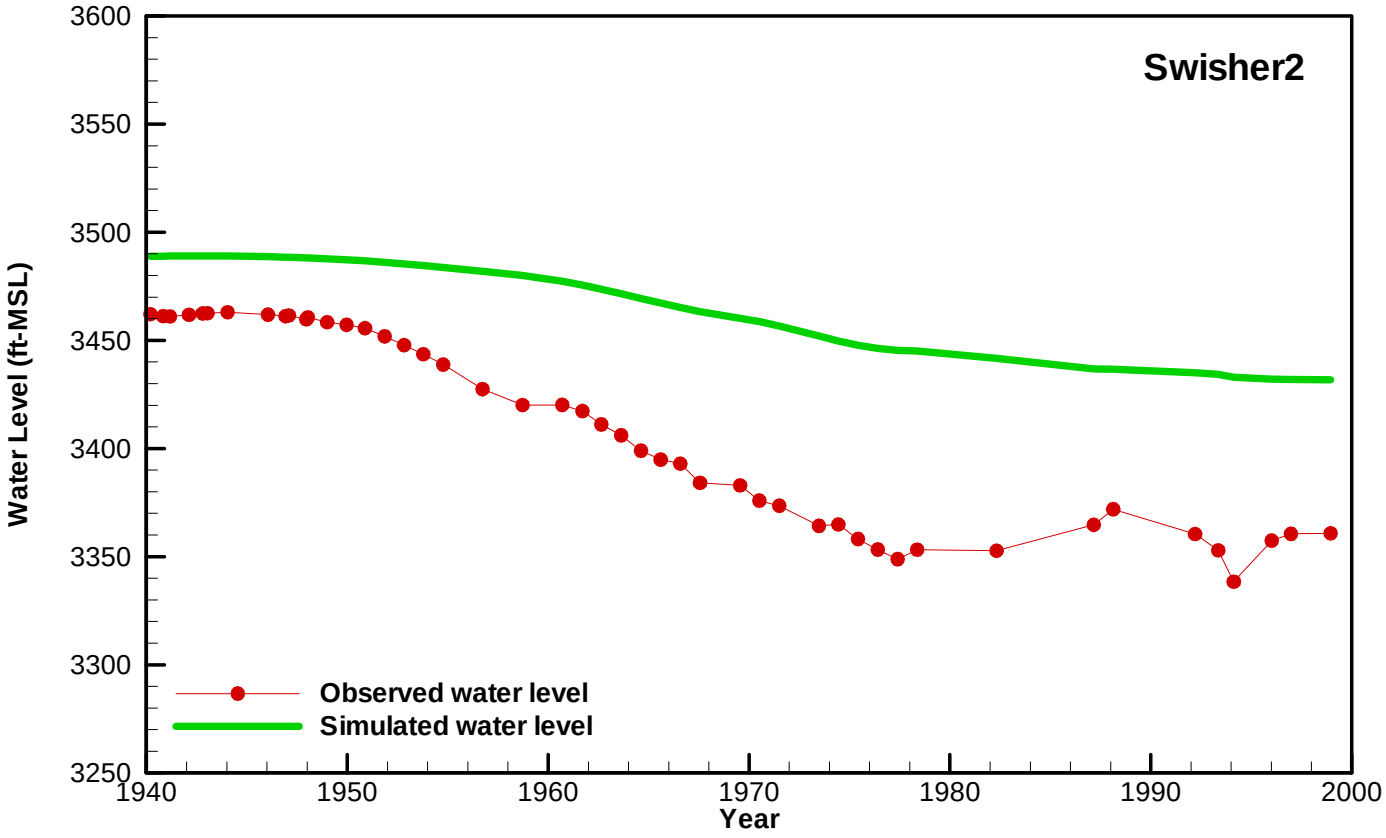

Randall2
Water Level (ft-MSL)
3600
3575
3550
3525
3500
3475
3450
3425
3400
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

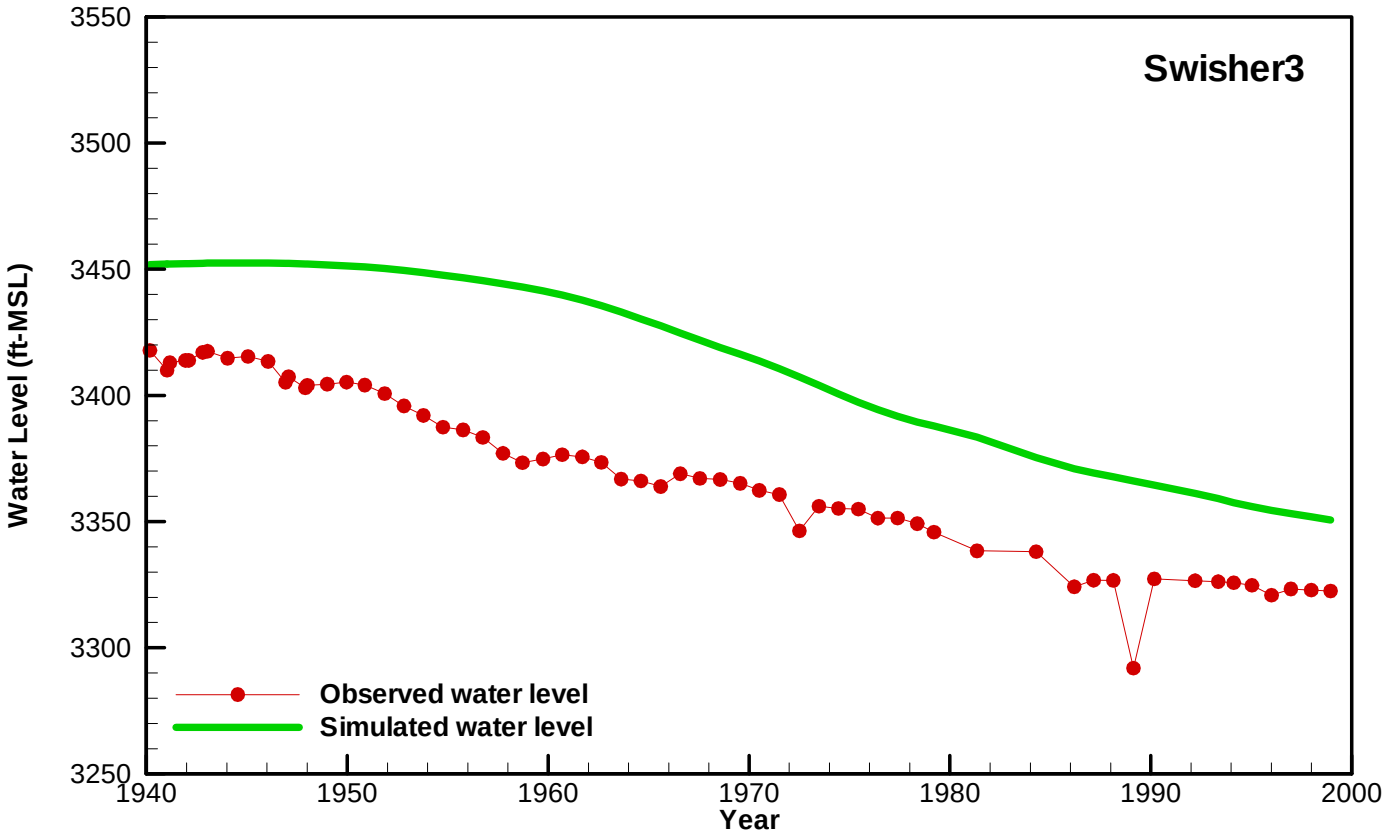

Roosevelt1
Water Level (ft-MSL)
4150
4125
4100
4075
4050
4025
4000
3975
3950
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

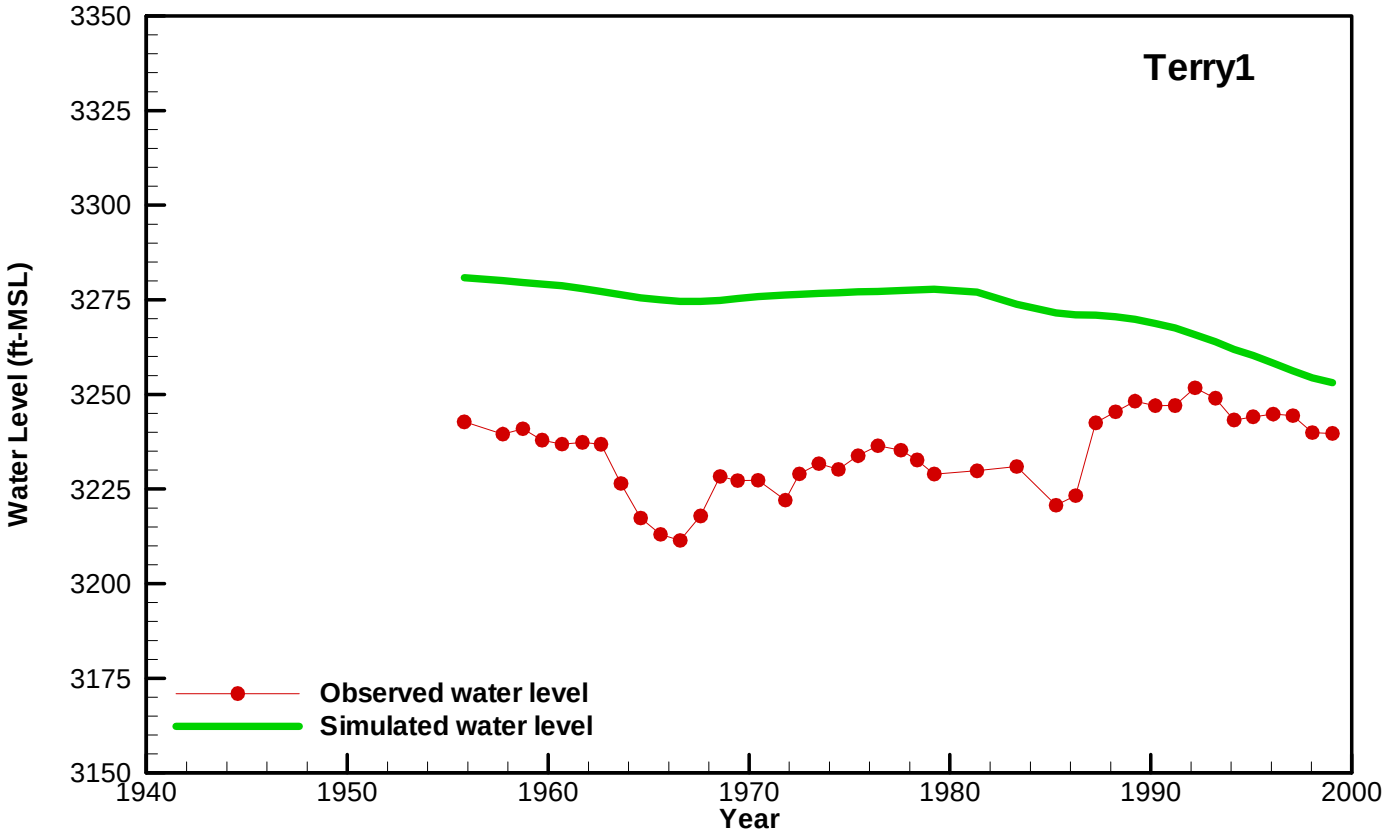

Roosevelt2
Water Level (ft-MSL)
4000
3975
3950
3925
3900
3875
3850
3825
3800
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

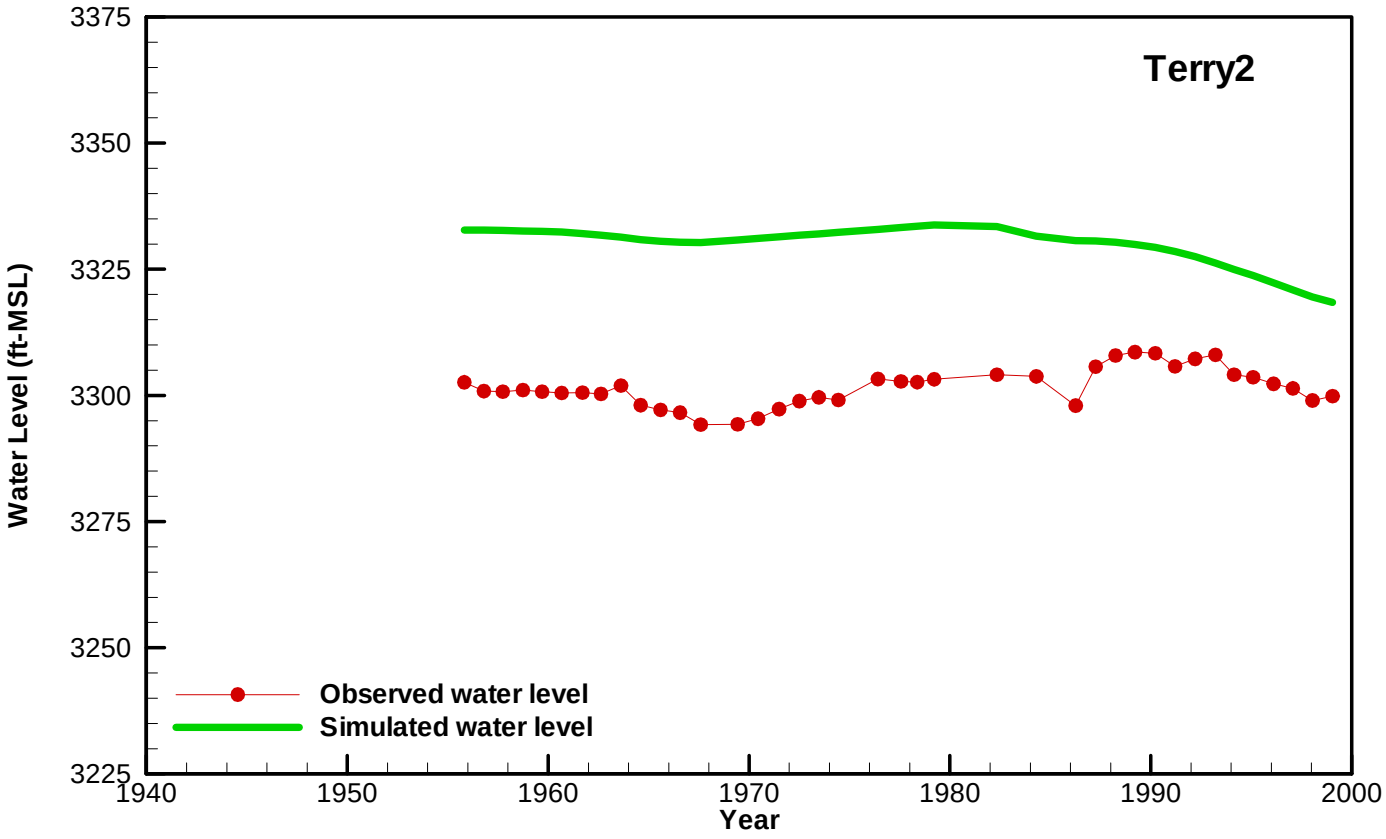

Roosevelt3
Water Level (ft-MSL)
4050
4000
3950
3900
3850
3800
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

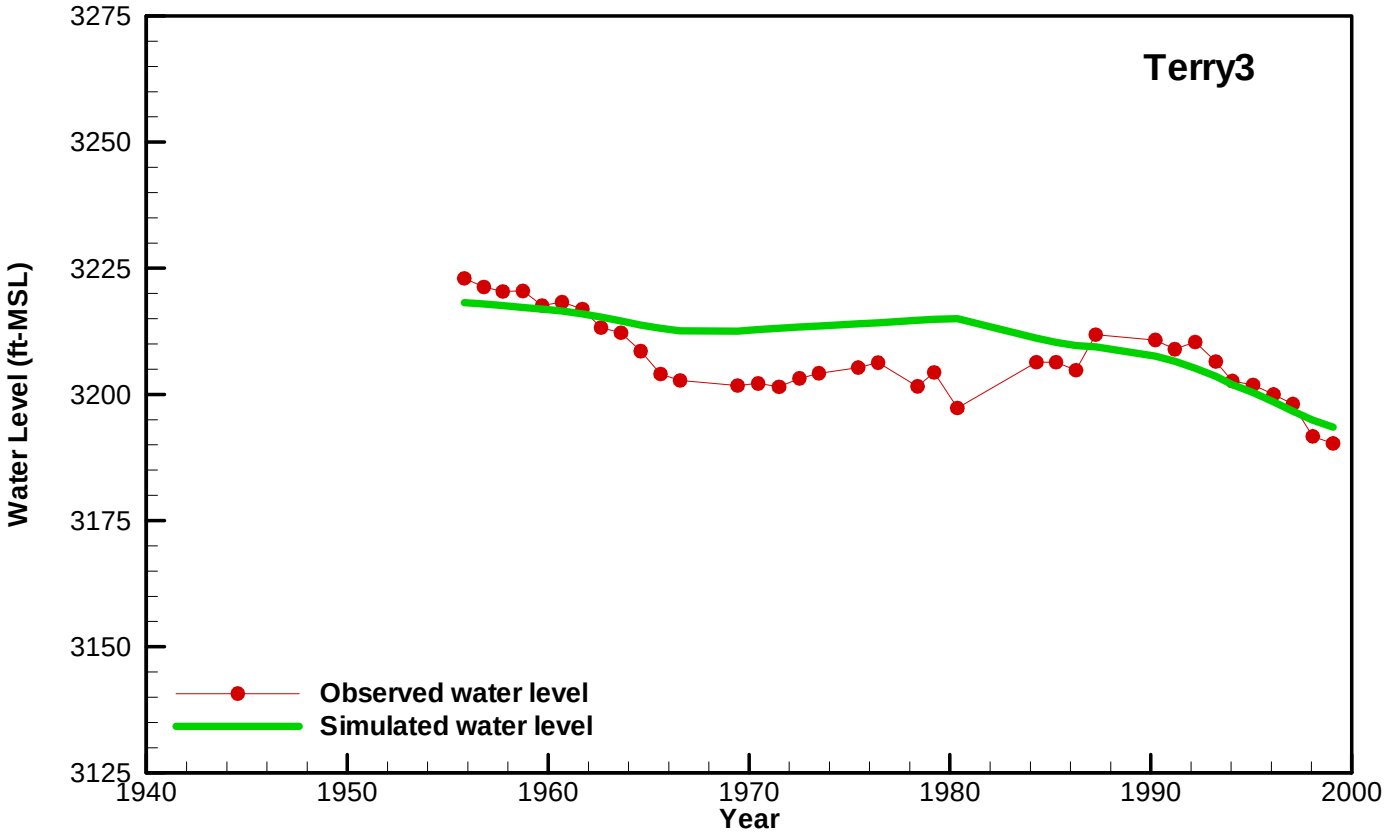

Swisher1
Water Level (ft-MSL)
3600
3575
3550
3525
3500
3475
3450
3425
3400
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

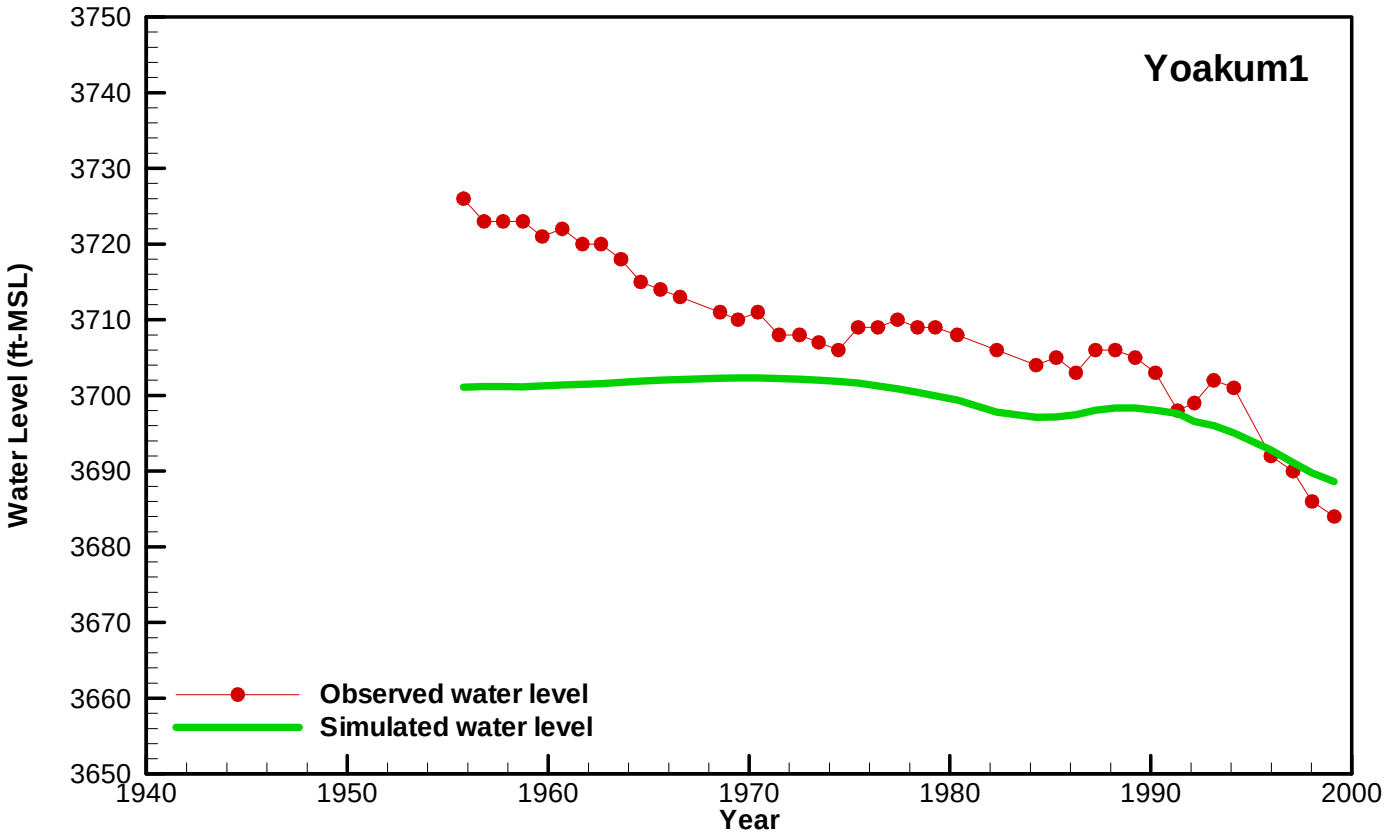

Swisher2
Water Level (ft-MSL)
3600
3550
3500
3450
3400
3350
3300
3250
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

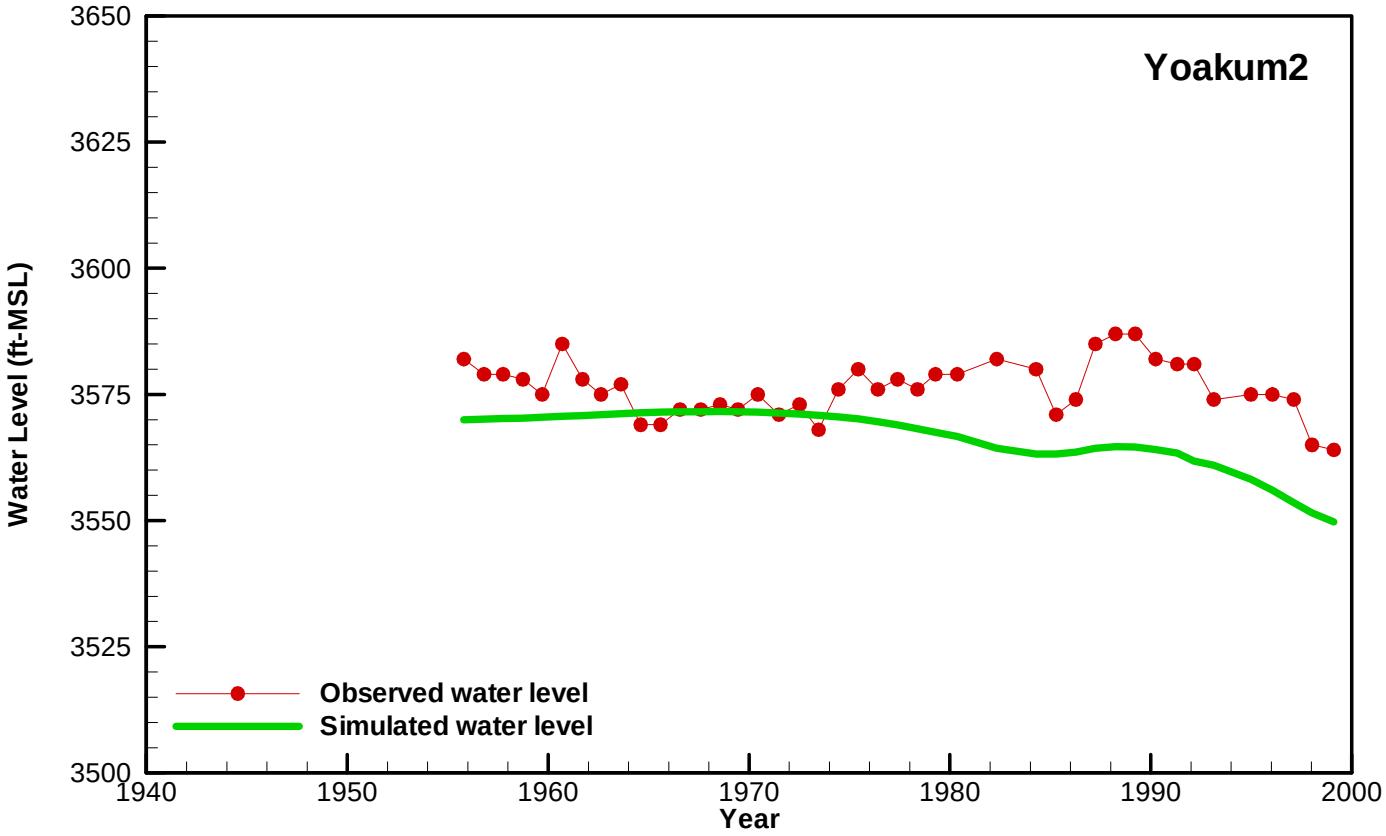

Swisher3
Water Level (ft-MSL)
3550
3500
3450
3400
3350
3300
3250
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

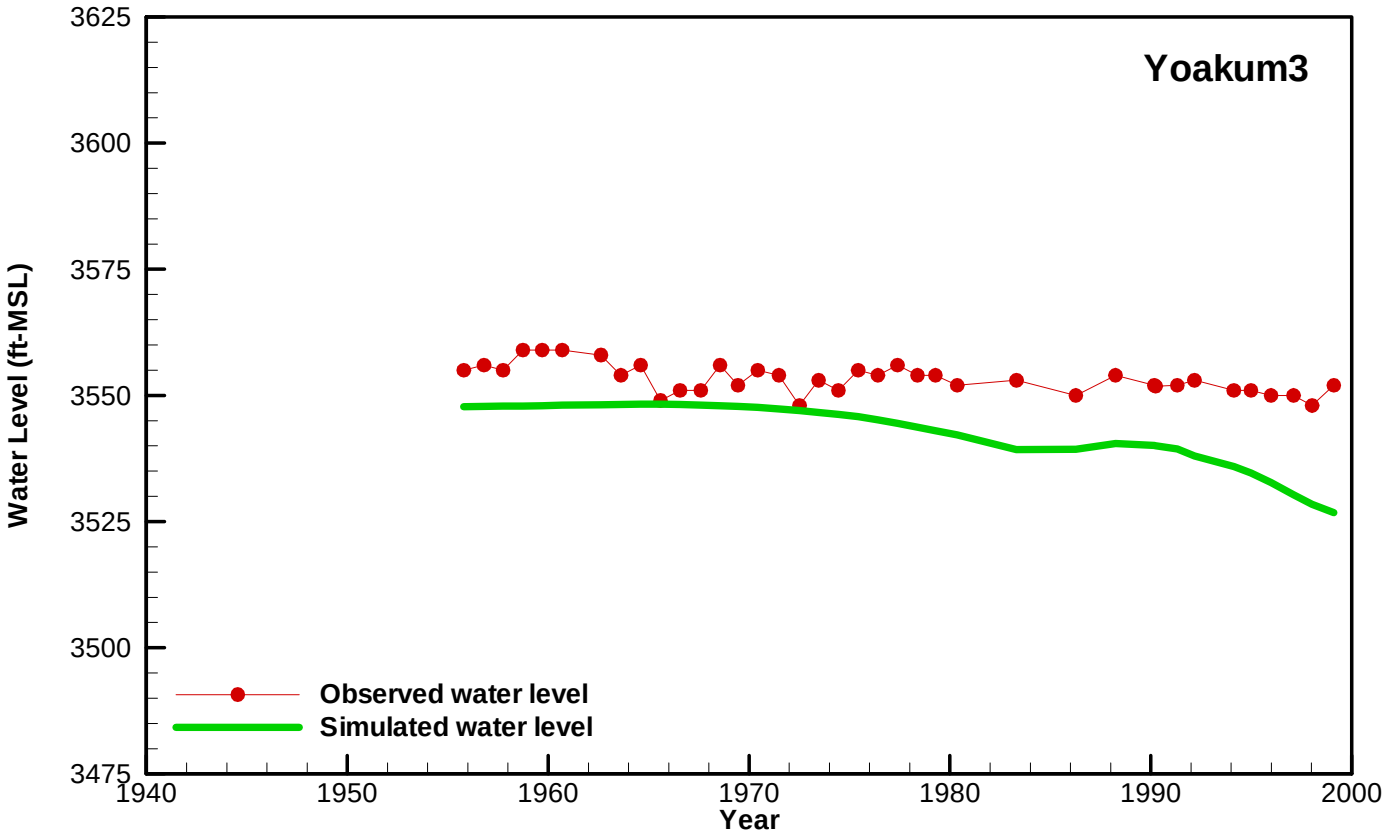

Terry1
Water Level (ft-MSL)
3350
3325
3300
3275
3250
3225
3200
3175
3150
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

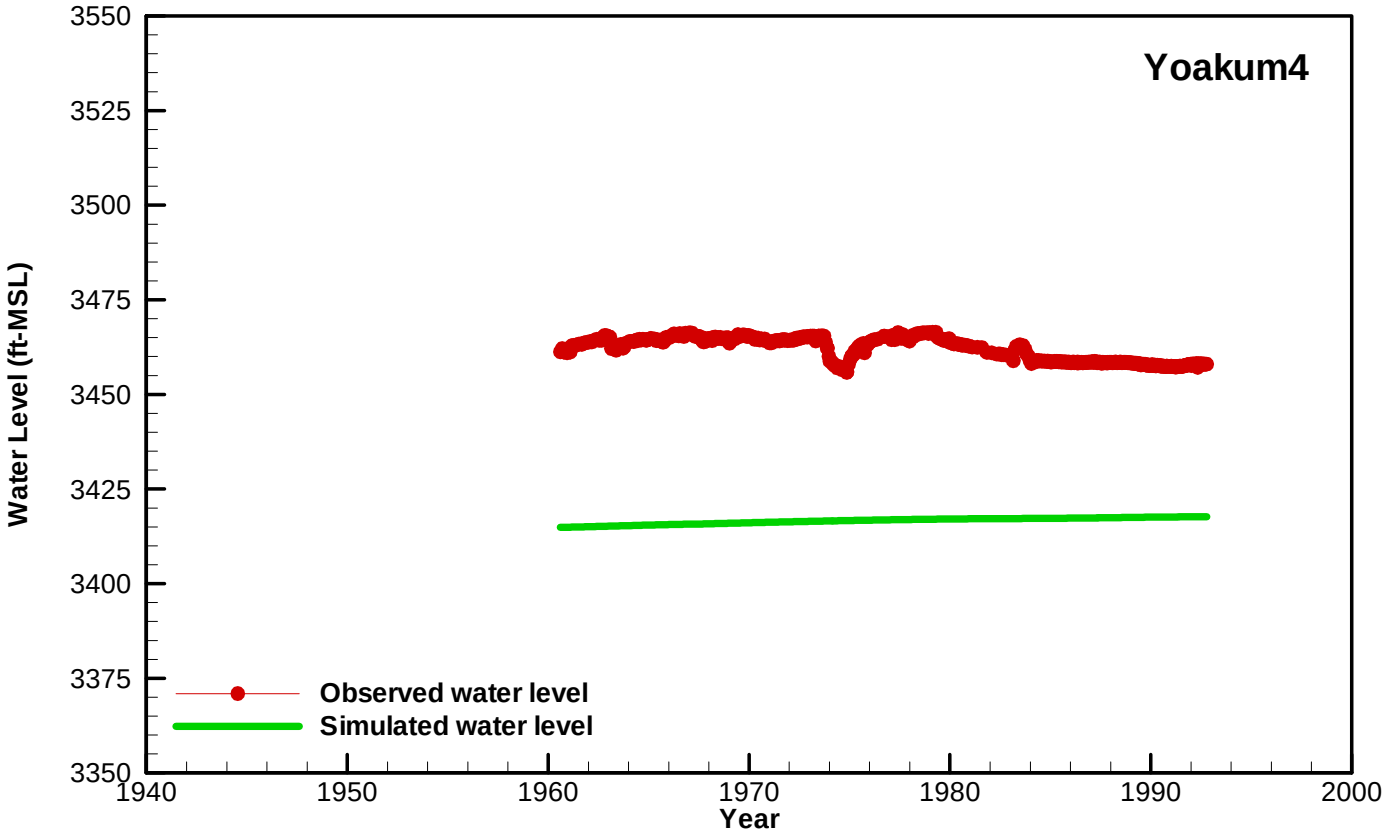

Terry2
Water Level (ft-MSL)
3375
3350
3325
3300
3275
3250
3225
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level


Terry3
Water Level (ft-MSL)
3275
3250
3225
3200
3175
3150
3125
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level


Yoakum1
Water Level (ft-MSL)
3750
3740
3730
3720
3710
3700
3690
3680
3670
3660
3650
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level


Yoakum2
Water Level (ft-MSL)
3650
3625
3600
3575
3550
3525
3500
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level


Yoakum3
Water Level (ft-MSL)
3625
3600
3575
3550
3525
3500
3475
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level


Yoakum4
Water Level (ft-MSL)
3550
3525
3500
3475
3450
3425
3400
3375
3350
1940
1950
1960
1970
1980
1990
2000
Year
Observed water level
Simulated water level

Appendix E

Executive Administrator's Comments on Draft Report

ATTACHMENT 1

TEXAS WATER DEVELOPMENT BOARD
Review of the Draft Final Report: Contract No. 2001-483-379
" Draft Groundwater Availability of the Southern Ogallala Aquifer in Texas and New Mexico Numerical Simulations Through 2050"

DRAFT REPORT TECHNICAL / ADMINISTRATIVE COMMENTS:

DRAFT REPORT – TABLE OF CONTENTS

1. No comments

DRAFT REPORT – REPORT TITLE

1. Report title should read " Groundwater Availability Model of the Southern Ogallala Aquifer in Texas and New Mexico: Numerical Simulations Through 2050".

   Edit made.

DRAFT REPORT – ABSTRACT

1. The second sentence should read "…and it updates other **availability** models," instead of available models.

   Edit made.

DRAFT REPORT – INTRODUCTION

1. No comments

DRAFT REPORT – STUDY AREA

1. Page 5: Please mention evaporation and include a map of evaporation (see RFP Attachment 1, page 4/40).

   Evaporation map is now included (Figure 10) and report has been amended.

2. Page 5: Please include a map of the physiographic provinces (see RFP Attachment 1, page 4/40).

   Physiographic map is now included, (Figure 4).

3. Figure 3: Please mention source of population data.

   Edit made on Figure 3.

4. Figure 6: Please mention source of soils data.

   Edit made on Figure 7.

5. Figure 7: Please mention source of precipitation data.

   Edit made on Figure 8.

6. Figure 7: Please indicate units for precipitation data.

   Units already on figure.

7. Physiography and Climate section: Please include a map and discussion of average net lake evaporation.

   Map (Figure 10) and discussion provided.

8. Physiography and Climate section: Please include a discussion of evapotranspiration.

   Discussion of evapotranspiration provided in Discharge section.

9. Figure 9: Please mention source of geologic data. Although included in the legend, there does not appear to be 'Paleogene sedimentary rocks' or 'Neogene sedimentary rocks' on the map. Unclear how the terminology on the figure relates to the stratigraphic column or the text. Please provide a clearer geologic map that relates to the text and stratigraphic column.

   The figure and text have been amended.

10. Figure 9: Please indicate units for thickness data.

    Edit made; units are feet.

11. Figure 15: "Olgallala" should be Ogallala

    Edit made.

12. Figure 16: This figure doesn't print well in black and white and Ogallala is spelled wrong.

    Edits made.

DRAFT REPORT – PREVIOUS WORK

1. Page 22, last paragraph of "SB1 Regional Water Planning Model," line 3: "that" should be "than"

   Edit made.

DRAFT REPORT – HYDROGEOLOGIC SETTING

1. Figure 17: Please add the Ruppel (1983) and Howard and Williams (1972) references to the reference list at the end of the report.

   References added.

2. Page 25, 4th paragraph: 'Osterkamp and other, 1987' versus 'Osterkamp and Wood (1987)' in the reference list. Please verify reference.

   Sources verified. Osterkamp and Wood is correct reference.

3. Page 25, 5th bulleted item: Please include Gutentag (1981) in the reference list at the end of the report.

   Reference added.

4. Page 25, Structure: Is the structure in Figure 18 and discussed in the section the bottom of the Ogallala Formation or the Ogallala aquifer (= High Plains aquifer)?

   Bottom of Ogallala aquifer, which is equivalent to the High plains aquifer.

5. Figure 19: Unclear what 'DBS&A hydrograph available' means. There do not appear to be any solid dots on the figure.

   DBS&A Hydrograph wells notation removed on Figure 21.

6. Water Levels and Regional Groundwater Flow: Please include maps of aquifer (saturated) thickness for the three potentiometric surfaces.

   Not required in scope of work.

7. River, Streams, Springs, and Lakes: Please include plots of representative stream-flow gages and a map of gage locations, if any.

   Added Figures 34 and 35 and associated write up.

8. Hydraulic Conductivity: Please include a discussion of vertical variations of hydraulic conductivity.

   Added requested write up.

9. Hydraulic Conductivity: Please include a discussion of horizontal anisotropy.

   Added requested write up.

10. Discharge: Please include a discussion of discharge to streams/lakes.

    Added requested write up.

11. Pages 42-43: Please discuss whether rejected recharge is considered in the model. (see RFP Attachment 1, page 7/40).

    Added requested write up.

12. Page 48: Discuss large-scale anisotropy of horizontal hydraulic conductivity caused by distribution shown in Figure 33. (see RFP Attachment 1, page 8/40)

    Added requested write up.

13. Page 51: Include at least a couple of spring flow hydrographs (see RFP Attachment 1, page 26/40, xviii).

    Insufficient information for plotting spring flow hydrographs. Flow information documented in Table 2.

DRAFT REPORT – CONCEPTUAL MODEL OF GROUNDWATER FLOW

1. The conceptual model diagrams (Figures 40a & b) indicate that the Upper Dockum Group "red beds" form the base of the Ogallala aquifer. Previous investigators and models on the Southern High Plains (SHP) have recognized that water-bearing strata in hydraulic continuity with the Ogallala Formation should be considered part of the High Plains aquifer. However, it is unclear from the text and figures in the report whether or not the entire Cretaceous subcrop has been included as part of the High Plains aquifer in the

GAM (i.e., if model cells in the area underlain by Cretaceous have been extended to the base of the Cretaceous). If the entire Cretaceous subcrop is included and values of hydraulic conductivity for initial input to the model were calculated as a weighted average of hydraulic conductivity of both the Ogallala Formation and the Cretaceous section (as described on page 49), the hydraulic conductivity values of the dynamic section of the aquifer (i.e., the Ogallala section) will be significantly modified. Since sensitivity analyses indicate that the model is most sensitive to hydraulic conductivity (along with recharge), it is imperative that conductivity values accurately represents the conductivity of the aquifer. (external comment)

Text has been amended to clarify this issue. Only a portion of the Cretaceous subcrop (as interpreted in previous studies) is included in the model.

DRAFT REPORT – MODEL DESIGN

1. Page 68, Model Design, Layers and Grid: Please mention the projection parameters and the grid origin coordinates.

   Provided in Figure 45.

2. Page 69, Model Parameters, 6th paragraph: Please clarify that although pumping was reduced in low transmissivity cells, 100% of pumping volume was preserved.

   Clarification added.

DRAFT REPORT – MODELING APPROACH

1. Page 73: Discuss how this model will match up with Ogallala North model (Dutton et al., 2000). (see RFP Attachment 1, page 13/40).

   Discussion added.

2. Include a map of the grid. Consider doing what the BEG did: show 10 cell by 10 cellblocks. Then show one 10 x 10 block magnified with all of the cells in it. This way readers can see the orientation and extent of the grid. This will also allow you to explain that you extended the grid to the east so that the Dockum aquifer could be added at a later date.

   Two new figures were added to illustrate the model grid (figs. 45 and 46). Discussion added.

DRAFT REPORT – STEADY-STATE MODEL

1. Figures 44 and 57: Show locations of observation wells. (see RFP Attachment 1, page 26/40, xxviii) Locations of observed water levels are plotted in Figure 21 and Figure 23.

   Locations of observation wells are plotted on Figures 21 and 23, and a note to that effect is included on the figures. There are too many data points in some locations to plot them on the cited figures - the water level contours would be too obscured.

2. Pages 80 and 96: Please include detailed tables of the water budget for the calibration and predictive simulations listing (1) recharge, (2) natural discharge (3) cross-formational flow, (4) well discharge, (5) changes in storage etc. The tables should include budgets for steady state, 1980, 1990, 2000, 2010, 2020, 2030, 2040, and 2050. (see RFP Attachment 1, pages 15/40 and 17/40).

   Requested water budgets have been added as tables in the report.

3. Page 80: Please include a table or figure depicting results of hydraulic head sensitivity analysis.

   Table 4 added.

4. Page 77: Please also report the Mean Absolute Error.

   Mean absolute error reported.

5. Page 83, Figure 50a: Y-axis label should be flux at springs (not average difference in simulated head).

   Figure corrected.

6. Water Budget, page 80: Please include a detailed water budget for the steady-state model.

   Water budget table included.

7. Figure 50: It appears that the Y-axis of the top plot is incorrectly identified.

   Figure corrected.

8. Figure 50: The variations in the lines for drain conductance and recharge of the bottom plot appear unusual. These plots generally do not show reversals of slope. Please check that the data represented in the plot is correct.

   Calculations were checked and figure was redone - there was an error in the draft report figure.

DRAFT REPORT – TRANSIENT MODEL

1. Please include a detailed water budget for:
   - steady-state
   - beginning of calibration period
   - the drought of the calibration period
   - end of the calibration period
   - end of the verification period
   - end of 2000, 2010, 2020,2030,2040, and 2050.

   Requested water budgets have been added as tables in the report

3. Page 84: Please give RMS for fitting hydrographs (see RFP Attachment 1, page 15/40).

   RMS for hydrographs is provided and documented.

4. Page 100: Please include a figure depicting hydrograph sensitivity to specific yield (see RFP Attachment 1, page 16/40).

   Figure 68 added.

5. Page 94, Figure 58: Legend label for 100 – 150 ft is mislabeled as 10 – 150 ft.

   Legend corrected.

6. Page 96, 1st paragraph: Please change '138.651 ac-ft' to '138,651 ac-ft.'

   Edit made.

7. Page 91, first paragraph: Verb "are" has been omitted from second sentence. Should read "…statistics for 1980 **are** similar to those for …"

   Edit made.

8. Page 93, first paragraph, last sentence: Please leave out second occurrence of "are."

   Edit made.

9. According to the report under the Transient Model component, 80 wells were used for model verification; specifically Gaines County well #2624307 has a simulated hydrograph value which some 50 feet below the observed hydrograph level. Why is there is such a large difference between these values? Does this not in fact show that these values, at least in Gaines County's case, are off? (external comment).

   Calibration results are documented and discussed in the report, and were discussed during several SAF meetings.

10. Additionally, again under the Transient Model component, 80 wells were used for model calibration, which is represented as figures Gaines 1, 2, 3, and 4 in appendix D. The average of these wells has a simulated hydrograph value some 55 feet below the observed hydrograph level. Again, as you can see these values are substantially different from what are observed. At what point are these observed values being used in this model and how can it be considered accurate if the figures are consistently off by some 50 feet particularly if we have a saturated thickness of say 150 feet? (external comment)

    Calibration results are documented and discussed in the report, and were discussed during several SAF meetings.

11. The difference in simulated vs. observed heads on numerous model runs was frequently 25 to 50 feet (occasionally up to 100 feet). It is unclear why model input parameters were not adjusted to improve model correlation to actual conditions. (external comment)

    Calibration results are documented and discussed in the report, and were discussed during several SAF meetings. Close matches between observed and simulated water levels can not be obtained in all areas unless detailed adjustments to model input parameters are made, for which there is no basis other than matching water levels. The TWDB does not want to develop "over-calibrated" models.

12. It is unclear why model input parameters were not adjusted to reduce the number of model cells that went dry. Comparison of actual data to Year 2000 simulations confirms that the numerous cells that are drying (as well as flooding) do not represent actual aquifer conditions. (external comment)

    This issue is discussed in the report in the Transient Calibration section.

13. Why does the model show rising water levels in Dawson County? Recently, monitor wells have indicated declining water levels. (external comment).

    Water levels have been rising away outside of irrigated areas, and declining within or near irrigated areas. The model replicates these general trends.

14. Monitor wells 27-07-901 and 28-26-206 in the northern and southern portions of the Dawson County, respectively, would make better observation wells for model calibration than the the two that were selected. (external comment)

    These two wells were added as observation wells and are included in Appendix D.

15. A model that will give the amount of water in storage based on the change in water levels from year to year would be helpful. Will this model do that? (external comment)

    Yes, on a regional basis and over the long term. For county by county annual calculations, other methods or tools may be more appropriate.

DRAFT REPORT – PREDICTIONS

1. Page 102: Were monthly stress periods used for final 10 years of each scenario? (See RFP Attachment 1, page 17/40).

    Yes, and the text has been amended.

1. Pages 102 and C-3: Please say more about the source of predictive pumping data (see RFP page 17/40 "using RWPG water demand projections under average and drought-of –record conditions").

    Text has been amended.

2. Predictions: Please provide discussion on the effects of water-level declines/rises on environmental resource.

    Additional section has been added.

DRAFT REPORT – LIMITATIONS OF THE MODEL

1. Page 134, second paragraph, last sentence: Please add the word "to" before phrase "be average values…"

    Edit made.

DRAFT REPORT – RECOMMENDED FUTURE IMPROVEMENTS

1. No comments

DRAFT REPORT – SUMMARY AND CONCLUSIONS

1. No comments

DRAFT REPORT – ACKNOWLEDGMENTS

1. No comments

DRAFT REPORT – REFERENCES

1. No comments

DRAFT REPORT – APPENDICES – PART A

1. Time lag for irrigation return flow (Appendix A) utilized calculations based on soil types; however, soil types are appropriate only for soils and paleosols and are not representative of the majority of the sediment profile on the southern high plains.

    The word "soil" has been replaced with "sediment".

DRAFT REPORT – APPENDICES – PART B

1. No comments

DRAFT REPORT – APPENDICES – PART C

1. No comments

DRAFT REPORT – APPENDICES – PART D

1. No comments

The following figures are not readable when photocopied in black and white (see RFP Attachment 1 page 25/40, "figures shall be designed such that a black and white photocopy is readable"):

Figure 3
Figure 4
Figure 5
Figure 6
Figure 11
Figure 12
Figure 22
Figure 34
Figure 41
Figure 46
Figure 47
Figure 48
Figure 58
Figure 59
Figure 60
Figures 63, 64, 65, 66, 67
Figures 68, 69, 70, 71
Figures 72, 73, 74, 75, 76, 77, 78, 79, 80
Figures 81, 82, 83, 84, 85, 86, 87, 88, 89, 90,91, 92, 93, 94, 95

Each of these figures were recreated and black and white copy tested to ensure their readability when reprinted.

DRAFT REPORT – REVIEW OF SOURCE DATA

OGLL_s GAM Review – Part B: Project Data

Did we get all of the data files we requested? NO
Is the data organized in the way we requested? NO

Introduction:

It is imperative that enough source data to completely rebuild the groundwater model from scratch and reproduce all report figures and tables (should it be necessary) be received. In other words, if a new model grid resolution and/or orientation is needed, there should be sufficient data to create a new model for the study area. Moreover, there should be enough data to regenerate any or all of the intermediate derivative data with updated information. This source and intermediate derivative data should be organized under the SRCDATA folder/directory according to the guidelines set forth in Attachments 1 & 2 of the RFP. An empty directory tree structure was provided to facilitate the organization of the project data. The empty directory tree structure is available for download in zip format at http://www.twdb.state.tx.us/gam/resources/gam_tree.zip.

It is also required that all final model parameter and variable/stress data be delivered in a database format that can easily be referenced to each and every model grid cell. In other words, there should be enough cell-referenced data to regenerate all or update any individual cell value of the required MODFLOW or PMWIN input files. The file format of these databases may be in Excel 97, Access 97, or in an ESRI GIS format compatible with ArcView 3.2 or ArcInfo 7.21. Each sheet, table, or coverage should be attributed with the appropriate model grid cell-reference information as set forth in Attachments 1 & 2 of the RFP. These data sets should be organized under the GRDDATA folder directory and with in the appropriate sub-folders/directories. The GRDDATA OUTPUT folder and its sub-folders/directories may be omitted or left empty.

Finally, the actual MODFLOW 96 and PMWIN 5.0 formatted files for both INPUT and OUTPUT must be organized as set forth in Attachments 1 & 2 of the RFP. Separate folders/directories must be used for 1) the calibrated steady-state model files; 2) the calibrated transient model files; 3) the verification transient model files; 4) and each of the decadal transient predictive model simulation run files.

All required data, model inputs and outputs, and GIS files have been provided as requested. Some specific comments are provided below, but each item is not addressed individually.

Review Summary:

The data provided by the OGLL_s contractor is mostly incomplete but somewhat unorganized. Many of the geographic features in the draft report are not included in the data CDs such as roads, cities, counties, streams, reservoirs, playas, target calibration wells, regional geologic structures, Cretaceous extent, surficial geology, soil types, topography, population density, groundwater conservation districts, lines of geologic cross-section(s), landuse (original), various water-use pumping maps, ibounds, specific yield, recharge maps, top of aquifer, thickness of Ogallala sediments, thickness of Cretaceous sediments, etc. More information on source and derivative data used to estimate recharge and return flows is needed.

The contractor must follow the requirements as set forth in Attachments 1 & 2 of the RFP. It is therefore required that the contractor resubmit the project data after reading and understanding Attachments 1 & 2 of the RFP. Furthermore, all GIS data appears to be correct NAD83 Datum but listed as NAD27 datum within the metadata. Finally, all Access databases may be in wrong version since reviewer was unable to open any of them in Access 97. All Access databases must be in Access 97 format.

DRIVE:\OGLL_s\grddata\input\hydraul
The shape coverage is not referenced to row, column, and/or cell_id. This coverage belongs under srcdata folder. The metadata file is incomplete and requires Data_Abstract, Attributes, Attribute_Descriptions, and Attributes_Domain.

Metadata file was expanded and the files were moved to the OGLL_s/scrdata/subhyd folder.

Model Cells folder contains accurate information for this area.
DRIVE:\OGLL_s\grddata\input\ibnd
NO DATA FOUND – model cell referenced ibound data should go here.
DRIVE:\OGLL_s\grddata\input\stress\ststate\drns
NO DATA FOUND – model cell referenced drain package parameters should go here.
DRIVE:\OGLL_s\grddata\input\stress\ststate\evt
NO DATA FOUND – model cell referenced ET package parameters should go here.
DRIVE:\OGLL_s\grddata\input\stress\ststate\rech
NO DATA FOUND – model cell referenced recharge package parameters should go here.
DRIVE:\OGLL_s\grddata\input\stress\ststate\res
NO DATA FOUND – model cell referenced reservoir package parameters should go here if applicable.
DRIVE:\OGLL_s\grddata\input\stress\ststate\strm
NO DATA FOUND – model cell referenced streamflow-routing package parameters should go here if applicable.
DRIVE:\OGLL_s\grddata\input\stress\ststate\well
NO DATA FOUND – model cell referenced well package data should go here.
DRIVE:\OGLL_s\grddata\input\stress\trans\drns
NO DATA FOUND – model cell drain package parameters should go here.
DRIVE:\OGLL_s\grddata\input\stress\trans\evt
NO DATA FOUND – model cell referenced ET package parameters should go here.
DRIVE:\OGLL_s\grddata\input\stress\trans\rech
NO DATA FOUND – model cell referenced recharge package parameters should go here.
DRIVE:\OGLL_s\grddata\input\stress\trans\res
NO DATA FOUND – model cell referenced reservoir package parameters should go here if applicable.
DRIVE:\OGLL_s\grddata\input\stress\trans\strm
NO DATA FOUND – model cell referenced streamflow-routing package parameters should go here if applicable.
DRIVE:\OGLL_s\grddata\input\stress\trans\well
NO DATA FOUND – model cell referenced well package data should go here.
DRIVE:\OGLL_s\grddata\input\struct
NO DATA FOUND – model cell referenced structure data such as tops and bottoms of each model layer should go here.
DRIVE:\OGLL_s\modflow\modfl_96\input\ststate
These files are acceptable.
DRIVE:\OGLL_s\modflow\modfl_96\input\trans
These files are acceptable.
DRIVE:\OGLL_s\modflow\pmwin_50\input\ststate
NO DATA FOUND
DRIVE:\OGLL_s\modflow\pmwin_50\input\trans
Borehole files for calibration not found. These files must be included under this folder. Remainder of files acceptable.
DRIVE:\OGLL_s\modflow\pmwin_50\refdxf
OK … contains county, model bndy, and rivers.

DRIVE:\OGLL_s\scrdata\bndy
Census 2000 data missing for New Mexico are of model. The metadata for census does not match with coverage (some fields have no values) and reference is made to landuse/landcover relation to census tract polygons in metadata but no such relation exists in coverage. Also missing population density.

Census 2000 date from New Mexico was not used as approved by the TWDB and therefore is not present as a coverage. Metadata file has been updated. The population density is included in these files and is indicated as such. The tx_censusblocks_2000.shp file has an attribute field derived by DBS&A described in the metadata. The two 1990 files have the pop_90_sqmile filed which was already present in the source data.

Model grid and study area coverages appear to be acceptable.

Need to include basin and county boundary coverages as well as roads, groundwater conservation districts, and city boundaries.

DRIVE:\OGLL_s\scrdata\clim
Contoured precipitation coverage OK but also require the source point data used to interpolate contour coverage.

DRIVE:\OGLL_s\scrdata\cnsv
The irrigated shape file is not the same as described by metadata. The metadata must be updated to fit manipulated irrigated coverage and correct coverage for metadata file should be added. Landuse coverage has also been manipulated from its original form and requires original landuse data as well as manipulated coverage provided. Grid referenced recharge information is in wrong directory.

DRIVE:\OGLL_s\scrdata\geol
Insufficient or no metadata for the point and polygon sand fraction coverages. Remainder of lithologic data acceptable.
No coverages of regional geologic structures, Cretaceous extent, surficial geology? No cross-sections used in study?

The maps of regional geological structures and surficial geology included in the report (Figures 9 and 17), the cross sections presented in Figures 11 and 12, and the Cretaceous subcrop map (Figure 13) were prepared as graphics files for the purpose of conveying required information in the report. These information were not needed as GIS coverages for the purposes of model construction or analysis.

DRIVE:\OGLL_s\scrdata\geom
NO DATA FOUND – DEMs, physiography, and any other geomorphologic data should go here

DEMs were moved to this folder and physiography was added here.

DRIVE:\OGLL_s\scrdata\geop
NO DATA FOUND – Landsat data should go here along with any other geophysical data.

Landsat data was moved to this folder.

DRIVE:\OGLL_s\scrdata\soil
The coverage has no soil attributes. Instead the coverage is an intermediate derivative coverage for recharge and has only recharge attributes without the actual soils source data. Greater detail is needed for the processing of the recharge coverage that is provided within the readme or metadata file.
No coverage of soils data?

Recharge metadata description was expanded and STATSGO data was added to this folder.

DRIVE:\OGLL_s\scrdata\subhyd
The metadata implies that several sources were used to develop the aquifer base yet only the resultant contours are provided in the coverage. The point source data must be provided as well as interpreted data for the aquifer base. Top of aquifer must be provided or referenced to another directory (ie. DEM location) No coverage of aquifer thickness or saturated thickness?

The digitized files that were used to create the aquifer base were added to a subfolder called aquifer_base_source and the metadata was updated to note this. A reference file is provided here noting that the DEM was used as the top of aquifer and that it can be found in the OGLL_s\scrdata\geom directory.

Hydraulic data is acceptable.

Water level data is acceptable but needs readme/metadata file.

Water level shapefile metadata files exist as: water_level_1990.txt, water_level_2000.txt and water_level_pre_devt.txt. The ogll_s_Waterlevels.MDB file has an associated .txt file as well.

Need source and intermediate derivative coverages used to spatially distribute pumpage data.

Need coverage of specific yield and porosity if available.

Not available. Specific yield based on hydraulic conductivity zones as used in the model.

Need point coverage of calibration target boreholes and hydrographs.
DRIVE:\OGLL_s\scrdata\surhyd
The only coverage is for springs. The metadata references associations to landuse but none was found in the attribute table. Further explanation is needed regarding how data was transformed into GAM coordinates. Missing coverage data for streams, reservoirs, and playas.
DRIVE:\OGLL_s\scrdata\tran
NO DATA FOUND – no roads or transportation features submitted in report?

DRAFT REPORT – OGALLALA SOUTH – EDITORIAL COMMENTS

Page ii: Please list Appendices in Table of Contents.

Edit made.

Page 19, Figure 15 caption: Ogallala is misspelled.

Edit made.

Page 21, Figure 16 caption: Ogallala is misspelled.

Edit made.

Page 91, 1st paragraph, last line: "….for 1980 are similar to those …." ("are" is missing).

Edit made.

Page 118, last 2 paragraphs: Suggest moving sentence "In addition …… by Amosson and others (Appendix B)" to the beginning of the next paragraph.

Not changed.

Page A-6, top of page: "preferential flow", "pre" is missing.

Edit made.

Page A-10, Figure 6 caption: The last sentence is incomplete.

Edit made.

Page B-8, Table 2: The numbers in the top two rows are not centered.

Edit made.

Page B-16, Figure 5: Nothing is plotted in this figure?

Figure corrected.

It is difficult to differentiate the color scale on some figures (for example, the blue scale for the ranges of 200 to 350 feet on Figure 58). It would be most helpful to the end users if distinct color scales would be used. (external comment)

Color figures were edited and tested for black and white photocopy readability.