Appendix B

Public Water Supply Sector

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

B.1 Public water supply model development

The development of the water use equation for preparing future water withdrawals represented a significant challenge because of the aggregate nature of the data and the limited number of observations on historical water withdrawals. The total number of available cross-sectional and time series observations was 205 (i.e., 41 study areas times 5 time periods). The procedure for estimating the predictive water-use equations consisted of three steps: (1) derivation of a "structural model", (2) compensating for fixed effects of study sites, and (3) examination of outliers on the estimated model coefficients. Each of these steps is described and illustrated with tables and figures below.

B.1.1 Structural model

A preliminary analysis of the data revealed that population served by public water supply systems in the study area explains 97 percent of the variability in total public-supply withdrawals. Therefore, population served was used to express the dependent variable as average public-supply water withdrawals (and purchases) per capita per day for each study area and data year. If the per capita rate of water withdrawals in each study area can be predicted with sufficient accuracy, then total public supply withdrawals can be estimated by multiplying the per capita use by population served, where the latter represents a driver of public-supply demands. One advantage of modeling the per capita use is that by expressing total withdrawals in per capita terms, the dependent variable is "normalized" across study sites and the heterogeneity associated with total withdrawals among the supply systems is reduced.

The first step was to identify the relevant explanatory variables, which would explain the variability of per capita withdrawals across study sites and time periods. These variables were selected based on information from previous studies of water demand. Several combinations of explanatory variables were examined prior to selecting the best "structural" model which explained the variability of historical water quantities in the data in terms of known determinants of water demand. The criteria for developing a good forecasting model are somewhat different from criteria in typical econometric applications where researcher wishes to know which variables are significant. A useful forecasting model requires not only an appropriate model specification but also accurate estimates of the regression coefficient (or elasticity) for each of the explanatory variables.

Table B.1 shows the estimated log-liner regression equation of the structural model. The equation includes six relevant explanatory variables. The expected signs (positive or negative) and magnitudes of the regression coefficients in the structural model are based on economic theory

Table B.1: Structural log-linear model of per capita water demand in public water supply sector (ln GPCD).

Variables	Estimated coefficient	t Ratio	Probability >|t|
Structural Model			
Intercept	2.3339	0.30	0.7624
Max. summer temperature (ln)	0.8730	0.51	0.6085
Summer precipitation (ln)	0.0458	0.39	0.6936
Employment-population ratio	0.3057	1.71	0.0897
Marginal price of water (ln)	-0.3218	-4.55	<.0001
Median household income (ln)	-0.3457	-2.93	0.0038
Conservation trend	0.0015	0.33	0.7401
N = 205, R^2= 0.22, Mean Y = 4.74, Root MSE = 0.31			

and on the underlying physical relationships as well as on the results of the previous studies of aggregate water demand in public water systems. The expected signs are positive for temperature and income and negative for precipitation and price of water. Expectations about the sign of the other two other variables are: positive for employment-to-population ratio and negative for time/conservation trend. However, the prior knowledge about the magnitude of the coefficients of these two variables is limited.

The results in Table B.1 show that three of the six regression coefficients are not statistically significant. Median household income, employment-population ratio, and marginal price of water variables have statistically significant coefficients at 10 percent level of significance. Also, the coefficients of the summer precipitation and the conservation trend variables are positive, which is contrary to the expected sign.

The low significance of the three variables is likely a result of the small data sets (n = 205) and possible data errors in some of the observations on the dependent and independent variables. Under such conditions it is a challenge to derive a water-demand equation which meets the requirements of a good model for deriving future water demand. This is the main reason why alternative model specifications must be considered and each data point needs to be examined in some detail.

B.1.2 Model with Year 2005 binary

One concern regarding the data was that the year 2005 was a drought year (with a moderate drought in terms of precipitation deficits) and that its inclusion in the data could bias the estimated regres-

Table B.2: Re-estimated log-linear model of per capita water demand with Year 2005 binary (ln GPCD).

Variables	Estimated coefficient	t Ratio	Probability >|t|
Structural Model			
Intercept	-3.9862	-0.75	0.4550
Max. summer temperature (ln)	1.7903	1.53	0.1289
Summer precipitation (ln)	-0.1047	-1.56	0.1206
Employment-population ratio	0.6562	5.54	<.0001
Marginal price of water (ln)	-0.2050	-3.39	0.0009
Median household income (ln)	0.3282	3.07	0.0025
Conservation trend	-0.0028	-1.07	0.2861
Year 2005 binary	-0.0756	-1.58	0.1170
N = 205, R^2= 0.23, Mean Y = 4.74, Root MSE = 0.30			

sion coefficients of the structural variables. In order to determine if this was the case a time period binary variable which designates the year 2005 was added to the extended model (from Table B.1) and the model was re-estimated. The resultant regression equation is shown in Table B.2 below.

The results in Table B.2 show that the coefficient of the binary time period variable (Year 2005 binary) is not significant at the 10 percent level of significance. The addition of the 2005 binary increased the coefficients of temperature and changed the sign of the precipitation variable. Also the level of significance of the temperature and precipitation variables have increased although the coefficients of the temperature, precipitation, and conservation trend variables are not significant at the 10 percent level. Because of the lack of statistical significance of the four regression coefficients the next step in model building was undertaken.

B.1.3 Model with fixed effects of study areas

The next step in model development was to extend the model from Table B.2 by including the binary variables designating individual study areas. A regression of the key structural variables along with the study area binary variables to compete for a significant share of the remaining model variance was estimated. This was accomplished by using a stepwise regression procedure through which binary variables are added to the structural model to account for each study area. The binary study area variables with statistically significant regression coefficients were kept in the model. This extended, fully-specified model is presented in Table B.4 below. In addition to the six structural model variables and the Year 2005 binary, it includes 26 binary variables which designate the study areas. All but 2 of the 26 system bianary variables have regression coefficients which are statistically significant. These statistically significant coefficients can be considered as representing site specific “intercept adjusters” because they increase or decrease the main intercept of the regression equation.

The structural part of the model in Table B.4 includes statistically significant regression coefficients for three of the six variables and the Year 2005 binary. Because of the lack of statistical significance of the three regression coefficients the next step in model building was undertaken.

B.1.4 Effects of outliers on model coefficients

The model shown in Table B.4 was examined for the effects of possible outliers on the magnitudes and statistical significance of the estimated coefficients. A special procedure was used to examine the effects of outliers on the estimated model without removing any suspected observation from the data or changing the observations in the original data by using a statistical “smoothing” procedure, or other methods. Accordingly, each of the 205 observations in the data set was assigned a binary indicator variable (i.e. a spike dummy) which assumes the value of 1 for a given data point and a value of zero elsewhere. For example a binary variable designated as Springfield-2005 assumes the value of 1 for the 2005 data point for Springfield system and zero for all other observations. Similarly, Bloomington-1995 is binary variable which assumes the value of 1 for 1995 in Bloomington and zero elsewhere.

These binary variables are referred to as “outlier variables” and their estimated coefficients would reveal “outlier effects”. The advantage of this procedure is that all observations can be assessed with respect to the prediction surface of any model being estimated. It is important to note that the term “outlier” as used in this analysis or any other analysis is not necessarily a data error. It is only an observation that is far away from the regression surface or the prediction surface in a multivariate model. This distance depends on the model and different outliers are identified for different models. In this sense, these data points can be could be called "model outliers" as opposed to "data outliers."

Using the above procedure, the effects of outliers on the coefficients of the model in Table B.4 are analyzed and are presented in Table B.5 and are graphed in Figures B.1 - B.6. For some variables these effects appear to be minor. Significant shifts on the regression coefficients were obtained for four variables: maximum summer temperature, summer precipitation, median household income, and conservation trend.

Table B.3: Re-estimated log-linear model of per capita water demand with study area binaries (ln GPCD).

Variables	Estimated coefficient	t Ratio	Probability >|t|
Structural model			
Intercept	-1.1056	-0.19	0.8534
Max. summer temperature (ln)	1.1247	0.86	0.3934
Summer precipitation (ln)	-0.0515	-0.69	0.4925
Employment-population ratio	0.6289	4.81	<.0001
Marginal price of water (ln)	-0.2257	-3.33	0.0011
Median household income (ln)	0.3003	2.53	0.0123
Conservation trend	-0.0004	-0.14	0.8857
Year 2005 binary	-0.0945	-1.76	0.0796
System intercepts			
Cass County Rem.	0.2356	2.94	0.0037
Champaign-Urbana	0.1700	2.13	0.0343
Mahomet	-0.4324	-4.79	<.0001
Champaign County Rem.	-0.6201	-7.70	<.0001
Ford County Rem.	0.1229	1.51	0.1342
Lincoln	0.3184	3.79	0.0002
Decatur	0.8335	10.07	<.0001
Forsyth	-0.3232	-2.79	0.0058
Macon County Rem.	-0.3962	-4.72	<.0001
Petersburg	-0.2800	-3.31	0.0011
Menard County Rem.	-0.7185	-8.73	<.0001
Monticello	0.1553	1.87	0.0633
Piatt County Rem.	-0.2889	-3.49	0.0006
East Peoria	-0.1853	-2.25	0.0260
Pekin	0.2514	3.10	0.0023
Tazewell County Rem.	-0.4970	-6.16	<.0001
Danville	0.3797	4.53	<.0001
Vermilion County Rem.	0.4102	5.18	<.0001
N = 205, R^2= 0.80, Mean Y = 4.74, Root MSE = 0.17			

Rem. = remainder of the county served by a PWS not listed as a study area.

Table B.4: Re-estimated log-linear model of per capita water demand with study area binaries (ln GPCD). (continued)

Variables	Estimated coefficient	t Ratio	Probability >|t|
System intercepts			
Goodfield	-0.3738	-4.33	<.0001
Woodford County Rem.	-0.3677	-4.37	<.0001
Beardstown	0.3202	2.66	0.0086
Hudson	-0.2744	-2.52	0.0125
Normal	-0.2334	-2.86	0.0047
Iroquois County Rem.	-0.1702	-2.11	0.0362
McLean County Rem.	-0.1325	-1.61	0.1091
Sangamon County Rem.	-0.3240	-3.89	0.0001
N = 205, R^2= 0.80, Mean Y = 4.74, Root MSE = 0.17			

Rem. = remainder of the county served by a PWS not listed as a study area.

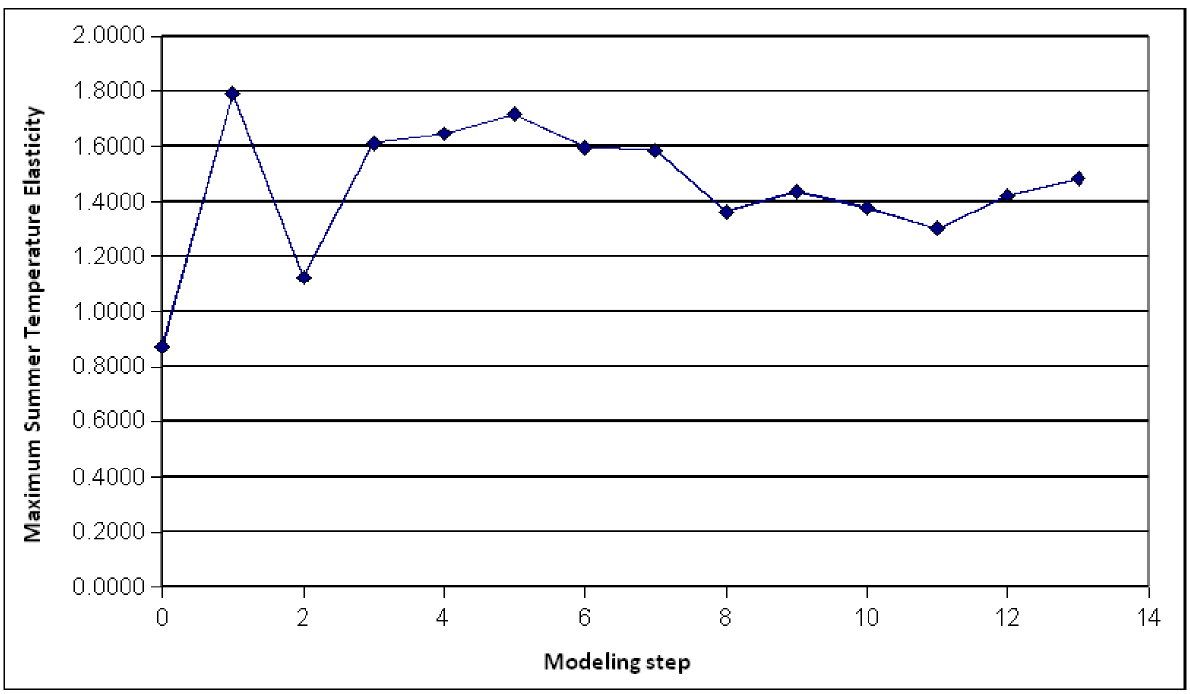

Figure B.1: Effects of binary site variables and spike dummies on estimated elasticity of temperature.

Table B.5: Effects of adding binary study area and spike dummies on estimated regression coefficients of the structural model.

Step	Model specification/ Outliers	Maximum Summer Temperature (ln)	Summer Precipitation (ln)	Employment to Population ratio	Marginal Prince (ln)	Median Household Income (ln)	Conservation Trend	Year 2005
0	Structural model only	0.8730	0.0458	0.3057	-0.3218	-0.3457	0.0015	–
1	Structural + Year 2005	1.7903	-0.1047	0.6562	-0.2050	0.3282	-0.0028	-0.0756
2	Study area binaries	1.1247	-0.0515	0.6289	-0.2257	0.3003	-0.0004	-0.0945
Spike variables								
3	Mason Co. Rem. 2005	1.6133	-0.0664	0.6579	-0.2276	0.2784	-0.0010	-0.1021
4	Bloomington 2000	1.6455	-0.0695	0.6368	-0.2424	0.2561	-0.0013	-0.0980
5	Decatur 1985	1.7150	-0.0747	0.6397	-0.2397	0.2721	-0.0021	-0.0960
6	Washington 2005	1.5967	-0.0874	0.6089	-0.2465	0.3180	-0.0023	-0.0857
7	Sangamon Co. Rem. 2005	1.5859	-0.0872	0.6049	-0.2446	0.3164	-0.0022	-0.0765
8	Sangamon Co. Rem. 2000	1.3628	-0.0956	0.5962	-0.2442	0.3123	-0.0013	-0.0820
9	DeWitt Co. Rem. 2005	1.4369	-0.0865	0.6060	-0.2403	0.3232	-0.0014	-0.0715
10	Mason City 1990	1.3758	-0.0996	0.6491	-0.2277	0.3308	-0.0015	-0.0726
11	Ford Co. Rem. 1985	1.3005	-0.1169	0.6493	-0.2211	0.3248	-0.0019	-0.0732
12	Piatt Co. Rem. 2000	***1.4222***	***-0.1140***	***0.6381***	***-0.2226***	***0.3244***	***-0.0026***	***-0.0645***
13	Dewitt 2005	1.4810	-0.0993	0.6008	-0.2204	0.3593	-0.0027	-0.0468

Rem. = remainder. Note: Coefficients of the selected model are shown in ***italics***.

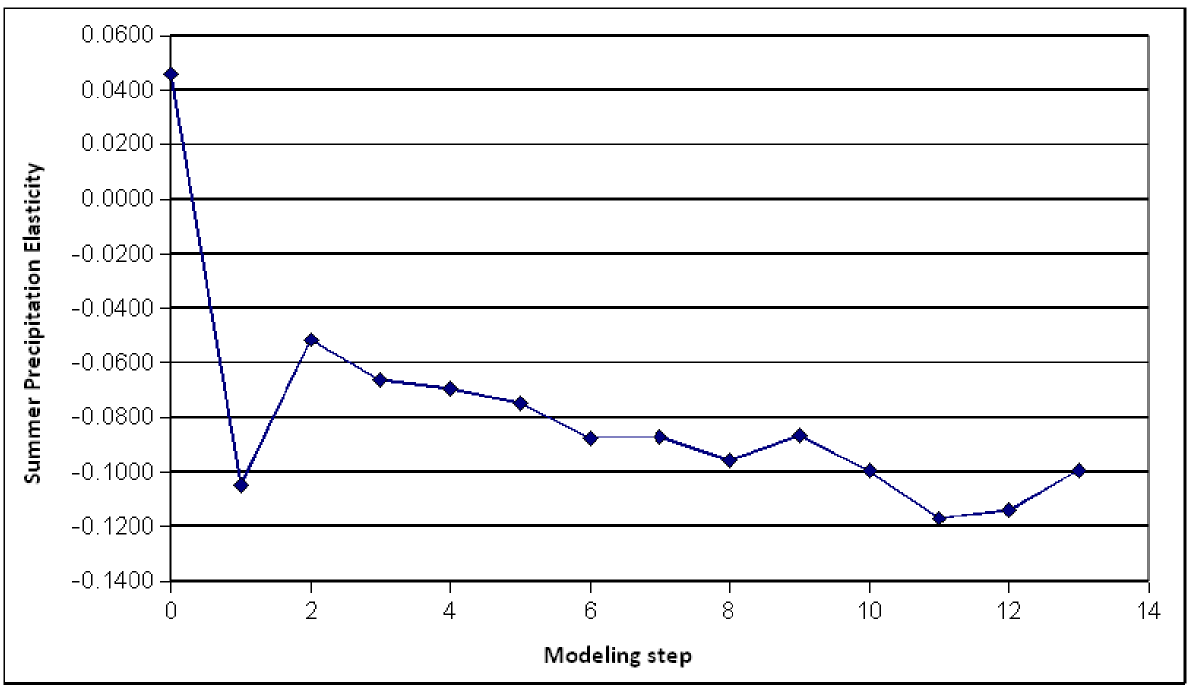

Figure B.2: Effects of binary site variables and spike dummies on estimated elasticity of precipitation.

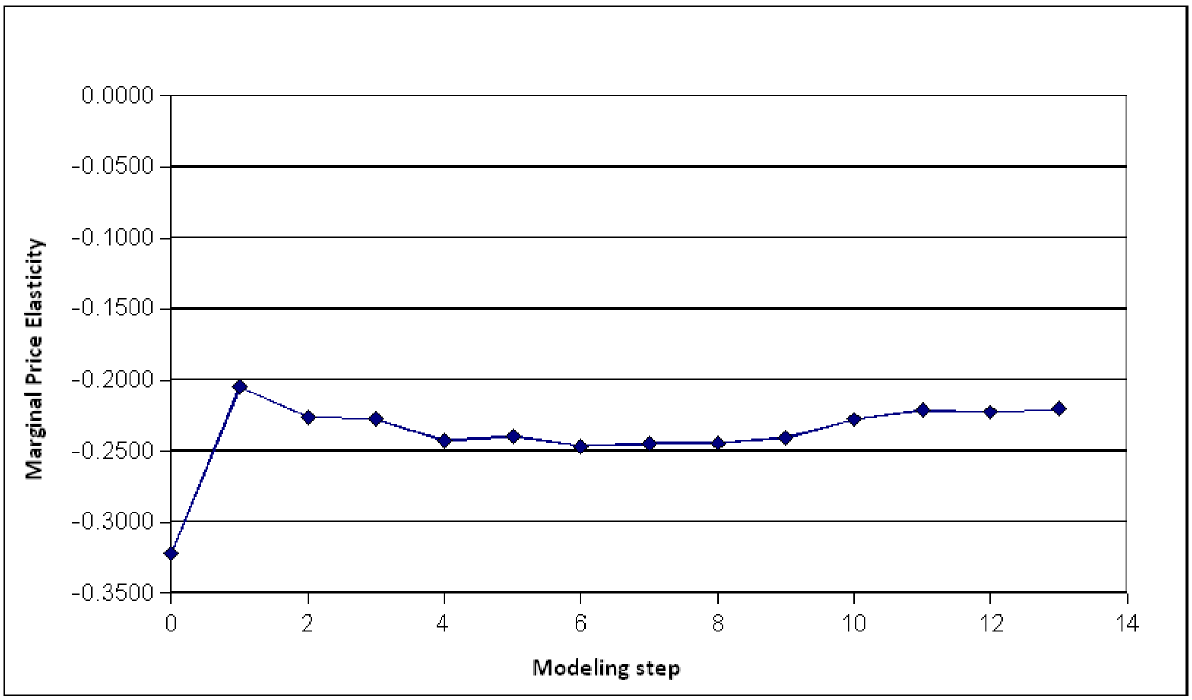

Figure B.3: Effects of binary site variables and spike dummies on estimated elasticity of marginal price.

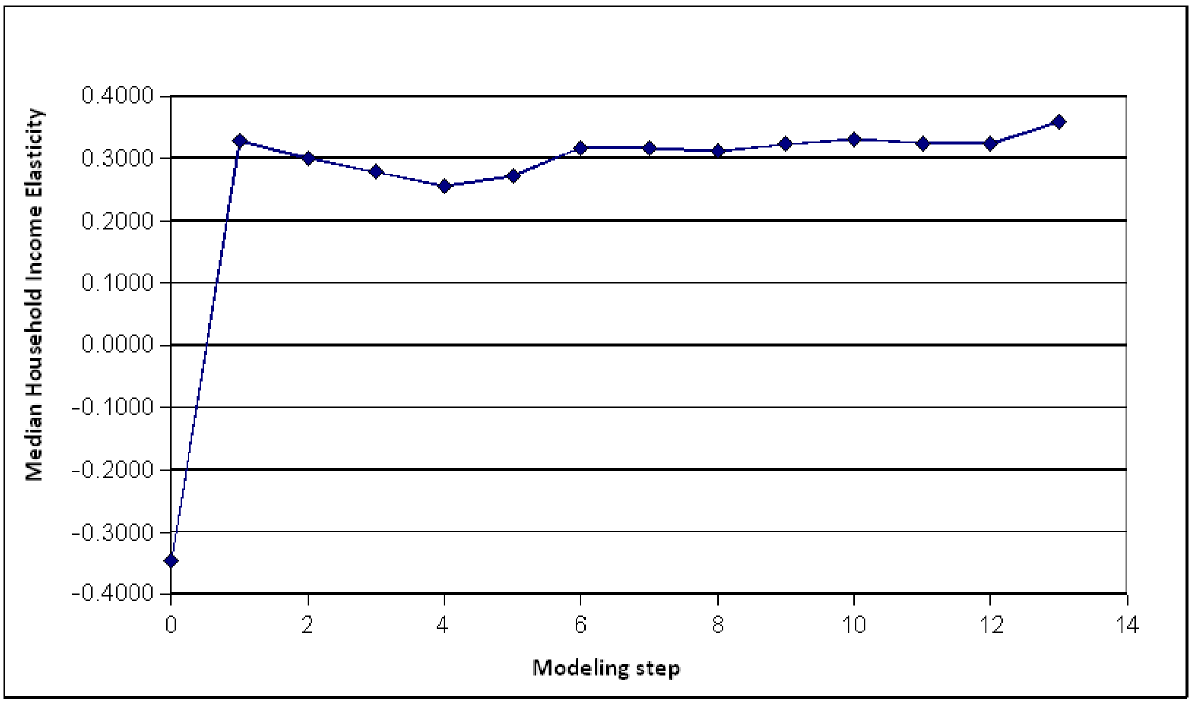

Figure B.4: Effects of binary site variables and spike dummies on estimated elasticity of median household income.

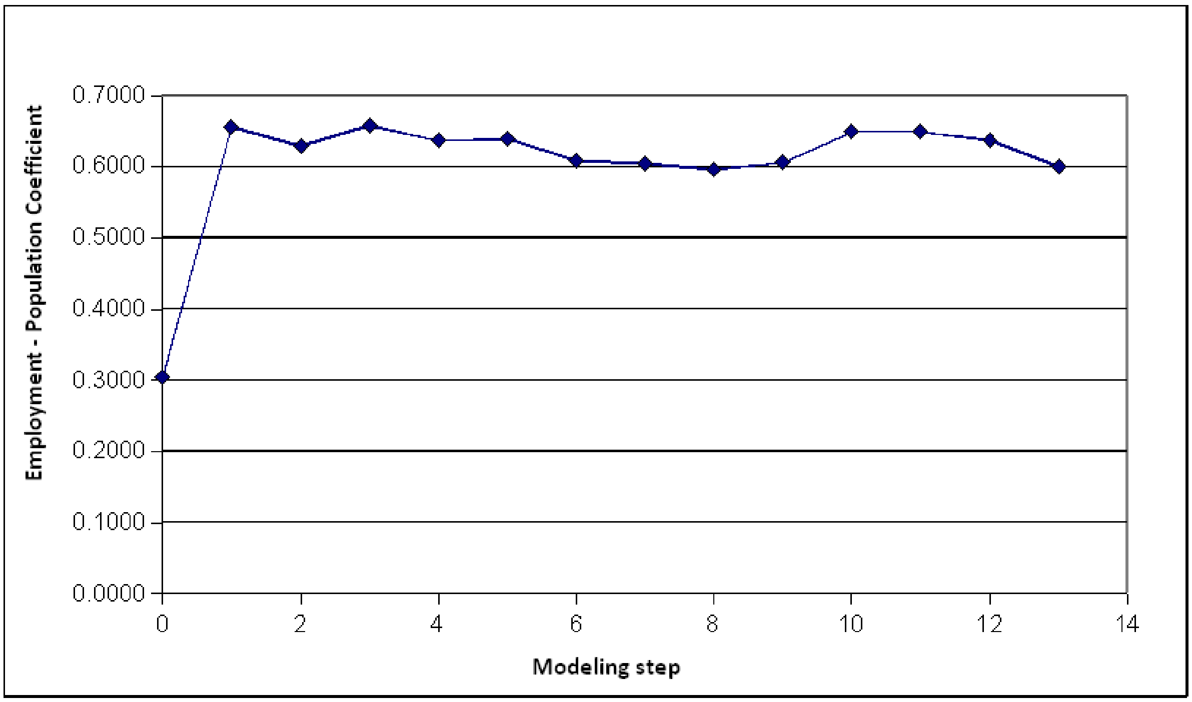

Figure B.5: Effects of binary site variables and spike dummies on estimated coefficient of population to employment ratio.

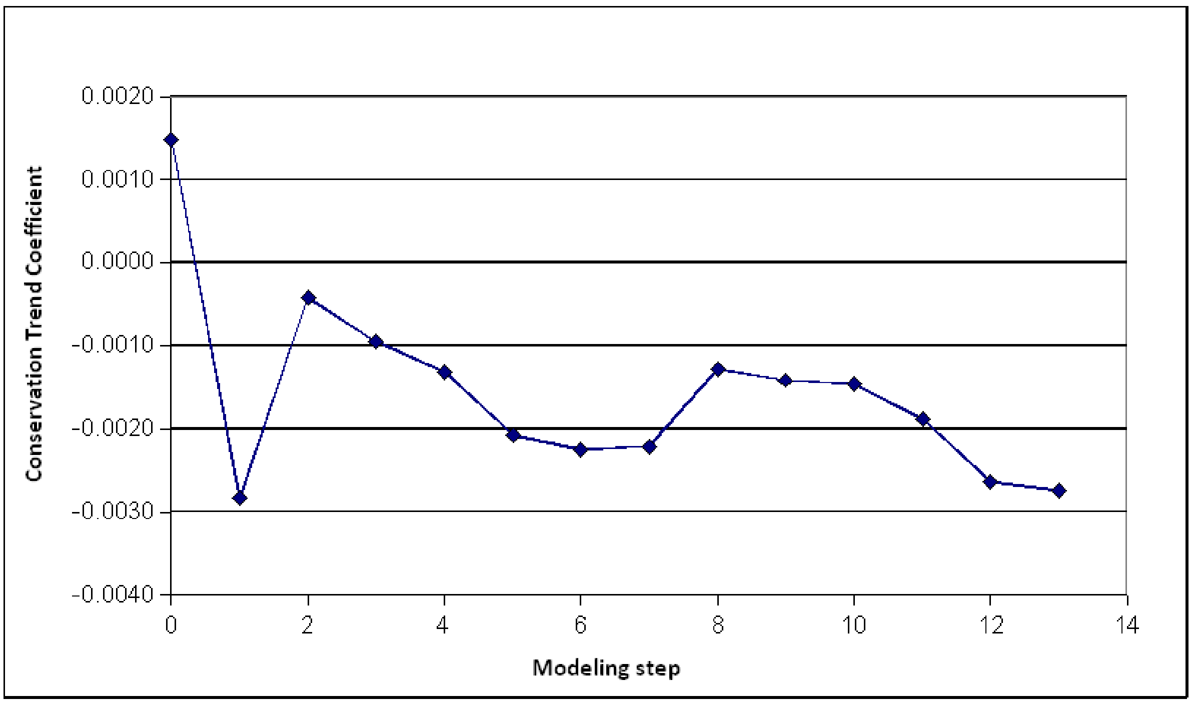

Figure B.6: Effects of binary site variables and spike dummies on estimated coefficient of conservation trend variable.

B.1.5 Final regression model

After examining the effects of model outliers on the estimated regression coefficients of the structural model, 10 binary outlier variables were added to the model from Table B.5, thus removing their effects on the estimated model. The re-estimated regression equation with the 10 outlier variables is shown in Table B.6 below.

Table B.6: Final log-linear model of per capita water demand in public water supply sector (ln GPCD).

Variables	Estimated coefficient	t Ratio	Probability >|t|
Structural model			
Intercept	-2.3058	-0.43	0.6683
Max. summer temperature (ln)	1.4222	1.20	0.2313
Summer precipitation (ln)	-0.1140	-1.67	0.0964
Employment-population ratio	0.6381	5.30	<.0001
Marginal price of water (ln)	-0.2226	-3.64	0.0004
Median household income (ln)	0.3244	2.99	0.0033
Conservation trend	-0.0026	-0.98	0.3284
Year 2005 binary	-0.0645	-1.33	0.1863

Table B.6: Final log-linear model of per capita water demand in public water supply sector (ln GPCD).

Variables	Estimated coefficient	t Ratio	Probability >|t|
System intercepts			
Cass County Rem.	0.2323	3.26	0.0014
Champaign-Urbana	0.1707	2.41	0.0172
Mahomet	-0.4449	-5.48	<.0001
Champaign County Rem.	-0.6218	-8.66	<.0001
Ford County Rem.	0.1819	2.26	0.0255
Lincoln	0.3132	4.18	<.0001
Decatur	0.9007	11.03	<.0001
Forsyth	-0.3502	-3.36	0.0010
Macon County Rem.	-0.4081	-5.45	<.0001
Petersburg	-0.2865	-3.80	0.0002
Menard County Rem.	-0.7343	-9.97	<.0001
Monticello	0.1510	2.03	0.0439
Piatt County Rem.	-0.3826	-4.72	<.0001
East Peoria	-0.1987	-2.70	0.0077
Pekin	0.2430	3.36	0.0010
Tazewell County Rem.	-0.5103	-7.08	<.0001
Danville	0.3806	5.10	<.0001
Vermilion County Rem.	0.4085	5.80	<.0001
Goodfield	-0.3969	-5.11	<.0001
Woodford County Rem.	-0.3894	-5.16	<.0001
Beardstown	0.3222	2.99	0.0033
Hudson	-0.2936	-2.99	0.0032
Normal	-0.2422	-3.33	0.0011
Iroquois County Rem.	-0.1714	-2.39	0.0180
McLean County Rem.	-0.1474	-2.00	0.0470
Sangamon County Rem.	-0.1542	-1.65	0.1001

Table B.6: Final log-linear model of per capita water demand in public water supply sector (ln GPCD).

Variables	Estimated coefficient	t Ratio	Probability >|t|
Spike Binaries			
Mason Co. Rem. 2005	-0.5772	-3.71	0.0003
Bloomington 2000	0.3475	2.25	0.0258
Decatur 1985	-0.3755	-2.21	0.0285
Washington 2005	-0.3597	-2.28	0.0240
Sangamon Co. Rem. 2005	-0.4765	-2.72	0.0073
Sangamon Co. Rem. 2000	-0.4344	-2.49	0.0139
DeWitt Co. Rem. 2005	-0.3094	-2.02	0.0451
Mason City 1990	0.2892	1.85	0.0663
Ford Co. Rem. 1985	-0.3195	-1.87	0.0633
Piatt Co. Rem. 2000	0.4436	2.62	0.0095

N = 205, R^2= 0.848, Mean Y = 4.737, Root MSE = 0.149; MAPE = 14.0%
Model specification tests (statistic and significance): Ramsey power 2 = 0.1595 (0.6901), Ramsey power 3 = 0.0793 (0.9238), Ramsey power 4 = 0.0636 (0.9790)
Heteroscedasticity tests (statistic and significance):
White's test = 158.0 (0.6982), Breusch-Pagan test =36.55 (0.7456)

The results in Table B.6 show that the significance of the regression coefficients has increased to approximately 10 percent level for the weather variables. Model diagnostics tests shown at the bottom of the table indicate that the model is free from model specification errors (all three Ramsey tests have statistics which are not statistically significant).

The two heteroscedasticity tests of the model in Table B.6 relate to the classical assumptions of the regression model that the model error variance is constant, or homogeneous, across all observations. If this assumption is violated, the errors are said to be heteroscedastic. Heteroscedasticity (i.e., non-constant error problem) often arises in the analysis of cross-sectional data. The White test (158.0) is highly insignificant thus accepting the null hypothesis of no heteroscedasticity. Also, the Breusch-Pagan test (36.55) shows an insignificant value indicating the absence of the heteroscedasticity problem.

Finally, the graph of residuals versus predicted values of the dependent variable (Figure B.7 below) does not indicate a problem of non-constant error.

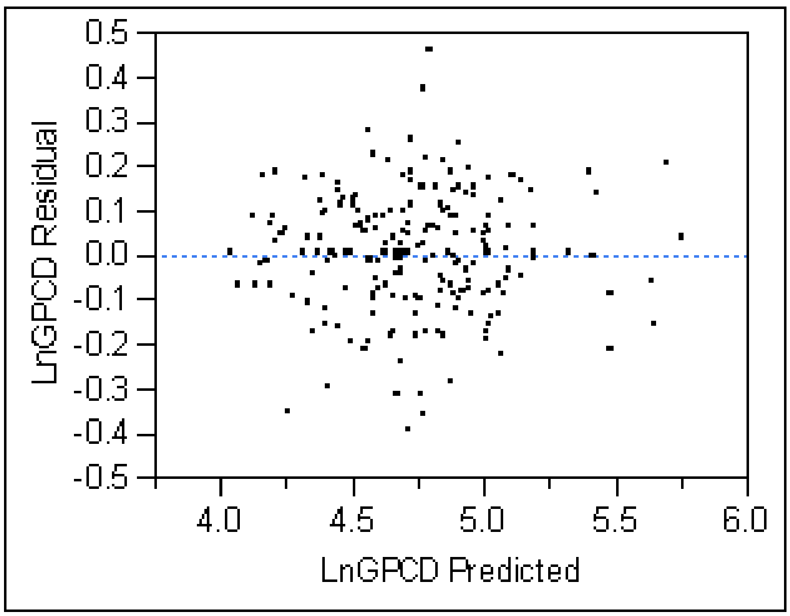

Figure B.7: Residuals plot for the model in Table B.6.

B.1.6 In-sample prediction error

The accuracy of the predictive models shown in Table B.6 was evaluated by the mean absolute percentage error (MAPE) by using the regression equation to estimate the historical values of water use in the data. This procedure is known as "in-sample" predictions.

In a linear model, designating $\hat{Y}_{it}$ to be the predicted value of the dependent variable Y_{it}, the absolute percentage error (APE) is given by:

$$APE_{it} = \left| \frac{\hat{Y}_{it} - Y_{it}}{Y_{it}} \right| x\,100 \tag{B.1}$$

In a log-linear model of the form shown in Table B.6, the APE in the log scale is given by:

$$APE_{it} = \left| \frac{ln\hat{Y}_{it} - lnY_{it}}{lnY_{it}} \right| x\,100 \tag{B.2}$$

Assuming that the errors are normally distributed in a log-linear model it can be shown that the expected value of the dependent variable in the raw (linear) scale is:

$$E\left(Y \mid explanatory\,variables\right) = e^{\sigma_{\varepsilon}^{2}/2}(e^{\ln\,\mathrm{Y}}) \tag{B.3}$$

Thus, in log-linear models, the predicted raw scale value denoted as $\widetilde{Y}$ is given by:

$$\widetilde{Y} = e^{\hat{\sigma}_{\varepsilon}^{2}/2}(e^{\ln\hat{\ }\mathrm{Y}}) \tag{B.4}$$

where:
$\hat{\sigma}_{\varepsilon}^{2}$= the mean square error of the log-linear model; and
$ln\hat{Y}_{it}$ = the predicted value obtained from the log-linear model.
APE in the raw scale is obtained as:

$$APE_{it} = \left| \frac{\widetilde{Y_{it}} - Y_{it}}{Y_{it}} \right| x\,100 \tag{B.5}$$

Finally, the mean absolute percentage error (MAPE) is defined as the average over all observations (*i.e.*, over i and t) of APE_{it}. *i.e.*,

$$MAPE = \frac{\sum_{i}\sum_{t} APE_{it}}{n} \tag{B.6}$$

where:

$n = mT$, *i.e.*, number of cross-sectional observations times the number of time periods in the data.

The regression model from Table B.6 has the MAPE value for in-sample predictions of 14.0 percent. The actual and predicted values of per capita water use in the data are shown in Tables B.7 - B.13 below.

Table B.7: Actual and predicted values of per capita water demand in historical data.

Study Area	Year	Actual GPCD	Predicted GPCD	Difference	Absolute Error (%)
Beardstown	1985	258.0	228.3	-29.6	11.5
(Cass County)	1990	267.2	226.8	-40.4	15.1
	1995	193.4	247.7	54.3	28.1
	2000	223.8	234.3	10.5	4.7
	2005	220.0	218.3	-1.7	0.8
Cass County Rem.	1985	104.0	137.7	33.7	32.4
(Cass County)	1990	143.1	132.0	-11.1	7.7
	1995	130.2	137.8	7.6	5.8
	2000	156.7	141.6	-15.1	9.6
	2005	122.9	159.8	36.9	30.1
Champaign/Urbana	1985	165.3	144.6	-20.7	12.5
(Champaign County)	1990	166.4	141.9	-24.5	14.7
	1995	162.8	158.2	-4.6	2.8
	2000	165.1	158.2	-6.9	4.2
	2005	162.7	162.6	0.0	0.0
Mahomet	1985	89.6	82.2	-7.4	8.3
(Champaign County)	1990	81.4	89.6	8.2	10.1
	1995	75.8	97.1	21.3	28.2
	2000	96.8	94.9	-1.9	2.0
	2005	97.9	96.2	-1.7	1.7
Rantoul	1985	106.8	100.6	-6.2	5.8
(Champaign County)	1990	94.7	104.0	9.3	9.8
	1995	117.1	121.2	4.1	3.5
	2000	119.2	135.6	16.4	13.8
	2005	128.5	137.3	8.8	6.9
Champaign County Rem.	1985	75.2	62.5	-12.7	16.9
(Champaign County)	1990	86.4	65.4	-21.0	24.3
	1995	101.0	69.1	-31.9	31.6
	2000	78.5	73.3	-5.2	6.6
	2005	77.0	74.5	-2.5	3.2

Table B.8: Actual and predicted values of per capita water demand in historical data.

Study Area	Year	Actual GPCD	Predicted GPCD	Difference	Absolute Error (%)
Clinton	1985	118.0	135.1	17.0	14.4
(DeWitt County)	1990	120.0	129.2	9.2	7.6
	1995	133.1	142.5	9.3	7.0
	2000	133.6	142.0	8.5	6.3
	2005	116.5	126.5	10.0	8.5
Village of DeWitt	1985	93.5	100.3	6.8	7.3
(DeWitt County)	1990	121.3	99.4	-21.9	18.1
	1995	107.8	110.8	3.0	2.7
	2000	86.7	108.8	22.0	25.4
	2005	74.4	92.0	17.6	23.7
DeWitt County Rem.	1985	89.9	98.3	8.4	9.3
(DeWitt County)	1990	89.1	99.5	10.3	11.6
	1995	82.0	122.1	40.1	48.9
	2000	95.4	119.7	24.2	25.4
	2005	89.4	91.2	1.8	2.0
Paxton	1985	125.4	113.8	-11.5	9.2
(Ford County)	1990	109.6	111.8	2.3	2.1
	1995	135.4	120.1	-15.2	11.2
	2000	148.5	124.9	-23.5	15.9
	2005	116.6	115.4	-1.1	1.0
Ford County Rem.	1985	118.4	113.1	-5.3	4.4
(Ford County)	1990	130.7	152.9	22.2	16.9
	1995	171.5	162.9	-8.6	5.0
	2000	173.6	170.6	-3.0	1.7
	2005	164.3	183.5	19.2	11.7
Watseka	1985	99.4	111.4	12.0	12.1
(Iroquois County)	1990	105.2	119.2	13.9	13.2
	1995	126.3	124.0	-2.4	1.9
	2000	116.4	116.9	0.5	0.4
	2005	105.8	106.6	0.8	0.8

Table B.9: Actual and predicted values of per capita water demand in historical data.

Study Area	Year	Actual GPCD	Predicted GPCD	Difference	Absolute Error (%)
Iroquois County Rem.	1985	93.5	97.7	4.2	4.5
(Iroquois County)	1990	101.0	97.0	-3.9	3.9
	1995	101.7	111.0	9.3	9.1
	2000	102.7	111.6	8.9	8.6
	2005	99.1	114.7	15.7	15.8
Lincoln	1985	151.5	162.9	11.4	7.5
(Logan County)	1990	158.5	151.9	-6.6	4.2
	1995	128.4	155.8	27.4	21.3
	2000	149.7	156.5	6.8	4.6
	2005	179.2	170.8	-8.3	4.7
Logan County Rem.	1985	102.0	101.4	-0.6	0.6
(Logan County)	1990	96.0	98.4	2.4	2.5
	1995	111.9	112.0	0.1	0.1
	2000	102.3	124.3	22.0	21.5
	2005	103.2	128.4	25.1	24.3
Decatur	1985	187.9	206.9	18.9	10.1
(Macon County)	1990	229.8	291.5	61.7	26.8
	1995	268.2	323.7	55.5	20.7
	2000	295.9	311.2	15.3	5.2
	2005	287.5	286.8	-0.7	0.2
Forsyth	1985	103.8	125.9	22.1	21.3
(Macon County)	1990	121.4	124.9	3.5	2.9
	1995	146.4	116.8	-29.6	20.2
	2000	121.8	141.1	19.3	15.9
	2005	139.3	150.4	11.1	8.0
Macon County Rem.	1985	76.4	92.2	15.8	20.7
(Macon County)	1990	77.3	87.3	9.9	12.8
	1995	86.2	97.7	11.5	13.4
	2000	63.7	89.4	25.8	40.5
	2005	60.8	61.0	0.2	0.4

Table B.10: Actual and predicted values of per capita water demand in historical data.

Study Area	Year	Actual GPCD	Predicted GPCD	Difference	Absolute Error (%)
Mason City	1985	104.4	109.0	4.5	4.3
(Mason County)	1990	130.0	133.8	3.8	2.9
	1995	127.7	107.0	-20.7	16.2
	2000	109.8	106.8	-3.0	2.7
	2005	104.1	115.2	11.2	10.8
Mason County Rem.	1985	107.8	132.6	24.7	23.0
(Mason County)	1990	117.5	117.7	0.1	0.1
	1995	130.6	106.6	-24.1	18.4
	2000	103.3	137.3	34.0	32.9
	2005	78.8	84.5	5.6	7.2
Bloomington	1985	152.2	134.0	-18.2	12.0
(McLean County)	1990	170.9	120.3	-50.6	29.6
	1995	190.6	124.6	-66.1	34.7
	2000	178.6	186.3	7.7	4.3
	2005	157.2	159.1	1.9	1.2
Hudson	1985	65.7	73.2	7.5	11.5
(McLean County)	1990	64.0	66.5	2.5	3.8
	1995	69.3	69.4	0.2	0.3
	2000	73.6	72.7	-0.9	1.2
	2005	78.8	85.6	6.8	8.6
Normal	1985	95.7	99.1	3.4	3.6
(McLean County)	1990	100.3	91.9	-8.4	8.4
	1995	93.6	97.2	3.7	3.9
	2000	99.2	96.3	-3.0	3.0
	2005	85.0	83.9	-1.1	1.3
McLean County Rem.	1985	84.9	107.1	22.2	26.2
(McLean County)	1990	84.3	100.4	16.1	19.1
	1995	96.2	111.6	15.4	16.0
	2000	95.7	113.6	17.9	18.8
	2005	85.6	86.5	0.9	1.1

Table B.11: Actual and predicted values of per capita water demand in historical data.

Study Area	Year	Actual GPCD	Predicted GPCD	Difference	Absolute Error (%)
Petersburg	1985	83.2	84.2	1.0	1.2
(Menard County)	1990	68.1	77.9	9.8	14.4
	1995	83.7	86.8	3.1	3.7
	2000	89.2	78.6	-10.6	11.9
	2005	74.3	87.5	13.2	17.7
Menard County Rem.	1985	95.0	58.7	-36.3	38.2
(Menard County)	1990	68.3	58.0	-10.3	15.1
	1995	70.6	68.0	-2.6	3.7
	2000	68.2	69.4	1.2	1.8
	2005	50.4	49.3	-1.2	2.3
Monticello	1985	158.0	152.5	-5.4	3.4
(Piatt County)	1990	135.2	150.8	15.6	11.5
	1995	150.4	147.9	-2.6	1.7
	2000	128.5	145.4	16.9	13.1
	2005	142.2	147.9	5.8	4.1
Piatt County Rem.	1985	81.2	83.6	2.4	3.0
(Piatt County)	1990	81.5	88.1	6.6	8.0
	1995	83.0	95.1	12.1	14.5
	2000	74.8	158.3	83.5	111.7
	2005	74.0	73.1	-0.9	1.2
Sangamon County Rem.	1985	166.8	119.0	-47.8	28.6
(Sangamon County)	1990	147.1	114.4	-32.7	22.2
	1995	123.2	130.5	7.2	5.9
	2000	99.2	81.9	-17.3	17.4
	2005	75.3	83.8	8.4	11.2
Springfield	1985	130.8	133.8	3.0	2.3
(Sangamon County)	1990	147.7	126.5	-21.2	14.3
	1995	148.2	143.6	-4.6	3.1
	2000	139.8	138.8	-1.0	0.7
	2005	149.1	148.9	-0.2	0.1

Table B.12: Actual and predicted values of per capita water demand in historical data.

Study Area	Year	Actual GPCD	Predicted GPCD	Difference	Absolute Error (%)
Creve Coeur	1985	84.1	108.9	24.8	29.5
(Tazewell County)	1990	109.2	107.5	-1.7	1.6
	1995	132.5	129.4	-3.1	2.4
	2000	140.7	131.5	-9.2	6.5
	2005	156.8	157.1	0.2	0.2
East Peoria	1985	100.8	101.8	1.0	1.0
(Tazewell County)	1990	92.7	102.0	9.3	10.0
	1995	104.2	119.5	15.3	14.7
	2000	114.6	109.1	-5.5	4.8
	2005	120.6	123.8	3.2	2.7
Morton	1985	139.8	129.0	-10.8	7.7
(Tazewell County)	1990	144.5	135.7	-8.8	6.1
	1995	164.9	157.1	-7.8	4.7
	2000	146.1	167.6	21.5	14.8
	2005	162.5	192.7	30.2	18.6
Pekin	1985	123.1	151.0	27.9	22.6
(Tazewell County)	1990	130.5	142.2	11.6	8.9
	1995	146.3	162.4	16.1	11.0
	2000	196.5	172.4	-24.1	12.2
	2005	201.7	203.1	1.4	0.7
Tazewell County Rem.	1985	93.0	64.4	-28.6	30.8
(Tazewell County)	1990	104.8	72.4	-32.3	30.9
	1995	88.6	85.4	-3.2	3.6
	2000	82.1	84.3	2.2	2.7
	2005	76.5	75.4	-1.0	1.4
Washington	1985	132.2	114.0	-18.2	13.8
(Tazewell County)	1990	102.7	109.3	6.6	6.4
	1995	110.4	128.4	18.1	16.4
	2000	85.6	122.7	37.1	43.4
	2005	88.1	99.2	11.2	12.7

Table B.13: Actual and predicted values of per capita water demand in historical data.

Study Area	Year	Actual GPCD	Predicted GPCD	Difference	Absolute Error (%)
Danville	1985	126.4	159.8	33.4	26.4
(Vermilion County)	1990	166.9	146.6	-20.3	12.2
	1995	153.9	152.8	-1.1	0.7
	2000	151.8	156.5	4.6	3.1
	2005	151.6	151.9	0.3	0.2
Hoopeston	1985	136.8	119.2	-17.5	12.8
(Vermilion County)	1990	114.5	111.3	-3.2	2.8
	1995	135.8	116.8	-19.0	14.0
	2000	77.7	111.5	33.9	43.6
	2005	94.2	107.6	13.5	14.3
Vermilion County Rem.	1985	83.1	182.0	98.8	118.9
(Vermilion County)	1990	86.2	159.8	73.5	85.3
	1995	94.6	182.0	87.4	92.4
	2000	58.2	187.7	129.5	222.6
	2005	57.8	55.8	-2.0	3.5
Goodfield	1985	83.0	80.9	-2.0	2.5
(Woodford County)	1990	88.1	82.1	-6.0	6.8
	1995	73.2	91.9	18.7	25.6
	2000	78.0	99.5	21.5	27.5
	2005	126.1	108.0	-18.1	14.3
Woodford County Rem.	1985	69.1	79.0	9.9	14.4
(Woodford County)	1990	71.9	83.2	11.3	15.7
	1995	99.4	89.5	-9.9	9.9
	2000	102.5	94.6	-7.9	7.7
	2005	96.3	93.9	-2.3	2.4

B.2 Public supply data tables

Table B.15: Normal maximum summer temperature and summer precipitation values used in each study area in East-Central Illinois.

Study Area	County	Normal maximum temperature ($^{\circ}F$)	Normal precipitation (in)
Beardstown	Cass	82.48	17.90
Cass County Rem.	Cass	82.48	17.90
Champaign/Urbana	Champaign	80.44	21.27
Mahomet	Champaign	81.29	20.53
Rantoul	Champaign	82.14	19.78
Champaign County Rem.	Champaign	81.29	20.53
Clinton	DeWitt	81.00	19.37
DeWitt	DeWitt	81.00	19.37
DeWitt County Rem.	DeWitt	81.00	19.37
Paxton	Ford	79.76	18.06
Ford County Rem.	Ford	80.33	18.33
Watseka	Iroquois	79.48	19.94
Iroquois County Rem.	Iroquois	79.48	19.94
Lincoln	Logan	81.00	19.87
Logan County Rem.	Logan	81.00	19.50
Decatur	Macon	82.82	20.03
Forsyth	Macon	82.82	20.03
Macon County Rem.	Macon	82.82	20.03
Mason City	Mason	82.42	18.59
Mason County Rem.	Mason	82.48	18.59
Bloomington	McLean	80.65	18.53
Hudson	McLean	80.65	18.53
Normal	McLean	80.36	19.13
McLean County Rem.	McLean	80.65	18.53

in = inches. Rem. = remainder. Source: Illinois State Climatologist, Illinois State Water Survey.

Normal weather data is average from 1971-2000.

Summer is May 1 through September 30.

Table B.15: Normal maximum summer temperature and summer precipitation values used in each study area in East-Central Illinois.

Study Area	County	Normal maximum temperature ($^{\circ}F$)	Normal precipitation (in)
Petersburg	Menard	82.48	19.64
Menard County Rem.	Menard	82.48	19.64
Monticello	Piatt	81.29	19.89
Piatt County Rem.	Piatt	81.29	19.89
Springfield	Sangamon	81.44	17.60
Sangamon County Rem.	Sangamon	81.44	17.60
Creve Coeur	Tazewell	80.65	18.77
East Peoria	Tazewell	80.65	18.77
Morton	Tazewell	80.65	18.77
Pekin	Tazewell	80.65	18.77
Washington	Tazewell	81.01	19.49
Tazewell County Rem.	Tazewell	80.65	18.77
Danville	Vermilion	81.48	20.53
Hoopeston	Vermilion	80.54	18.82
Vermilion County Rem.	Vermilion	81.01	19.49
Goodfield	Woodford	80.65	18.42
Woodford County Rem.	Woodford	80.65	18.42

in = inches. Rem. = remainder. Source: Illinois State Climatologist, Illinois State Water Survey.

Normal weather data is average from 1971-2000.

Summer is May 1 through September 30.

Table B.14: Weather stations in East-Central Illinois.

County	Station name / location	Station no.
Cass	Virginia	118870
Cass	Beardstown	110492
Champaign	Urbana	118740
Champaign	Rantoul	117150
DeWitt	Clinton 1 SSW	111743
Ford	Gibson City 1 E	113413
Ford	Paxton	116663
Ford	Piper City	116819
Iroquois	Watseka 2 NW	119021
Logan	Lincoln	115079
Logan	Mount Pulaski	115927
Macon	Decatur	112193
Mason	Havana 4 NNE	113940
Mason	Mason City 1 W	115413
McLean	Normal	116200
McLean	Bloomington Waterworks	110761
McLean	Chenoa	111475
Menard	Petersburg 2 SW	116765
Menard	Petersburg 3 SSW	116760
Piatt	Monticello No 2.	115792
Sangamon	Springfield WSO AP	118179
Tazewell	Mackinaw 1 N	115272
Vermilion	Danville	112140
Vermilion	Danville Sewage Plant	112145
Vermilion	Hoopeston	114198
Vermilion	Sidell 5 NW	117952
Peoria	Peoria GTR Peoria Regional AP	116711
Woodford	Minonk	115712
Morgan	Jacksonville 2E	114442

Source: Illinois State Climatologist, Illinois State Water Survey, 2007.

Table B.16: Historical values of dependent and independent variables for public water supply.

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Beardstown*	1985	1.51	258.0	79.76	17.72	0.552	$0.00	$34,860	5,837
(Cass County)	1990	1.44	267.2	80.32	26.79	0.617	$0.00	$34,167	5,380
	1995	1.04	193.4	80.52	20.17	0.715	$0.00	$33,253	5,380
	2000	1.26	223.8	81.78	23.48	0.628	$0.00	$32,910	5,614
	2005	1.30	220.0	84.80	11.49	0.693	$0.00	$30,500	5,908
Cass County Rem.	1985	0.31	104.0	79.76	17.72	0.396	$3.37	$36,157	2,951
(Cass County)	1990	0.42	143.1	80.32	26.79	0.406	$3.37	$35,427	2,934
	1995	0.39	130.2	80.52	20.17	0.388	$3.37	$37,725	2,994
	2000	0.46	156.7	81.78	23.48	0.396	$3.37	$39,852	2,946
	2005	0.36	122.9	84.80	11.49	0.406	$3.37	$37,819	2,960
Champaign/Urbana	1985	16.66	165.3	79.66	19.02	0.480	$2.16	$35,515	100,777
(Champaign County)	1990	17.29	166.4	79.24	24.57	0.516	$2.18	$35,701	103,902
	1995	18.87	162.8	80.98	19.89	0.526	$1.95	$39,468	115,888
	2000	20.46	165.1	80.18	20.98	0.539	$2.13	$42,721	123,953
	2005	23.24	162.7	83.30	15.61	0.522	$2.59	$39,604	142,873
Mahomet	1985	0.23	89.6	80.20	19.71	0.457	$2.99	$50,319	2,548
(Champaign County)	1990	0.25	81.4	79.29	24.04	0.511	$2.25	$58,568	3,115
	1995	0.29	75.8	81.82	18.60	0.486	$2.17	$61,925	3,837
	2000	0.47	96.8	81.16	18.27	0.446	$2.22	$65,104	4,904
	2005	0.54	97.9	83.86	17.59	0.469	$2.56	$59,600	5,520
Rantoul*	1985	1.38	106.8	80.20	20.39	0.224	$2.99	$36,913	12,898
(Champaign County)	1990	1.13	94.7	79.29	23.51	0.316	$3.00	$39,267	11,900
	1995	1.29	117.1	81.82	17.30	0.358	$2.56	$40,431	11,000
	2000	1.55	119.2	81.16	15.55	0.500	$2.42	$41,731	13,000
	2005	1.67	128.5	83.86	19.56	0.587	$2.85	$38,200	13,000

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem. = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.17: Historical values of dependent and independent variables for public water supply.

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Champaign County Rem.	1985	1.66	75.2	80.20	19.71	0.500	$2.99	$34,164	22,135
(Champaign County)	1990	1.79	86.4	79.29	24.04	0.579	$2.25	$33,470	20,669
	1995	1.76	101.0	81.82	18.60	0.539	$2.17	$33,726	17,411
	2000	1.17	78.5	81.16	18.27	0.533	$2.22	$42,721	14,855
	2005	1.12	77.0	83.86	17.59	0.540	$2.56	$40,756	14,480
Clinton*	1985	1.01	118.0	80.84	19.07	0.614	$2.34	$36,552	8,573
(DeWitt County)	1990	1.00	120.0	79.58	23.81	0.599	$2.02	$35,995	8,300
	1995	1.09	133.1	81.90	18.68	0.613	$2.04	$38,632	8,200
	2000	0.87	133.6	81.14	18.55	0.570	$1.80	$41,024	6,537
	2005	0.87	116.5	83.62	15.17	0.464	$3.18	$38,100	7,500
Village of DeWitt	1985	0.01	93.5	80.84	19.07	0.324	$5.80	$42,035	130
(DeWitt County)	1990	0.02	121.3	79.58	23.81	0.324	$4.80	$43,081	140
	1995	0.02	107.8	81.90	18.68	0.324	$4.10	$44,846	155
	2000	0.02	86.7	81.14	18.55	0.324	$4.52	$46,645	190
	2005	0.01	74.4	83.62	15.17	0.324	$3.07	$48,051	180
DeWitt County Rem.	1985	0.39	89.9	80.84	19.07	0.310	$5.80	$40,626	4,377
(DeWitt County)	1990	0.38	89.1	79.58	23.81	0.354	$4.80	$40,752	4,275
	1995	0.37	82.0	81.90	18.68	0.488	$4.10	$43,854	4,543
	2000	0.43	95.4	81.14	18.55	0.474	$4.52	$46,652	4,553
	2005	0.40	89.4	83.62	15.17	0.506	$3.07	$44,506	4,487
Paxton	1985	0.55	125.4	79.75	14.75	0.344	$2.18	$34,345	4,422
(Ford County)	1990	0.49	109.6	78.97	21.06	0.347	$1.80	$35,619	4,473
	1995	0.61	135.4	81.42	22.78	0.354	$1.69	$38,510	4,539
	2000	0.70	148.5	79.74	17.69	0.358	$1.64	$42,748	4,725
	2005	0.56	116.6	82.80	16.21	0.379	$1.42	$39,700	4,800

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem. = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.18: Historical values of dependent and independent variables for public water supply. (continued)

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Ford County Rem.	1985	0.81	118.4	79.75	14.75	0.488	$2.18	$38,781	6,800
(Ford County)	1990	0.91	130.7	78.97	21.06	0.510	$1.80	$38,662	6,934
	1995	1.12	171.5	81.42	22.78	0.515	$1.69	$40,921	6,519
	2000	1.16	173.6	79.74	17.69	0.558	$1.64	$43,052	6,700
	2005	1.12	164.3	82.80	16.21	0.549	$1.42	$42,629	6,788
Watseka	1985	0.58	99.4	79.38	18.53	0.486	$3.26	$32,922	5,802
(Iroquois County)	1990	0.60	105.2	78.1	19.61	0.602	$2.70	$32,487	5,700
	1995	0.72	126.3	80.84	18.77	0.809	$6.38	$33,391	5,700
	2000	0.66	116.4	79.64	19.28	0.632	$4.40	$34,421	5,670
	2005	0.58	105.8	81.8	16.55	0.537	$0.85	$31,900	5,500
Iroquois County Rem.	1985	1.47	93.5	79.38	18.53	0.430	$2.72	$37,899	15,715
(Iroquois County)	1990	1.60	101.0	78.10	19.61	0.423	$2.25	$38,113	15,853
	1995	1.62	101.7	80.84	18.77	0.481	$1.92	$40,685	15,927
	2000	1.65	102.7	79.64	19.28	0.472	$1.70	$43,050	16,113
	2005	1.61	99.1	81.80	16.55	0.515	$2.20	$40,971	16,203
Lincoln*	1985	2.82	151.5	80.84	18.69	0.631	$5.51	$37,669	18,604
(Logan County)	1990	2.62	158.5	79.58	26.52	0.574	$4.71	$38,103	16,500
	1995	2.57	128.4	81.90	22.81	0.486	$4.15	$38,352	20,000
	2000	2.69	149.7	81.14	19.49	0.461	$3.87	$38,939	18,000
	2005	2.94	179.2	83.62	11.84	0.462	$3.61	$36,100	16,400
Logan County Rem.	1985	0.68	102.0	80.84	18.94	0.256	$4.08	$40,532	6,695
(Logan County)	1990	0.64	96.0	79.58	26.52	0.264	$3.54	$41,250	6,639
	1995	0.73	111.9	81.90	22.20	0.312	$3.02	$42,871	6,533
	2000	0.66	102.3	81.14	20.03	0.465	$3.08	$44,541	6,451
	2005	0.66	103.2	83.62	11.84	0.371	$2.71	$40,475	6,421

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem. = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.19: Historical values of dependent and independent variables for public water supply. (continued)

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Decatur*	1985	16.77	187.9	81.76	17.70	0.417	$2.61	$38,787	89507
(Macon County)	1990	20.33	229.8	80.56	24.08	0.443	$2.34	$38,137	88730
	1995	23.46	268.2	83.30	16.22	0.461	$2.23	$37,518	87718
	2000	25.59	295.9	82.36	19.32	0.441	$2.07	$37,441	86705
	2005	23.64	287.5	84.68	17.03	0.434	$1.83	$32,233	82449
Forsyth*	1985	0.12	103.8	81.76	17.70	0.819	$2.99	$60,642	1,194
(Macon County)	1990	0.16	121.4	80.56	24.08	0.764	$2.47	$72,270	1,302
	1995	0.29	146.4	83.30	16.22	0.459	$2.11	$75,103	2,010
	2000	0.31	121.8	82.36	19.32	0.852	$2.68	$78,024	2,575
	2005	0.41	139.3	84.68	17.03	0.884	$2.37	$71,300	2,910
Macon County Rem.	1985	1.28	76.4	81.76	17.70	0.546	$2.43	$42,850	16,784
(Macon County)	1990	1.42	77.3	80.56	24.08	0.529	$2.20	$42,853	18,299
	1995	1.55	86.2	83.30	16.22	0.559	$2.12	$42,576	17,959
	2000	1.23	63.7	82.36	19.32	0.485	$2.21	$42,810	19,248
	2005	1.28	60.8	84.68	17.03	0.472	$2.03	$39,047	20,989
Mason City	1985	0.27	104.4	81.03	14.11	0.157	$1.81	$37,432	2,561
(Mason County)	1990	0.33	130.0	80.11	26.62	0.172	$1.80	$35,409	2,510
	1995	0.32	127.7	81.90	21.28	0.182	$1.92	$37,956	2,483
	2000	0.27	109.8	82.70	17.54	0.193	$3.05	$40,273	2,481
	2005	0.27	104.1	86.16	8.79	0.186	$3.46	$37,400	2,620
Mason County Rem.	1985	0.68	107.8	81.03	14.11	0.480	$1.81	$35,557	6,274
(Mason County)	1990	0.77	117.5	80.11	26.62	0.464	$1.80	$33,729	6,557
	1995	0.85	130.6	81.90	21.28	0.520	$2.56	$37,560	6,476
	2000	0.70	103.3	82.70	17.54	0.516	$2.21	$40,771	6,733
	2005	0.56	78.8	86.16	8.79	0.506	$2.50	$38,420	7,043

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem. = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.20: Historical values of dependent and independent variables for public water supply. (continued)

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Bloomington	1985	8.26	152.2	80.68	19.76	0.484	$2.08	$44,506	54,300
(McLean County)	1990	9.91	170.9	79.87	23.78	0.551	$3.97	$43,986	58,000
	1995	11.44	190.6	80.82	23.73	0.563	$4.46	$48,594	60,000
	2000	12.50	178.6	80.49	19.99	0.571	$4.17	$52,577	70,000
	2005	11.23	157.2	84.44	10.65	0.548	$4.10	$51,273	72,330
Hudson*	1985	0.07	65.7	80.68	18.43	0.144	$5.44	$53,875	1,135
(McLean County)	1990	0.08	64.0	79.87	23.11	0.172	$9.59	$61,287	1,190
	1995	0.09	69.3	80.82	21.86	0.117	$8.20	$66,328	1,300
	2000	0.11	73.6	80.49	19.63	0.108	$7.24	$70,823	1,525
	2005	0.14	78.8	84.44	10.27	0.120	$6.40	$68,700	1,745
Normal*	1985	3.43	95.7	80.68	20.49	0.463	$3.27	$46,804	35,837
(McLean County)	1990	3.94	100.3	79.87	24.58	0.540	$4.90	$47,016	39,315
	1995	3.79	93.6	80.82	22.74	0.562	$3.97	$45,970	40,500
	2000	4.22	99.2	80.49	21.08	0.537	$3.90	$45,660	42,500
	2005	4.29	85.0	84.44	11.05	0.519	$3.84	$44,300	50,519
McLean County Rem.	1985	1.54	84.9	80.68	18.43	0.457	$3.27	$45,236	18,091
(McLean County)	1990	1.60	84.3	79.87	23.11	0.519	$4.90	$47,001	19,012
	1995	1.85	96.2	80.82	21.86	0.559	$3.97	$50,220	19,213
	2000	1.93	95.7	80.49	19.63	0.543	$3.90	$53,171	20,220
	2005	1.80	85.6	84.44	10.27	0.536	$3.84	$51,176	21,055
Petersburg	1985	0.39	83.2	80.06	17.53	0.452	$2.81	$31,425	4,657
(Menard County)	1990	0.31	68.1	79.74	28.13	0.463	$3.22	$31,651	4,500
	1995	0.33	83.7	82.32	15.85	0.466	$3.92	$34,827	4,000
	2000	0.36	89.2	80.82	18.22	0.416	$5.54	$39,225	4,000
	2005	0.36	74.3	84.14	13.09	0.472	$5.50	$36,400	4,850

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem. = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.21: Historical values of dependent and independent variables for public water supply. (continued)

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Menard County Rem.	1985	0.26	95.0	80.06	17.53	0.422	$3.20	$46,500	2,720
(Menard County)	1990	0.27	68.3	79.74	28.13	0.512	$3.35	$47,066	4,005
	1995	0.36	70.6	82.32	15.85	0.497	$2.86	$51,939	5,153
	2000	0.44	68.2	80.82	18.22	0.570	$2.96	$55,729	6,435
	2005	0.39	50.4	84.14	13.09	0.542	$4.27	$54,737	7,724
Monticello*	1985	0.73	158.0	79.66	19.02	0.450	$2.30	$48,756	4,640
(Piatt County)	1990	0.62	135.2	79.24	24.57	0.437	$1.90	$50,185	4,579
	1995	0.68	150.4	80.98	19.89	0.357	$2.26	$50,769	4,550
	2000	0.67	128.5	80.18	20.98	0.344	$2.16	$51,738	5,204
	2005	0.72	142.2	83.30	15.61	0.298	$2.40	$48,000	5,050
Piatt County Rem.	1985	0.52	81.2	79.66	19.02	0.437	$2.84	$45,000	6,417
(Piatt County)	1990	0.52	81.5	79.24	24.57	0.528	$2.35	$45,690	6,409
	1995	0.55	83.0	80.98	19.89	0.522	$2.27	$48,815	6,579
	2000	0.50	74.8	80.18	20.98	0.619	$2.17	$51,735	6,675
	2005	0.49	74.0	83.30	15.61	0.639	$1.34	$50,621	6,563
Springfield*	1985	17.78	130.8	80.06	17.53	0.514	$1.98	$40,474	135,912
(Sangamon County)	1990	20.75	147.7	79.74	28.13	0.531	$2.18	$41,950	140,477
	1995	21.45	148.2	82.32	15.85	0.523	$1.99	$43,169	144,742
	2000	20.84	139.8	80.82	18.22	0.531	$2.07	$44,539	149,007
	2005	22.94	149.1	84.14	13.09	0.519	$1.85	$43,054	153,872
Sangamon County Rem.	1985	2.21	166.8	80.06	17.53	0.520	$1.89	$43,897	13,248
(Sangamon County)	1990	2.34	147.1	79.74	28.13	0.550	$1.96	$45,478	15,892
	1995	2.35	123.2	82.32	15.85	0.540	$1.73	$46,965	19,032
	2000	2.26	99.2	80.82	18.22	0.546	$1.76	$48,575	22,745
	2005	1.83	75.3	84.14	13.09	0.538	$1.85	$46,022	24,321

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem. = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.22: Historical values of dependent and independent variables for public water supply. (continued)

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Creve Coeur	1985	0.59	84.1	79.10	18.81	0.393	$3.72	$40,292	7,070
(Tazewell County)	1990	0.74	109.2	77.38	29.70	0.482	$2.92	$37,549	6,800
	1995	0.79	132.5	80.54	18.01	0.523	$2.38	$39,206	5,934
	2000	0.83	140.7	80.14	13.30	0.502	$2.53	$40,864	5,900
	2005	0.93	156.8	83.90	9.73	0.512	$2.63	$39,200	5,900
East Peoria	1985	2.32	100.8	79.10	18.81	0.546	$3.72	$44,700	22,976
(Tazewell County)	1990	2.09	92.7	77.38	29.70	0.648	$2.92	$42,532	22,500
	1995	2.40	104.2	80.54	18.01	0.641	$2.38	$44,796	23,000
	2000	2.59	114.6	80.14	13.30	0.572	$4.02	$46,971	22,638
	2005	2.73	120.6	83.90	9.73	0.597	$3.50	$45,000	22,638
Morton*	1985	2.02	139.8	79.10	18.81	0.381	$2.81	$60,123	14,430
(Tazewell County)	1990	2.12	144.5	77.38	29.70	0.555	$2.32	$59,621	14,700
	1995	2.34	164.9	80.54	18.01	0.624	$2.51	$60,002	14,200
	2000	2.28	146.1	80.14	13.30	0.669	$2.44	$60,914	15,600
	2005	2.68	162.5	83.90	9.73	0.773	$2.65	$58,400	16,500
Pekin*	1985	4.41	123.1	79.10	18.81	0.378	$1.99	$39,410	35,806
(Tazewell County)	1990	4.57	130.5	77.38	29.70	0.446	$2.02	$37,758	35,000
	1995	5.30	146.3	80.54	18.01	0.469	$2.26	$40,470	36,250
	2000	6.39	196.5	80.14	13.30	0.470	$2.06	$42,938	32,500
	2005	7.42	201.7	83.90	9.73	0.479	$1.77	$41,100	36,800
Washington	1985	1.12	132.2	79.10	18.81	0.342	$3.72	$51,311	8,456
(Tazewell County)	1990	0.82	102.7	77.38	29.70	0.347	$2.92	$51,573	8,000
	1995	1.08	110.4	80.54	18.01	0.334	$2.38	$55,498	9,743
	2000	0.94	85.6	80.14	13.30	0.328	$4.02	$59,038	11,000
	2005	1.16	88.1	83.90	9.73	0.311	$2.63	$56,600	13,177

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.23: Historical values of dependent and independent variables for public water supply. (continued)

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Tazewell County Rem.	1985	3.18	93.0	79.10	18.81	0.286	$3.72	$47,415	34,226
(Tazewell County)	1990	3.63	104.8	77.38	29.70	0.487	$2.92	$48,136	34,658
	1995	3.12	88.6	80.54	18.01	0.573	$2.38	$47,483	35,281
	2000	2.95	82.1	80.14	13.30	0.526	$2.53	$47,746	35,880
	2005	2.76	76.5	83.90	9.73	0.508	$2.63	$45,647	36,145
Danville*	1985	8.15	126.4	81.26	16.87	0.400	$3.69	$34,196	64,470
(Vermilion County)	1990	10.02	166.9	79.16	23.64	0.402	$3.69	$33,438	60,000
	1995	8.46	153.9	81.00	22.20	0.402	$3.69	$33,792	55,000
	2000	8.35	151.8	81.36	19.56	0.388	$3.55	$34,411	55,000
	2005	8.34	151.6	83.46	16.06	0.387	$2.86	$31,000	55,000
Hoopeston*	1985	0.80	136.8	79.84	18.01	0.393	$1.63	$33,767	5,881
(Vermilion County)	1990	0.66	114.5	78.70	22.81	0.492	$2.70	$33,365	5,800
	1995	0.79	135.8	81.42	17.59	0.388	$2.31	$34,732	5,800
	2000	0.45	77.7	80.32	21.02	0.330	$2.04	$36,125	5,800
	2005	0.56	94.2	83.18	20.32	0.254	$2.12	$32,500	5,987
Vermilion County Rem.	1985	1.18	83.1	80.55	17.44	0.376	$1.81	$36,283	14,134
(Vermilion County)	1990	1.20	86.2	78.93	23.12	0.425	$3.22	$35,725	13,968
	1995	1.32	94.6	81.21	18.58	0.469	$2.75	$37,102	13,964
	2000	0.80	58.2	80.84	19.44	0.487	$2.43	$38,527	13,731
	2005	0.79	57.8	83.32	17.04	0.496	$3.42	$36,233	13,633

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem. = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.24: Historical values of dependent and independent variables for public water supply. (continued)

Study Area	Year	MGD	GPCD	Temp.	Precip.	E/P ratio	Price	Income	Pop. served
Goodfield	1985	0.04	83.0	79.60	15.91	0.391	$3.57	$49,452	515
(Woodford County)	1990	0.04	88.1	79.00	22.19	0.492	$3.57	$49,948	490
	1995	0.04	73.2	81.20	24.30	0.532	$3.52	$59,839	523
	2000	0.06	78.0	80.72	15.88	0.521	$3.41	$67,925	796
	2005	0.09	126.1	83.90	8.27	0.532	$4.02	$63,000	700
Woodford County Rem.	1985	1.44	69.1	79.60	15.91	0.385	$4.31	$50,410	20,869
(Woodford County)	1990	1.57	71.9	79.00	22.19	0.485	$3.57	$51,532	21,811
	1995	2.13	99.4	81.20	24.30	0.523	$3.52	$54,864	21,396
	2000	2.23	102.5	80.72	15.88	0.511	$3.41	$57,918	21,712
	2005	2.24	96.3	83.90	8.27	0.521	$4.02	$57,442	23,281
Average	1985	109.63	130.5	80.18	18.03	0.427	$3.02	$42,781	840,369
(MGD & Pop served is Total)	1990	121.37	142.7	79.21	25.11	0.473	$3.00	$43,141	851,217
	1995	129.61	148.8	81.44	19.48	0.482	$2.88	$45,121	871,432
	2000	134.01	148.8	80.84	18.27	0.486	$2.93	$47,321	900,820
	2005	137.02	144.9	83.91	13.44	0.486	$2.81	$44,578	946,821

MGD = million gallons per day; GPCD = gallons per capita per day; temp. = May - September average temperature

precip. = precipitation; E/P ratio = employment to population ratio; Rem. = remainder; Pop. = population

All price and income data have been converted to 2005 dollars.

* price data was obtained from representatives of the public water supply system at public outreach meetings.

Table B.25: Future withdrawals (in MGD) for public water supply baseline (BL) scenario for each study area.

Study Area	2005 Weather	2005 Normal	2010	2015	2020	2025	2030	2035	2040	2045	2050	2005-50 % Change
Beardstown	1.29	1.18	1.26	1.31	1.36	1.40	1.44	1.47	1.51	1.55	1.60	35.38
Cass County Rem.	0.47	0.43	0.59	0.61	0.63	0.64	0.66	0.68	0.69	0.71	0.73	68.63
Champaign/Urbana	23.24	21.34	22.22	23.34	24.54	25.47	25.93	26.88	27.63	28.40	29.19	36.77
Mahomet	0.53	0.50	0.53	0.56	0.59	0.61	0.62	0.62	0.63	0.65	0.67	34.30
Rantoul	1.78	1.71	1.82	1.91	2.01	2.09	2.12	2.18	2.24	2.31	2.37	38.32
Champaign County Rem.	1.08	1.01	1.08	1.13	1.19	1.23	1.26	1.28	1.31	1.35	1.39	36.53
Clinton	0.95	0.88	0.96	1.00	1.04	1.07	1.11	1.14	1.18	1.22	1.26	43.38
De Witt	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	43.72
DeWitt County Rem.	0.41	0.38	0.41	0.43	0.45	0.46	0.48	0.49	0.51	0.53	0.55	43.35
Paxton	0.55	0.52	0.54	0.57	0.59	0.60	0.62	0.64	0.65	0.67	0.69	32.85
Ford County Rem.	1.25	1.18	1.24	1.28	1.33	1.37	1.41	1.44	1.48	1.52	1.56	32.84
Watseka	0.59	0.55	0.59	0.61	0.64	0.67	0.69	0.71	0.74	0.76	0.79	43.74
Iroquois County Rem.	1.86	1.75	1.87	1.95	2.04	2.12	2.18	2.26	2.34	2.43	2.51	43.76
Lincoln	2.80	2.52	2.61	2.68	2.74	2.79	2.85	2.91	2.96	3.02	3.08	22.08
Logan County Rem.	0.82	0.74	0.77	0.79	0.81	0.82	0.84	0.86	0.87	0.89	0.91	22.08
Decatur	23.65	22.49	23.55	24.08	24.90	25.62	26.31	27.04	27.80	28.57	29.37	30.60
Forsyth	0.44	0.42	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.40	-3.74
Macon County Rem.	1.28	1.22	1.25	1.28	1.32	1.36	1.40	1.44	1.48	1.52	1.56	28.10
Mason City	0.30	0.26	0.28	0.29	0.30	0.30	0.30	0.30	0.31	0.31	0.32	22.67
Mason County Rem.	0.60	0.51	0.55	0.57	0.58	0.59	0.59	0.60	0.61	0.62	0.63	22.67

Rem. = remainder; MGD = million gallons per day.

2005 Weather = model generated results using actual 2005 weather data. 2005 Normal = model generated results using normal (1971-2000) weather data.

Table B.26: Future withdrawals (in MGD) for public water supply baseline (BL) scenario for each study area. (continued)

Study Area	2005 Weather	2005 Normal	2010	2015	2020	2025	2030	2035	2040	2045	2050	2005-50 % Change
Bloomington	11.36	9.99	10.71	11.41	12.14	12.79	13.21	13.78	14.37	14.98	15.63	56.38
Hudson	0.15	0.13	0.14	0.15	0.16	0.17	0.17	0.18	0.19	0.20	0.21	56.93
Normal	4.24	3.67	3.94	4.19	4.46	4.70	4.86	5.06	5.28	5.51	5.74	56.41
McLean County Rem.	1.82	1.60	1.71	1.82	1.94	2.04	2.11	2.20	2.29	2.39	2.49	56.39
Petersburg	0.42	0.39	0.42	0.45	0.47	0.49	0.50	0.51	0.52	0.54	0.55	39.84
Menard County Rem.	0.38	0.35	0.38	0.40	0.42	0.44	0.44	0.46	0.47	0.48	0.49	39.80
Monticello	0.75	0.70	0.72	0.75	0.77	0.79	0.80	0.82	0.83	0.85	0.86	23.20
Piatt County Rem.	0.48	0.45	0.46	0.48	0.50	0.51	0.51	0.52	0.53	0.54	0.56	23.23
Springfield	22.90	21.14	20.10	21.07	22.22	23.17	23.97	24.90	25.87	26.87	27.91	32.02
Sangamon County Rem.	2.04	1.88	2.78	2.91	3.05	3.18	3.29	3.42	3.55	3.69	3.83	103.71
Creve Coeur	0.93	0.81	0.83	0.89	0.94	1.00	1.03	1.08	1.13	1.18	1.24	52.10
East Peoria	2.80	2.46	2.67	2.84	3.02	3.19	3.30	3.45	3.61	3.78	3.95	60.84
Morton	3.18	2.79	3.03	3.22	3.42	3.62	3.75	3.92	4.10	4.29	4.48	60.75
Pekin	7.48	6.56	6.77	7.20	7.66	8.09	8.38	8.76	9.17	9.59	10.03	52.93
Tazewell County Rem.	2.73	2.39	2.60	2.76	2.94	3.10	3.21	3.36	3.52	3.68	3.85	60.81
Washington	1.31	1.15	1.25	1.33	1.41	1.49	1.54	1.61	1.69	1.77	1.85	60.73
Danville	8.35	7.85	7.53	7.53	7.62	7.78	8.07	8.30	8.54	8.79	9.04	15.20
Hoopeston	0.64	0.62	0.59	0.58	0.58	0.59	0.61	0.62	0.63	0.64	0.65	5.17
Vermilion County Rem.	0.76	0.72	0.69	0.69	0.70	0.71	0.74	0.76	0.78	0.81	0.83	15.19
Goodfield	0.08	0.07	0.07	0.07	0.08	0.08	0.09	0.09	0.09	0.10	0.10	57.93
Woodford County Rem.	2.19	1.89	2.01	2.14	2.28	2.41	2.49	2.61	2.73	2.85	2.98	57.85
Total	138.88	127.24	131.88	137.60	144.19	149.88	154.26	159.74	165.25	170.96	176.88	39.02

Rem. = remainder; MGD = million gallons per day.

2005 Weather = model generated results using actual 2005 weather data. 2005 Normal = model generated results using normal (1971-2000) weather data.

Table B.27: Future withdrawals (in MGD) for public water supply less resource intensive (LRI) for each study area.

System Name	2005 Weather	2005 Normal	2010	2015	2020	2025	2030	2035	2040	2045	2050	2005-2050 % Change
Beardstown	1.29	1.32	1.26	1.30	1.35	1.38	1.42	1.44	1.48	1.51	1.55	17.67
Cass County Rem.	0.47	0.34	0.58	0.59	0.60	0.60	0.61	0.61	0.62	0.62	0.63	81.94
Champaign/Urbana	23.24	21.76	21.88	22.63	23.42	23.92	23.97	24.44	24.70	24.97	25.24	15.96
Mahomet	0.53	0.50	0.52	0.54	0.56	0.57	0.57	0.56	0.57	0.57	0.58	16.77
Rantoul	1.78	1.56	1.79	1.85	1.92	1.96	1.96	1.98	2.00	2.02	2.04	30.81
Champaign County Rem.	1.08	0.85	1.06	1.10	1.14	1.16	1.16	1.16	1.17	1.19	1.20	40.59
Clinton	0.95	0.80	0.94	0.97	0.99	1.00	1.02	1.04	1.05	1.07	1.09	36.07
De Witt	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	49.79
DeWitt County Rem.	0.41	0.38	0.41	0.42	0.43	0.43	0.44	0.45	0.45	0.46	0.47	23.10
Paxton	0.55	0.44	0.54	0.55	0.56	0.57	0.58	0.59	0.59	0.60	0.61	38.94
Ford County Rem.	1.25	1.13	1.22	1.25	1.28	1.29	1.31	1.33	1.34	1.36	1.38	22.09
Watseka	0.59	0.57	0.58	0.60	0.62	0.64	0.65	0.66	0.68	0.69	0.71	25.50
Iroquois County Rem.	1.86	1.70	1.85	1.89	1.95	1.99	2.02	2.06	2.10	2.14	2.18	28.66
Lincoln	2.80	2.47	2.57	2.59	2.61	2.61	2.62	2.63	2.63	2.64	2.64	7.22
Logan County Rem.	0.82	0.68	0.76	0.77	0.77	0.77	0.78	0.78	0.78	0.78	0.78	14.93
Decatur	23.65	23.22	23.23	23.40	23.85	24.17	24.45	24.75	25.05	25.35	25.64	10.41
Forsyth	0.44	0.37	0.32	0.32	0.32	0.33	0.33	0.34	0.34	0.34	0.35	-5.42
Macon County Rem.	1.28	1.36	1.23	1.24	1.27	1.28	1.30	1.31	1.33	1.34	1.36	-0.51
Mason City	0.30	0.23	0.27	0.28	0.28	0.28	0.28	0.28	0.27	0.27	0.27	18.10
Mason County Rem.	0.60	0.44	0.54	0.55	0.56	0.55	0.55	0.55	0.55	0.55	0.55	24.33

Rem. = remainder; MGD = million gallons per day.

2005 Weather = model generated results using actual 2005 weather data. 2005 Normal = model generated results using normal (1971-2000) weather data.

Table B.28: Future withdrawals (in MGD) for public water supply less resource intensive (LRI) scenario for each study area. (continued)

Study Area	2005 Weather	2005 Normal	2010	2015	2020	2025	2030	2035	2040	2045	2050	2005-2050 % Change
Bloomington	11.36	10.21	10.53	11.03	11.55	11.95	12.13	12.44	12.74	13.05	13.37	30.98
Hudson	0.15	0.14	0.14	0.14	0.15	0.16	0.16	0.16	0.17	0.17	0.17	28.00
Normal	4.24	3.55	3.87	4.06	4.25	4.40	4.46	4.58	4.69	4.80	4.92	38.59
McLean County Rem.	1.82	1.84	1.68	1.76	1.84	1.91	1.94	1.99	2.04	2.09	2.14	16.06
Petersburg	0.42	0.35	0.42	0.43	0.45	0.45	0.45	0.46	0.46	0.47	0.47	34.77
Menard County Rem.	0.38	0.45	0.37	0.39	0.40	0.41	0.41	0.41	0.42	0.42	0.42	-5.19
Monticello	0.75	0.65	0.71	0.73	0.74	0.74	0.74	0.74	0.75	0.75	0.75	14.56
Piatt County Rem.	0.48	0.55	0.46	0.47	0.48	0.48	0.48	0.48	0.49	0.49	0.49	-10.55
Springfield	22.90	21.53	19.82	20.47	21.28	21.86	22.28	22.79	23.30	23.83	24.35	13.12
Sangamon County Rem.	2.04	1.71	2.74	2.83	2.92	3.00	3.06	3.13	3.20	3.27	3.34	95.54
Creve Coeur	0.93	0.69	0.82	0.86	0.90	0.94	0.95	0.98	1.01	1.04	1.07	53.98
East Peoria	2.80	2.29	2.63	2.75	2.87	2.99	3.04	3.13	3.21	3.30	3.39	48.18
Morton	3.18	2.67	2.98	3.12	3.27	3.40	3.46	3.56	3.66	3.77	3.87	45.34
Pekin	7.48	6.26	6.68	7.00	7.34	7.64	7.79	8.03	8.27	8.51	8.76	40.00
Tazewell County Rem.	2.73	2.94	2.56	2.68	2.80	2.91	2.97	3.05	3.14	3.23	3.32	13.11
Washington	1.31	1.04	1.23	1.29	1.35	1.40	1.43	1.47	1.51	1.55	1.60	53.96
Danville	8.35	7.97	7.42	7.30	7.27	7.30	7.44	7.53	7.62	7.71	7.80	-2.09
Hoopeston	0.64	0.61	0.59	0.58	0.58	0.58	0.59	0.60	0.61	0.61	0.62	1.94
Vermilion County Rem.	0.76	1.34	0.68	0.67	0.66	0.67	0.68	0.69	0.70	0.70	0.71	-46.86
Goodfield	0.08	0.08	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.09	0.09	12.81
Woodford County Rem.	2.19	2.00	1.97	2.07	2.17	2.25	2.29	2.35	2.42	2.48	2.55	27.37
Total	138.88	128.98	129.94	133.54	137.81	141.04	142.88	145.61	148.21	150.84	153.50	19.01

Rem. = remainder; MGD = million gallons per day.

2005 Weather = model generated results using actual 2005 weather data. 2005 Normal = model generated results using normal (1971-2000) weather data.

Table B.29: Future withdrawals (in MGD) for public water supply more resource intensive (MRI) scenario for each study area.

Study Area	2005 Weather	2005 Normal	2010	2015	2020	2025	2030	2035	2040	2045	2050	2005-50 % Change
Beardstown	1.29	1.32	1.27	1.33	1.38	1.42	1.48	1.52	1.57	1.62	1.67	26.89
Cass Co. Rem.	0.47	0.34	0.59	0.62	0.64	0.65	0.68	0.70	0.72	0.74	0.76	121.83
Champaign/Urbana	23.24	21.76	22.34	23.59	24.93	26.01	26.62	27.73	28.65	29.60	30.58	40.51
Mahomet	0.53	0.50	0.53	0.56	0.59	0.62	0.63	0.64	0.66	0.68	0.70	41.45
Rantoul	1.78	1.56	1.83	1.93	2.04	2.13	2.18	2.25	2.33	2.40	2.48	58.88
Champaign Co. Rem.	1.08	0.85	1.08	1.14	1.21	1.26	1.29	1.32	1.36	1.40	1.45	70.31
Clinton	0.95	0.80	0.96	1.01	1.05	1.09	1.14	1.18	1.23	1.27	1.32	65.68
DeWitt	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	82.25
DeWitt Co. Rem.	0.41	0.38	0.42	0.44	0.45	0.47	0.49	0.51	0.53	0.55	0.57	49.78
Paxton	0.55	0.44	0.55	0.57	0.60	0.62	0.64	0.66	0.68	0.70	0.72	65.41
Ford Co. Rem.	1.25	1.13	1.24	1.30	1.35	1.40	1.44	1.49	1.54	1.59	1.64	45.36
Watseka	0.59	0.57	0.59	0.62	0.65	0.68	0.71	0.74	0.77	0.80	0.83	46.75
Iroquois Co. Rem.	1.86	1.70	1.88	1.97	2.07	2.16	2.24	2.33	2.43	2.53	2.63	55.23
Lincoln	2.80	2.47	2.63	2.71	2.78	2.85	2.93	3.00	3.07	3.15	3.23	30.91
Logan Co. Rem.	0.82	0.68	0.77	0.80	0.82	0.84	0.86	0.88	0.91	0.93	0.95	39.41
Decatur	23.65	23.22	23.68	24.34	25.30	26.16	27.01	27.90	28.83	29.78	30.77	32.50
Forsyth	0.44	0.37	0.32	0.33	0.35	0.36	0.37	0.38	0.39	0.41	0.42	14.34
Macon Co. Rem.	1.28	1.36	1.26	1.29	1.34	1.39	1.43	1.48	1.53	1.58	1.63	19.77
Mason City	0.30	0.23	0.28	0.29	0.30	0.30	0.31	0.31	0.32	0.33	0.33	44.07
Mason Co. Rem.	0.60	0.44	0.55	0.58	0.59	0.60	0.61	0.62	0.63	0.65	0.66	50.52

Rem. = remainder; MGD = million gallons per day.

2005 Weather = model generated results using actual 2005 weather data. 2005 Normal = model generated results using normal (1971-2000) weather data.

Table B.30: Future withdrawals (in MGD) for public water supply more resource intensive (MRI) scenario for each study area. (continued)

Study Area	2005 Weather	2005 Normal	2010	2015	2020	2025	2030	2035	2040	2045	2050	2005-50 % Change
Bloomington	11.36	10.21	10.77	11.53	12.34	13.06	13.56	14.21	14.90	15.62	16.37	60.32
Hudson	0.15	0.14	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.21	57.82
Normal	4.24	3.55	3.96	4.24	4.54	4.80	4.99	5.23	5.48	5.74	6.02	69.43
McLean Co. Rem.	1.82	1.84	1.72	1.84	1.97	2.08	2.16	2.27	2.38	2.49	2.61	41.88
Petersburg	0.42	0.35	0.43	0.45	0.48	0.50	0.51	0.53	0.54	0.56	0.58	65.79
Menard Co. Rem.	0.38	0.45	0.38	0.41	0.43	0.45	0.46	0.47	0.49	0.50	0.52	16.14
Monticello	0.75	0.65	0.73	0.76	0.78	0.80	0.82	0.84	0.86	0.88	0.91	38.54
Piatt Co. Rem.	0.48	0.55	0.47	0.49	0.50	0.52	0.53	0.54	0.55	0.57	0.58	6.29
Springfield	22.90	21.53	20.21	21.29	22.57	23.67	24.61	25.69	26.82	28.00	29.24	35.79
Sangamon Co. Rem.	2.04	1.71	2.80	2.94	3.10	3.24	3.38	3.53	3.68	3.84	4.01	134.75
Creve Coeur	0.93	0.69	0.84	0.90	0.96	1.02	1.06	1.11	1.17	1.23	1.30	86.65
East Peoria	2.80	2.29	2.68	2.87	3.07	3.26	3.39	3.56	3.75	3.94	4.14	80.81
Morton	3.18	2.67	3.04	3.25	3.48	3.69	3.84	4.04	4.25	4.47	4.70	76.21
Pekin	7.48	6.26	6.81	7.28	7.78	8.26	8.60	9.04	9.50	9.99	10.50	67.85
Tazewell Co. Rem.	2.73	2.94	2.61	2.79	2.98	3.17	3.30	3.47	3.65	3.83	4.03	37.12
Washington	1.31	1.04	1.25	1.34	1.43	1.52	1.58	1.67	1.75	1.84	1.94	86.63
Danville	8.35	7.97	7.57	7.61	7.74	7.95	8.28	8.56	8.86	9.16	9.47	18.92
Hoopeston	0.64	0.61	0.60	0.60	0.61	0.63	0.66	0.68	0.70	0.72	0.75	22.86
Vermilion Co. Rem.	0.76	1.34	0.69	0.70	0.71	0.73	0.76	0.78	0.81	0.84	0.87	-35.19
Goodfield	0.08	0.08	0.07	0.07	0.08	0.09	0.09	0.09	0.10	0.10	0.11	38.04
Woodford Co. Rem.	2.19	2.00	2.02	2.16	2.32	2.46	2.56	2.69	2.83	2.97	3.12	55.85
Total	138.88	128.98	132.60	139.09	146.52	153.10	158.38	164.86	171.42	178.24	185.36	43.71

Rem. = remainder; MGD = million gallons per day.

2005 Weather = model generated results using actual 2005 weather data. 2005 Normal = model generated results using normal (1971-2000) weather data.

Table B.31: Estimated future population served for each public water supply study area.

Study Area	County	2010	2015	2020	2025	2030	2035	2040	2045	2050
Beardstown	Cass	6,258	6,442	6,605	6,695	6,829	6,896	7,011	7,127	7,246
Cass County Rem.	Cass	3,985	4,078	4,159	4,204	4,271	4,345	4,403	4,462	4,522
Champaign/Urbana	Champaign	147,156	152,866	158,975	163,211	164,373	168,488	171,286	174,131	177,023
Mahomet	Champaign	5,799	6,023	6,264	6,431	6,477	6,392	6,498	6,606	6,716
Rantoul	Champaign	13,656	14,186	14,753	15,146	15,254	15,505	15,762	16,024	16,290
Champaign County Rem.	Champaign	15,211	15,801	16,432	16,870	16,990	17,046	17,329	17,617	17,909
Clinton	DeWitt	8,073	8,308	8,537	8,725	8,923	9,121	9,323	9,530	9,742
De Witt	DeWitt	194	200	205	210	215	219	224	229	234
DeWitt County Rem.	DeWitt	4,829	4,969	5,107	5,219	5,337	5,456	5,577	5,701	5,827
Paxton	Ford	4,986	5,123	5,266	5,338	5,430	5,515	5,601	5,688	5,777
Ford County Rem.	Ford	7,051	7,244	7,446	7,548	7,679	7,799	7,920	8,044	8,169
Watseka	Iroquois	5,831	6,003	6,204	6,383	6,508	6,666	6,827	6,993	7,162
Iroquois County Rem.	Iroquois	17,179	17,687	18,280	18,808	19,176	19,640	20,116	20,604	21,103
Lincoln	Logan	16,802	17,023	17,237	17,340	17,532	17,681	17,832	17,984	18,138
Logan County Rem.	Logan	6,578	6,665	6,749	6,789	6,864	6,923	6,982	7,041	7,101
Decatur	Macon	85,425	86,379	88,355	89,911	91,328	92,845	94,387	95,955	97,549
Forsyth	Macon	2,961	2,994	3,062	3,116	3,165	3,218	3,271	3,326	3,381
Macon County Rem.	Macon	21,330	21,568	22,061	22,450	22,804	23,183	23,568	23,959	24,357
Mason City	Mason	2,765	2,843	2,881	2,859	2,854	2,868	2,883	2,897	2,912
Mason County Rem.	Mason	7,434	7,642	7,746	7,686	7,672	7,711	7,749	7,788	7,827
Bloomington	McLean	76,689	80,823	85,092	88,617	90,558	93,400	96,331	99,355	102,473
Hudson	McLean	1,857	1,957	2,060	2,145	2,192	2,261	2,332	2,405	2,481
Normal	McLean	53,572	56,459	59,442	61,904	63,259	65,245	67,293	69,405	71,583
McLean County Rem.	McLean	22,324	23,528	24,770	25,796	26,361	27,189	28,042	28,922	29,830

Rem. = remainder

Table B.32: Estimated future population served for each public water supply study area.

Study Area	County	2010	2015	2020	2025	2030	2035	2040	2045	2050
Petersburg	Menard	5,179	5,390	5,614	5,745	5,787	5,874	5,963	6,053	6,144
Menard County Rem.	Menard	8,245	8,582	8,937	9,146	9,213	9,352	9,493	9,637	9,782
Monticello	Piatt	5,153	5,266	5,373	5,418	5,459	5,503	5,547	5,592	5,636
Piatt County Rem.	Piatt	6,698	6,845	6,984	7,042	7,096	7,153	7,211	7,268	7,327
Springfield	Sangamon	144,736	150,057	156,544	161,479	165,237	169,746	174,379	179,139	184,028
Sangamon County Rem.	Sangamon	35,613	36,801	38,184	39,331	40,301	41,401	42,531	43,692	44,885
Creve Coeur	Tazewell	5,994	6,304	6,636	6,931	7,099	7,344	7,597	7,859	8,130
East Peoria	Tazewell	24,319	25,579	26,923	28,123	28,805	29,798	30,825	31,888	32,987
Morton	Tazewell	17,715	18,633	19,612	20,486	20,983	21,706	22,454	23,228	24,029
Pekin	Tazewell	37,587	39,535	41,613	43,467	44,522	46,056	47,644	49,286	50,984
Washington	Tazewell	14,145	14,878	15,660	16,358	16,755	17,332	17,929	18,547	19,187
Tazewell County Rem.	Tazewell	38,820	40,831	42,977	44,892	45,981	47,566	49,205	50,901	52,656
Danville	Vermilion	52,221	51,629	51,675	52,222	53,528	54,471	55,431	56,408	57,402
Hoopeston	Vermilion	5,687	5,623	5,628	5,687	5,829	5,932	6,037	6,143	6,251
Vermilion County Rem.	Vermilion	12,943	12,796	12,807	12,943	13,266	13,500	13,738	13,980	14,227
Goodfield	Woodford	736	777	820	856	876	906	937	969	1,002
Woodford County Rem.	Woodford	24,471	25,832	27,258	28,466	29,130	30,119	31,142	32,199	33,292

Rem. = remainder

Self-supplied domestic data tables

Table B.33: Estimated future water withdrawals (in MGD) for the self-supplied domestic sector for the baseline scenario.

County	2010	2015	2020	2025	2030	2035	2040	2045	2050
Cass	0.37	0.38	0.39	0.40	0.41	0.42	0.43	0.43	0.44
Champaign	2.27	2.33	2.39	2.44	2.47	2.44	2.48	2.52	2.56
DeWitt	0.31	0.32	0.33	0.35	0.36	0.37	0.38	0.39	0.4
Ford	0.22	0.22	0.23	0.23	0.24	0.24	0.25	0.25	0.25
Iroquois	0.78	0.8	0.83	0.85	0.87	0.89	0.91	0.94	0.96
Logan	0.65	0.66	0.67	0.67	0.68	0.69	0.69	0.7	0.71
Macon	0.18	0.19	0.19	0.19	0.2	0.2	0.2	0.21	0.21
Mason	0.53	0.54	0.55	0.54	0.54	0.55	0.55	0.55	0.55
McLean	1.16	1.22	1.29	1.34	1.37	1.42	1.46	1.51	1.55
Menard	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Piatt	0.42	0.43	0.44	0.45	0.45	0.45	0.46	0.46	0.46
Sangamon	1.21	1.25	1.31	1.35	1.38	1.42	1.46	1.50	1.54
Tazewell	0.08	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.12
Vermilion	0.60	0.59	0.59	0.60	0.62	0.63	0.64	0.65	0.66
Woodford	1.16	1.23	1.29	1.35	1.38	1.43	1.48	1.53	1.58
Total	9.96	10.28	10.62	10.89	11.09	11.25	11.50	11.75	12.01

MGD = million gallons per day

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK