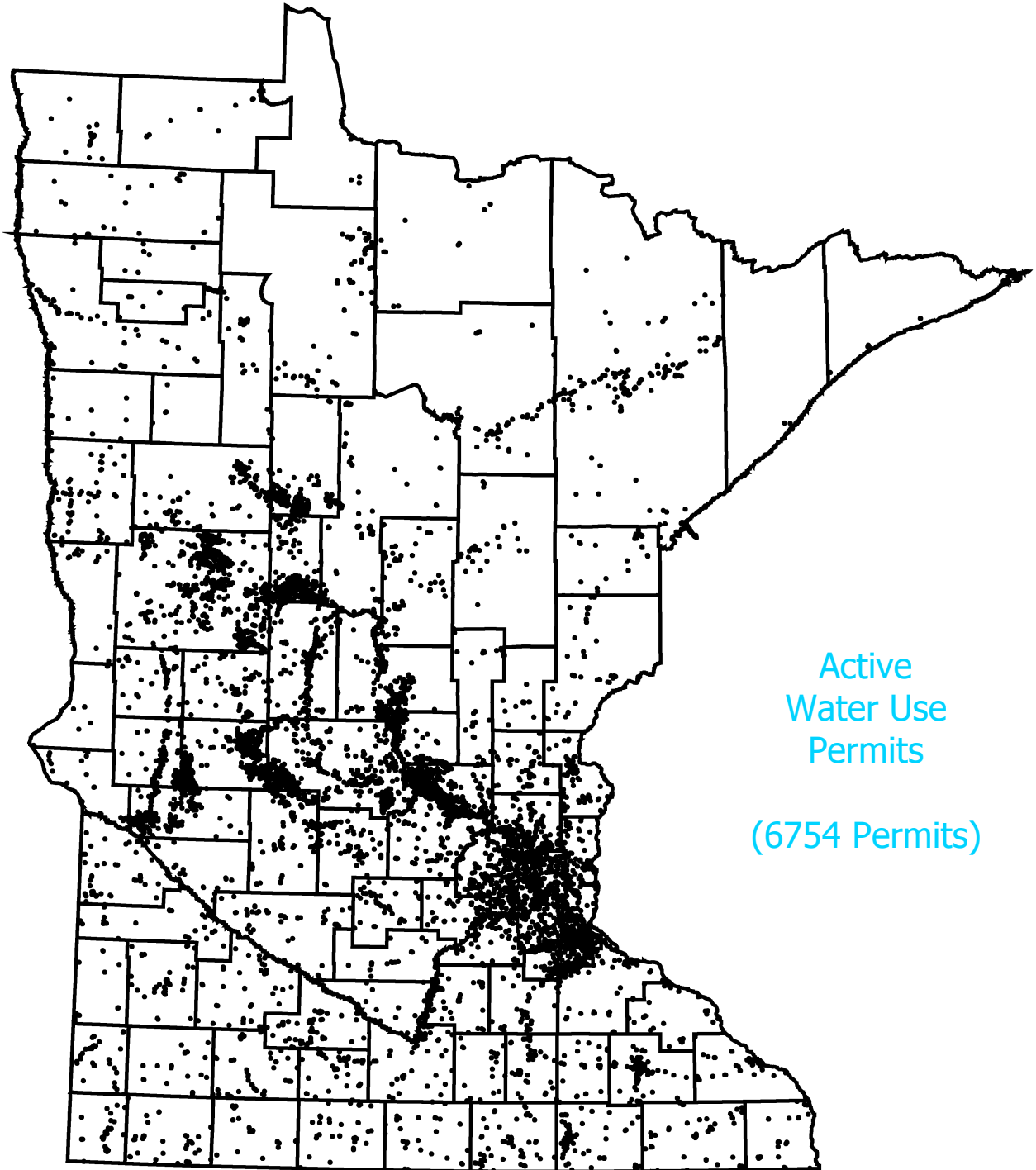


water use



Active
Water Use
Permits

(6754 Permits)

Introduction

DNR water appropriations permits are required for all users withdrawing surface or ground water in excess of ten thousand gallons per day or one million gallons per year. Uses less than this, such as rural domestic use, do not require a permit from the DNR and therefore are not included in this chapter.

All permittees must use a flow meter or other approved method of measurement to determine the volume of

water withdrawn and must submit an annual report of water use. Reported water use data are used for many purposes, such as documenting water conflicts, understanding the hydrology of aquifers from which water is withdrawn and evaluating existing water supplies by monitoring use and the impact of that use. The data are reported on a calendar year basis. This chapter summarizes the reported water use data for calendar years (CY) 2002 and 2003.

MAJOR WATER USE CATEGORIES

THERMOELECTRIC POWER GENERATION - water used to cool power generating plants. This is historically the largest volume use and relies almost entirely on surface water sources. Thermoelectric power generation is primarily a nonconsumptive* use in that most of the water withdrawn is returned to its source.

PUBLIC WATER SUPPLY - water distributed by community suppliers for domestic, commercial, industrial and public users. This category relies on both surface water and ground water sources.

INDUSTRIAL PROCESSING - water used in mining activities, paper mill operations, food processing, etc. Three-fourths or more of withdrawals are from surface water sources. Consumptive use varies, depending upon the type of industrial process.

IRRIGATION - water withdrawn from both surface water and ground water sources for major crop and noncrop uses. Nearly all irrigation is considered to be consumptive use.

OTHER - large volumes of water withdrawn for activities including air conditioning, construction dewatering, water level maintenance and pollution confinement.

*Consumptive use is defined as water that is withdrawn from its source and is not directly returned to the source (M.S. 103G.005, Subd. 8). Under this definition, all ground water withdrawals are consumptive unless the water is returned to the same aquifer. Surface water withdrawals are considered consumptive if the water is not directly returned to the source so that it is available for immediate further use.

Comparison of 2002 and 2003 Statewide Water Use

Water use in 2003 was 1374.0 billion gallons (BG) and was the highest use ever reported. 2002 reported use was 6% less than the 2003 total and is nearly the same as the value reported in 1999. Figure 1 is a comparison of 2002 and 2003 showing use by major category, and the volume and percent change between the years. The largest change in the two-year period was for irrigation, increasing by 35 BG or 50%. The smallest change in use was for the category “other,” increasing by 1 BG or 2%. No category reported a decrease in usage, reflecting the fact that 2003 was climatologically the driest year in more than a decade.

Figure 2 graphically shows the changes in use patterns for four main use categories (excluding power generation) from 1985 to 2003. Water use in 2003 for irrigation and public supply was the highest since the drought year 1988 and the large uses reported in 2001. The pattern seen in irrigation reflects low use in times of high precipitation and large use in times of lower precipitation. Industrial processing use is influenced by economic vitality. Industrial water use rebounded to past levels, after a notable decline in 2001, mainly due to a resumption in mine processing and pit dewatering for hard rock mining.

Figure 1

**Comparison of Water Use
by Major Category: 2002 & 2003
(Billions of Gallons)**

Use Category	Water Use				Change from 2002 to 2003	
	2002		2003		BG	%
	BG	% of Total	BG	% of Total	Change	Change
Power Generation	814.4	63%	824.7	60%	10	1%
Public Supply	198.9	15%	221.9	16%	23	12%
Industrial Processing	162.4	13%	168.7	12%	6	4%
Irrigation	70.0	5%	104.7	8%	35	50%
Other	53.1	4%	54.1	4%	1	2%
Totals	1,298.8	100%	1,374.0	100%	+75	5.8%

column totals may not sum due to independent rounding

A comparison of surface water versus ground water use for 2003 (Figure 3) shows that the majority of appropriations are from surface water sources. However, if the non-consumptive water use for power generation is removed, uses of ground water and surface water are more even (non-consumptive use means water that is immediately returned to its source after use). In 2003, 80% of total use in Minnesota was

from surface water sources, however, 60% of the total was for power plant cooling, a relatively non-consumptive use.

Surface water use increased from 2001 to 2003 due to demands for power generation and industrial processing, while ground water use increased due to demands for irrigation by agriculture and by public water suppliers.

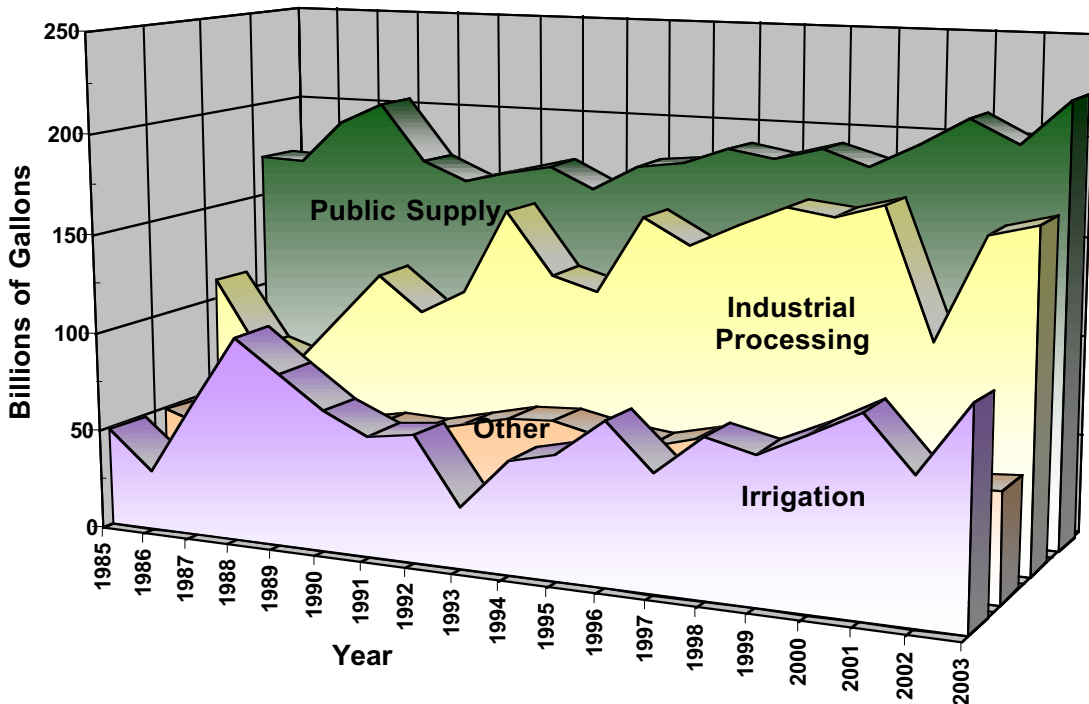
Figure 2

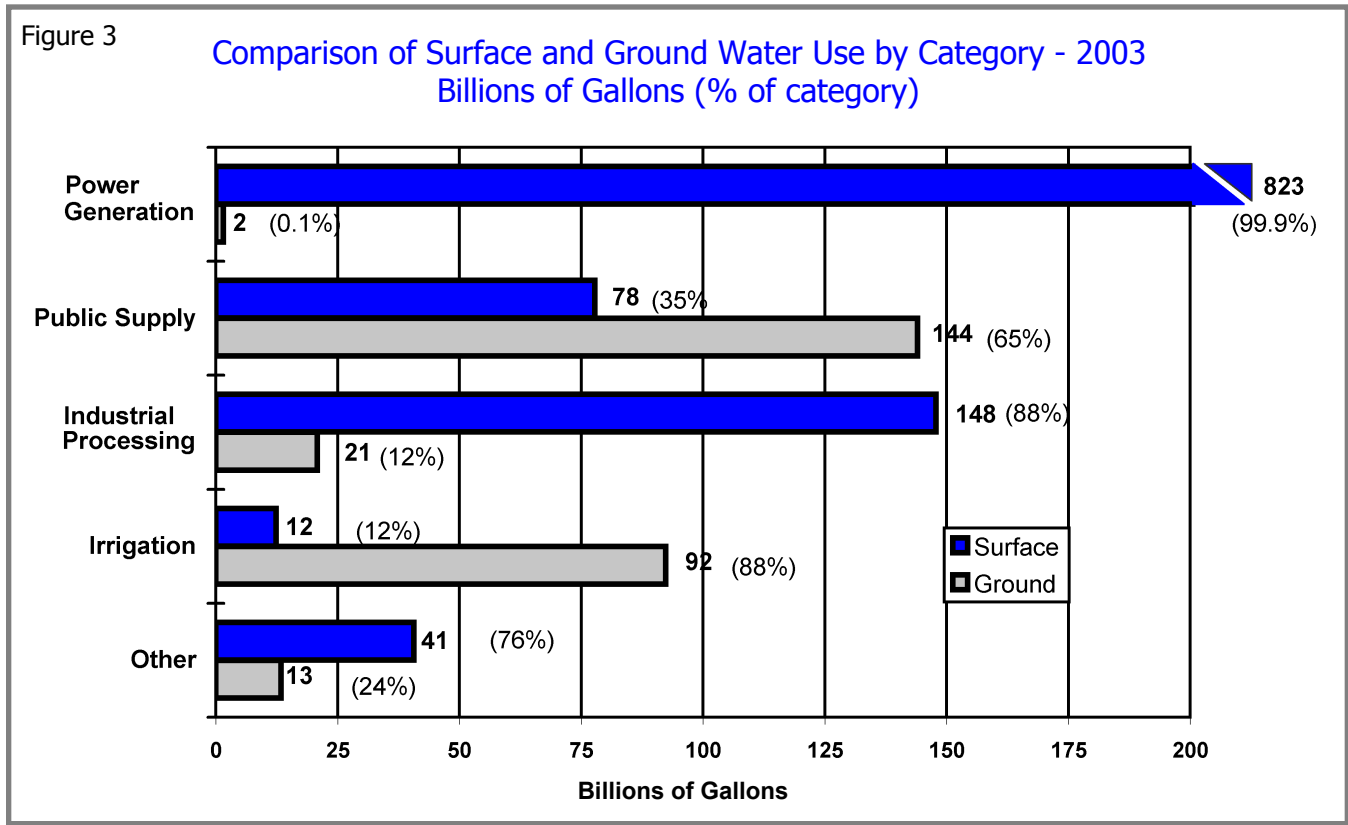
Minnesota Water Use - 1985 to 2003
(Billions of Gallons)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Power Generation	508	539	637	663	664	698	694	679	722	765	748	710	701	785	812	829	798	814	825
Public Supply	171	170	192	203	174	164	170	175	164	178	180	189	185	192	184	197	211	199	222
Industrial Processing	109	76	69	94	120	102	115	158	127	120	160	147	159	169	166	173	110	162	169
Irrigation	49	30	67	103	86	71	60	63	30	56	62	80	58	77	72	83	96	70	105
Other	49	42	38	42	48	53	52	58	63	64	60	57	63	58	65	59	58	53	54
Total	886	857	1003	1105	1092	1088	1091	1133	1106	1183	1210	1183	1166	1281	1299	1341	1273	1299	1374

column totals may not sum due to independent rounding

Minnesota Water Use
(excluding Power Generation)
in Billions of Gallons





Power Generation

Figure 4 shows that power generation (nuclear power cooling and steam power cooling) was the primary use in eight of the 11 counties with the highest total use in 2003. Goodhue and Wright Counties alone accounted for 24% of reported use in 2003, largely due to nuclear power plant cooling. Surface water sources supply nearly all water used for power plant cooling, most of which is returned to the surface water source.

Public Water Supply

Public supply gradually increased from 1990 to 1999 due to population increases, higher use for lawn watering and demands by industrial customers. However, public supply increased at a faster pace from 2000 to 2003 (Figure 5). Reported water use for 2001 and 2003 was 211 BG and 222 BG respectively. 65% of public water supply came from ground water in 2003, compared to 37% nationally (USGS, *Estimated Use of Water in the United States in 2000*).

Local water conservation programs that implement measures to improve water use efficiencies and promote the wise use of water can help communities reduce the need for expensive new municipal wells and water/wastewater treatment plants. Public water suppliers that serve more than 1,000 people are required to develop water emergency and conservation

plans and also implement demand management measures before requesting approvals for new municipal wells. These efforts can help water customers and communities save money while helping to protect Minnesota’s valuable water resources for future domestic and economic uses.

Figure 4

Appropriations by the Counties with the Greatest Use in CY 2003
Billions of Gallons

	County	Surface Water	Ground Water	Total	Primary Use
1)	Goodhue	208.7	2.4	211.1	Nuclear Power Cooling
2)	Wright	116.3	3.7	120.0	Nuclear Power Cooling
3)	Washington	103.3	13.6	116.9	Steam Power Cooling
4)	Dakota	87.7	29.9	117.6	Steam Power Cooling
5)	Hennepin	77.5	39.6	117.1	Steam Power Cooling
6)	Cook	68.3	0.0	68.3	Mine Processing
7)	Itasca	68.2	1.0	69.2	Steam Power Cooling
8)	St. Louis	87.4	2.1	89.5	Steam Power Cooling
9)	Ramsey	69.6	12.5	82.1	Steam Power Cooling
10)	Lake	48.9	0.0	48.9	Mine Processing
11)	Anoka	37.8	12.5	50.3	Municipal Waterworks
	Total	973.7	117.3	1091.0	
		<i>88% of</i>	<i>43% of</i>	<i>79% of</i>	
		SW Use	GW Use	Total Use	

Irrigation

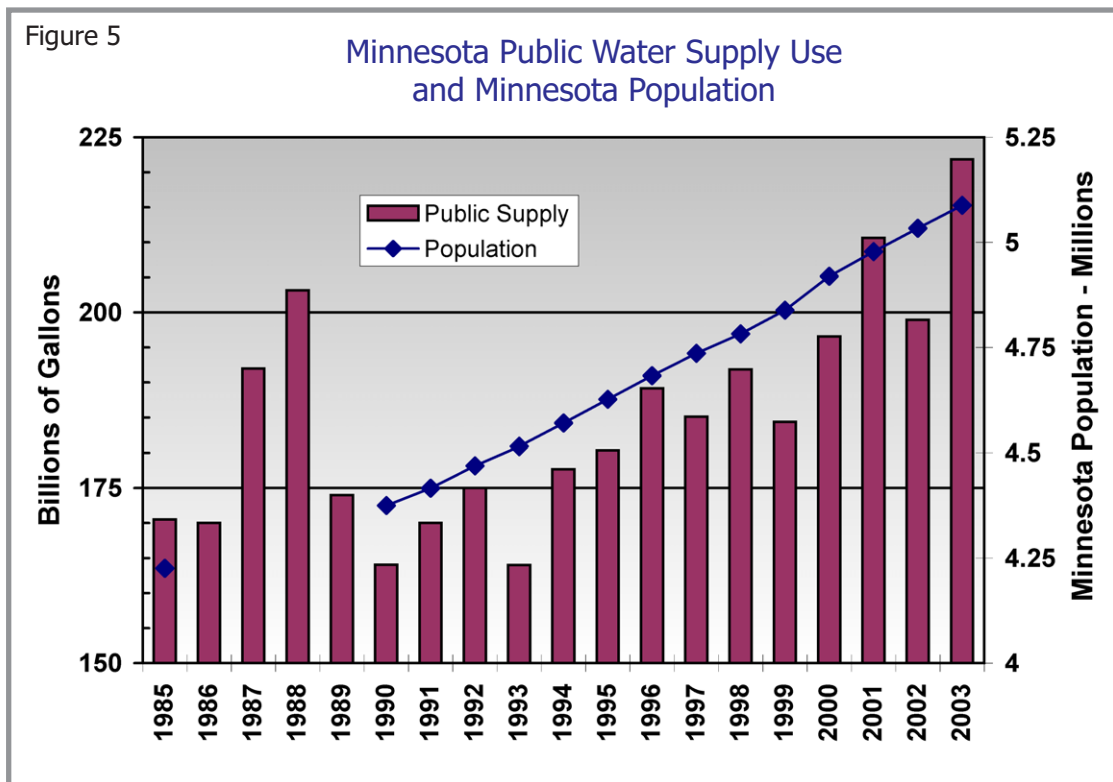
Annual variations in the amount and distribution of rainfall greatly affect the demand for irrigation water. Combined irrigation use for calendar years 2002-2003 was 3% lower compared to the previous two-year period. However, 2003 had the highest irrigation use of the 4-year period with 105 billion gallons.

Irrigation accounts for only a small amount (8%) of total water use in Minnesota. However, this use is significant because it is almost entirely consumptive and the majority is from ground water sources (88% in 2003). The timing of irrigation water use can be significant when evaluating regional water supplies and the potential for well interferences. Almost all irrigation water use is compacted into the five-month period from May to September of each year.

Otter Tail and Sherburne Counties reported the highest appropriations for irrigation in 2003, using 14.5 BG and 9.1 BG respectively. Roseau, Sibley, Traverse and Winona Counties reported only golf course irrigation under the irrigation category.

Industrial Processing

Industrial processing use decreased from an average of 170 BG to 110 BG in 2001 due to a reduction in demand for mine processing and pit dewatering. Mine processing use decreased by 50%, accounting for most of the decline. In 2002 and 2003, overall industrial processing use was back to pre-2001 levels due to the resumption of mining activities. Pulp and paper processing, and agricultural processing, accounted for 15% and 6%, respectively, of the total use reported.



Other Uses

Other uses include air conditioning, water level maintenance, fisheries operations, temporary construction dewatering, pollution confinement, snowaccount for the majority of use, totaling 824.7 BG (or making and other specialty uses that represent about 60%) in 2003. Surface water accounts for 80% of all 4% of Minnesota's total water use.

Summary

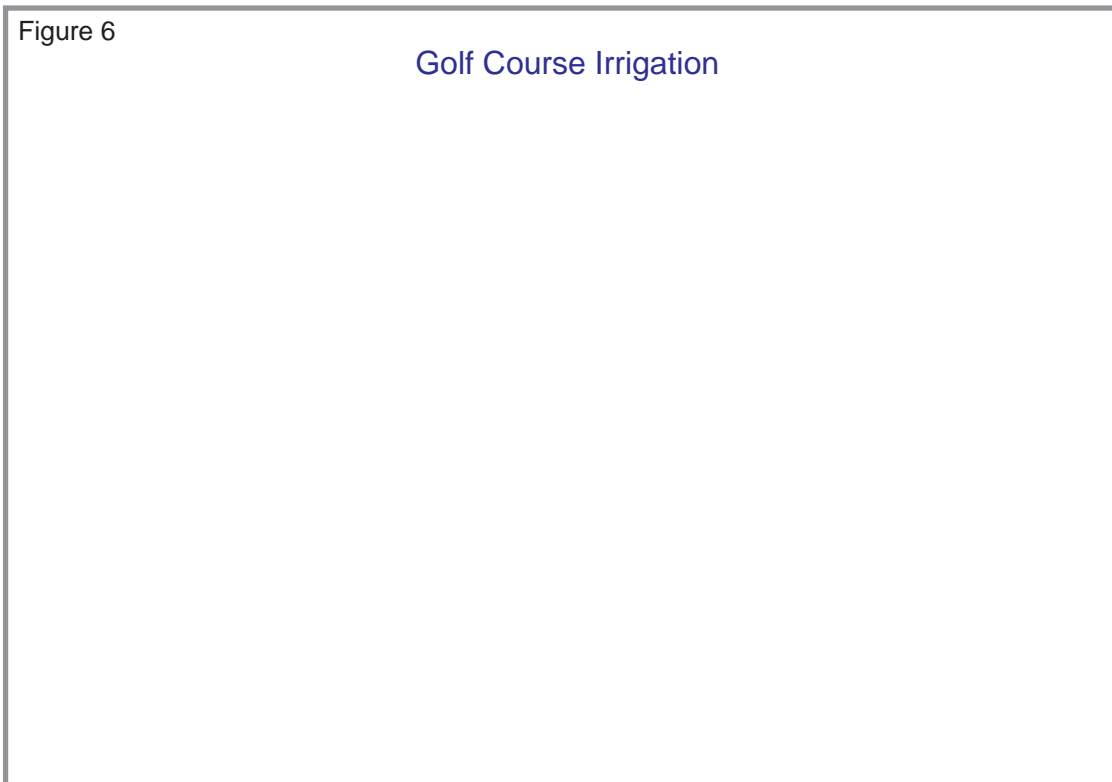
Total water use in 2003 increased to a new high of 1374 billion gallons. Power generation continues to account for the majority of use, totaling 824.7 BG (or making and other specialty uses that represent about 60%) in 2003. Surface water accounts for 80% of all appropriations.

Golf Course Irrigation

As the number of golf courses has increased in Minnesota, so has the associated water use (Figure 6). Over the last 15 years the number of golf course permits has more than doubled, as has the water use, depending upon the relative dryness of a given year.

Figure 6

Golf Course Irrigation



Reported Water Use by County 2002 - 2003 (Millions of Gallons)

Reported Water Use

County	2002			2003			Primary Use	% of 2003 Total
	Surface	Ground	Total	Surface	Ground	Total		
1 Aitkin	1,234.3	101.0	1,335.3	1,018.4	114.3	1,132.7	Wild Rice Irrigation	86
2 Anoka	35,722.9	10,511.7	46,234.6	37,769.8	12,509.9	50,279.7	Municipal Waterworks	95
3 Becker	13.0	2,513.9	2,526.9	13.8	3,420.2	3,434.0	Major Crop Irrigation	71
4 Beltrami	1,368.1	729.7	2,097.8	630.3	763.4	1,393.7	Municipal Waterworks	45
5 Benton	3,613.7	2,492.8	6,106.5	3,854.8	4,096.4	7,951.2	Industrial Processing	47
6 Big Stone	25.3	446.0	471.3	14.3	545.6	559.9	Major Crop Irrigation	53
7 Blue Earth	7,518.9	3,724.4	11,243.3	8,056.7	3,946.2	12,002.9	Steam Power Cooling	66
8 Brown	120.1	982.9	1,103.0	126.7	1,023.5	1,150.2	Major Crop Irrigation	45
9 Carlton	2,305.4	660.5	2,965.9	1,988.1	717.3	2,705.4	Pulp/Paper Processing	72
10 Carver	23.0	2,854.9	2,877.9	35.7	3,605.4	3,641.1	Municipal Waterworks	82
11 Cass	34.8	1,133.5	1,168.3	21.7	1,301.1	1,322.8	Major Crop Irrigation	38
12 Chippewa	25.5	531.8	557.3	75.0	605.4	680.4	Municipal Waterworks	71
13 Chisago	156.9	962.1	1,119.0	102.9	1,262.1	1,365.0	Municipal Waterworks	56
14 Clay	1,700.6	832.6	2,533.2	1,837.5	1,024.4	2,861.9	Municipal Waterworks	70
15 Clearwater	3,366.6	107.4	3,474.0	3,637.7	127.7	3,765.4	Wild Rice Irrigation	96
16 Cook	53,511.2	13.6	53,524.8	68,272.2	7.9	68,280.1	Mine Processing	99
17 Cottonwood	461.0	1,162.6	1,623.6	129.1	1,222.6	1,351.7	Municipal Waterworks	40
18 Crow Wing	489.6	1,766.4	2,256.0	546.9	2,129.0	2,675.9	Municipal Waterworks	45
19 Dakota	68,024.2	21,826.6	89,850.8	87,736.5	29,945.7	117,682.2	Steam Power Cooling	71
20 Dodge	68.9	580.8	649.7	15.6	564.6	580.2	Municipal Waterworks	62
21 Douglas	91.3	1,453.1	1,544.4	119.2	1,793.8	1,913.0	Major Crop Irrigation	39
22 Faribault	0.0	808.0	808.0	0.0	839.4	839.4	Municipal Waterworks	61
23 Fillmore	3,532.8	662.8	4,195.6	3,354.1	647.9	4,002.0	Hatcheries & Fisheries	83
24 Freeborn	12.6	1,624.5	1,637.1	47.0	1,685.6	1,732.6	Municipal Waterworks	74
25 Goodhue	216,262.0	2,061.3	218,323.3	208,719.3	2,352.0	211,071.3	Nuclear Power Cooling	91
26 Grant	0.0	628.0	628.0	0.0	855.5	855.5	Major Crop Irrigation	79
27 Hennepin	76,098.8	33,821.3	109,920.1	77,480.2	39,575.5	117,055.7	Steam Power Cooling	66
28 Houston	9.0	533.4	542.4	27.6	558.6	586.2	Municipal Waterworks	73
29 Hubbard	26.0	4,470.2	4,496.2	22.1	5,213.2	5,235.3	Major Crop Irrigation	79
30 Isanti	3.6	626.9	630.5	3.3	807.3	810.6	Municipal Waterworks	46
31 Itasca	68,606.6	1,007.8	69,614.4	68,231.0	1,017.8	69,248.8	Steam Power Cooling	84
32 Jackson	165.8	296.7	462.5	149.5	297.0	446.5	Municipal Waterworks	59
33 Kanabec	10.3	163.0	173.3	18.3	210.2	228.5	Municipal Waterworks	69
34 Kandiyohi	570.5	2,335.5	2,906.0	447.2	3,521.4	3,968.6	Municipal Waterworks	47
35 Kittson	77.4	351.7	429.1	137.9	427.7	565.6	Major Crop Irrigation	46
36 Koochiching	18,750.4	46.3	18,796.7	16,285.8	46.6	16,332.4	Pulp/Paper Processing	97
37 Lac Qui Parle	33.5	1,296.7	1,330.2	68.0	1,510.0	1,578.0	Agricultural Processing	45
38 Lake	47,649.6	0.6	47,650.2	48,889.1	0.3	48,889.4	Mine Processing	99
39 Lake of the Woods	274.7	67.4	342.1	270.5	68.9	339.4	Wild Rice Irrigation	78
40 Le Sueur	4,422.2	1,251.4	5,673.6	4,209.4	1,370.6	5,580.0	Quarry/Mine Dewatering	60
41 Lincoln	6.4	482.1	488.5	8.3	1,394.4	1,402.7	Municipal Waterworks	62
42 Lyon	144.1	1,437.8	1,581.9	117.7	1,554.2	1,671.9	Municipal Waterworks	63
43 McLeod	71.2	1,848.1	1,919.3	421.1	1,950.8	2,371.9	Municipal Waterworks	51
44 Mahanomen	0.0	84.9	84.9	0.0	85.2	85.2	Municipal Waterworks	95

Reported Water Use by County 2002 - 2003 (Millions of Gallons)

		2002			2003			% of 2003	
County		Surface	Ground	Total	Surface	Ground	Total	Primary Use	Total
45	Marshall	143.7	226.3	370.0	143.7	227.6	371.3	Municipal Waterworks	30
46	Martin	7,564.7	414.8	7,979.5	8,712.2	398.8	9,111.0	Steam Power Cooling	89
47	Meeker	13.9	776.6	790.5	22.8	1,760.0	1,782.8	Major Crop Irrigation	59
48	Mille Lacs	24.8	454.0	478.8	37.8	565.4	603.2	Municipal Waterworks	67
49	Morrison	59.8	3,447.3	3,507.1	144.3	4,623.2	4,767.5	Major Crop Irrigation	77
50	Mower	35.2	2,618.3	2,653.5	42.1	2,767.7	2,809.8	Municipal Waterworks	44
51	Murray	48.2	225.6	273.8	85.4	234.9	320.3	Municipal Waterworks	70
52	Nicollet	78.8	1,806.1	1,884.9	104.8	1,982.7	2,087.5	Municipal Waterworks	84
53	Nobles	60.9	1,163.3	1,224.2	59.6	1,149.8	1,209.4	Municipal Waterworks	93
54	Norman	0.4	136.0	136.4	0.0	145.9	145.9	Municipal Waterworks	90
55	Olmsted	5,624.1	6,230.0	11,854.1	10,512.2	5,726.8	16,239.0	Steam Power Cooling	65
56	Otter Tail	26,204.2	12,457.9	38,662.1	24,457.5	15,170.6	39,628.1	Steam Power Cooling	60
57	Pennington	748.7	26.7	775.4	723.8	26.5	750.3	Municipal Waterworks	56
58	Pine	17.8	481.3	499.1	88.3	557.7	646.0	Municipal Waterworks	52
59	Pipestone	40.1	997.8	1,037.9	54.6	967.1	1,021.7	Rural Waterworks	45
60	Polk	4,141.6	478.5	4,620.1	4,688.1	653.9	5,342.0	Municipal Waterworks	65
61	Pope	48.9	4,125.7	4,174.6	55.6	8,955.8	9,011.4	Major Crop Irrigation	95
62	Ramsey	65,896.7	12,080.1	77,976.8	69,590.7	12,510.6	82,101.3	Steam Power Cooling	63
63	Red Lake	527.5	341.9	869.4	308.4	355.2	663.6	Municipal Waterworks	53
64	Redwood	125.7	435.4	561.1	66.9	485.1	552.0	Municipal Waterworks	74
65	Renville	97.1	776.6	873.7	59.1	783.8	842.9	Municipal Waterworks	56
66	Rice	86.4	2,632.7	2,719.1	79.3	2,781.5	2,860.8	Municipal Waterworks	81
67	Rock	34.4	634.4	668.8	50.6	605.5	656.1	Municipal Waterworks	59
68	Roseau	0.2	322.3	322.5	0.0	338.5	338.5	Municipal Waterworks	91
69	St. Louis	96,064.4	2,083.7	98,148.1	87,382.6	2,073.0	89,455.6	Steam Power Cooling	60
70	Scott	175.2	4,662.0	4,837.2	178.4	5,791.0	5,969.4	Municipal Waterworks	68
71	Sherburne	19,917.9	8,442.6	28,360.5	22,441.3	11,328.2	33,769.5	Steam Power Cooling	38
72	Sibley	9.7	728.9	738.6	3.2	687.1	690.3	Municipal Waterworks	82
73	Stearns	3,317.5	6,880.0	10,197.5	3,468.2	10,553.0	14,021.2	Major Crop Irrigation	50
74	Steele	1,430.1	1,751.8	3,181.9	1,424.0	1,918.6	3,342.6	Municipal Waterworks	54
75	Stevens	56.4	1,592.0	1,648.4	80.0	2,607.6	2,687.6	Major Crop Irrigation	80
76	Swift	28.7	3,904.5	3,933.2	34.1	5,875.8	5,909.9	Major Crop Irrigation	91
77	Todd	143.2	2,551.1	2,694.3	236.9	3,142.9	3,379.8	Major Crop Irrigation	74
78	Traverse	3.3	102.9	106.2	2.8	101.2	104.0	Municipal Waterworks	97
79	Wabasha	0.9	1,039.4	1,040.3	10.5	1,097.6	1,108.1	Municipal Waterworks	79
80	Wadena	494.5	3,078.8	3,573.3	730.4	3,781.3	4,511.7	Major Crop Irrigation	90
81	Waseca	29.0	744.4	773.4	27.6	779.8	807.4	Municipal Waterworks	89
82	Washington	102,216.1	10,879.3	113,095.4	103,343.4	13,553.6	116,897.0	Steam Power Cooling	86
83	Watonwan	51.7	1,098.7	1,150.4	25.5	1,174.2	1,199.7	Municipal Waterworks	59
84	Wilkin	50.6	154.8	205.4	73.1	213.7	286.8	Municipal Waterworks	49
85	Winona	1,017.9	2,273.4	3,291.3	984.4	2,462.7	3,447.1	Municipal Waterworks	45
86	Wright	125,144.8	2,974.4	128,119.2	116,343.8	3,742.4	120,086.2	Nuclear Power Cooling	97
87	Yellow Medicine	60.4	870.8	931.2	74.2	774.6	848.8	Rural Waterworks	47
Totals		1,298,837			1,374,012				

Minnesota Reported Water Use

Category	2002	2003
Power Generation	(Millions of Gallons)	
Nuclear Power		
surface	325,423.0	309,011.0
ground	13.1	14.8
Steam Power Cooling		
surface	385,286.9	409,473.4
ground	452.0	644.0
Other Power		
surface	102,315.7	104,686.5
ground	904.7	869.9
Subtotal	814,395.4	824,699.6
Percent of Total	63%	60%
surface	813,025.6	823,170.9
ground	1,369.8	1,528.7
Public Supply		
Municipal Water Works		
surface	72,979.1	77,803.9
ground	121,689.7	140,013.1
Private Water Works		
surface	10.6	10.6
ground	710.0	736.7
Commercial & Institutional		
surface	0.0	0.0
ground	1,436.5	1,315.9
Cooperative Water Works		
surface	0.0	0.0
ground	1.6	1.9
Fire Protection		
surface	0.0	0.0
ground	17.4	17.4
State Parks, Waysides, Rest Areas		
surface	0.0	0.0
ground	42.9	45.0
Rural Water Districts		
surface	0.0	0.0
ground	2,032.3	1,914.2
Subtotal	198,920.1	221,858.7
Percent of Total	15%	16%
surface	72,989.7	77,814.5
ground	125,930.4	144,044.2

Minnesota Reported Water Use

Category	2002	2003
Irrigation		
Golf Course		
surface	1,276.0	1,710.4
ground	4,366.9	6,818.3
Cemetery		
surface	0.0	3.2
ground	32.4	63.7
Landscaping		
surface	40.8	63.6
ground	498.0	647.4
Sod		
surface	65.2	138.7
ground	39.2	234.5
Nursery		
surface	119.0	180.2
ground	328.5	552.8
Orchard		
surface	1.6	2.8
ground	1.7	10.3
Non Crop		
surface	2.8	9.1
ground	25.2	20.9
Temporary		
surface	0.0	0.0
ground	11.0	50.9
Major Crop		
surface	1,794.6	2,714.7
ground	52,935.8	83,827.9
Wild Rice		
surface	8,363.7	7,540.1
ground	83.8	133.8
Subtotal		
	69,986.2	104,723.3
Percent of Total		
	5%	8%
surface	11,663.7	12,362.8
ground	58,322.5	92,360.5

Minnesota Reported Water Use

Category	2002	2003
Industrial Processing		
Agricultural		
surface	172.9	68.7
ground	10,038.7	9,673.8
Pulp and Paper		
surface	28,453.4	25,024.7
ground	1,031.9	868.0
Mine		
surface	109,747.8	119,521.4
ground	61.5	137.6
Sand and Gravel Washing		
surface	2,876.1	2,760.5
ground	1,033.1	1,168.6
Industrial Process Cooling Once-Through		
surface	164.8	216.8
ground	1,661.4	1,656.6
Petroleum or Chemical		
surface	182.0	259.6
ground	3,661.0	4,224.8
Metal		
surface	0.0	0.0
ground	1,434.4	1,442.4
Non-Metal		
surface	0.5	0.4
ground	1,523.7	1,248.1
Other		
surface	0.0	0.0
ground	365.3	385.6
Subtotal		
	162,408.5	168,657.6
Percent of Total	13%	12%
surface	141,597.5	147,852.1
ground	20,811.0	20,805.5
Other		
Air Conditioning		
Commercial & Institutional Building AC		
surface	274.1	282.8
ground	159.2	134.6

Minnesota Reported Water Use

Category	2002	2003
Heat Pumps & Coolant Pumps		
surface	82.2	105.3
ground	0.0	0.0
District Heating		
surface	0.0	0.0
ground	0.0	0.0
Once-Through Heating or AC		
surface	0.0	0.0
ground	2,341.9	1,900.7
Other AC		
surface	0.0	0.0
ground	0.0	0.0
Temporary		
Temporary Construction Non-Dewatering		
surface	11.2	7.6
ground	4.7	4.2
Temporary Construction Dewatering		
surface	81.5	8.7
ground	1,943.9	2,247.0
Temporary Pipeline and Tank Testing		
surface	0.0	2.6
ground	0.0	0.0
Other Temporary		
surface	56.0	131.1
ground	0.0	0.0
Water Level Maintenance		
Basin (Lake) Level Maintenance		
surface	856.1	2,479.2
ground	189.9	348.6
Mine Dewatering		
surface	19,653.4	21,078.4
ground	26.7	7.3
Quarry Dewatering		
surface	11,967.2	10,661.0
ground	0.0	0.0
Sand/Gravel Pit Dewatering		
surface	402.3	491.4
ground	17.7	44.6

Minnesota Reported Water Use

Category	2002	2003
Tile Drainage & Pumped Sumps		
surface	35.2	30.5
ground	315.2	140.6
Other Water Level Maintenance		
surface	27.9	44.0
ground	1,200.3	1,220.8
Special Categories		
Pollution Confinement		
surface	0.0	0.0
ground	4,468.4	4,323.2
Hatcheries & Fisheries		
surface	5,474.0	5,091.2
ground	658.0	586.0
Snow Making		
surface	212.8	172.5
ground	303.6	314.1
Peat Fire Control		
surface	0.0	0.0
ground	0.0	0.0
Livestock Watering		
surface	0.0	0.0
ground	925.5	680.3
Other Special Categories		
surface	28.3	78.7
ground	1,409.6	1,455.9
Subtotal		
	53,126.8	54,072.9
Percent of Total	4%	4%
surface	39,162.2	40,665.0
ground	13,964.6	13,407.9
Grand Total (Millions of Gallons)		
	1,298,837	1,374,012
surface	1,078,439	1,101,865
ground	220,398	272,147

This document is also available on
our website at www.dnr.state.mn.us/waters