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LWC 20-Year Forecasts

Prepared by

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Data were recorded monthly from January, 1975 through December, 2004. The data included usage: residential, commercial, industrial, wholesale, other, total, and number of customers: residential, commercial, industrial, wholesale, other, total. The data were first forecast both monthly and yearly with a 20-year lead (240 months) without using any dynamic regressors. The monthly forecast indicates a very seasonal and slightly increasing pattern for residential, commercial, wholesale, other, and total. There was a seasonal, decreasing pattern for industrial. The yearly forecast, while not seasonal, indicated a similar increasing (decreasing for industrial) trend.

Dynamic regressors were added sequentially to ensure that the resulting forecasts were robust and to ensure against over-fitting. The following regressors were used in the model from the Bureau of Economic Analysis (http://www.bea.gov/bea/regional/spi/#download):

1. Population census data for Jefferson County
2. Population census data for Bullitt County
3. Population census data for Oldham County
4. Population census data for Kentucky
5. Number of households for same
6. Personal income for Kentucky residents
7. Employment for Kentucky
8. Number of businesses for Kentucky

In addition, for usage (but not for the number of customers), the PDSI index (Palmer Drought Severity Index, http://wwwagwx.ca.uky.edu/drought_cd2.txt) was included. Since usage is dependent upon the number of customers, the forecast for usage using only PDSI index and number of customers was compared to the forecast using PDSI and the economic indicators. The results were virtually identical (excepting for wholesale usage where the definition of customer changes from individual unit to unit serving many individuals). For each forecasted value, the following information is provided:

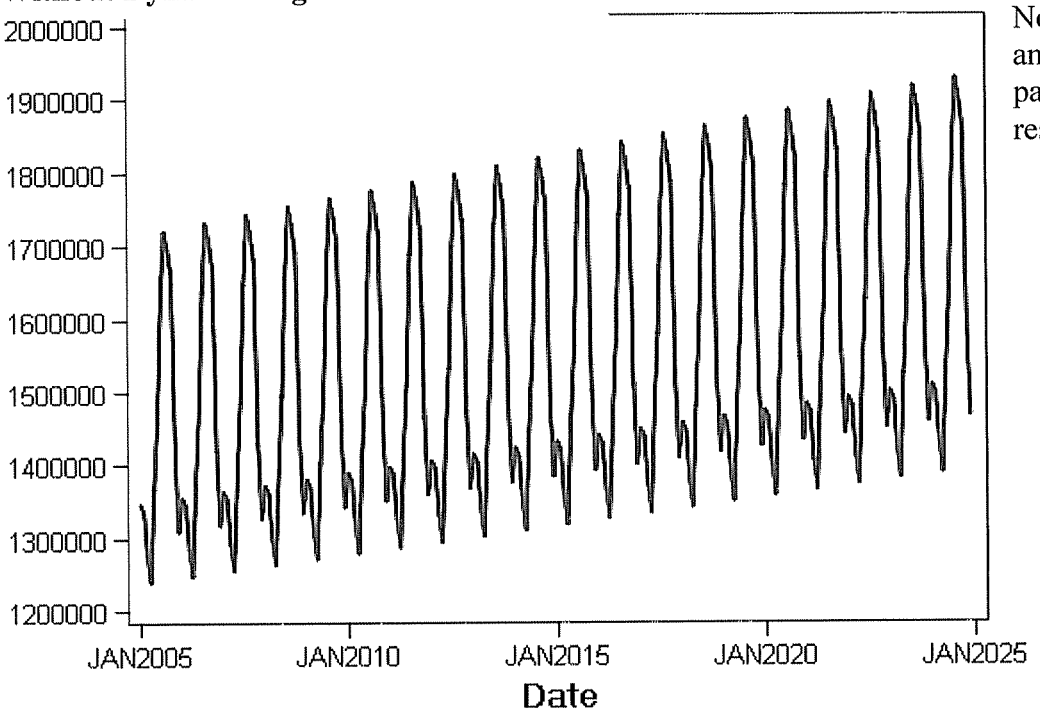
1. Monthly forecast of usage without the use of dynamic regressors.
2. Yearly forecast of outcomes without the use of dynamic regressors.
3. Yearly forecast of outcomes with the addition of dynamic regressors.
4. Forecast of the ratio of usage to customers to estimate individual usage by group
5. Yearly forecast showing upper and lower confidence limits.
6. Numeric table of forecasted values including upper and lower 95% confidence limits.

For comparison purposes, the forecasts for the dynamic regressors are also provided.

For the most part, the addition of economic regressors contributed little to the forecast for the next 20 years, indicating that most of the forecast comes directly from the trends in usage and in the number of customers for the previous 30 years. Therefore, the trends in both usage and number of customers are fairly robust, which suggests confidence in the forecasted results.

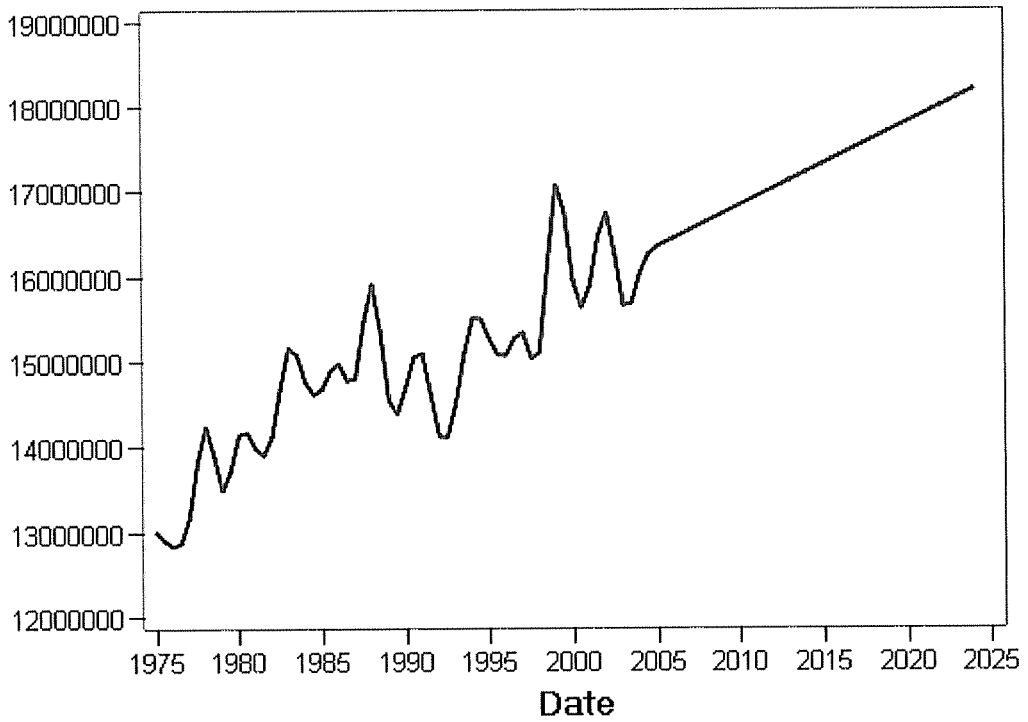
Forecasts for Usage, 2005-2025

Figure 1.1. Residential Monthly Forecast Without Dynamic Regressors



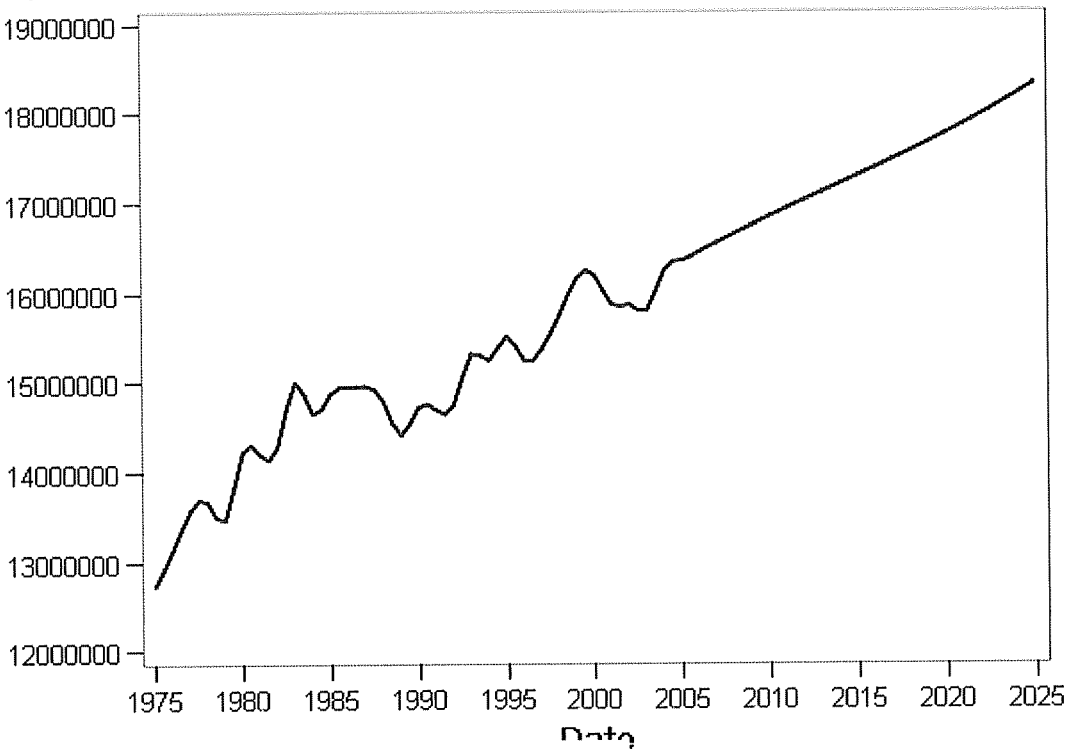
Note the seasonality and the increasing pattern in the residential usage.

Figure 1.2. Residential Yearly Forecast Without Dynamic Regressors



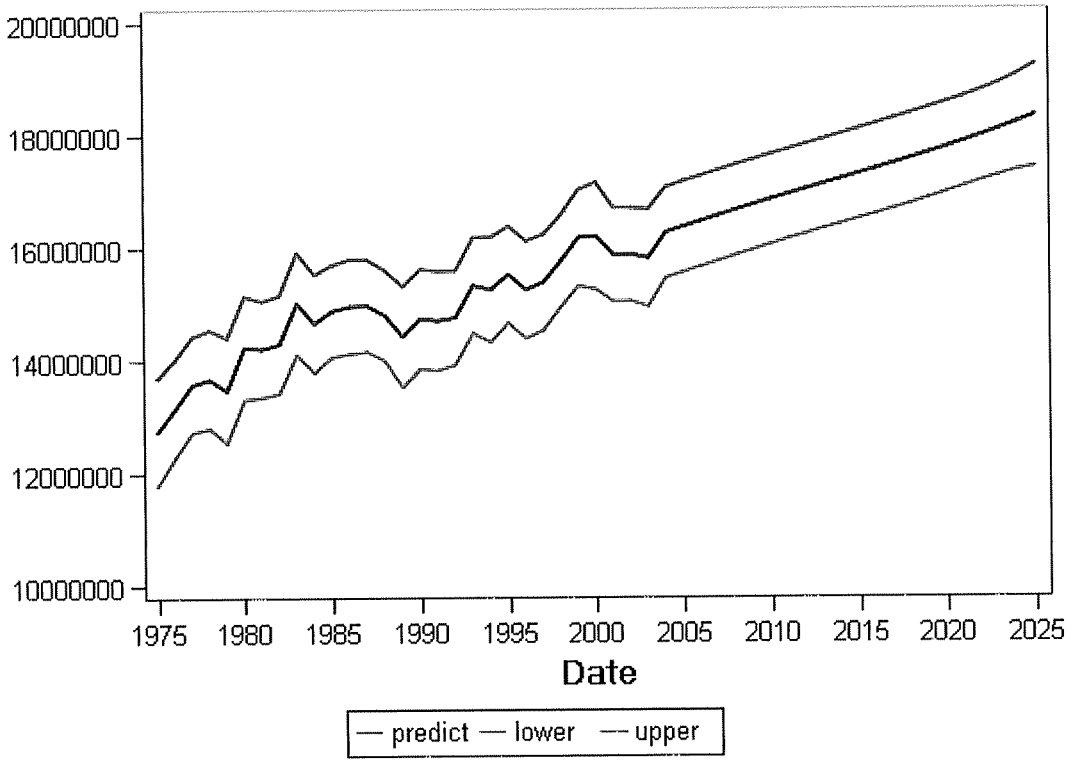
Note that the curve indicates a steady increase in residential usage over the next 20 years.

Figure 1.3. Residential Yearly Forecast With Economic Factors and PDSI



Including the economic factors and the PDSI does not change the slope of the increase given in Figure 2, indicating the robustness of the forecast.

Figure 1.4. Residential Yearly Forecast With Confidence Limits



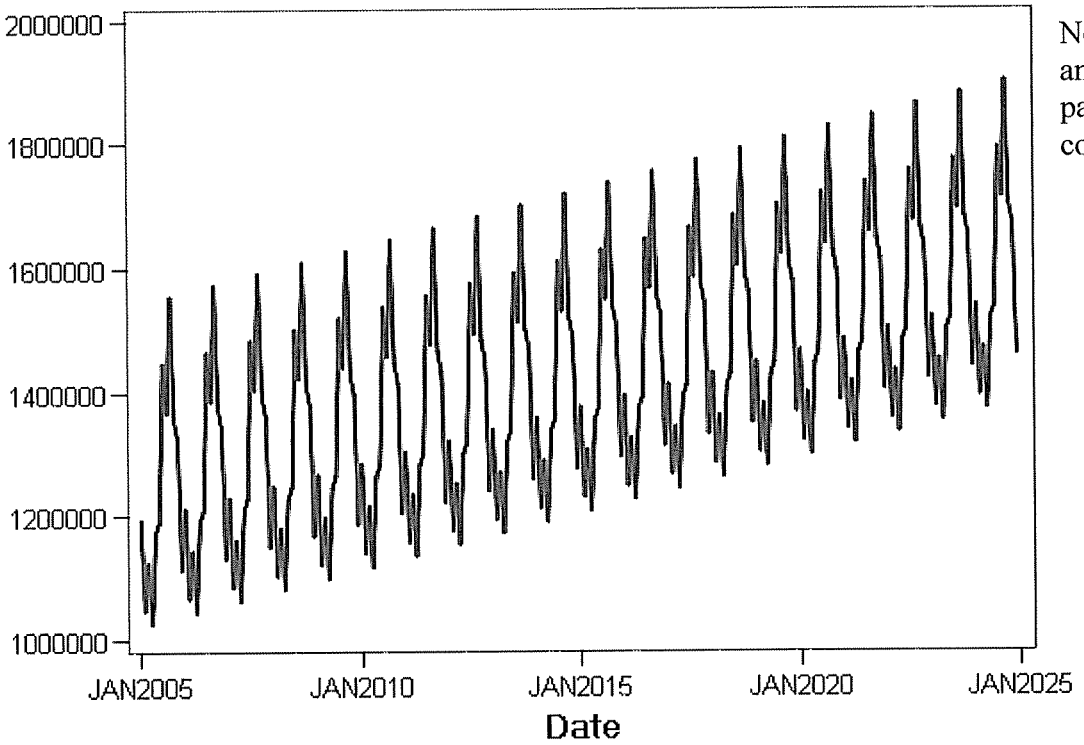
The range of the confidence limits is approximately ± 1,000,000 units per year.

Table 1.1. Forecast Values for Residential Usage

year	predict	lower	upper	year	predict	lower	upper
1975	12740201.30	11785550.56	13694852.03	**2005**	16361299.54	15553964.63	17168634.45
1976	13144520.25	12275863.16	14013177.33	**2006**	16456980.23	15649169.63	17264790.82
1977	13579818.45	12732397.50	14427239.41	**2007**	16556940.43	15749698.96	17364181.90
1978	13668604.90	12800285.16	14536924.63	**2008**	16654565.06	15849340.25	17459789.88
1979	13470639.33	12539923.65	14401355.01	**2009**	16749936.95	15947714.58	17552159.31
1980	14224860.99	13312355.52	15137366.45	**2010**	16843278.34	16044253.35	17642303.34
1981	14200785.23	13348696.71	15052873.74	**2011**	16934922.40	16138462.64	17731382.16
1982	14286038.14	13420192.92	15151883.36	**2012**	17025288.10	16230132.35	17820443.85
1983	15008243.54	14099959.96	15916527.11	**2013**	17114858.44	16319472.72	17910244.15
1984	14653888.11	13784404.32	15523371.89	**2014**	17204161.46	16407160.02	18001162.90
1985	14874941.01	14054365.88	15695516.15	**2015**	17293753.96	16494283.36	18093224.56
1986	14951128.78	14110355.88	15791901.68	**2016**	17384207.42	16582199.83	18186215.02
1987	14963124.67	14143475.80	15782773.54	**2017**	17476096.14	16672316.93	18279875.34
1988	14790017.08	13983692.89	15596341.28	**2018**	17569987.14	16765821.43	18374152.85
1989	14417676.27	13526685.41	15308667.13	**2019**	17666431.81	16863364.73	18469498.89
1990	14726221.01	13842591.44	15609850.58	**2020**	17765959.00	16964706.26	18567211.74
1991	14696304.96	13810615.72	15581994.21	**2021**	17869069.40	17068323.23	18669815.58
1992	14752644.99	13914144.25	15591145.73	**2022**	17976231.16	17171041.41	18781420.90
1993	15320790.36	14470430.73	16171149.98	**2023**	18087876.39	17267845.34	18907907.44
1994	15247706.39	14314411.23	16181001.56	**2024**	18204398.73	17352151.03	19056646.44
1995	15515567.21	14653981.81	16377152.60	**2025**	18326151.55	17416784.27	19235518.83
1996	15245015.57	14376013.42	16114017.73				
1997	15377868.70	14524044.72	16231692.67				
1998	15753673.80	14934441.92	16572905.68				
1999	16166761.93	15307599.17	17025924.70				

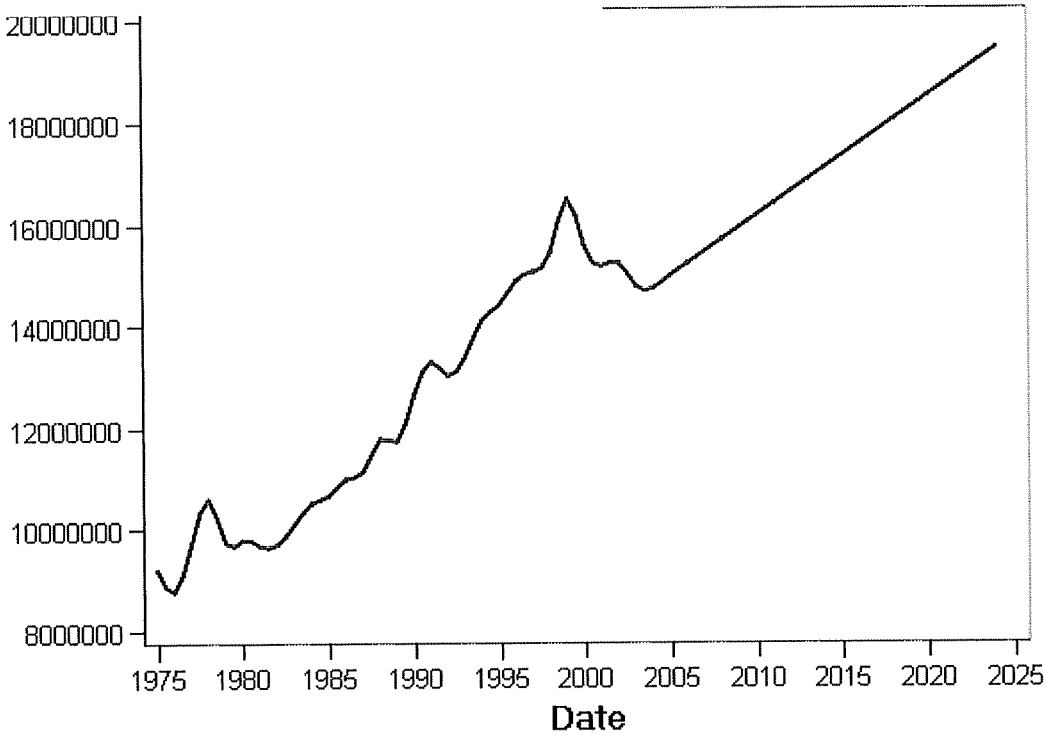
year	predict	lower	upper	year	predict	lower	upper
2000	16197667.91	15246617.51	17148718.30				
2001	15865468.82	15028442.36	16702495.29				
2002	15867437.66	15034172.55	16700702.76				
2003	15805717.95	14941551.61	16669884.30				
2004	16257232.85	15450631.91	17063833.78				

Figure 1.5. Commercial Monthly Forecast Without Dynamic Regressors



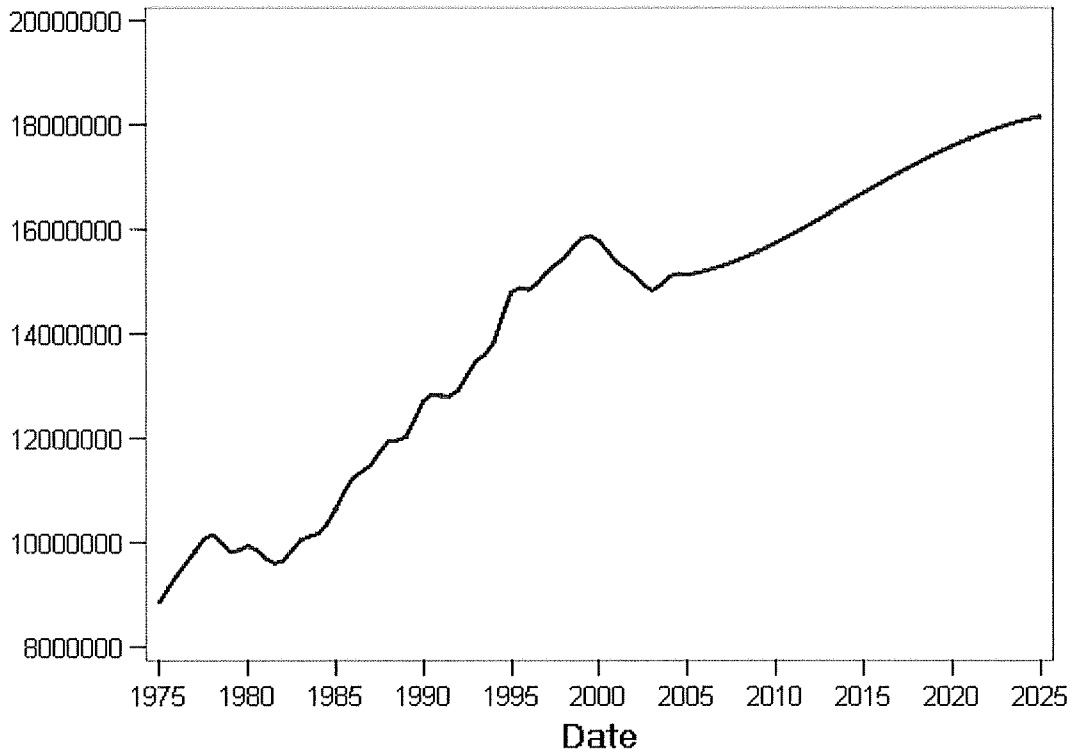
Note the seasonality and the increasing pattern in the commercial usage.

Figure 1.6. Commercial Yearly Forecast Without Dynamic Regressors



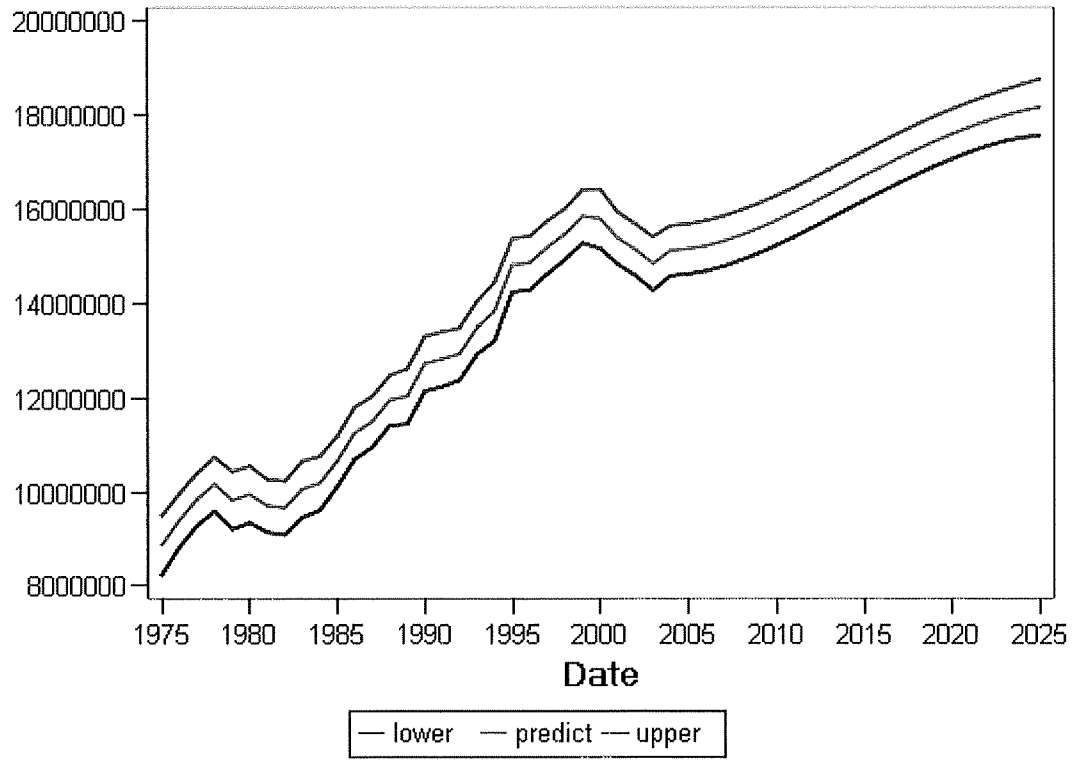
Commercial usage also has a steady increase, steeper compared to the increase for residential usage.

Figure 1.7. Commercial Yearly Forecast With Economic Factors and PDSI



Adding the dynamic regressors results in a slightly lower rate of increase compared to that in Figure 6.

Figure 1.8. Commercial Yearly Forecast With Confidence Limits



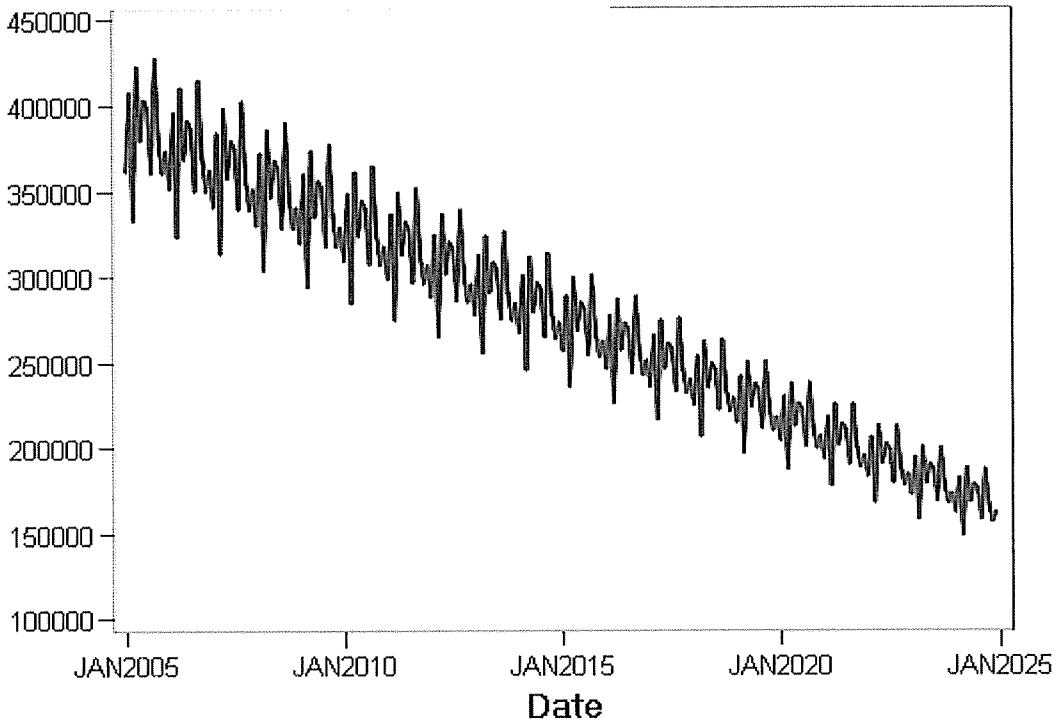
The range of the confidence limits is approximately ± 500,000.

Table 2. Forecast Values for Commercial Usage

year	predict	lower	upper	year	predict	lower	upper
1975	8862309.78	8230703.88	9493915.68	**2005**	15140014.18	14605873.85	15674154.51
1976	9384544.25	8809832.43	9959256.07	**2006**	15206061.47	14671606.47	15740516.46
1977	9834668.42	9274006.72	10395330.11	**2007**	15306126.03	14772047.62	15840204.45
1978	10162983.75	9588495.41	10737472.10	**2008**	15431194.17	14898450.01	15963938.33
1979	9821134.53	9205364.18	10436904.87	**2009**	15577167.90	15046410.17	16107925.63
1980	9944879.98	9341157.67	10548602.30	**2010**	15740118.27	15211475.92	16268760.63
1981	9700705.94	9136956.13	10264455.75	**2011**	15916299.32	15389354.11	16443244.53
1982	9660160.13	9087308.94	10233011.32	**2012**	16102158.27	15576075.78	16628240.77
1983	10054052.01	9453122.95	10654981.07	**2013**	16294342.47	15768107.80	16820577.13
1984	10181303.22	9606044.50	10756561.94	**2014**	16489703.42	15962399.78	17017007.06
1985	10649156.35	10106256.03	11192056.67	**2015**	16685298.58	16156361.34	17214235.82
1986	11248001.17	10691737.84	11804264.50	**2016**	16878391.01	16347775.30	17409006.71
1987	11488700.41	10946412.93	12030987.89	**2017**	17066447.41	16534659.63	17598235.19
1988	11942355.15	11408883.42	12475826.88	**2018**	17247134.77	16715091.30	17779178.23
1989	12028112.01	11438623.98	12617600.04	**2019**	17418315.77	16886999.17	17949632.36
1990	12717379.36	12132761.73	13301997.00	**2020**	17578043.33	17047927.10	18108159.56
1991	12813868.42	12227888.02	13399848.82	**2021**	17724554.38	17194773.26	18254335.50
1992	12924373.50	12369613.54	13479133.45	**2022**	17856263.00	17323541.93	18388984.07
1993	13481849.45	12919243.46	14044455.44	**2023**	17971753.18	17429212.94	18514293.41
1994	13821752.26	13204275.31	14439229.21	**2024**	18069771.20	17505916.20	18633626.21
1995	14794923.05	14224890.16	15364955.94	**2025**	18149217.84	17547572.20	18750863.49
1996	14844806.01	14269865.94	15419746.08				
1997	15175944.45	14611046.41	15740842.48				
1998	15454875.45	14912863.88	15996887.01				
1999	15833335.14	15264904.92	16401765.37				

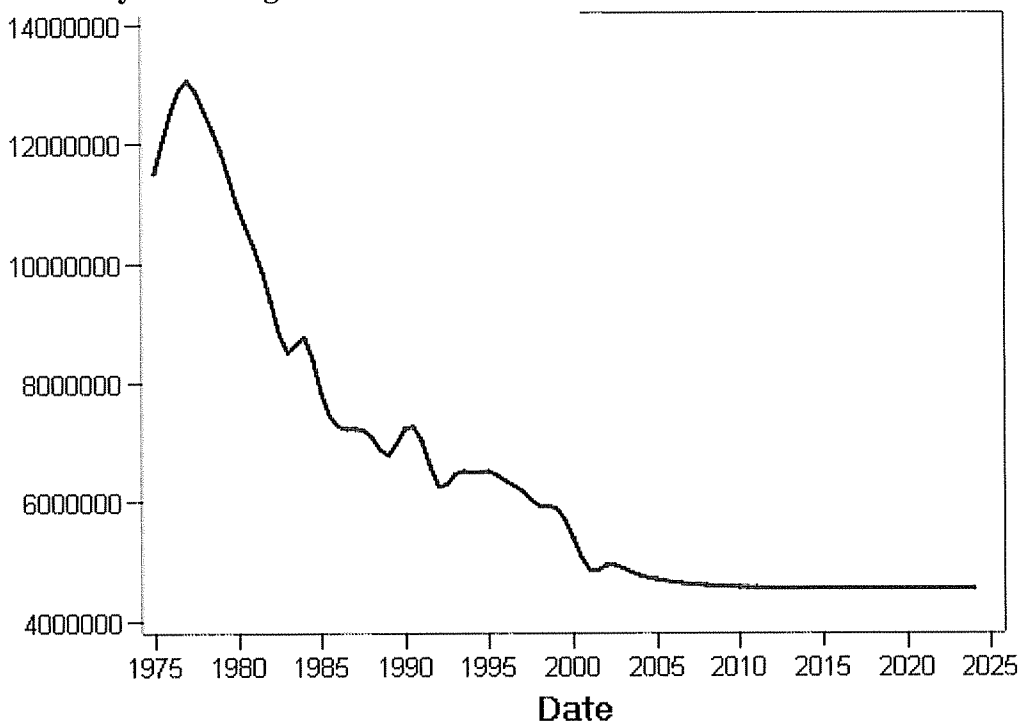
year	predict	lower	upper	year	predict	lower	upper
2000	15778906.21	15149682.44	16408129.98				
2001	15367196.74	14813412.42	15920981.05				
2002	15126144.04	14574848.10	15677439.98				
2003	14829556.11	14257815.57	15401296.65				
2004	15102893.97	14569239.18	15636548.75				
2025	18149217.84	17547572.20	18750863.49				

Figure 1.9. Industrial Monthly Forecast Without Dynamic Regressors



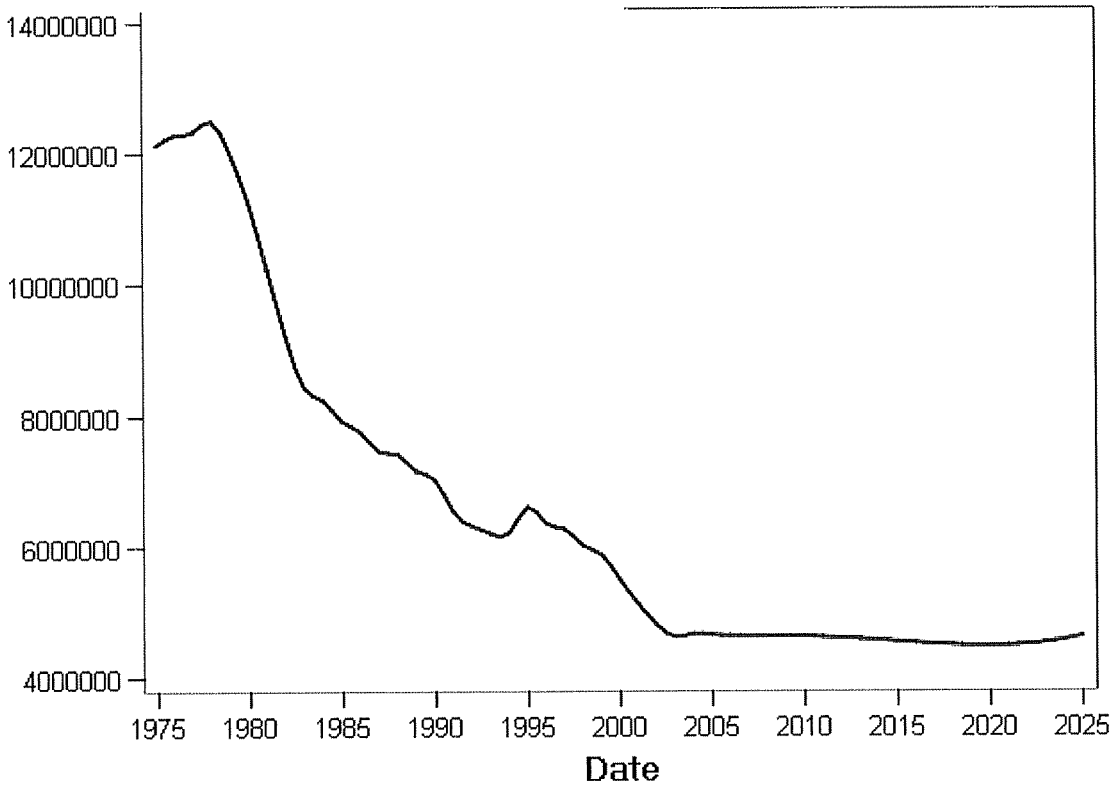
The usage in the industrial sector is decreasing, and will continue to decrease.

Figure 1.10. Industrial Yearly Forecast Without Dynamic Regressors



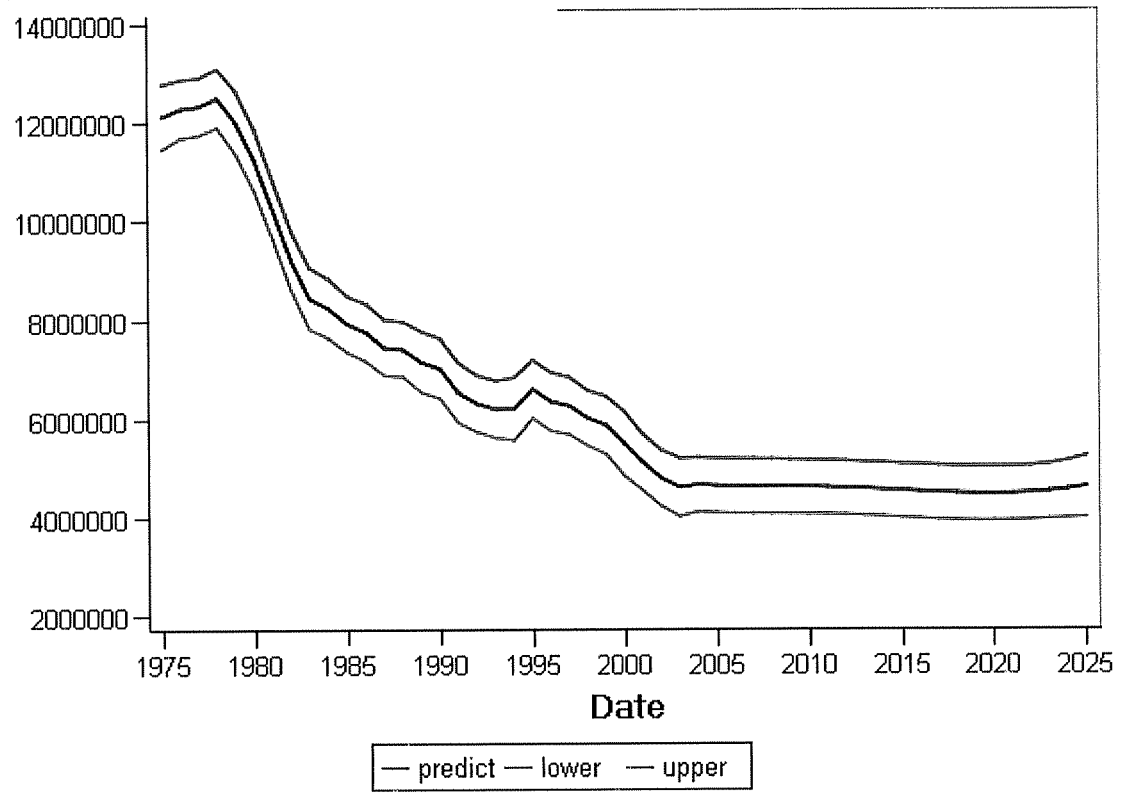
Industrial usage has been declining since 1980. The rate of decline is expected to decrease over the next 20 years.

Figure 1.11. Industrial Yearly Forecast With Economic Factors and PDSI



Adding the dynamic regressors still shows a leveling off of the decrease in the rate of decline.

Figure 1.12. Industrial Yearly Forecast With Confidence Limits



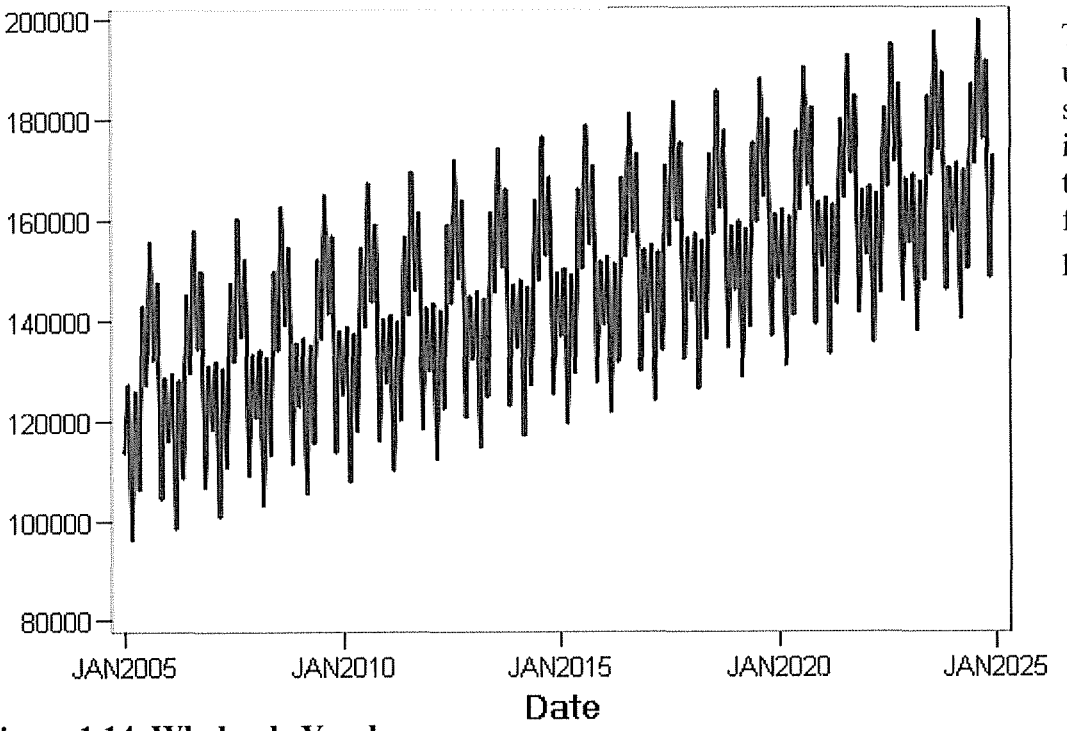
The range of the confidence limits is approximately ± 1,000,000.

Table 1.3. Forecast Values for Industrial Usage

year	predict	lower	upper	year	predict	lower	upper
1975	12124080.42	11469776.10	12778384.73	**2005**	4652884.92	4099548.81	5206221.03
1976	12281970.33	11686604.72	12877335.95	**2006**	4642078.16	4088416.09	5195740.23
1977	12333237.17	11752426.62	12914047.71	**2007**	4637818.56	4084546.61	5191090.51
1978	12499427.22	11904293.16	13094561.29	**2008**	4635163.03	4083273.28	5187052.78
1979	12019096.04	11381196.35	12656995.73	**2009**	4631585.99	4081754.05	5181417.92
1980	11255911.50	10630492.81	11881330.18	**2010**	4625483.17	4077842.63	5173123.72
1981	10241566.35	9657556.70	10825575.99	**2011**	4616024.07	4070141.65	5161906.49
1982	9214546.92	8621108.84	9807984.99	**2012**	4603021.11	4058032.40	5148009.82
1983	8435713.08	7813188.04	9058238.13	**2013**	4586814.28	4041667.93	5131960.64
1984	8238162.87	7642230.70	8834095.03	**2014**	4568169.45	4021915.70	5114423.19
1985	7924571.29	7362160.40	8486982.18	**2015**	4548189.26	4000243.21	5096135.31
1986	7755836.66	7179582.53	8332090.79	**2016**	4528235.33	3978550.50	5077920.16
1987	7453005.30	6891229.27	8014781.32	**2017**	4509860.50	3958961.48	5060759.53
1988	7416373.69	6863730.23	7969017.14	**2018**	4494750.30	3943586.41	5045914.20
1989	7157838.51	6547165.66	7768511.36	**2019**	4484672.55	3934261.65	5035083.45
1990	7027551.58	6421924.16	7633178.99	**2020**	4481434.28	3932266.88	5030601.68
1991	6533579.59	5926540.42	7140618.75	**2021**	4486845.24	3938024.97	5035665.50
1992	6316680.76	5741984.05	6891377.48	**2022**	4502687.16	3950821.28	5054553.03
1993	6204380.59	5621555.84	6787205.33	**2023**	4530688.26	3968650.34	5092726.18
1994	6214286.13	5574618.49	6853953.77	**2024**	4572502.33	3988383.65	5156621.01
1995	6610087.66	6019569.15	7200606.17	**2025**	4629691.83	4006424.45	5252959.21
1996	6355610.32	5760008.23	6951212.41				
1997	6270968.58	5685769.42	6856167.74				
1998	6021369.95	5459879.75	6582860.16				
1999	5878692.90	5289834.60	6467551.19				

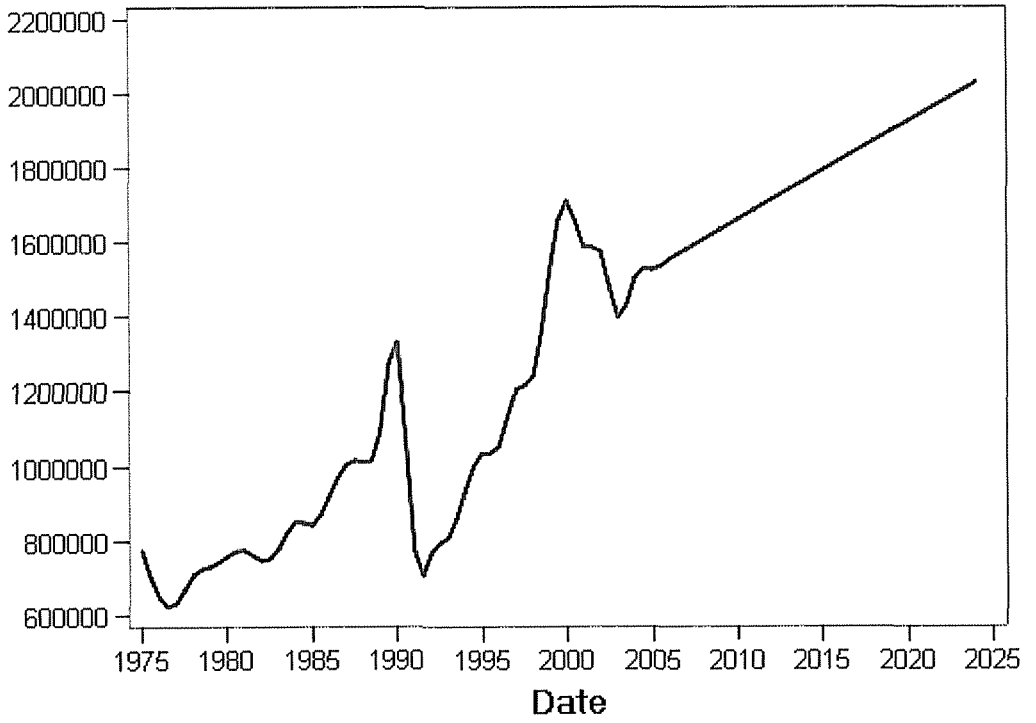
year	predict	lower	upper	year	predict	lower	upper
2000	5502571.87	4850735.29	6154408.45				
2001	5126321.88	4552635.89	5700007.88				
2002	4806572.52	4235464.30	5377680.74				
2003	4619978.92	4027691.35	5212266.48				
2004	4672484.27	4119651.16	5225317.39				

Figure 1.13. Wholesale Monthly Forecast Without Dynamic Regressors



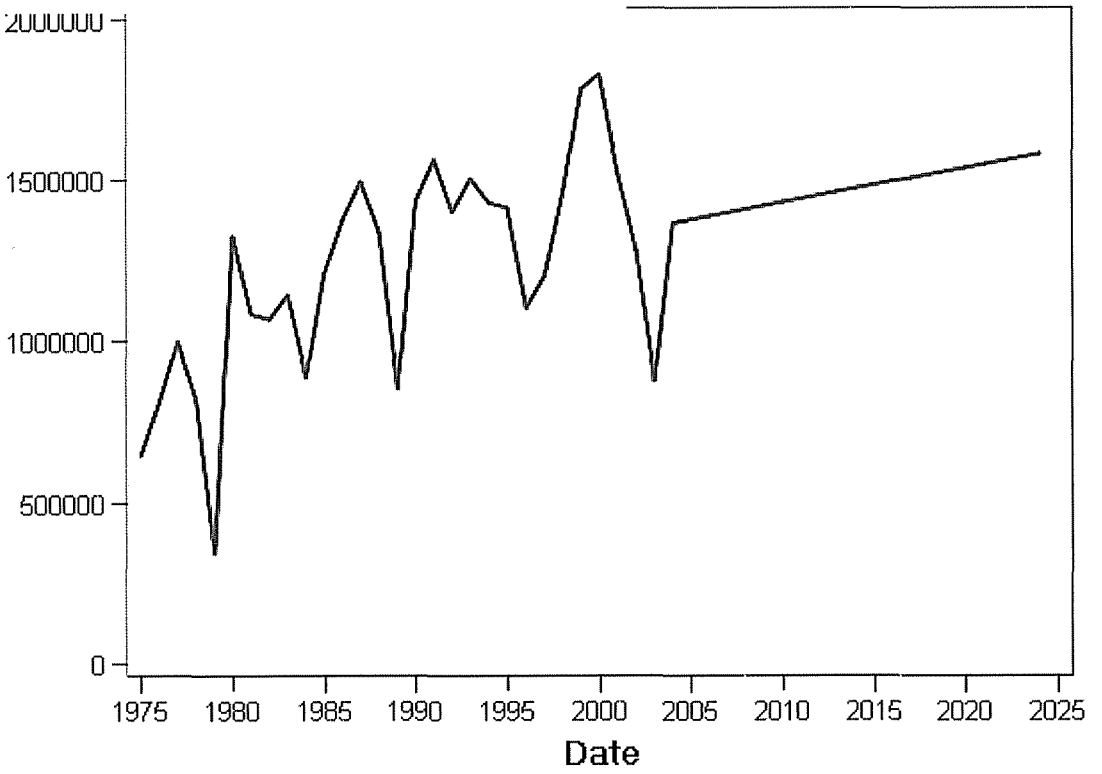
The wholesale usage is steadily increasing over the 20-year forecasting period.

Figure 1.14. Wholesale Yearly Forecast Without Dynamic



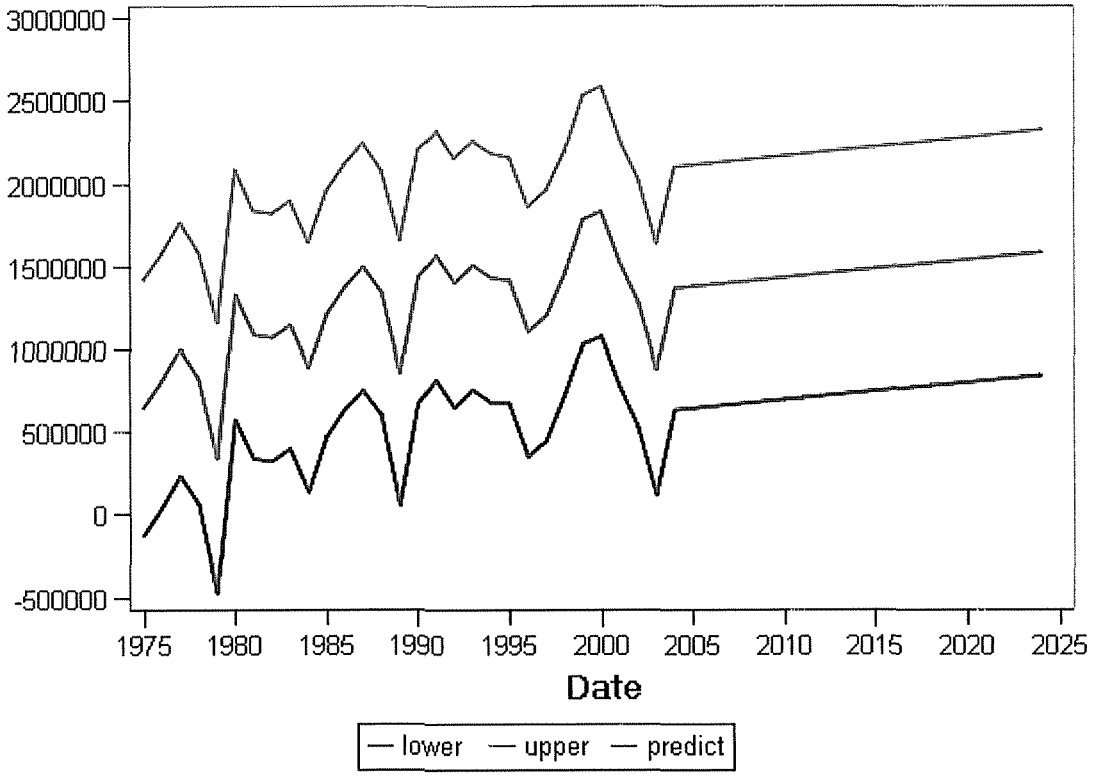
There was apparently a change in the wholesale customers or definition in 1992 as indicated by the drop that occurred in that year. There is a steady increase predicted over the next 20 years.

Figure 1.15. Wholesale Yearly Forecast With Economic Factors and PDSI



Including the economic factors and the PDSI changes the rate of increase to a somewhat lower value. Additionally, the abrupt drop noted in 1992 is not present in this graph, indicating a possible economic cause.

Figure 1.16. Wholesale Yearly Forecast With Confidence Limits



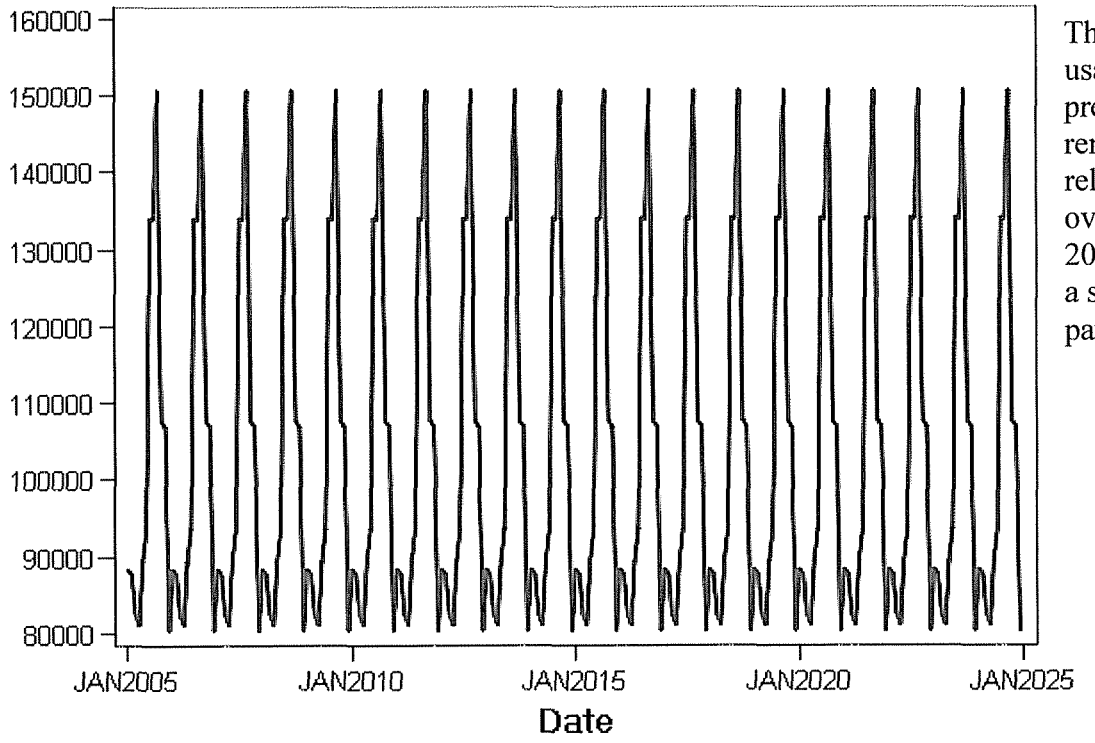
The range of the confidence limits is greater than ± 500,000. The confidence range is wider proportionally, because of the variability from 1975-2004.

Table 1.4. Forecast Values for Wholesale Usage

year	predict	lower	upper	year	predict	lower	upper
1975	653035.16	396362.41	909707.91	**2005**	1553332.04	1336267.47	1770396.60
1976	664281.38	430729.37	897833.39	**2006**	1568130.29	1350937.83	1785322.75
1977	747555.69	519713.34	975398.04	**2007**	1586157.80	1369118.36	1803197.24
1978	781488.66	548027.34	1014949.98	**2008**	1606546.47	1390049.24	1823043.70
1979	743729.11	493491.68	993966.54	**2009**	1628945.89	1413255.92	1844635.86
1980	692117.46	446776.12	937458.79	**2010**	1653020.71	1438190.41	1867851.02
1981	740313.86	511216.56	969411.15	**2011**	1678452.95	1464312.35	1892593.55
1982	743424.48	510628.48	976220.49	**2012**	1704943.82	1491153.83	1918733.81
1983	767102.76	522896.55	1011308.97	**2013**	1732215.05	1518363.23	1946066.87
1984	953847.65	720073.37	1187621.94	**2014**	1760009.88	1545723.65	1974296.11
1985	878440.91	657816.48	1099065.34	**2015**	1788093.58	1573143.48	2003043.68
1986	884912.24	658857.33	1110967.15	**2016**	1816253.80	1600621.59	2031886.02
1987	879045.59	658670.21	1099420.98	**2017**	1844300.57	1628192.03	2060409.11
1988	904327.12	687534.28	1121119.96	**2018**	1872066.10	1655853.64	2088278.55
1989	957259.05	717702.26	1196815.84	**2019**	1899404.44	1683487.37	2115321.51
1990	1077401.71	839824.12	1314979.30	**2020**	1926190.91	1710761.65	2141620.16
1991	930383.47	692252.10	1168514.83	**2021**	1952321.46	1737028.40	2167614.51
1992	1040877.14	815433.14	1266321.15	**2022**	1977711.90	1761224.13	2194199.68
1993	1022171.99	793539.54	1250804.43	**2023**	2002297.05	1781818.96	2222775.15
1994	925251.46	674320.50	1176182.42	**2024**	2026029.83	1796889.78	2255169.87
1995	1039053.93	807403.26	1270704.61	**2025**	2048880.26	1804382.71	2293377.81
1996	1057514.86	823870.08	1291159.63				
1997	1151275.22	921711.33	1380839.10				
1998	1333783.54	1113520.29	1554046.80				
1999	1468133.17	1237133.87	1699132.47				

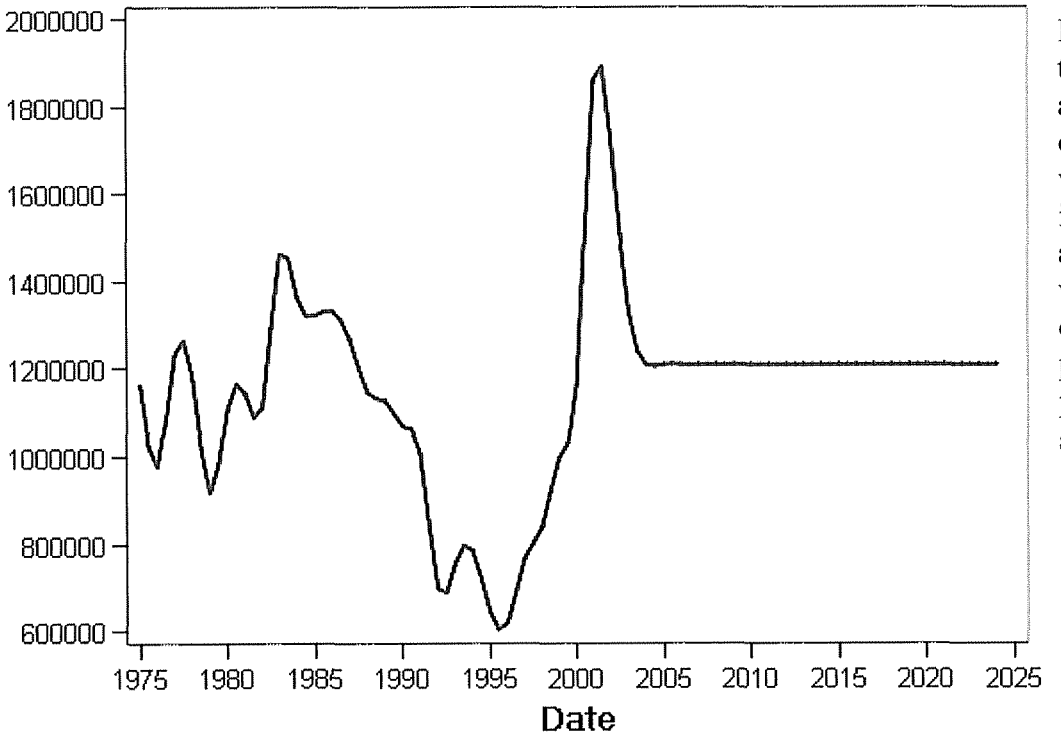
year	predict	lower	upper	year	predict	lower	upper
2000	1730789.10	1475084.37	1986493.83				
2001	1455486.94	1230439.33	1680534.56				
2002	1381481.86	1157445.56	1605518.17				
2003	1525045.89	1292701.31	1757390.48				
2004	1541129.66	1324262.44	1757996.88				

Figure 1.17. Other Monthly Forecast Without Dynamic Regressors



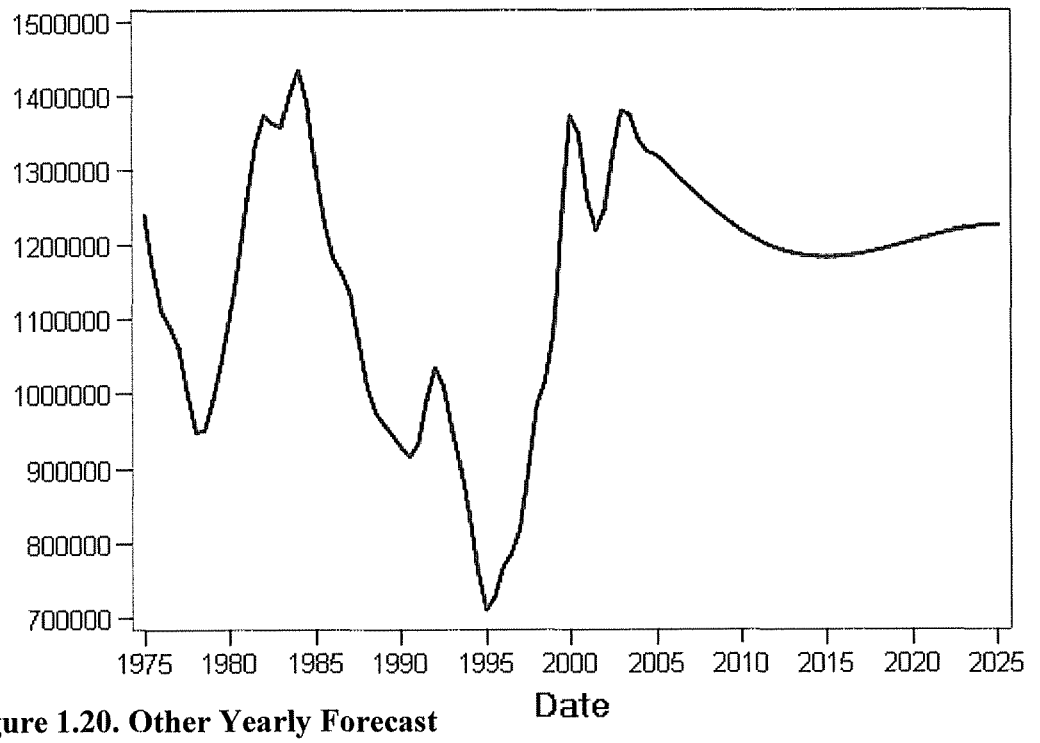
The Other usage is predicted to remain relatively static over the next 20 years, with a seasonal pattern.

Figure 1.18. Total Yearly Forecast Without Dynamic



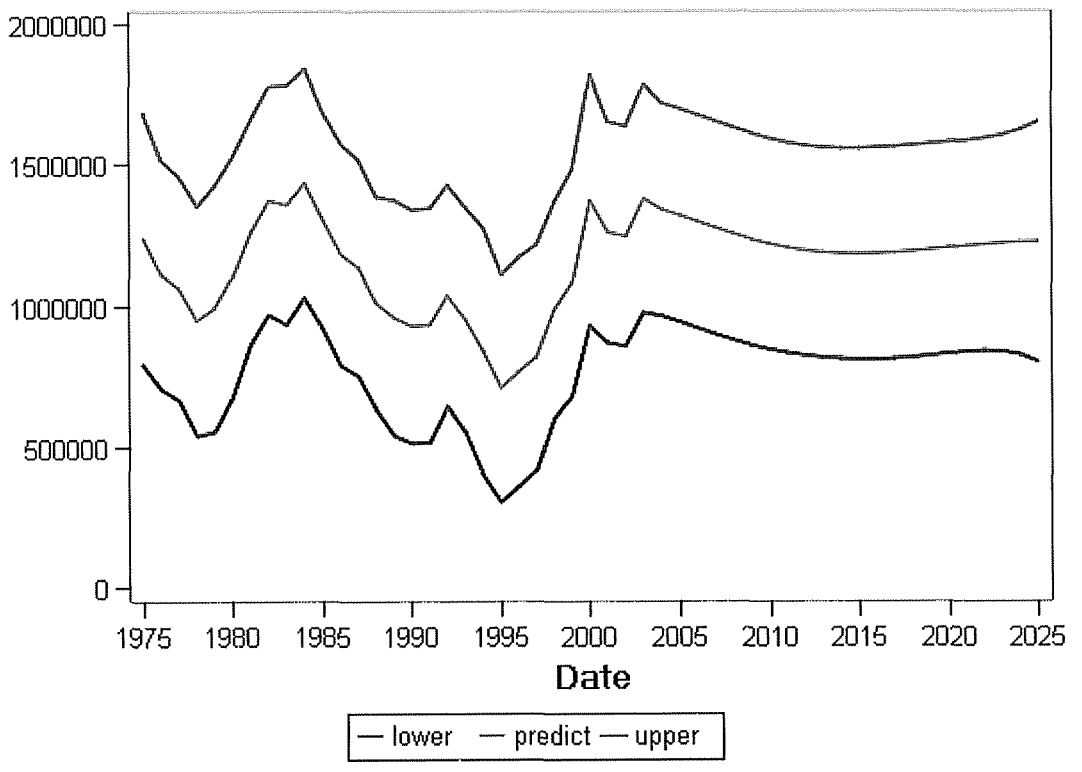
From 1975-1995, there is essentially a decline in the other category, which starts to increase in 1996 to a peak in 2000 with a continued decline to the present. It is predicted to remain static.

Figure 1.19. Other Yearly Forecast with Economic Factors and PDSI



The drop prior to 1995 followed by an increase to 2000 is retained when the economic factors are added. The forecast shows a continued decrease followed by a slight increase, resulting in a slightly lower overall level in 2025 compared to the forecast in Figure 1.18.

Figure 1.20. Other Yearly Forecast with Confidence Limits



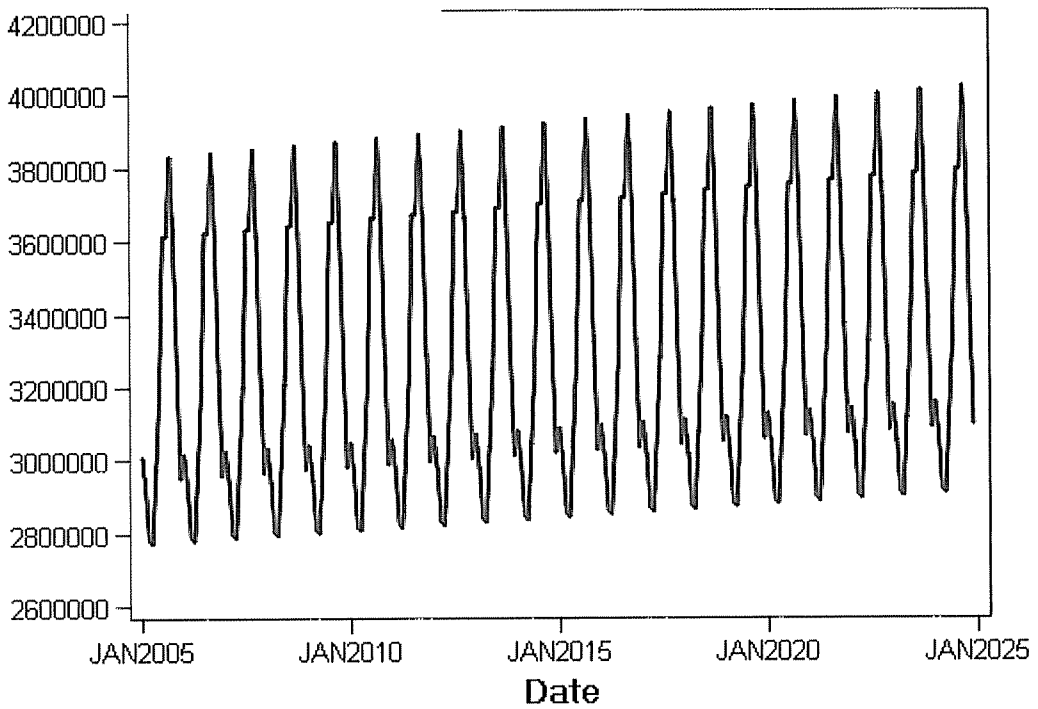
The range of the confidence limits is approximately ± 500,000. The confidence range is wider proportionally, because of the variability from 1975-2004.

Table 1.5. Forecast Values for Other Usage

year	predict	lower	upper	year	predict	lower	upper
1975	1239716.19	793281.92	1686150.46	**2005**	1320881.50	943338.26	1698424.73
1976	1112227.83	706007.80	1518447.86	**2006**	1298688.90	920923.19	1676454.61
1977	1062600.14	666310.97	1458889.31	**2007**	1276380.33	898880.76	1653879.91
1978	948734.43	542672.06	1354796.81	**2008**	1255228.61	878672.11	1631785.11
1979	992598.04	557356.84	1427839.24	**2009**	1236143.01	860990.58	1611295.43
1980	1104567.05	677841.70	1531292.39	**2010**	1219736.75	846079.56	1593393.94
1981	1261476.26	863004.36	1659948.16	**2011**	1206373.66	833916.10	1578831.22
1982	1373461.54	968556.36	1778366.72	**2012**	1196209.48	824361.75	1568057.22
1983	1358382.59	933631.57	1783133.60	**2013**	1189228.40	817273.13	1561183.67
1984	1434664.31	1028057.68	1841270.95	**2014**	1185275.19	812564.35	1557986.04
1985	1305730.07	921995.16	1689464.98	**2015**	1184083.45	810217.92	1557948.98
1986	1183885.28	790705.05	1577065.51	**2016**	1185300.24	810248.29	1560352.19
1987	1135094.73	751792.98	1518396.49	**2017**	1188507.58	812627.14	1564388.02
1988	1010526.31	633455.72	1387596.90	**2018**	1193241.00	817179.81	1569302.20
1989	958925.04	542260.82	1375589.26	**2019**	1199005.62	823458.19	1574553.05
1990	928187.34	514965.53	1341409.15	**2020**	1205289.76	830590.80	1579988.73
1991	933207.80	519022.83	1347392.78	**2021**	1211576.69	837114.64	1586038.75
1992	1035844.81	643727.11	1427962.52	**2022**	1217354.35	840814.32	1593894.39
1993	950661.33	552997.96	1348324.70	**2023**	1222123.56	838643.13	1605604.00
1994	840240.62	403793.16	1276688.08	**2024**	1225404.75	826858.44	1623951.06
1995	710005.52	307092.44	1112918.59	**2025**	1226743.37	801485.49	1652001.24
1996	767836.97	361455.59	1174218.36				
1997	819255.57	419972.13	1218539.01				
1998	985848.26	602741.51	1368955.01				
1999	1081547.35	679767.27	1483327.42				

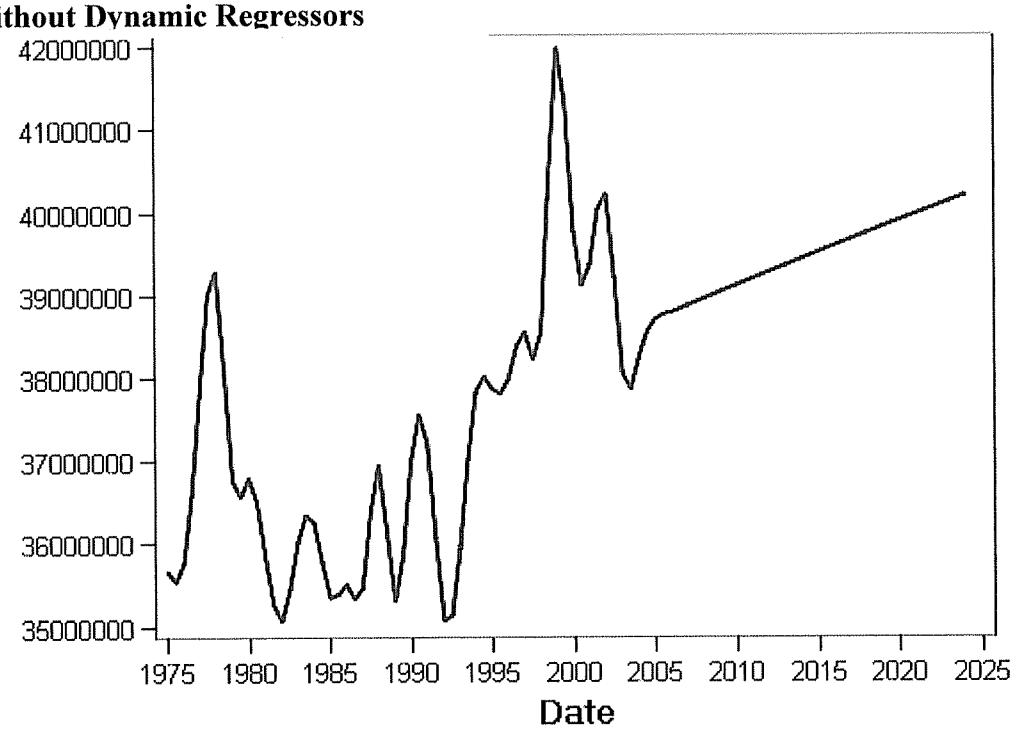
year	predict	lower	upper	year	predict	lower	upper
2000	1373115.88	928365.27	1817866.49				
2001	1260458.61	869030.27	1651886.95				
2002	1247171.51	857502.20	1636840.81				
2003	1380513.56	976393.57	1784633.54				
2004	1341322.55	964122.57	1718522.54				

Figure 1.21. Total Monthly Forecast Without Dynamic Regressors



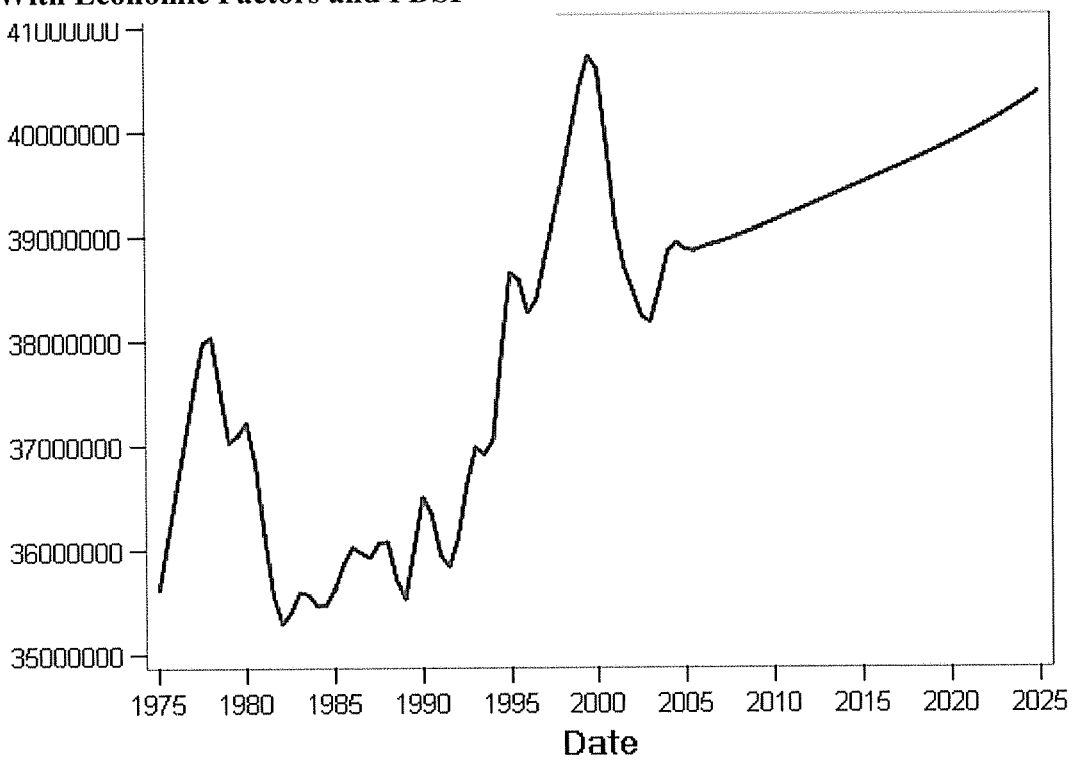
The Total usage is predicted to increase slightly over the next 20 years, with a seasonal pattern.

Figure 1.22. Total Yearly Forecast Without Dynamic Regressors



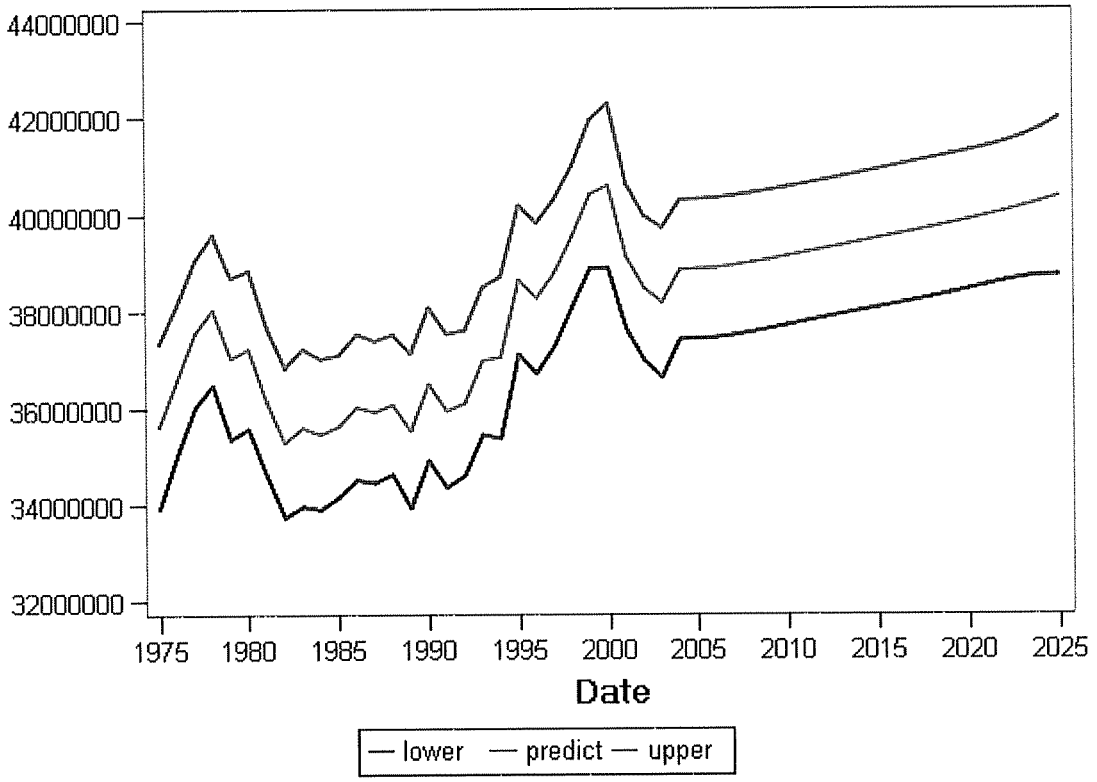
There seems to be a considerable increase in total usage from 1992-2000, with a decrease from that point. The forecast indicates a steady increase over the next 20 years.

Figure 1.23. Total Yearly Forecast With Economic Factors and PDSI



Including the economic factors and the PDSI gives a similar increase prediction compared to the forecast without regressors.

Figure 1.24. Total Yearly Forecast With Confidence Limits



The range of the confidence limits is approximately ± 750,000.

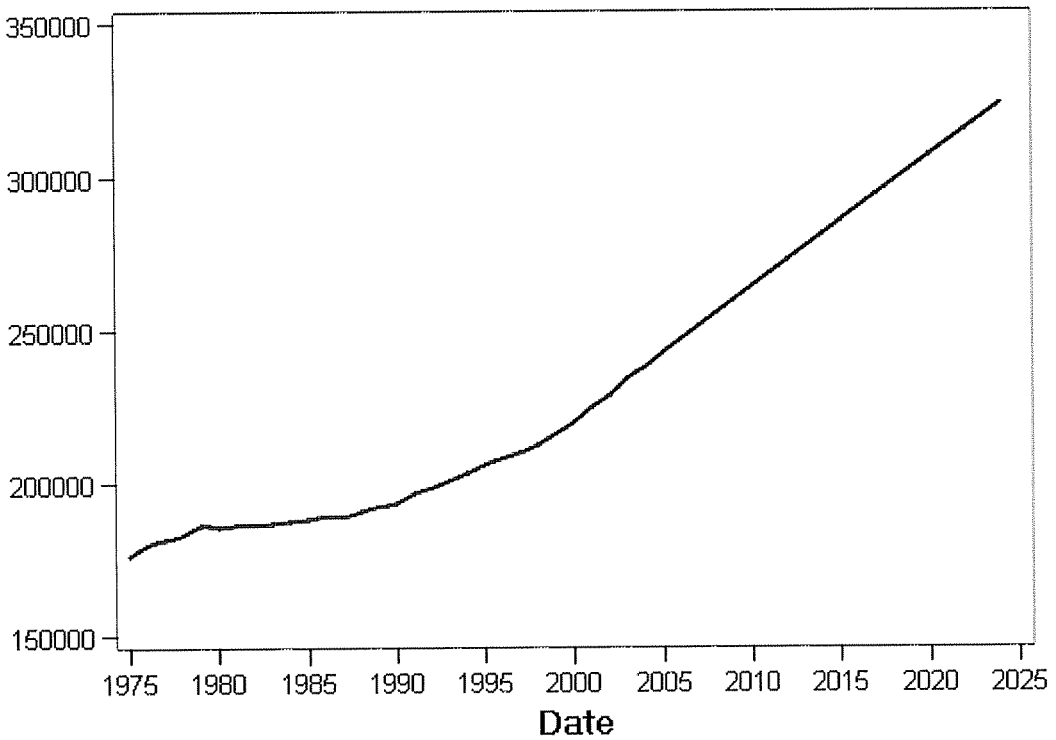
Table 1.6. Forecast Values for Total Usage

year	predict	lower	upper	year	predict	lower	upper
1975	35634189.60	33925719.37	37342659.83	**2005**	38873254.54	37428424.96	40318084.11
1976	36589010.82	35034437.28	38143584.35	**2006**	38895211.56	37449530.68	40340892.45
1977	37547875.20	36031306.44	39064443.96	**2007**	38944162.68	37499500.32	40388825.04
1978	38041297.50	36487327.66	39595267.33	**2008**	39002900.86	37561847.57	40443954.15
1979	37036916.70	35371281.34	38702552.06	**2009**	39068166.64	37632486.62	40503846.66
1980	37222170.48	35589124.63	38855216.33	**2010**	39137489.30	37707531.38	40567447.21
1981	36154251.77	34629329.81	37679173.73	**2011**	39209074.77	37783707.68	40634441.85
1982	35297849.30	33748307.94	36847390.67	**2012**	39281705.26	37858671.89	40704738.63
1983	35600798.91	33975308.68	37226289.14	**2013**	39354649.68	37931204.75	40778094.61
1984	35468416.67	33912363.65	37024469.70	**2014**	39427583.87	38001247.39	40853920.34
1985	35634402.86	34165878.15	37102927.56	**2015**	39500519.86	38069764.51	40931275.21
1986	36027912.89	34523241.70	37532584.08	**2016**	39573743.33	38138447.70	41009038.96
1987	35930293.01	34463425.98	37397160.03	**2017**	39647758.49	38209292.34	41086224.65
1988	36081532.84	34638512.04	37524553.65	**2018**	39723239.78	38284081.93	41162397.63
1989	35539725.85	33945183.17	37134268.54	**2019**	39800989.62	38363797.91	41238181.33
1990	36504939.18	34923570.48	38086307.88	**2020**	39881901.80	38447957.08	41315846.51
1991	35950841.36	34365786.60	37535896.11	**2021**	39966929.74	38533891.59	41399967.88
1992	36113030.98	34612426.10	37613635.85	**2022**	40057059.34	38616068.86	41498049.82
1993	36982591.00	35460763.14	38504418.86	**2023**	40153285.83	38685734.93	41620836.73
1994	37050380.58	35380128.92	38720632.24	**2024**	40256594.15	38731387.40	41781800.91
1995	38653029.00	37111111.16	40194946.85	**2025**	40367942.67	38740513.06	41995372.27
1996	38271174.20	36715983.15	39826365.26				
1997	38796679.73	37268651.98	40324707.48				
1998	39552021.14	38085900.38	41018141.90				
1999	40424724.62	38887142.43	41962306.82				

year	predict	lower	upper	year	predict	lower	upper
2000	40602075.80	38900048.85	42304102.74				
2001	39134661.59	37636695.12	40632628.06				
2002	38478605.28	36987370.27	39969840.29				
2003	38179936.55	36633399.81	39726473.29				
2004	38857625.71	37414109.68	40301141.75				

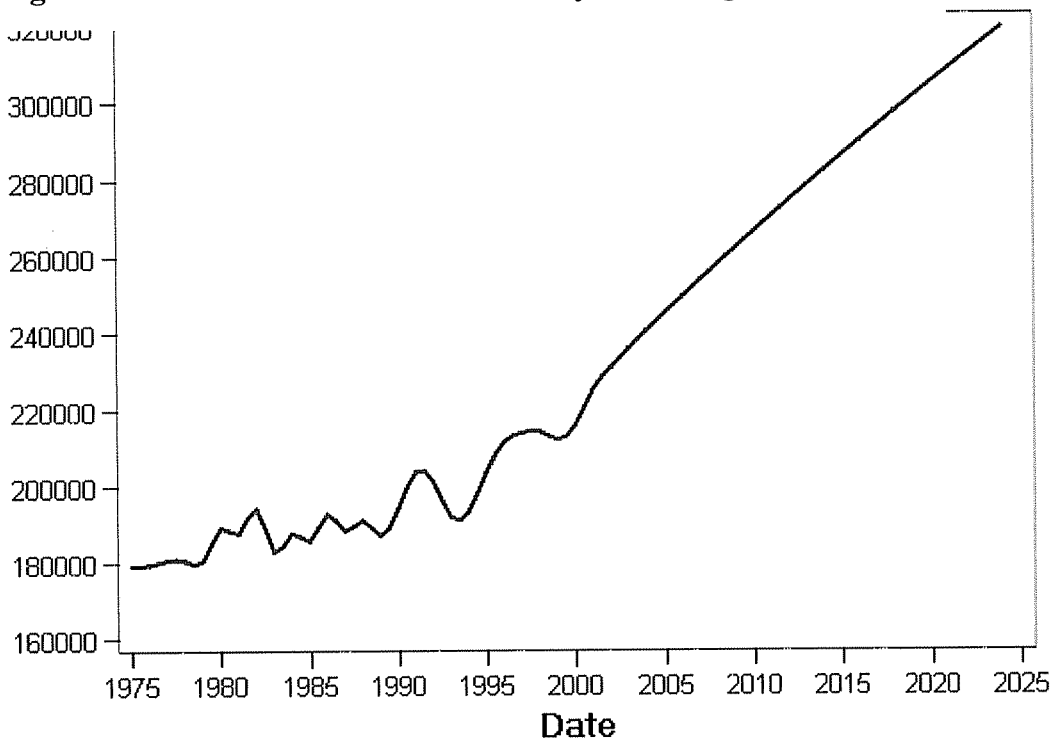
Forecasts for Customers, 2005-2025

Figure 2.1. Residential Customers Without Dynamic Regressors



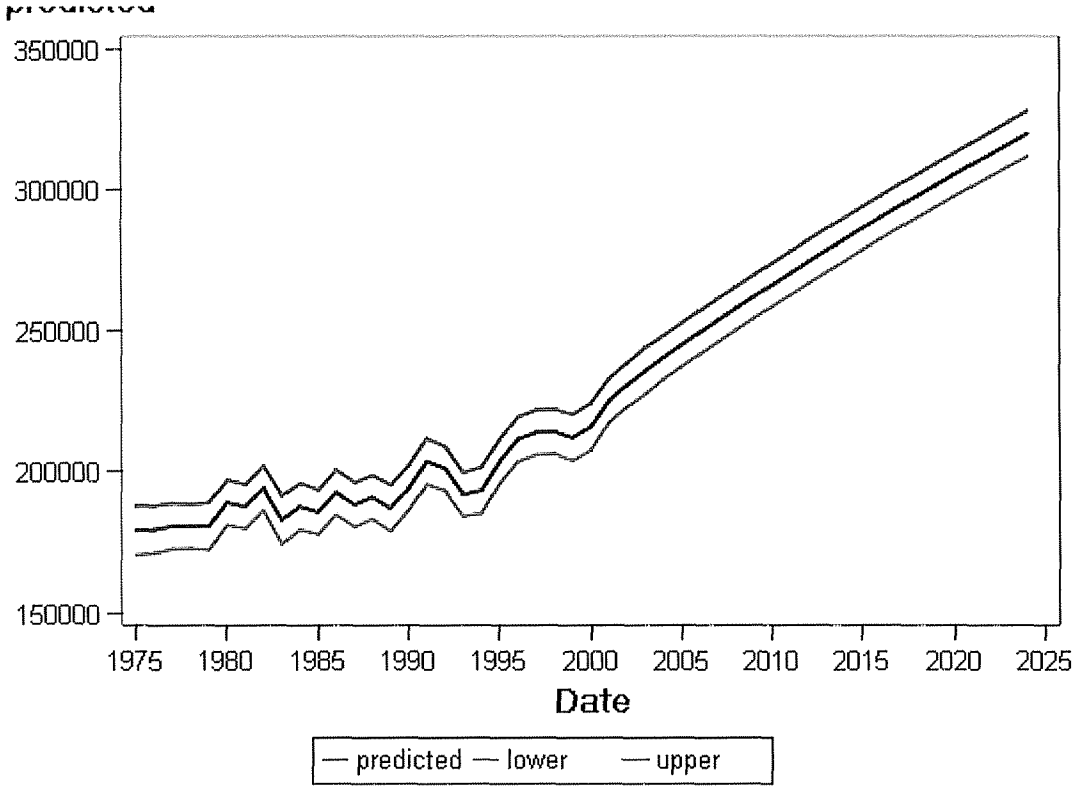
The number of residential customers is expected to increase linearly over the next 20 years.

Figure 2.2. Residential Customers With Dynamic Regressors



Adding the economic regressors does not appear to change the forecast.

Figure 2.3. Residential Customers With Confidence Limits



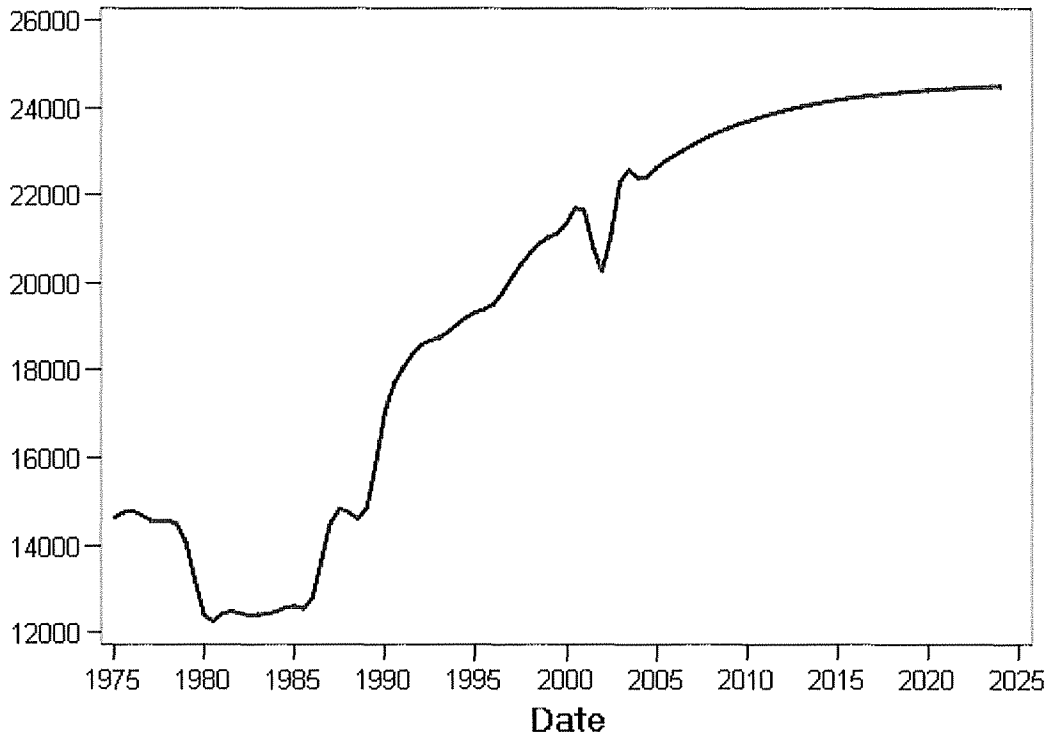
The confidence interval is relatively small, indicating that variability is small.

Table 2.1. Forecast Values for Residential Customers

Date	predicted	lower	upper	Date	predicted	lower	upper
1975	179135.21	170327.60	187942.82	**2005**	244777.91	237136.62	252419.21
1976	179494.89	171072.99	187916.79	**2006**	249132.20	241487.69	256776.70
1977	180792.41	172631.66	188953.16	**2007**	253443.51	245791.31	261095.72
1978	180640.02	172784.97	188495.08	**2008**	257710.98	250050.59	265371.37
1979	180542.83	172157.34	188928.31	**2009**	261934.25	254267.75	269600.75
1980	189063.39	181077.01	197049.77	**2010**	266113.43	258444.30	273782.56
1981	187561.14	179709.99	195412.30	**2011**	270248.99	262581.12	277916.86
1982	194159.24	186287.24	202031.24	**2012**	274341.66	266678.58	282004.74
1983	182810.52	174209.88	191411.16	**2013**	278392.42	270736.67	286048.17
1984	187767.15	179459.97	196074.33	**2014**	282402.41	274755.04	290049.78

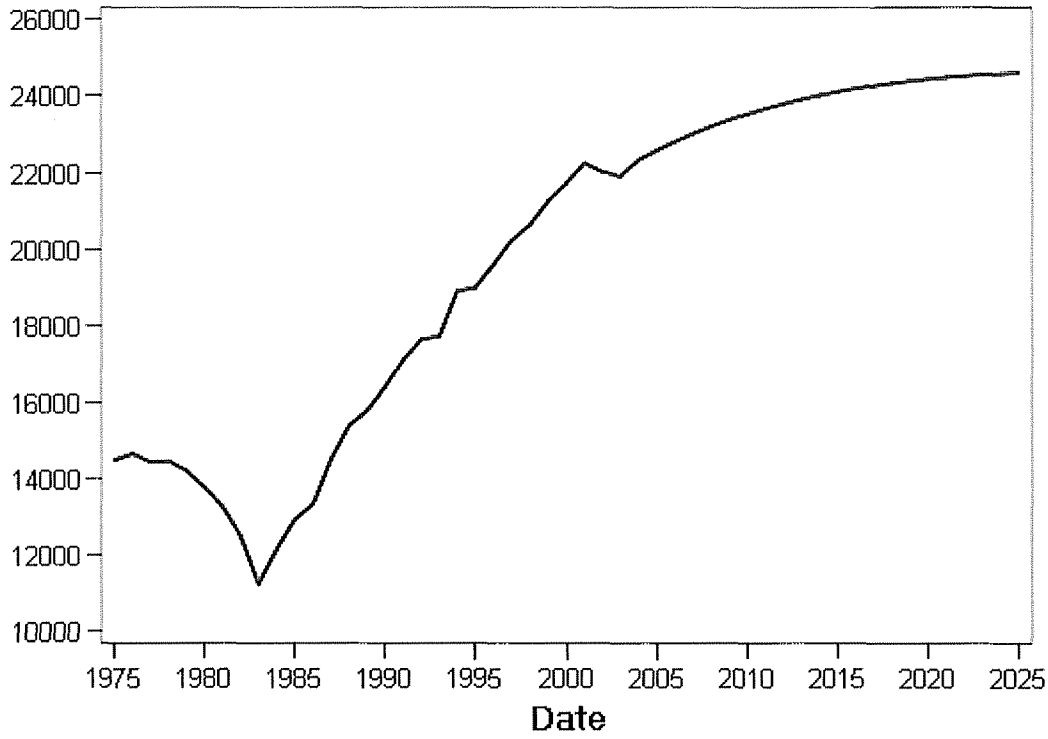
Date	predicted	lower	upper	Date	predicted	lower	upper
1985	185630.53	177716.95	193544.11	**2015**	286372.88	278733.04	294012.72
1986	192829.14	184863.00	200795.27	**2016**	290305.19	282669.87	297940.52
1987	188239.56	180322.57	196156.55	**2017**	294200.76	286564.52	301837.00
1988	191022.69	183227.27	198818.10	**2018**	298061.03	290415.94	305706.12
1989	187052.78	178805.13	195300.42	**2019**	301887.47	294223.01	309551.93
1990	194439.74	186475.69	202403.80	**2020**	305681.54	297984.66	313378.43
1991	203894.68	195721.04	212068.33	**2021**	309444.69	301699.89	317189.50
1992	201139.57	193201.31	209077.83	**2022**	313178.34	305367.86	320988.83
1993	191609.00	183848.52	199369.48	**2023**	316883.88	308987.94	324779.82
1994	192872.58	184702.61	201042.54	**2024**	320562.66	312559.78	328565.55
1995	203749.73	196015.66	211483.80	**2025**	324215.99	316083.28	332348.70
1996	211781.16	203838.47	219723.86				
1997	214121.29	206178.49	222064.09				
1998	214352.77	206448.46	222257.07				
1999	212137.69	203914.26	220361.12				
2000	215972.00	207589.64	224354.36				
2001	225115.76	217401.68	232829.84				
2002	230662.09	222954.88	238369.31				
2003	235721.40	227520.17	243922.64				
2004	240391.74	232744.02	248039.47				

Figure 2.4. Commercial Customers Without Dynamic Regressors



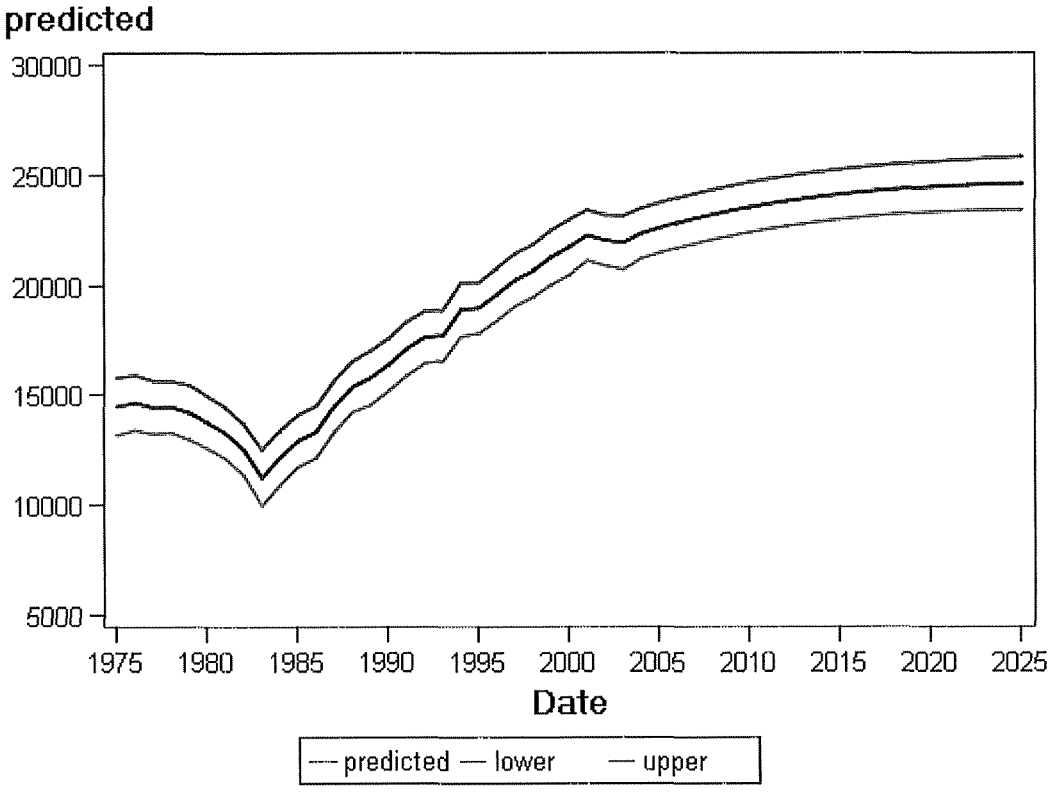
The number of commercial customers is expected to increase over the next 20 years, but the rate is expected to decrease.

Figure 2.5. Commercial Customers With Dynamic Regressors



The forecast with dynamic regressors changes relatively little when compared to Figure 2.4.

Figure 2.6. Commercial Customers With Confidence Limits



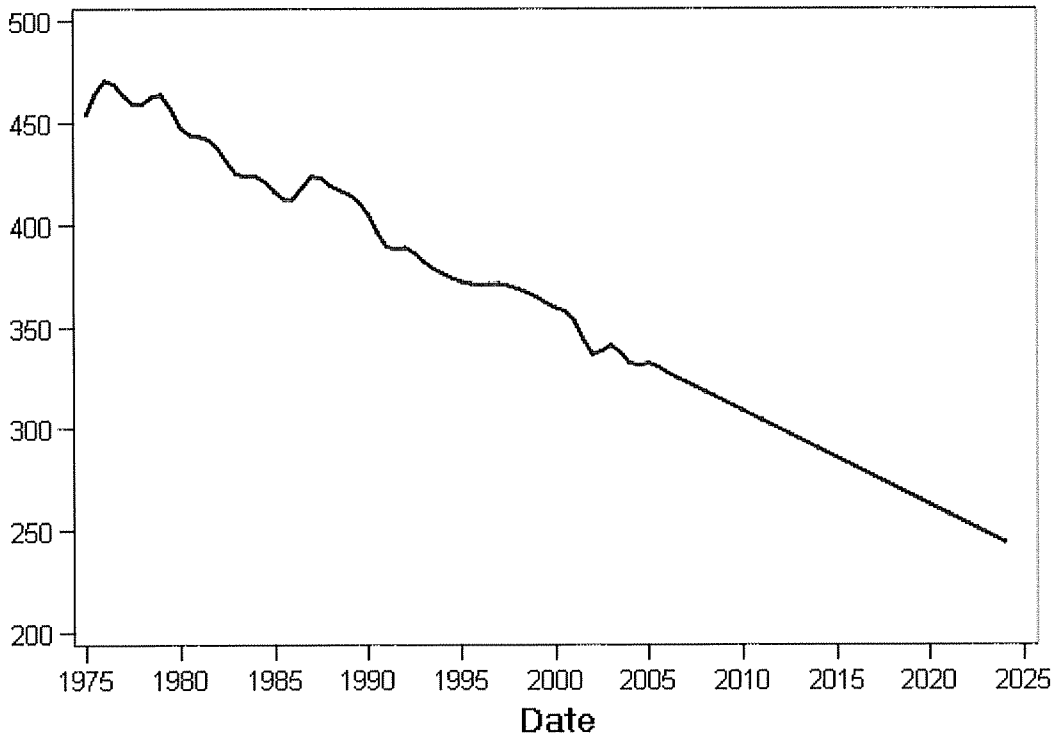
The confidence interval is somewhat larger when compared to Figure 2.3. for residential customers, but it is still relatively small, approximately ±1000.

Table 2.2. Forecast Values for Commercial Usage

Date	predicted	lower	upper	Date	predicted	lower	upper
1975	14487.88	13176.19	15799.58	**2005**	22573.52	21435.52	23711.52
1976	14644.79	13390.54	15899.04	**2006**	22800.72	21662.24	23939.19
1977	14429.48	13214.12	15644.84	**2007**	23008.16	21868.54	24147.78
1978	14452.34	13282.51	15622.18	**2008**	23197.37	22056.53	24338.21
1979	14200.01	12951.18	15448.84	**2009**	23369.74	22227.99	24511.49
1980	13751.82	12562.43	14941.21	**2010**	23526.53	22384.38	24668.67
1981	13268.95	12099.70	14438.20	**2011**	23668.91	22526.95	24810.86
1982	12512.20	11339.85	13684.56	**2012**	23797.94	22656.69	24939.18
1983	11242.07	9961.20	12522.94	**2013**	23914.59	22774.44	25054.74
1984	12136.69	10899.53	13373.86	**2014**	24019.77	22880.87	25158.68

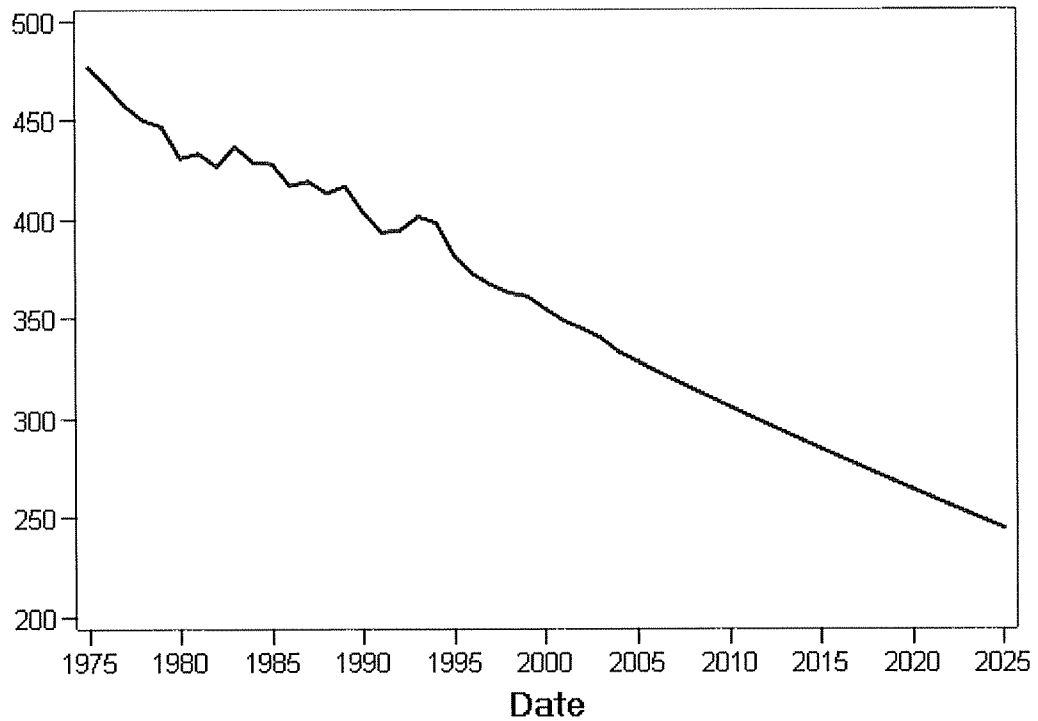
Date	predicted	lower	upper	Date	predicted	lower	upper
1985	12913.36	11734.81	14091.91	**2015**	24114.30	22976.52	25252.08
1986	13318.37	12132.00	14504.75	**2016**	24198.94	23061.83	25336.05
1987	14491.19	13312.14	15670.25	**2017**	24274.39	23137.14	25411.63
1988	15369.59	14208.64	16530.54	**2018**	24341.28	23202.72	25479.85
1989	15781.63	14553.33	17009.93	**2019**	24400.23	23258.78	25541.68
1990	16387.67	15201.60	17573.74	**2020**	24451.78	23305.50	25598.05
1991	17106.19	15888.91	18323.47	**2021**	24496.43	23343.01	25649.84
1992	17627.20	16444.97	18809.42	**2022**	24534.65	23371.46	25697.85
1993	17706.61	16550.86	18862.36	**2023**	24566.89	23390.97	25742.81
1994	18891.73	17675.00	20108.46	**2024**	24593.54	23401.69	25785.39
1995	18971.33	17819.51	20123.14	**2025**	24614.97	23403.79	25826.16
1996	19585.25	18402.37	20768.14				
1997	20227.31	19044.41	21410.21				
1998	20644.46	19467.29	21821.63				
1999	21248.73	20024.03	22473.42				
2000	21709.96	20461.60	22958.33				
2001	22237.65	21088.82	23386.49				
2002	22012.77	20864.96	23160.59				
2003	21903.30	20681.91	23124.69				
2004	22327.10	21188.15	23466.06				

Figure 2.7. Industrial Customers Without Dynamic Regressors



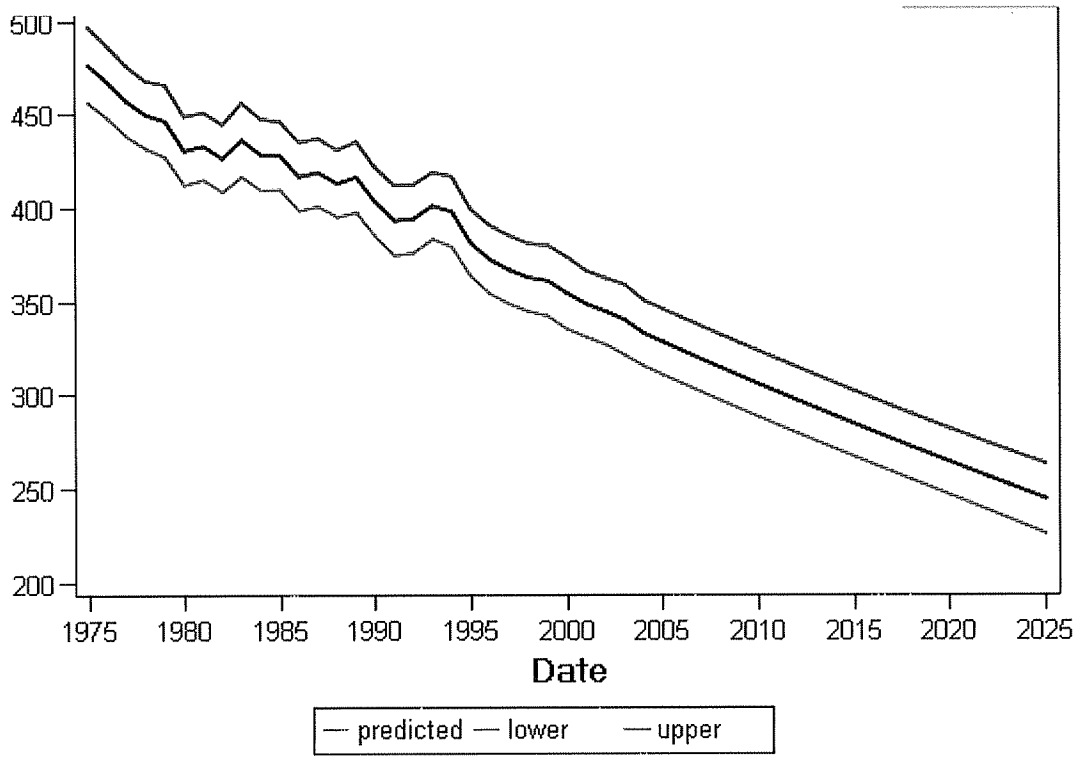
The decline in the number of industrial customers is linear, and this is expected to continue over the next 20 years.

Figure 2.8. Industrial Customers With Dynamic Regressors



Adding dynamic regressors does not change the forecast.

Figure 2.9. Industrial Customers With Confidence Limits



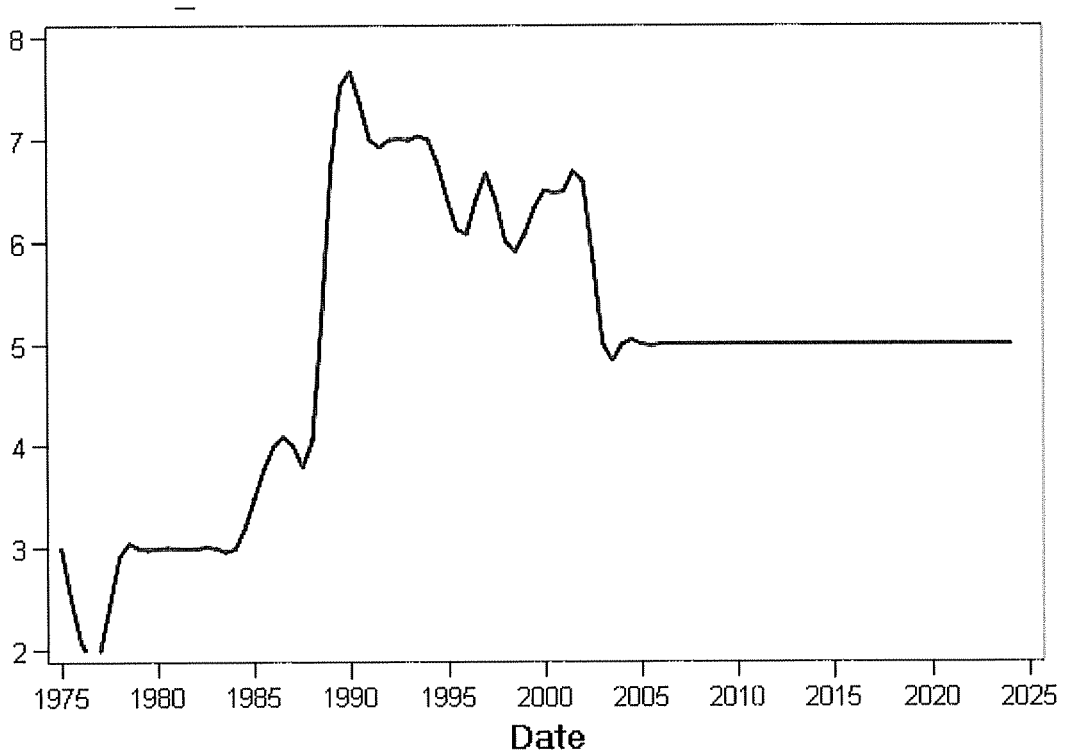
The confidence interval is very narrow because of the limited variability in the linear decline.

Table 2.3. Forecast Values for Industrial Customers

Date	predicted	lower	upper	Date	predicted	lower	upper
1975	476.753	456.510	496.997	**2005**	328.370	310.807	345.933
1976	467.506	448.149	486.863	**2006**	323.753	306.183	341.323
1977	457.332	438.575	476.089	**2007**	319.196	301.608	336.784
1978	450.051	431.996	468.105	**2008**	314.697	297.090	332.304
1979	446.807	427.534	466.080	**2009**	310.253	292.632	327.873
1980	430.847	412.491	449.203	**2010**	305.860	288.233	323.487
1981	433.242	415.197	451.287	**2011**	301.517	283.893	319.141
1982	426.705	408.612	444.798	**2012**	297.221	279.608	314.834
1983	436.649	416.881	456.417	**2013**	292.969	275.373	310.565
1984	428.699	409.606	447.792	**2014**	288.759	271.182	306.336

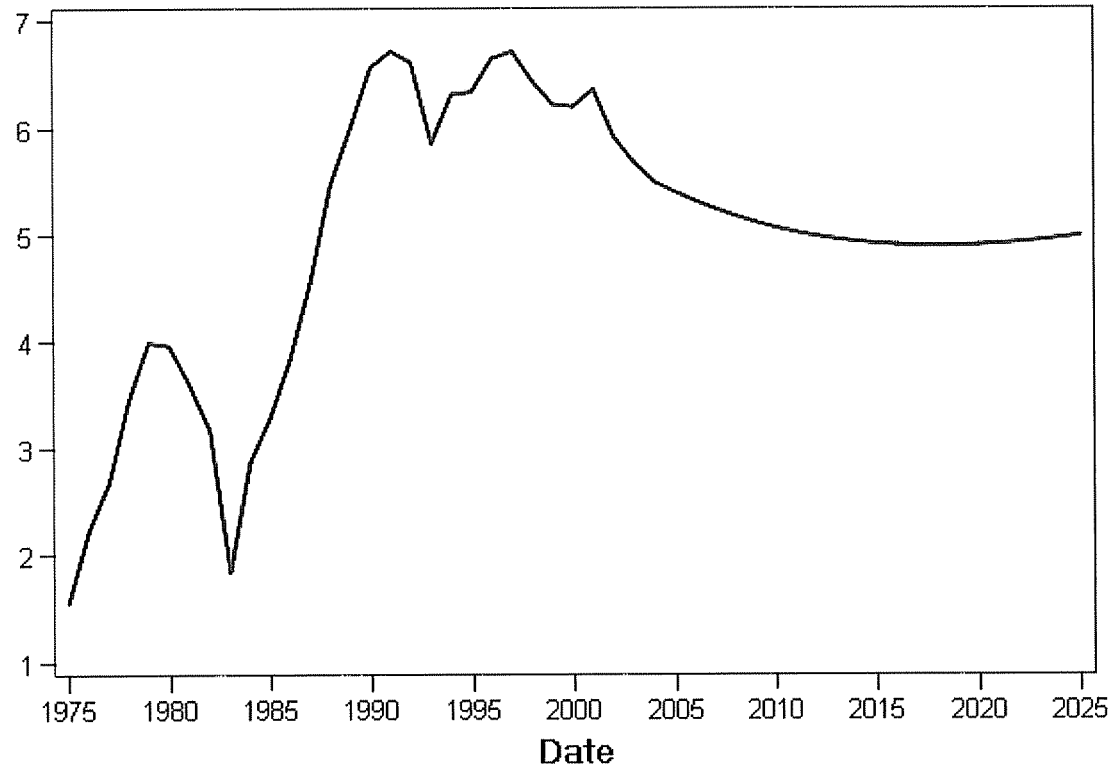
Date	predicted	lower	upper	Date	predicted	lower	upper
1985	427.994	409.806	446.183	**2015**	284.588	267.029	302.148
1986	416.976	398.666	435.285	**2016**	280.455	262.906	298.005
1987	419.159	400.962	437.356	**2017**	276.358	258.807	293.909
1988	413.216	395.299	431.133	**2018**	272.294	254.722	289.865
1989	416.640	397.683	435.596	**2019**	268.261	250.645	285.877
1990	403.386	385.081	421.690	**2020**	264.258	246.567	281.948
1991	393.427	374.640	412.213	**2021**	260.283	242.482	278.084
1992	394.357	376.111	412.602	**2022**	256.334	238.382	274.286
1993	401.248	383.411	419.084	**2023**	252.411	234.262	270.559
1994	398.203	379.425	416.981	**2024**	248.511	230.117	266.905
1995	381.407	363.631	399.183	**2025**	244.633	225.940	263.325
1996	372.460	354.204	390.716				
1997	366.952	348.696	385.208				
1998	362.890	344.723	381.057				
1999	361.135	342.234	380.036				
2000	354.569	335.302	373.835				
2001	348.691	330.961	366.421				
2002	344.773	327.059	362.488				
2003	340.182	321.332	359.032				
2004	333.001	315.424	350.579				

Figure 2.10. Wholesale Customers Without Dynamic Regressors



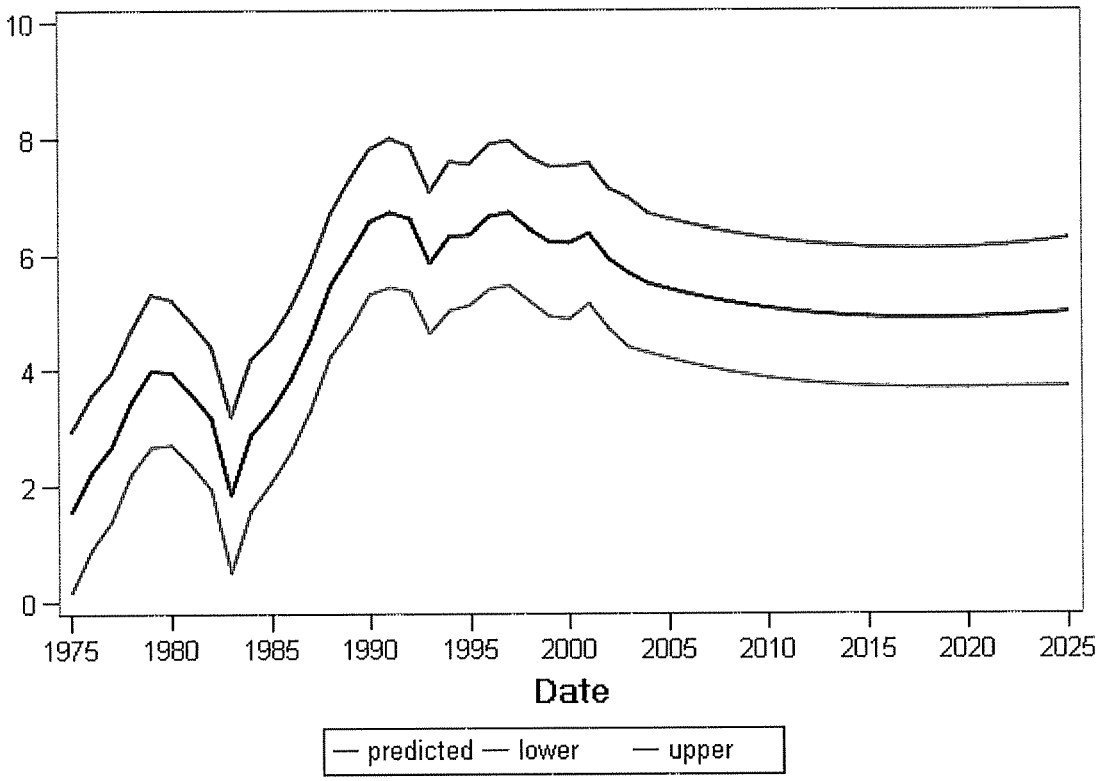
The number of wholesale customers increased between 1987 and 1990 and then decreased slightly. The projected forecast is static.

Figure 2.11. Wholesale Customers With Dynamic Regressors



The addition of dynamic regressors does change the forecast slightly, but the projection in 2025 remains the same.

Figure 2.12. Wholesale Customers With Confidence Limits



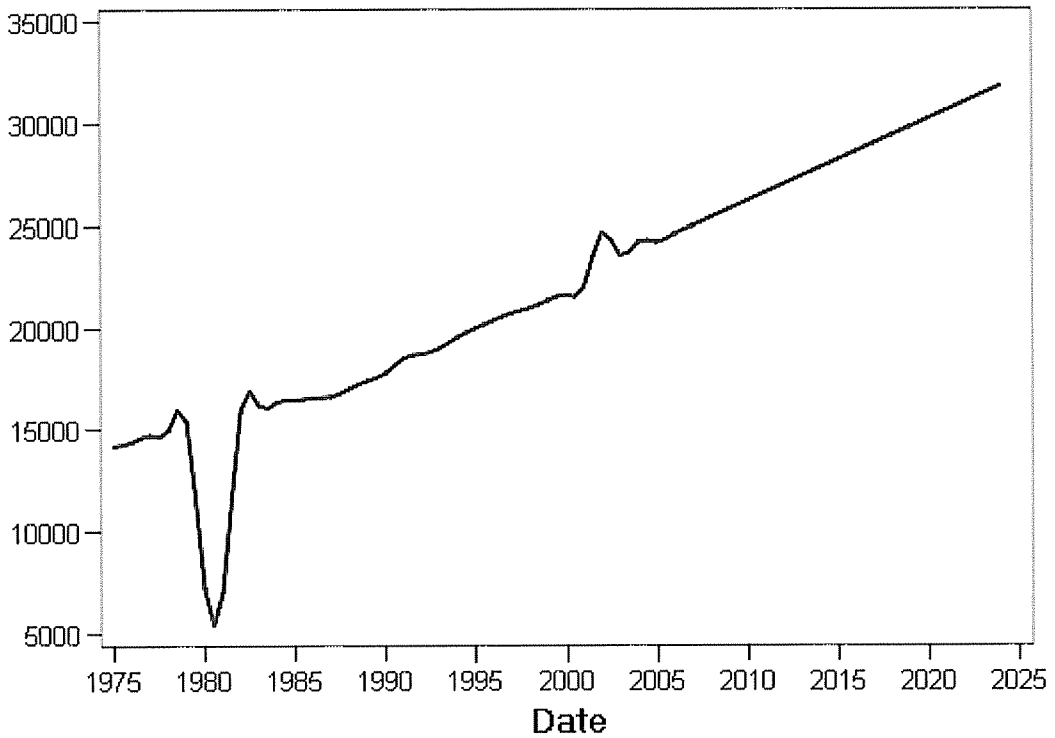
The expected width of the confidence interval is approximately ±1 customer.

Table 2.4. Forecast Values for Wholesale Customers

Date	predicted	lower	upper	Date	predicted	lower	upper
1975	1.55779	0.17257	2.94301	**2005**	5.39841	4.19662	6.60019
1976	2.23263	0.90808	3.55719	**2006**	5.31420	4.11191	6.51649
1977	2.67847	1.39499	3.96195	**2007**	5.23896	4.03546	6.44246
1978	3.45061	2.21520	4.68601	**2008**	5.17230	3.96751	6.37709
1979	3.98725	2.66843	5.30608	**2009**	5.11380	3.90805	6.31955
1980	3.95908	2.70302	5.21514	**2010**	5.06307	3.85690	6.26923
1981	3.59792	2.36313	4.83271	**2011**	5.01970	3.81373	6.22566
1982	3.17564	1.93758	4.41371	**2012**	4.98330	3.77809	6.18851
1983	1.84717	0.49450	3.19984	**2013**	4.95349	3.74943	6.15755
1984	2.87635	1.56984	4.18287	**2014**	4.92990	3.72716	6.13264

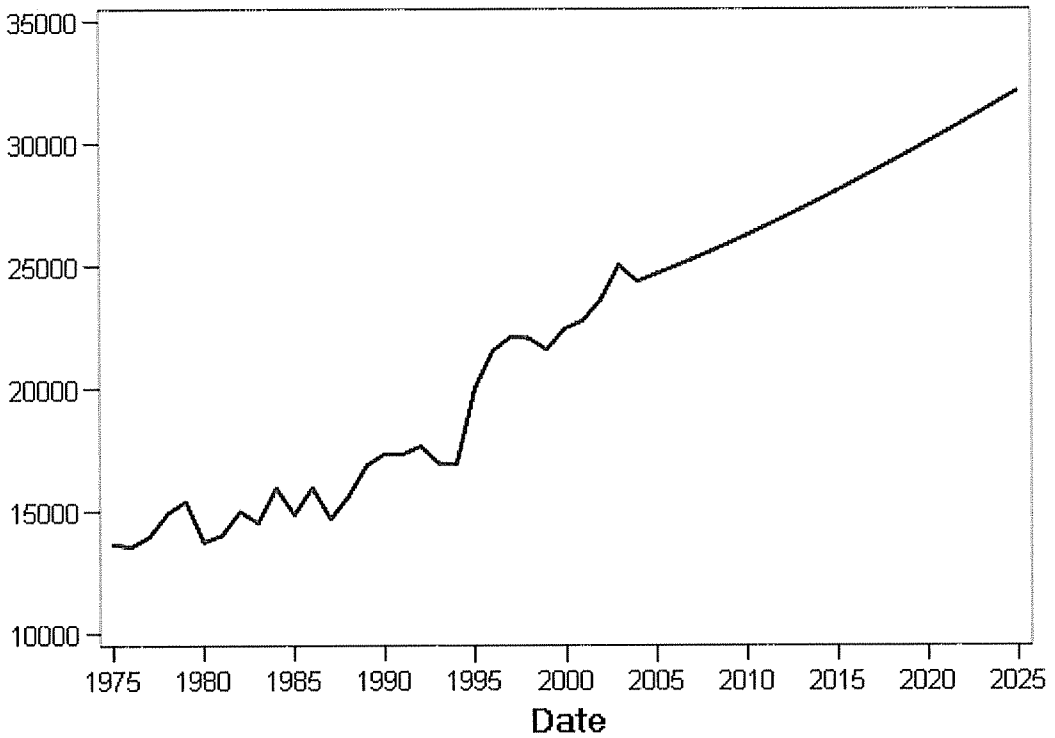
Date	predicted	lower	upper	Date	predicted	lower	upper
1985	3.29033	2.04572	4.53494	**2015**	4.91217	3.71061	6.11372
1986	3.83370	2.58082	5.08657	**2016**	4.89994	3.69910	6.10079
1987	4.54919	3.30404	5.79433	**2017**	4.89290	3.69191	6.09389
1988	5.45358	4.22756	6.67961	**2018**	4.89072	3.68833	6.09310
1989	6.00021	4.70306	7.29736	**2019**	4.89309	3.68766	6.09852
1990	6.56396	5.31142	7.81651	**2020**	4.89972	3.68919	6.11025
1991	6.71547	5.42996	8.00098	**2021**	4.91034	3.69228	6.12841
1992	6.60876	5.36027	7.85725	**2022**	4.92469	3.69629	6.15308
1993	5.85208	4.63155	7.07261	**2023**	4.94251	3.70067	6.18434
1994	6.30869	5.02375	7.59362	**2024**	4.96357	3.70492	6.22223
1995	6.33481	5.11843	7.55118	**2025**	4.98765	3.70858	6.26672
1996	6.64806	5.39887	7.89725				
1997	6.71278	5.46358	7.96199				
1998	6.43334	5.19019	7.67649				
1999	6.21677	4.92343	7.51011				
2000	6.19460	4.87626	7.51293				
2001	6.35766	5.14443	7.57090				
2002	5.91504	4.70289	7.12719				
2003	5.67402	4.38417	6.96387				
2004	5.49043	4.28763	6.69323				

Figure 2.13. Other Customers Without Dynamic Regressors



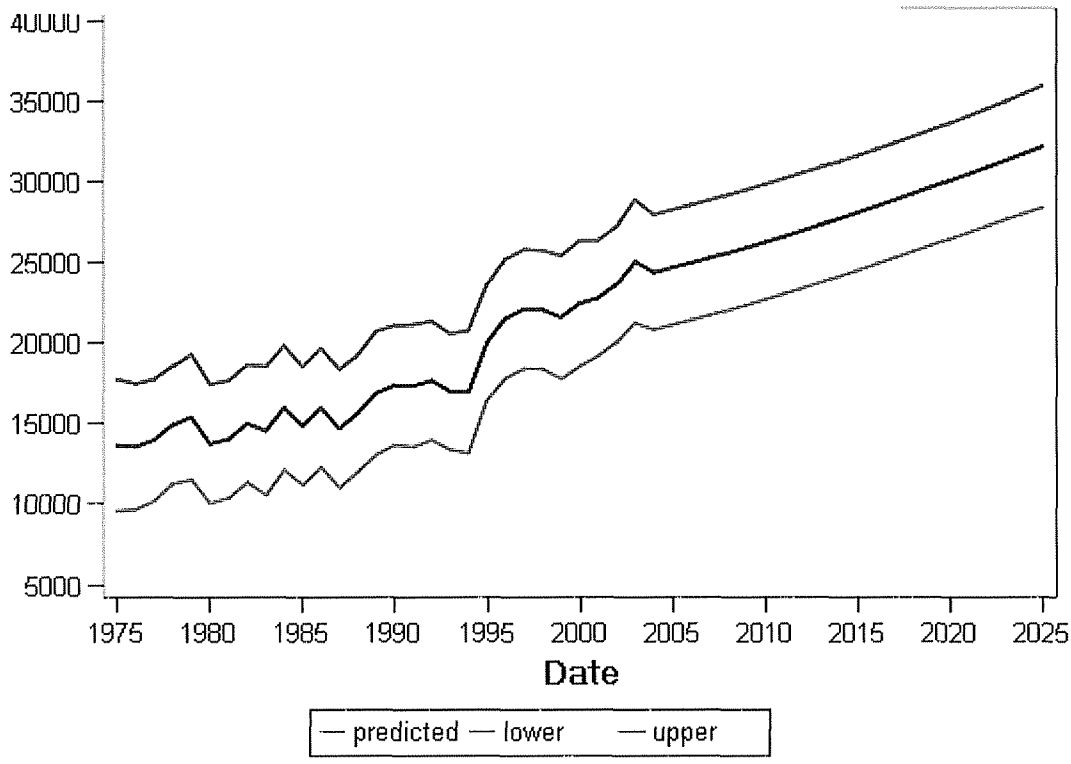
The number of other customers has increased linearly from 1975-2000 with an abrupt change in 1980-81. The linear increase is expected to continue.

Figure 2.14. Other Customers With Dynamic Regressors



Adding dynamic regressors does not change the linear increase projected for 2005-2025.

Figure 2.15. Other Customers With Confidence Limits



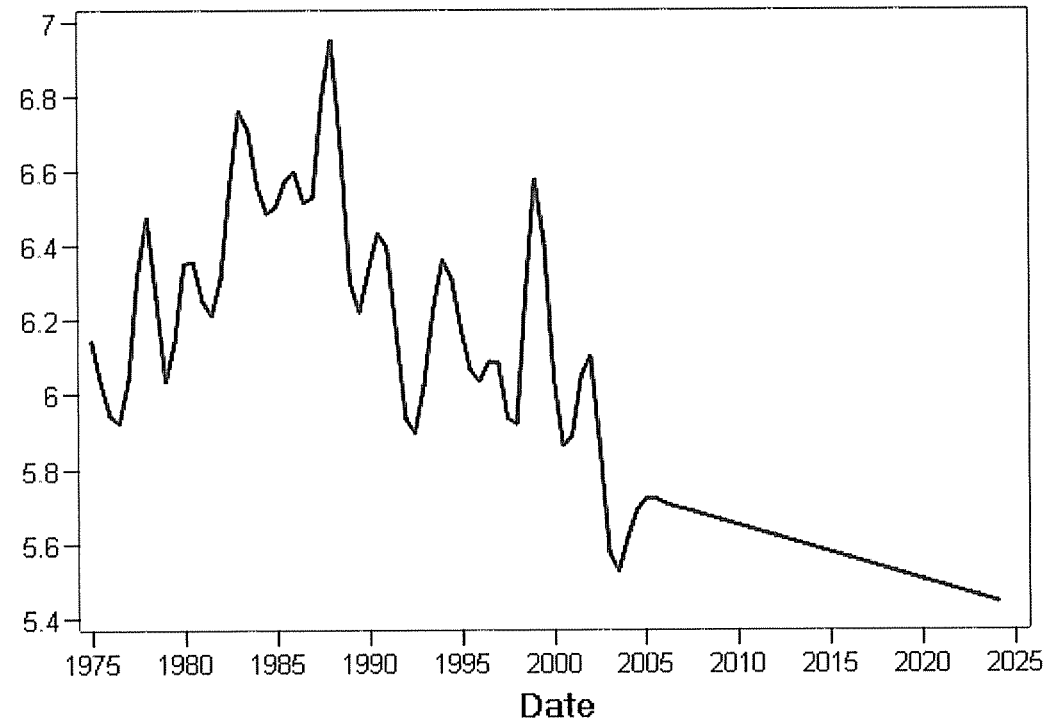
The confidence width is ±4000.

Table 2.5. Forecast Values for Other Customers

Date	predicted	lower	upper	Date	predicted	lower	upper
1975	13660.55	9567.34	17753.76	**2005**	24669.16	21117.98	28220.34
1976	13566.61	9652.65	17480.57	**2006**	24962.80	21410.12	28515.47
1977	13974.66	10182.07	17767.25	**2007**	25268.30	21712.05	28824.56
1978	14932.63	11282.10	18583.15	**2008**	25585.01	22024.95	29145.07
1979	15413.08	11516.05	19310.12	**2009**	25912.28	22349.38	29475.17
1980	13753.80	10042.24	17465.36	**2010**	26249.48	22685.36	29813.60
1981	14031.46	10382.75	17680.18	**2011**	26596.02	23032.48	30159.55
1982	14996.98	11338.58	18655.38	**2012**	26951.33	23390.02	30512.64
1983	14539.49	10542.47	18536.52	**2013**	27314.88	23756.98	30872.78
1984	15963.11	12102.47	19823.75	**2014**	27686.14	24132.13	31240.14

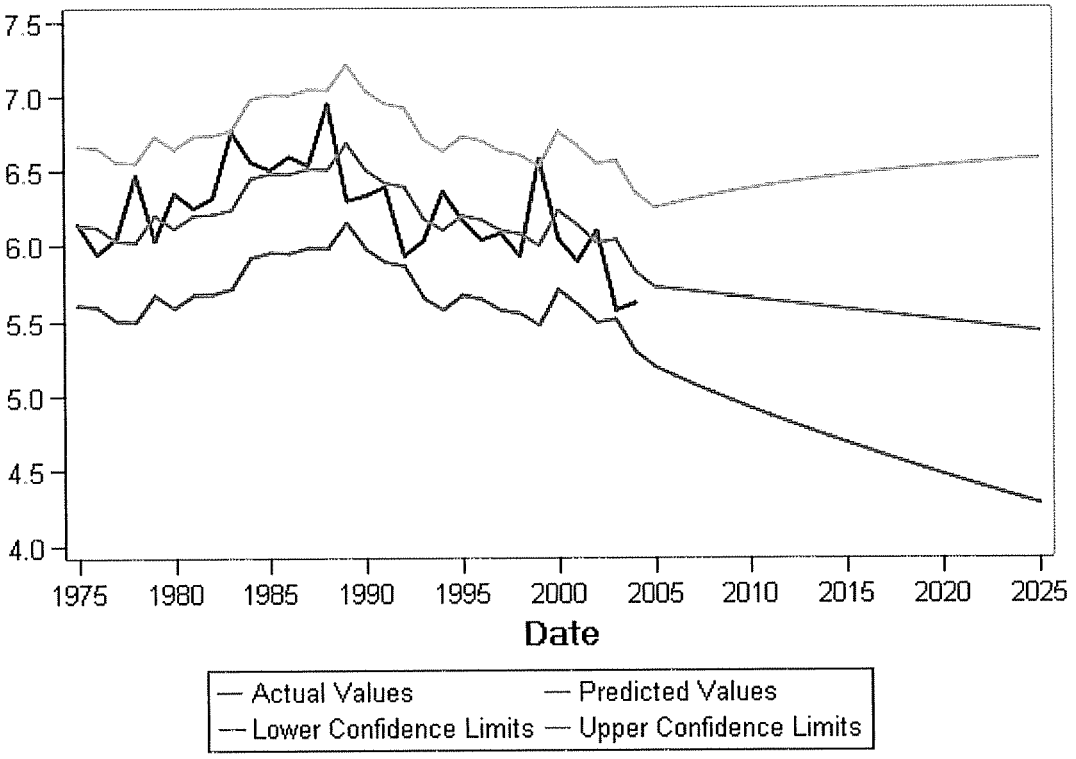
With the addition of low-flow devices, per capita usage is expected to decrease. The ratio of water usage/number of customers was computed for each category.

Figure 3.1. Ratio of Residential Usage to Number of Residential Customers



After an increase to 1990, average usage declined, and is predicted to continue the steady decline.

Figure 3.2. Ratio with Confidence Limits

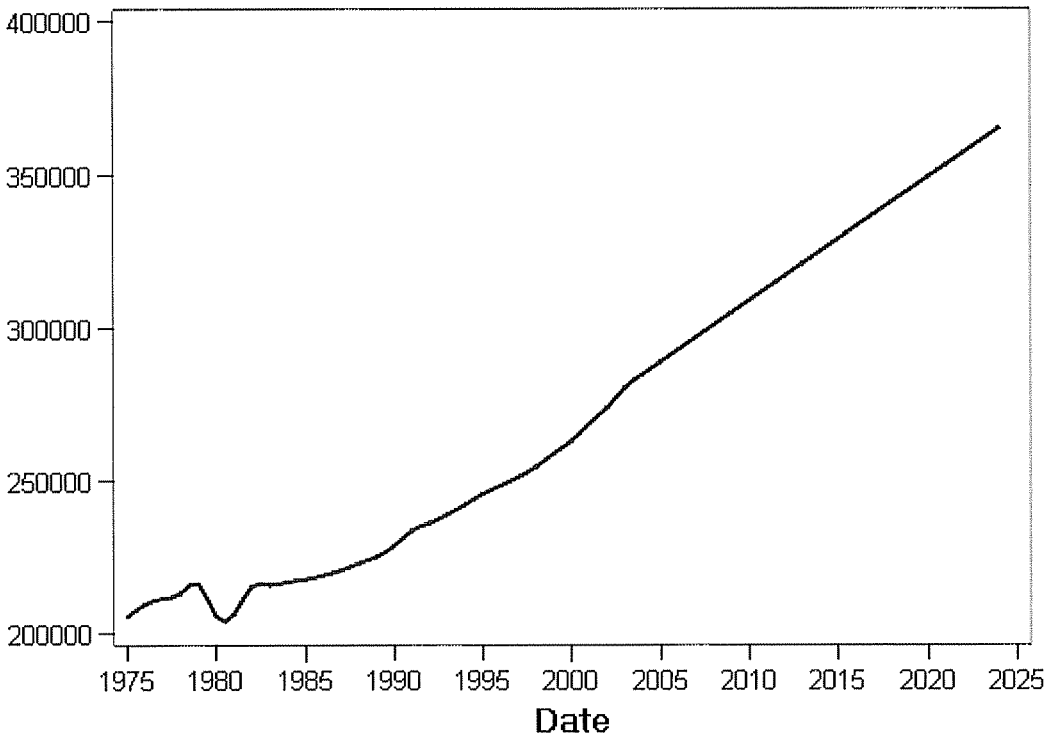


The confidence limits, however, are very wide, indicating some volatility.

Table 3.1. Predicted Residential Ratio With Confidence Limits

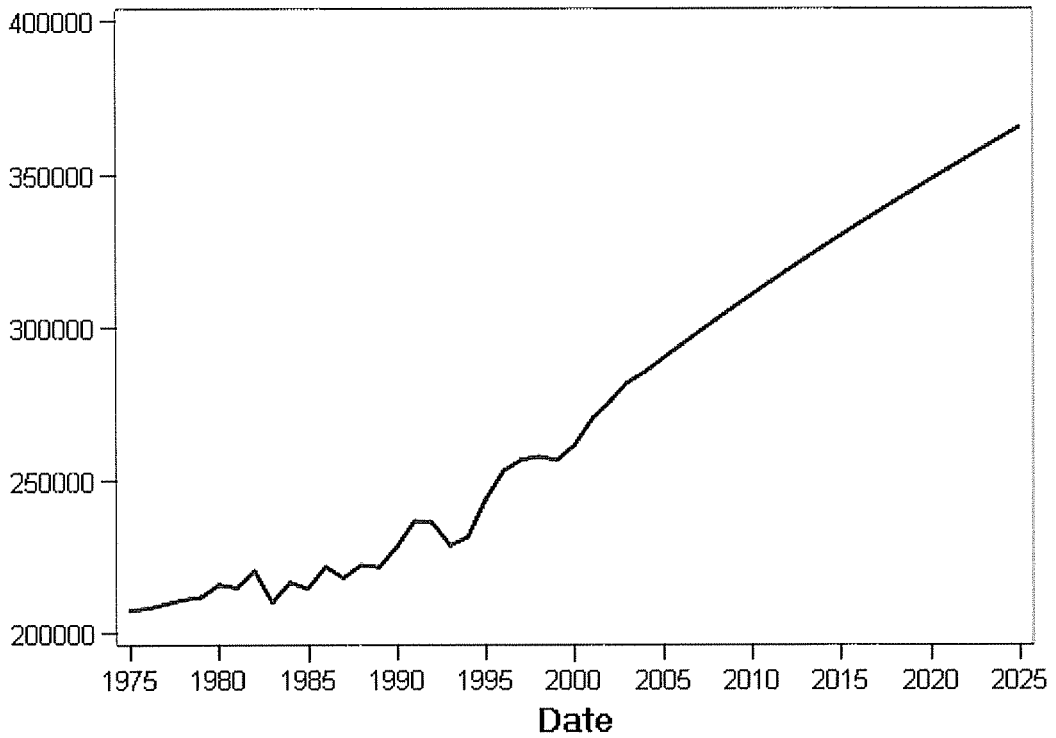
Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1975	6.13650	5.60850	6.66449	**2005**	5.72083	5.19284	6.24882
1976	6.12487	5.59688	6.65286	**2006**	5.70619	5.13165	6.28074
1977	6.03249	5.50449	6.56048	**2007**	5.69156	5.07388	6.30924
1978	6.02445	5.49646	6.55244	**2008**	5.67692	5.01885	6.33499
1979	6.20221	5.67421	6.73020	**2009**	5.66228	4.96608	6.35848
1980	6.11626	5.58827	6.64425	**2010**	5.64764	4.91523	6.38006
1981	6.20237	5.67438	6.73036	**2011**	5.63301	4.86602	6.40000
1982	6.20895	5.68096	6.73694	**2012**	5.61837	4.81823	6.41850
1983	6.24115	5.71316	6.76914	**2013**	5.60373	4.77171	6.43575
1984	6.44903	5.92104	6.97702	**2014**	5.58909	4.72630	6.45189
1985	6.48217	5.95418	7.01016	**2015**	5.57446	4.68190	6.46702
1986	6.47811	5.95011	7.00610	**2016**	5.55982	4.63840	6.48124
1987	6.51420	5.98621	7.04220	**2017**	5.54518	4.59572	6.49464
1988	6.50889	5.98090	7.03688	**2018**	5.53054	4.55379	6.50730
1989	6.68295	6.15496	7.21095	**2019**	5.51591	4.51255	6.51926
1990	6.50465	5.97666	7.03264	**2020**	5.50127	4.47196	6.53058
1991	6.41763	5.88964	6.94562	**2021**	5.48663	4.43195	6.54132
1992	6.39227	5.86428	6.92026	**2022**	5.47199	4.39248	6.55150
1993	6.18084	5.65285	6.70883	**2023**	5.45736	4.35353	6.56118
1994	6.10268	5.57469	6.63067	**2024**	5.44272	4.31506	6.57038
1995	6.19863	5.67064	6.72662	**2025**	5.42808	4.27704	6.57913
1996	6.17233	5.64433	6.70032				
1997	6.09991	5.57191	6.62790				
1998	6.07770	5.54971	6.60569				
1999	5.99903	5.47104	6.52702				
2000	6.23247	5.70448	6.76046				
2001	6.13728	5.60929	6.66528				

Figure 2.16. Total Customers Without Dynamic Regressors



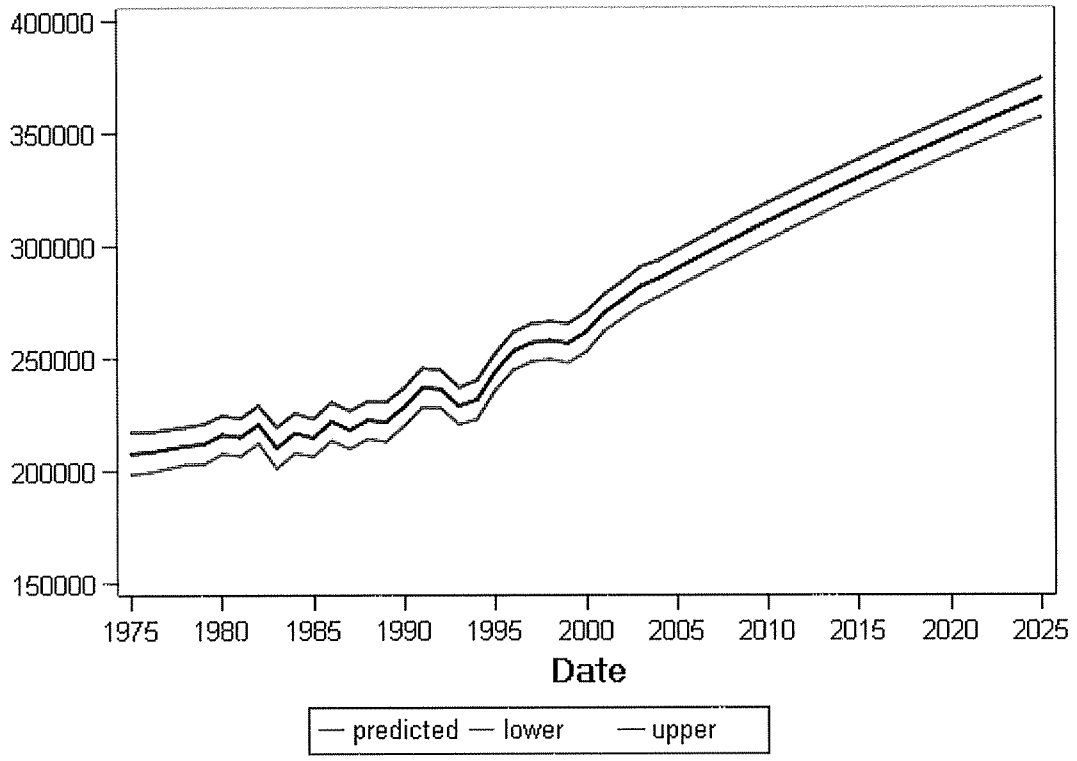
The increase in the total number of customers is projected to be linear from 2005-2025.

Figure 2.17. Total Customers With Dynamic Regressors



Adding the dynamic regressors does not significantly change the forecast.

Figure 2.18.Total Customers With Confidence Limits



The confidence width for the total number of customers is very narrow, indicating very little variability.

Table 2.5. Forecast Values for Total Customers

Date	predicted	lower	upper	Date	predicted	lower	upper
1975	207552.05	198182.01	216922.08	**2005**	289637.66	281508.42	297766.90
1976	208089.50	199129.81	217049.19	**2006**	293928.44	285795.78	302061.09
1977	209561.13	200879.27	218243.00	**2007**	298152.89	290012.04	306293.73
1978	210988.83	202632.17	219345.48	**2008**	302312.90	294163.34	310462.45
1979	211780.68	202859.72	220701.63	**2009**	306410.53	298254.48	314566.58
1980	215867.48	207371.12	224363.84	**2010**	310448.01	302289.16	318606.87
1981	214823.67	206471.17	223176.18	**2011**	314427.65	306270.14	322585.17
1982	220386.57	212011.90	228761.25	**2012**	318351.82	310199.40	326504.24
1983	210019.77	200869.92	219169.62	**2013**	322222.90	314078.28	330367.52
1984	216576.16	207738.52	225413.81	**2014**	326043.28	317907.58	334178.99

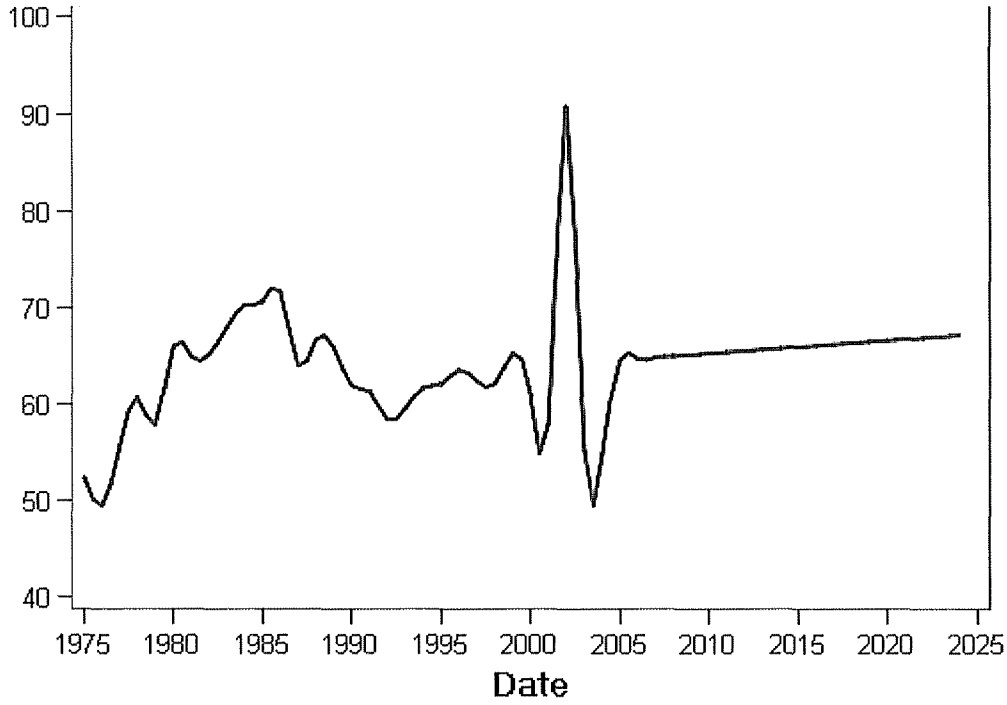
Date	predicted	lower	upper	Date	predicted	lower	upper
1985	214486.72	206067.80	222905.63	**2015**	329815.33	321687.64	337943.02
1986	221729.98	213255.15	230204.81	**2016**	333541.36	325418.47	341664.26
1987	218018.27	209595.73	226440.81	**2017**	337223.64	329099.78	345347.50
1988	222298.93	214005.72	230592.13	**2018**	340864.37	332731.09	348997.65
1989	221557.47	212783.17	230331.78	**2019**	344465.68	336311.80	352619.57
1990	228242.72	219770.10	236715.33	**2020**	348029.62	339841.24	356218.00
1991	236714.12	228018.53	245409.71	**2021**	351558.16	343318.80	359797.53
1992	236152.12	227706.95	244597.30	**2022**	355053.19	346743.96	363362.43
1993	228689.36	220433.32	236945.40	**2023**	358516.51	350116.36	366916.66
1994	231450.38	222758.70	240142.05	**2024**	361949.83	353435.91	370463.76
1995	243863.88	235635.94	252091.83	**2025**	365354.80	356702.76	374006.83
1996	253100.53	244650.64	261550.42				
1997	256756.35	248306.35	265206.34				
1998	257746.74	249337.69	266155.79				
1999	256557.83	247809.29	265306.38				
2000	261507.36	252589.73	270424.99				
2001	270150.98	261944.31	278357.65				
2002	275799.62	267600.25	283998.99				
2003	281813.26	273088.32	290538.19				
2004	285266.97	277130.89	293403.05				

Forecast of Per Capita Usage, 2005-2025

Date	predicted	lower	upper	Date	predicted	lower	upper
1985	14872.33	11194.61	18550.05	**2015**	28064.62	24514.12	31615.13
1986	15973.76	12271.61	19675.91	**2016**	28449.87	24901.46	31998.28
1987	14693.09	11013.79	18372.40	**2017**	28841.43	25292.60	32390.26
1988	15632.01	12009.20	19254.82	**2018**	29238.90	25685.96	32791.85
1989	16893.20	13060.23	20726.17	**2019**	29641.89	26079.94	33203.84
1990	17363.23	13662.05	21064.41	**2020**	30050.02	26473.01	33627.04
1991	17346.97	13548.38	21145.55	**2021**	30462.95	26863.66	34062.24
1992	17663.26	13974.07	21352.46	**2022**	30880.36	27250.54	34510.17
1993	16971.50	13364.92	20578.07	**2023**	31301.92	27632.40	34971.45
1994	16953.00	13156.12	20749.87	**2024**	31727.37	28008.14	35446.60
1995	19989.37	16395.07	23583.67	**2025**	32156.42	28376.86	35935.98
1996	21522.27	17831.01	25213.52				
1997	22103.31	18412.01	25794.62				
1998	22057.76	18384.35	25731.18				
1999	21587.34	17765.62	25409.06				
2000	22440.39	18544.81	26335.97				
2001	22773.34	19188.33	26358.35				
2002	23629.85	20048.03	27211.67				
2003	25042.05	21230.64	28853.45				
2004	24372.91	20818.74	27927.08				

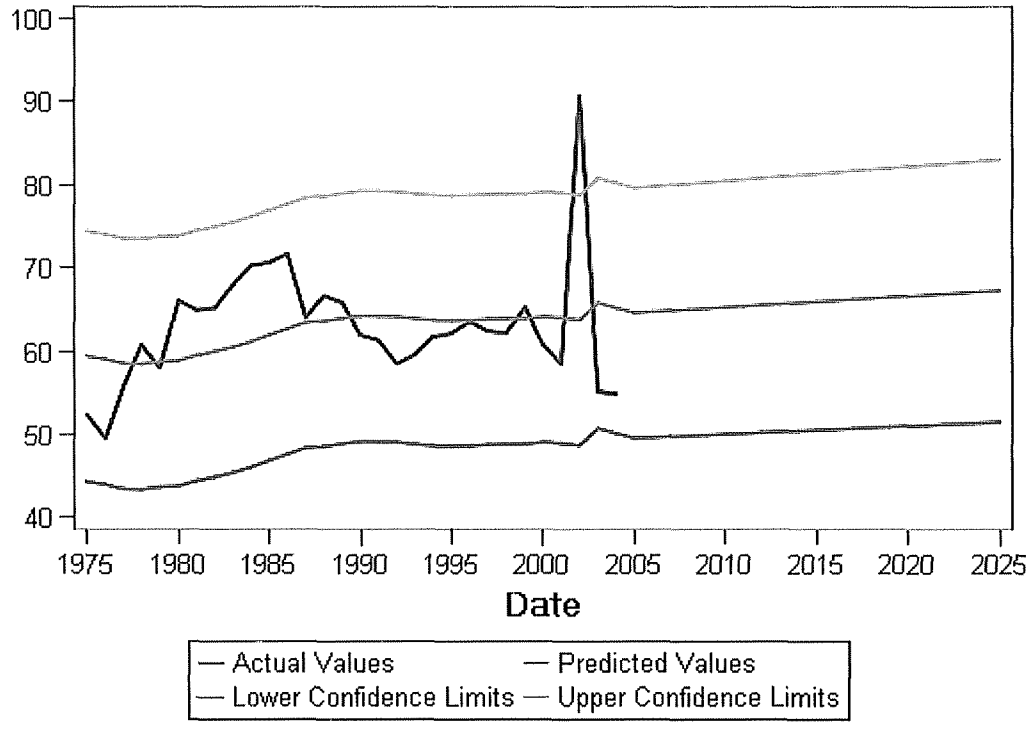
Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
2002	6.01798	5.48999	6.54597				
2003	6.03766	5.50967	6.56565				
2004	5.82313	5.29514	6.35112				

Figure 3.3. Ratio of Commercial Usage to Number of Commercial Customers



In contrast, commercial usage has stayed relatively constant except for a spike in 2001. The per capita usage is expected to increase slightly.

Figure 3.4. Ratio with Confidence Limits



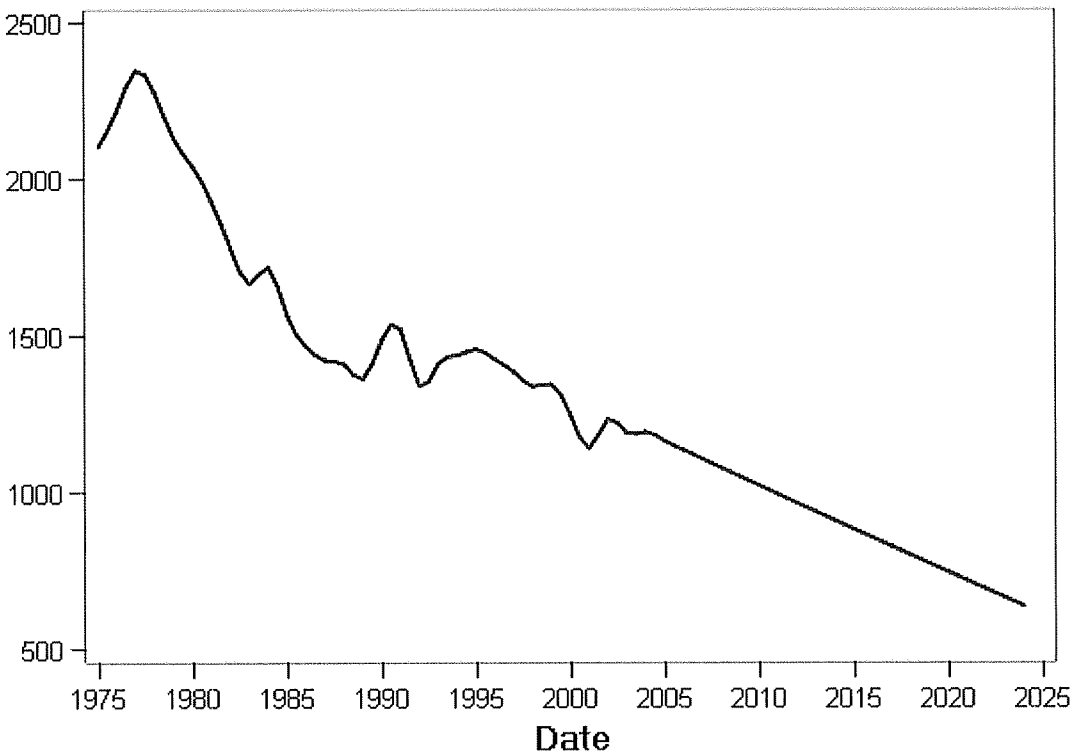
The confidence limits also reflect this slight increase.

Table 3.2. Predicted Commercial Ratio With Confidence Limits

Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1975	59.3835	44.3901	74.3768	**2005**	64.5853	49.5920	79.5786
1976	59.0264	44.0331	74.0197	**2006**	64.7201	49.6898	79.7505
1977	58.4950	43.5017	73.4883	**2007**	64.8550	49.7876	79.9223
1978	58.4326	43.4393	73.4259	**2008**	64.9898	49.8854	80.0942
1979	58.7237	43.7304	73.7170	**2009**	65.1246	49.9832	80.2660
1980	58.8028	43.8095	73.7962	**2010**	65.2595	50.0811	80.4378
1981	59.4431	44.4498	74.4364	**2011**	65.3943	50.1789	80.6096
1982	59.9594	44.9661	74.9527	**2012**	65.5291	50.2768	80.7814
1983	60.4620	45.4687	75.4553	**2013**	65.6639	50.3747	80.9531
1984	61.1250	46.1317	76.1183	**2014**	65.7988	50.4726	81.1249
1985	61.9020	46.9086	76.8953	**2015**	65.9336	50.5706	81.2966
1986	62.6513	47.6580	77.6446	**2016**	66.0684	50.6685	81.4683
1987	63.4207	48.4273	78.4140	**2017**	66.2032	50.7665	81.6400
1988	63.5963	48.6030	78.5896	**2018**	66.3381	50.8645	81.8117
1989	63.9477	48.9544	78.9410	**2019**	66.4729	50.9624	81.9834
1990	64.2146	49.2213	79.2079	**2020**	66.6077	51.0605	82.1550
1991	64.1893	49.1960	79.1826	**2021**	66.7426	51.1585	82.3266
1992	64.1217	49.1284	79.1150	**2022**	66.8774	51.2565	82.4983
1993	63.8587	48.8654	78.8520	**2023**	67.0122	51.3546	82.6699
1994	63.6926	48.6993	78.6859	**2024**	67.1470	51.4526	82.8415
1995	63.6882	48.6949	78.6815	**2025**	67.2819	51.5507	83.0130
1996	63.7135	48.7202	78.7069				
1997	63.8380	48.8447	78.8313				

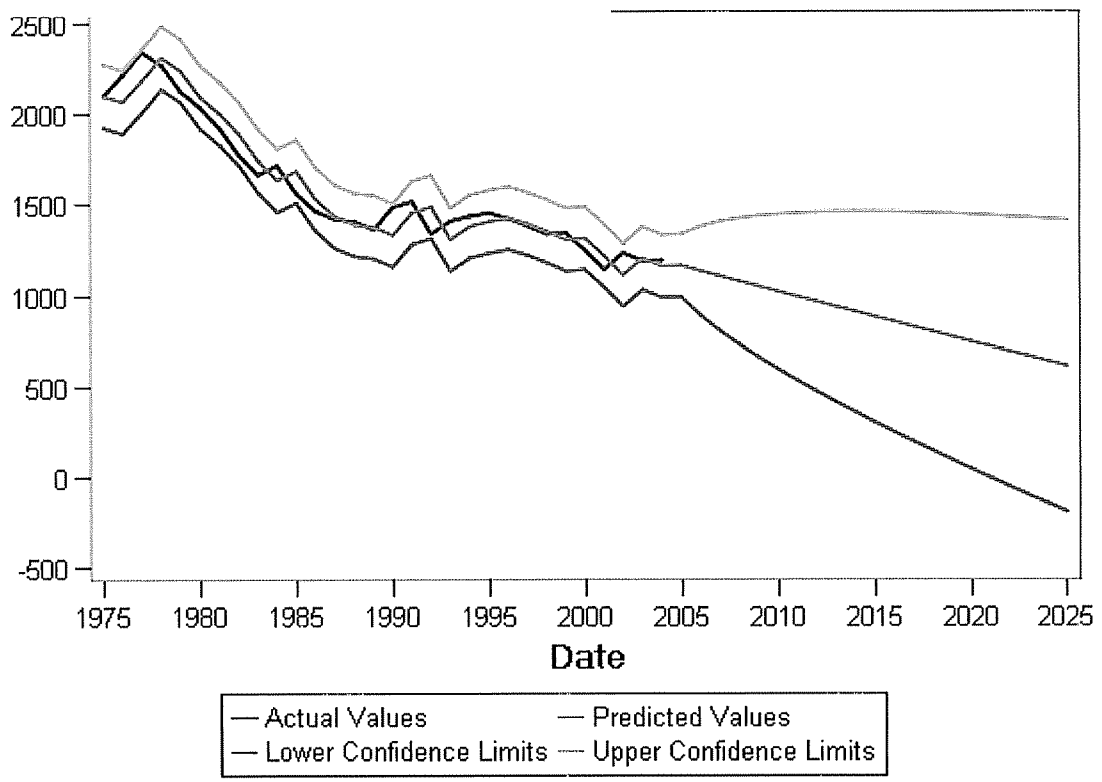
Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1998	63.8698	48.8765	78.8631				
1999	63.8852	48.8919	78.8785				
2000	64.1157	49.1224	79.1090				
2001	64.0126	49.0193	79.0059				
2002	63.7549	48.7616	78.7482				
2003	65.7866	50.7933	80.7799				
2004	65.1757	50.1824	80.1690				

Figure 3.5. Ratio of Industrial Usage to Number of Industrial Customers



In addition to a steady decrease in the number of industrial customers, there is a steady decrease in the per capita usage

Figure 3.6. Ratio with Confidence Limits



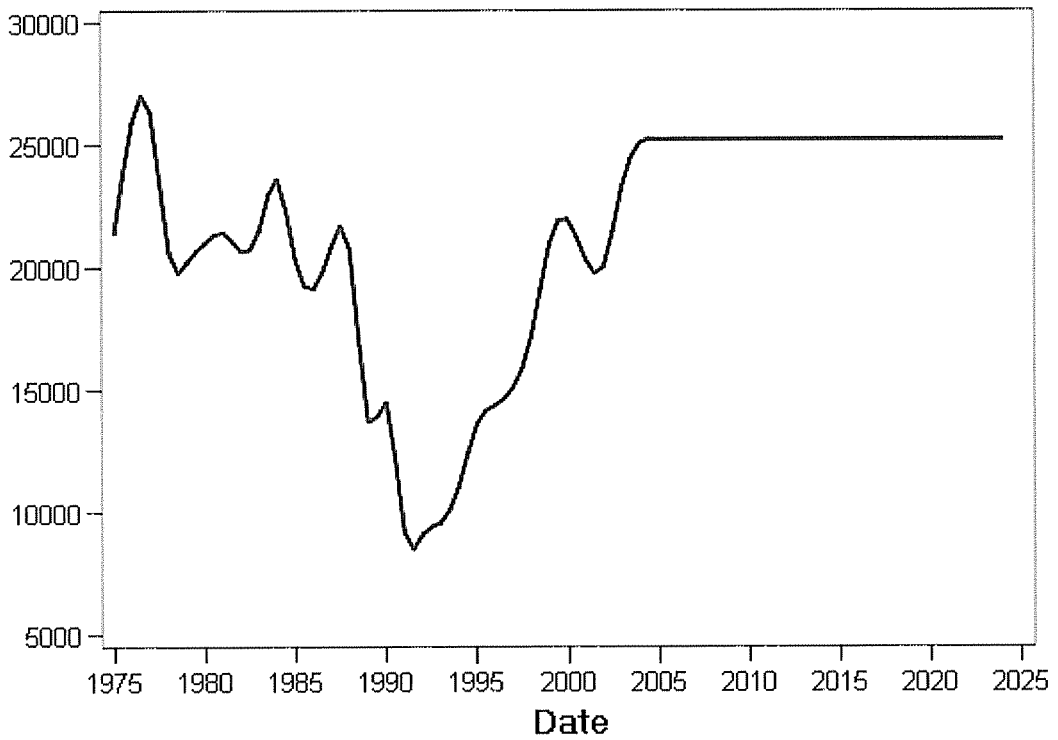
The trend here, with the confidence limits remains downward.

Table 3.3. Predicted Industrial Ratio With Confidence Limits

Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1975	2102.92	1929.01	2276.83	**2005**	1164.82	990.91	1338.73
1976	2070.68	1896.76	2244.59	**2006**	1136.21	890.26	1382.16
1977	2186.86	2012.95	2360.78	**2007**	1107.70	806.38	1409.02
1978	2313.89	2139.98	2487.80	**2008**	1079.30	731.22	1427.38
1979	2244.00	2070.08	2417.91	**2009**	1051.00	661.66	1440.35
1980	2098.44	1924.53	2272.36	**2010**	1022.81	596.12	1449.51
1981	2008.38	1834.47	2182.29	**2011**	994.73	533.63	1455.83
1982	1896.48	1722.57	2070.39	**2012**	966.75	473.58	1459.92
1983	1747.45	1573.53	1921.36	**2013**	938.87	415.54	1462.21
1984	1637.16	1463.24	1811.07	**2014**	911.10	359.19	1463.01
1985	1687.40	1513.49	1861.32	**2015**	883.43	304.31	1462.55
1986	1532.79	1358.87	1706.70	**2016**	855.86	250.70	1461.02
1987	1435.97	1262.05	1609.88	**2017**	828.40	198.23	1458.57
1988	1391.68	1217.76	1565.59	**2018**	801.04	146.77	1455.31
1989	1378.89	1204.98	1552.80	**2019**	773.78	96.22	1451.33
1990	1333.70	1159.79	1507.62	**2020**	746.62	46.51	1446.73
1991	1458.49	1284.58	1632.41	**2021**	719.56	-2.44	1441.56
1992	1489.48	1315.57	1663.39	**2022**	692.60	-50.68	1435.89
1993	1310.71	1136.79	1484.62	**2023**	665.75	-98.26	1429.76
1994	1382.38	1208.47	1556.29	**2024**	638.99	-145.24	1423.22
1995	1408.89	1234.98	1582.80	**2025**	612.33	-191.64	1416.30
1996	1427.80	1253.89	1601.72				
1997	1396.16	1222.25	1570.07				

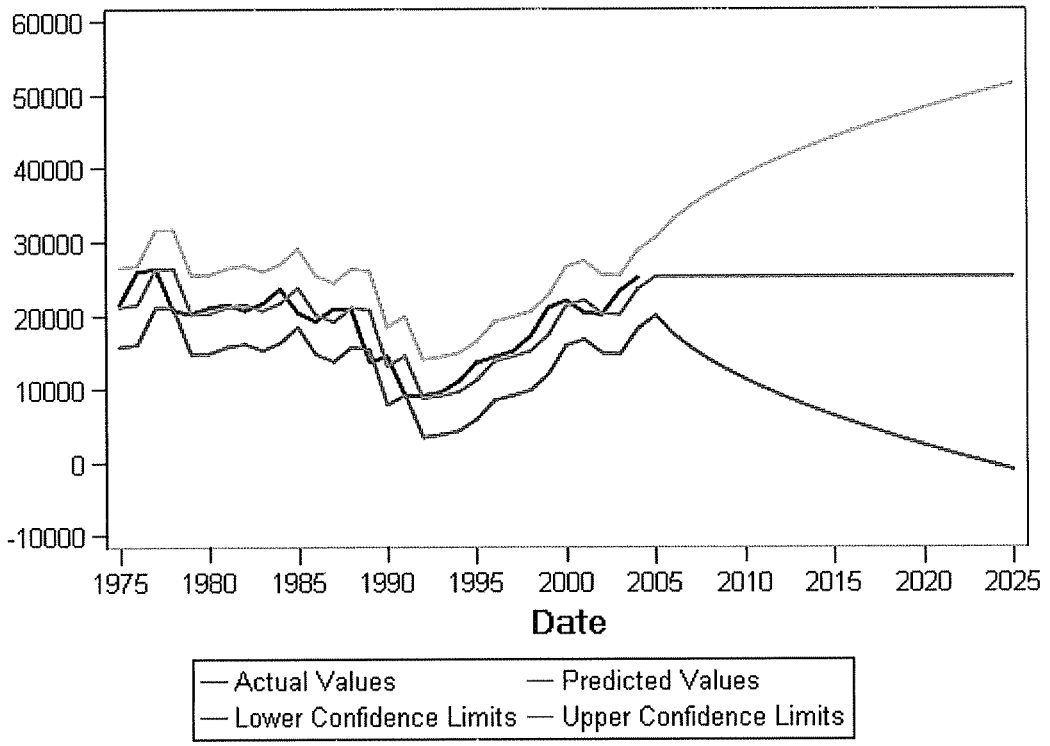
Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1998	1355.70	1181.78	1529.61				
1999	1309.54	1135.62	1483.45				
2000	1316.57	1142.66	1490.48				
2001	1219.30	1045.38	1393.21				
2002	1113.68	939.76	1287.59				
2003	1205.10	1031.19	1379.02				
2004	1162.09	988.18	1336.00				

Figure 3.7. Ratio of Wholesale Usage to Number of Wholesale Customers



There is a dip in the per capita usage peaking in the year 1992, possibly reflecting a change in definition. The per capita usage is expected to remain relatively steady over the next 20 years.

Figure 3.8. Ratio with Confidence Limits



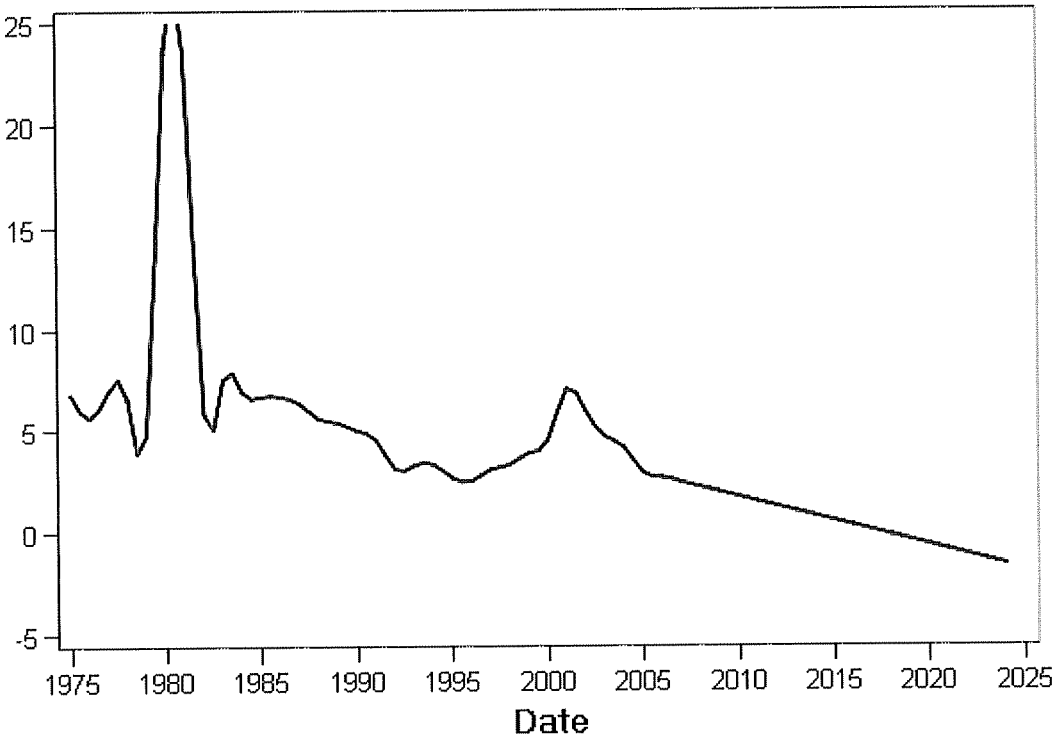
Again, this ratio appears to be somewhat volatile, but the overall prediction is for stability.

Table 3.4. Predicted Wholesale Ratio With Confidence Limits

Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1975	21107.06	15805.63	26408.48	2005	25234.00	19932.57	30535.43
1976	21462.17	16160.74	26763.60	2006	25245.42	17448.47	33042.37
1977	26325.37	21023.95	31626.80	2007	25246.33	15557.98	34934.68
1978	26339.18	21037.76	31640.61	2008	25246.40	13978.46	36514.34
1979	20132.55	14831.12	25433.98	2009	25246.41	12594.47	37898.34
1980	20217.74	14916.31	25519.17	2010	25246.41	11347.61	39145.20
1981	21105.62	15804.20	26407.05	2011	25246.41	10203.75	40289.06
1982	21476.22	16174.79	26777.64	2012	25246.41	9140.92	41351.89
1983	20626.05	15324.62	25927.48	2013	25246.41	8144.02	42348.80
1984	21654.59	16353.16	26956.01	2014	25246.41	7202.11	43290.71
1985	23762.23	18460.81	29063.66	2015	25246.41	6306.98	44185.83
1986	20066.08	14764.65	25367.51	2016	25246.41	5452.29	45040.52
1987	19081.07	13779.64	24382.50	2017	25246.41	4633.01	45859.80
1988	21028.41	15726.98	26329.84	2018	25246.41	3845.07	46647.74
1989	20703.54	15402.12	26004.97	2019	25246.41	3085.13	47407.68
1990	13161.72	7860.30	18463.15	2020	25246.41	2350.40	48142.42
1991	14530.66	9229.24	19832.09	2021	25246.41	1638.52	48854.29
1992	8761.25	3459.82	14062.67	2022	25246.41	947.49	49545.33
1993	9104.15	3802.72	14405.57	2023	25246.41	275.57	50217.24
1994	9633.91	4332.48	14935.33	2024	25246.41	-378.73	50871.54
1995	11215.08	5913.66	16516.51	2025	25246.41	-1016.74	51509.55
1996	13827.38	8525.95	19128.80				
1997	14444.73	9143.30	19746.16				
1998	15191.89	9890.46	20493.31				

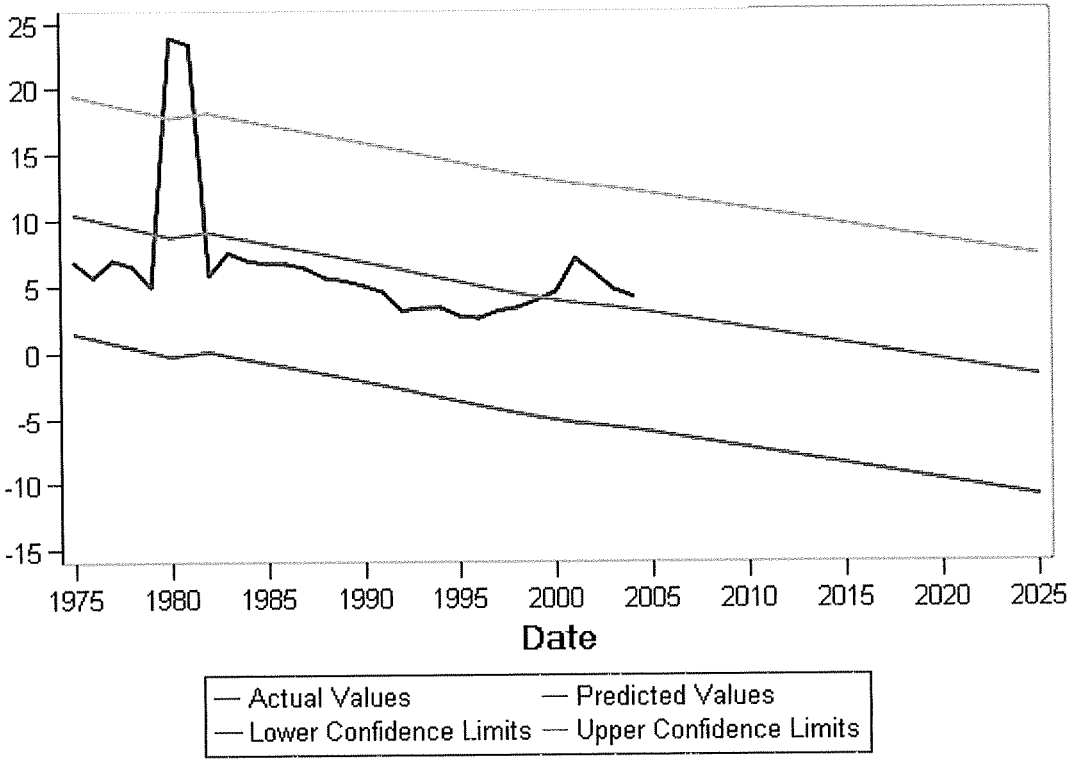
Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1999	17400.36	12098.93	22701.79				
2000	21301.88	16000.45	26603.30				
2001	22061.49	16760.06	27362.91				
2002	20207.10	14905.67	25508.52				
2003	20067.81	14766.38	25369.23				
2004	23541.26	18239.83	28842.69				

Figure 3.9. Ratio of Other Usage to Number of Other Customers



There is a steady decrease in the per capita usage for the customers defined in the "other" category.

Figure 3.10. Ratio with Confidence Limits



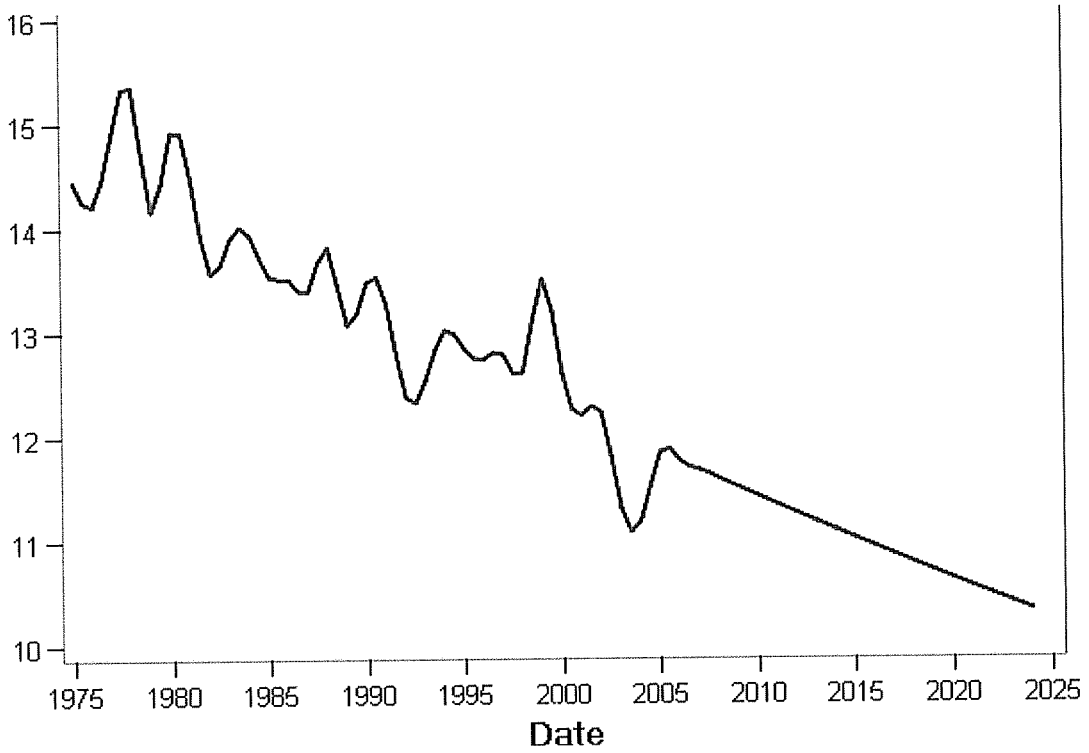
The trend in the usage ratio is definitely downwards for other customers.

Table 3.5. Predicted Other Ratio With Confidence Limits

Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1975	10.4330	1.4014	19.4646	2005	2.9321	-6.0995	11.9637
1976	10.0919	1.0603	19.1235	2006	2.6940	-6.3413	11.7293
1977	9.7272	0.6956	18.7589	2007	2.4560	-6.5831	11.4950
1978	9.4106	0.3790	18.4422	2008	2.2179	-6.8248	11.2607
1979	9.0902	0.0586	18.1218	2009	1.9799	-7.0666	11.0263
1980	8.7340	-0.2976	17.7656	2010	1.7418	-7.3084	10.7920
1981	8.9294	-0.1022	17.9610	2011	1.5038	-7.5502	10.5577
1982	9.1049	0.0733	18.1365	2012	1.2657	-7.7920	10.3234
1983	8.7732	-0.2584	17.8048	2013	1.0277	-8.0338	10.0891
1984	8.5000	-0.5316	17.5317	2014	0.7896	-8.2756	9.8548
1985	8.2177	-0.8139	17.2493	2015	0.5516	-8.5174	9.6205
1986	7.9365	-1.0951	16.9681	2016	0.3135	-8.7592	9.3862
1987	7.6630	-1.3686	16.6946	2017	0.0754	-9.0011	9.1520
1988	7.3876	-1.6441	16.4192	2018	-0.1626	-9.2429	8.9177
1989	7.0988	-1.9328	16.1304	2019	-0.4007	-9.4847	8.6834
1990	6.8122	-2.2194	15.8439	2020	-0.6387	-9.7266	8.4492
1991	6.5227	-2.5089	15.5543	2021	-0.8768	-9.9684	8.2149
1992	6.2276	-2.8040	15.2592	2022	-1.1148	-10.2103	7.9807
1993	5.9001	-3.1315	14.9317	2023	-1.3529	-10.4521	7.7464
1994	5.5878	-3.4438	14.6194	2024	-1.5909	-10.6940	7.5122
1995	5.2854	-3.7462	14.3170	2025	-1.8290	-10.9359	7.2779
1996	4.9726	-4.0591	14.0042				
1997	4.6647	-4.3670	13.6963				

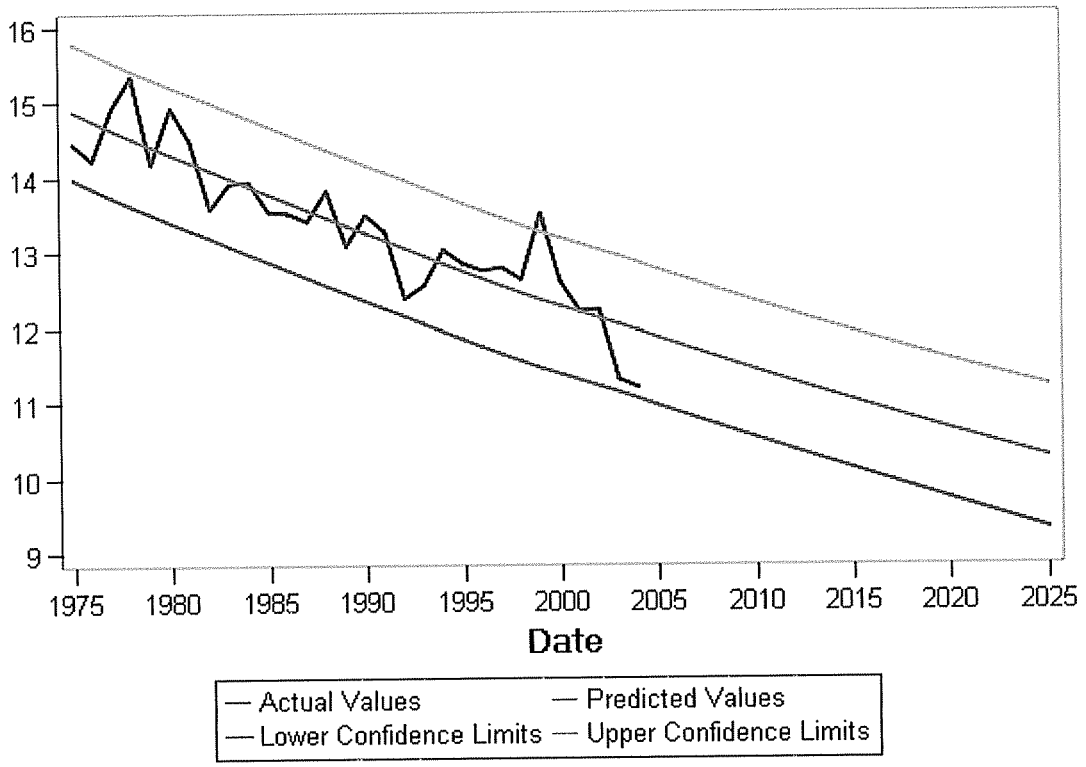
Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1998	4.3814	-4.6502	13.4130				
1999	4.1132	-4.9184	13.1448				
2000	3.8687	-5.1629	12.9003				
2001	3.6495	-5.3821	12.6811				
2002	3.5083	-5.5233	12.5399				
2003	3.3400	-5.6916	12.3716				
2004	3.1408	-5.8908	12.1724				

Figure 3.11. Ratio of Total Usage to Number of Total Customers



The per capita ratio of total usage to the total number of customers has been decreasing steadily, and is predicted to continue its steady decrease.

Figure 3.12. Ratio with Confidence Limits



The overall per capita trend for total usage/total customers is definitely downwards.

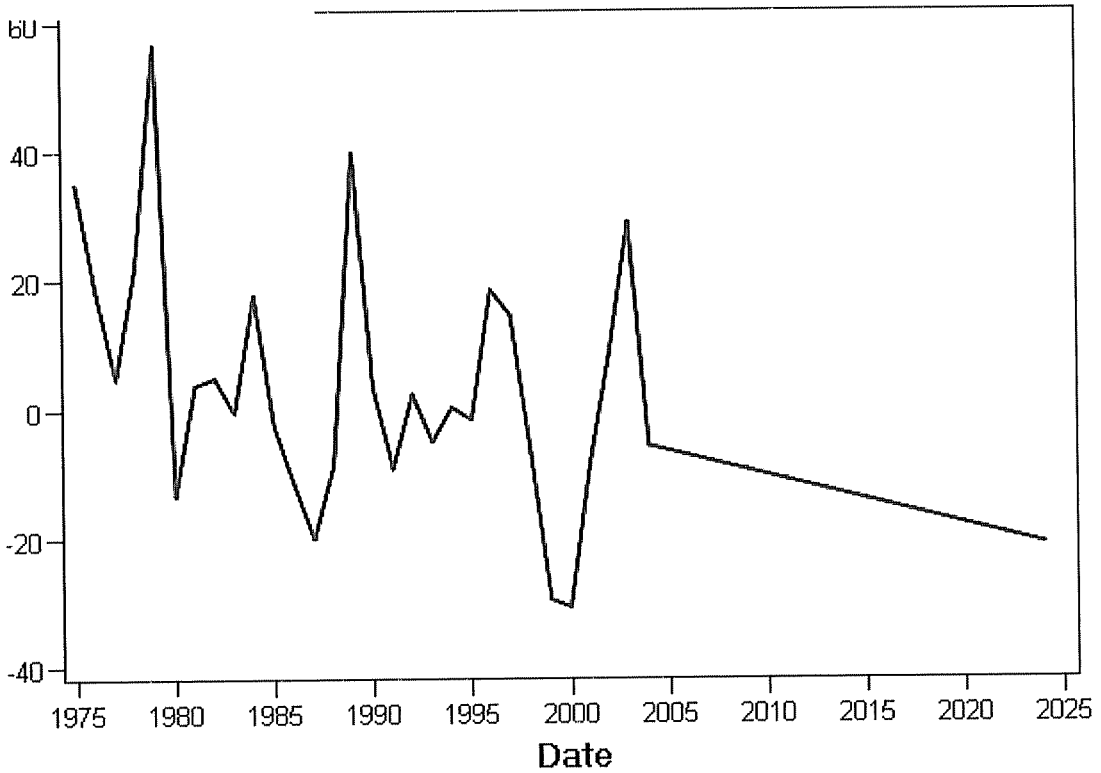
Table 3.6. Predicted Total Ratio With Confidence Limits

Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1975	14.8765	13.9763	15.7768	2005	11.8529	10.9527	12.7532
1976	14.7551	13.8548	15.6554	2006	11.7659	10.8656	12.6663
1977	14.6309	13.7307	15.5312	2007	11.6798	10.7793	12.5803
1978	14.5146	13.6144	15.4149	2008	11.5944	10.6937	12.4952
1979	14.4078	13.5076	15.3081	2009	11.5099	10.6088	12.4111
1980	14.2941	13.3938	15.1944	2010	11.4262	10.5244	12.3279
1981	14.1906	13.2903	15.0908	2011	11.3432	10.4407	12.2458
1982	14.0876	13.1873	14.9878	2012	11.2611	10.3575	12.1646
1983	13.9775	13.0773	14.8778	2013	11.1797	10.2749	12.0845
1984	13.8709	12.9706	14.7711	2014	11.0991	10.1927	12.0055
1985	13.7664	12.8661	14.6666	2015	11.0193	10.1110	11.9275
1986	13.6597	12.7594	14.5599	2016	10.9402	10.0297	11.8506
1987	13.5536	12.6533	14.4538	2017	10.8618	9.9489	11.7748
1988	13.4476	12.5473	14.3478	2018	10.7842	9.8684	11.7001
1989	13.3479	12.4476	14.2482	2019	10.7074	9.7882	11.6266
1990	13.2436	12.3433	14.1439	2020	10.6313	9.7083	11.5542
1991	13.1449	12.2447	14.0452	2021	10.5559	9.6288	11.4829
1992	13.0472	12.1469	13.9474	2022	10.4812	9.5495	11.4128
1993	12.9414	12.0412	13.8417	2023	10.4072	9.4705	11.3438
1994	12.8359	11.9357	13.7362	2024	10.3339	9.3918	11.2760
1995	12.7361	11.8358	13.6364	2025	10.2613	9.3132	11.2093
1996	12.6374	11.7371	13.5376				
1997	12.5403	11.6400	13.4406				

Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits	Date	Predicted Values	Lower Confidence Limits	Upper Confidence Limits
1998	12.4465	11.5462	13.3467				
1999	12.3542	11.4540	13.2545				
2000	12.2759	11.3757	13.1762				
2001	12.1953	11.2950	13.0955				
2002	12.1135	11.2133	13.0138				
2003	12.0339	11.1336	12.9341				
2004	11.9454	11.0451	12.8456				

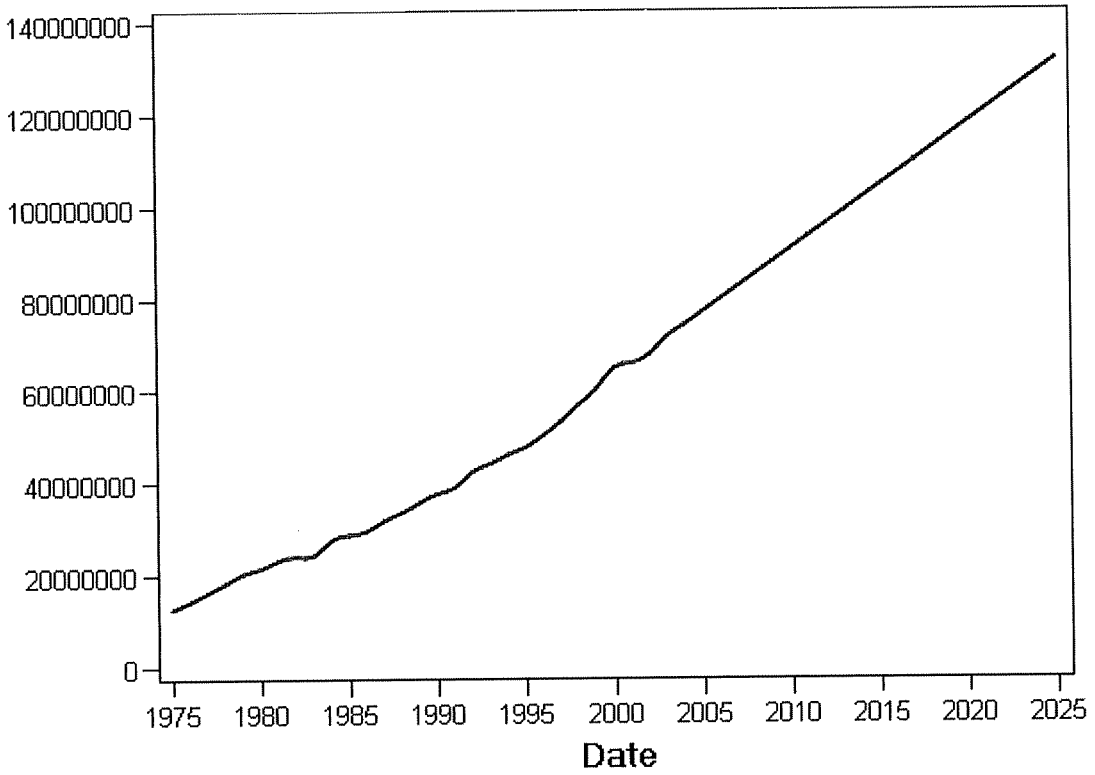
Forecasts of Dynamic Regressors, 2005-2025

Figure 4.1. PDSI Index

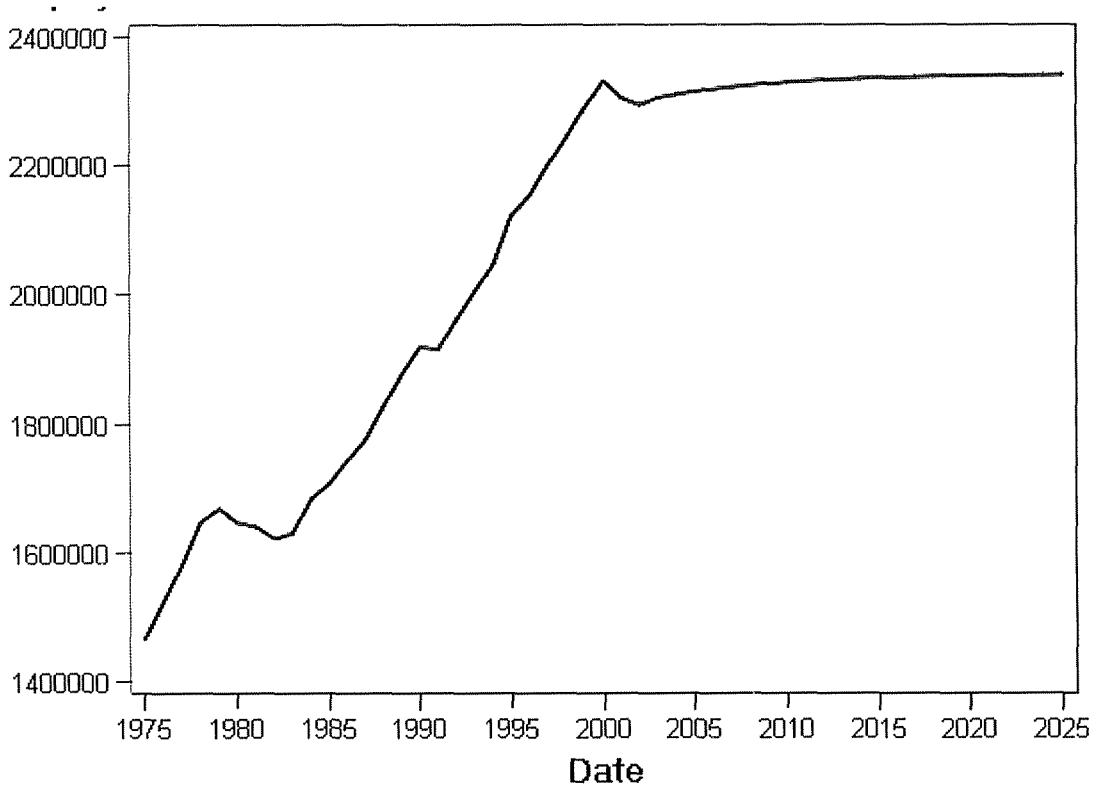


Overall, the forecast indicates a gradual drop in the moisture index.

Figure 4.2. Household Income

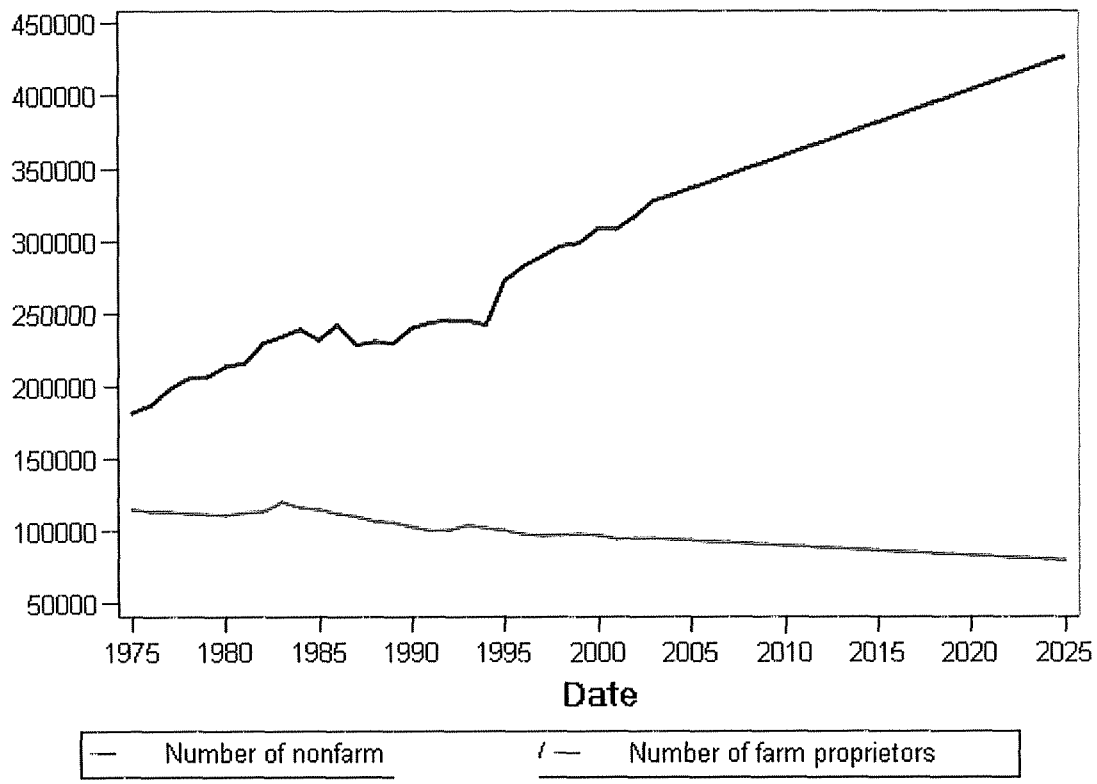


4.3. Employment



Employment, too, is expected to level off over the next 20 years.

4.4. Number of Kentucky Businesses



Farm businesses are expected to decrease slightly over the next 20 years; non-farm businesses will increase.