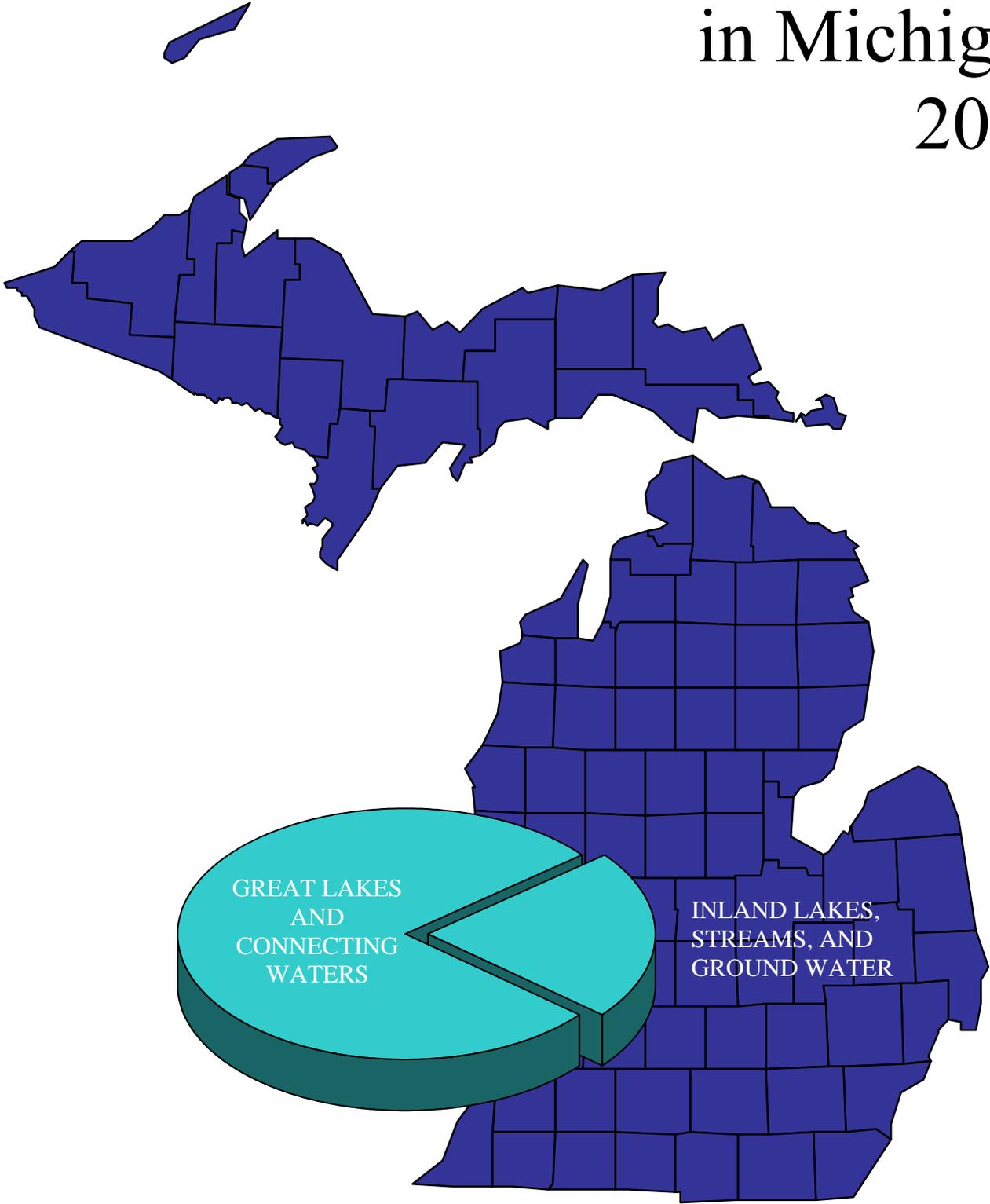


Water Withdrawals for Public Water Supply in Michigan 2006



Water Withdrawals for Public Water Supply in Michigan: 2006

Introduction

This report has been prepared by the Michigan Department of Environmental Quality to summarize public water supply information compiled in Michigan's Water Use Reporting Program. The overall goal of the program is to establish an environmental baseline and continuing assessment of major water uses in the state, including power generation, industrial, irrigation, and public water supply. This fulfills key requirements of the Great Lakes Charter, a regional agreement signed by the Great Lakes states and Canadian provinces in 1985, the Great Lakes Charter Annex 2001, and Michigan's water use reporting law (Part 327, Great Lakes Preservation, Natural Resources and Environmental Protection Act, 1994 PA 451, as amended).

Detailed water use information from the states and provinces is maintained by the Great Lakes Commission to facilitate regional policy-making and strengthen the legal defense against unwarranted diversions of Great Lakes water. It also provides essential water use information for state and regional water resources planning to support power generation, industrial, irrigation, and public water supply activities in a manner consistent with sound environmental management.

Background

Public water supply is the process of withdrawing, treating, and distributing water for a variety of residential, public, commercial, and industrial uses. Residential uses include water for drinking, household activities, and lawn and garden watering. Public uses include fire fighting, street washing, and supplying municipal parks, golf courses, and swimming pools. Commercial and industrial uses include providing water for hotels, restaurants, laundries, office buildings, manufacturers, and industrial complexes. Public water supply systems are the sole source of water for many of these facilities, while others use a combination of public and self-supplied water sources.

At the national level, a significant portion of public water supply withdrawals occurs in the Great Lakes Basin, which ranks fourth among the 21 major watersheds in the Nation. As a state, Michigan has the ninth largest public water supply withdrawals, following California, Texas, New York, Florida, Illinois, Ohio, Pennsylvania, and Georgia. Within the United States portion of the Great Lakes Basin, Michigan accounts for the largest amount of water withdrawn for public water supply systems. While the total volume of this water is significant, the amount consumed (e.g. effectively lost to the region due to evaporation, transpiration, and incorporation into products) is estimated between 10 to 15 percent.

For the purposes of this report, data have been compiled for Michigan's community public water supply systems. They are defined as systems that provide year-round water service to at least 15 service connections or serve an average of at least 25 residents. Community public water suppliers are required to employ certified operators and are monitored periodically to ensure that they meet all applicable state and federal standards. Drinking water standards and the associated monitoring

schedules are prescribed nationally by the United States Environmental Protection Agency with oversight typically mandated by the respective states. The Department of Environmental Quality maintains primacy for the drinking water regulatory program in Michigan.

Michigan Summary

Michigan's 1,410 community public water supply systems withdrew 1,077 million gallons of water per day (MGD) during 2006. This represents a total water volume of 393 billion gallons for the year delivered to residential, commercial, industrial, and public facilities serving 7.3 million persons. Nearly 76 percent of the water withdrawn for community public water supply systems came from the Great Lakes and their connecting waters, with about 23 percent of water withdrawals from ground water. Less than 2 percent of withdrawals were from inland lakes and streams, which are generally not used for community public water supply in the state.

Table 1 summarizes water withdrawals for community public water supply systems on a county basis.* Wayne County had the largest withdrawals in 2006, accounting for 39 percent (425 MGD) of the community public water supplies in the state. Most of these withdrawals were for the Detroit Public Water Supply System, which distributed water to 132 community systems in 8 counties. The next largest water withdrawal counties were Saint Clair, Kent, Ottawa, and Ingham. Together, these four counties accounted for an additional 29 percent of the total community public water supply withdrawals statewide. Over 93 percent of the water withdrawals in the five largest counties were from the Great Lakes and their connecting waters.

Table 2 summarizes community public water supply withdrawals by U.S. Geological Survey hydrologic basins in Michigan. Water withdrawals occurred in all 57 watersheds in the state. The largest withdrawals were from the Detroit Watershed (Basin 04090004), which accounted for 39 percent of the total community public water supply withdrawals statewide. Water withdrawals in the next four largest watersheds accounted for an additional 30 percent of the state withdrawals. They were the Birch-Willow (Basin 04080104), the Lower Grand (Basin 04050006), the Upper Grand (Basin 04050004), and the Black-Macatawa (Basin 04050002). Community public water supply systems in the five largest basins relied on the Great Lakes for 90 percent of their water supplies, with nearly all the rest from ground water sources.

To determine public water supply and demand relationships over time, longer-term trend analysis will be undertaken as community public water supply data are compiled annually in Michigan's Water Use Reporting Program. Aggregate estimates will also be made for over 10,400 smaller noncommunity public water supply systems in the state. This information will support the continued development of safe, reliable public water supplies in Michigan. When combined with water withdrawal data from other major water use sectors, it will provide a continuing environmental baseline to ensure the protection and wise management of the waters of the Great Lakes Basin.

* The amount of water withdrawn from a given county is often different than the amount of water used within the county, since water withdrawn in one county may be distributed to communities over a multi-county area.

Table 1: 2006 Water Withdrawals for Community Public Water Supply Systems in Michigan, by County*

County	Number of Systems Served**	Water Withdrawn (MGD)			Total
		Great Lakes	Surface Water	Ground Water	
Alcona	6	0.00	0.00	0.11	0.11
Alger	6	0.00	0.00	0.50	0.50
Allegan	47	0.00	0.00	4.10	4.10
Alpena	4	2.08	0.00	0.55	2.63
Antrim	10	0.00	0.00	1.49	1.49
Arenac	17	32.81	0.00	0.02	32.83
Baraga	3	0.61	0.00	0.00	0.62
Barry	18	0.00	0.00	1.65	1.65
Bay	17	9.35	0.00	0.00	9.35
Benzie	11	0.00	0.00	0.81	0.81
Berrien	52	12.61	0.00	3.56	16.17
Branch	13	0.00	0.00	3.00	3.00
Calhoun	20	0.00	0.00	13.79	13.79
Cass	18	0.00	0.00	1.34	1.34
Charlevoix	17	0.85	0.00	1.60	2.45
Cheboygan	8	0.00	0.00	1.08	1.08
Chippewa	6	1.77	0.00	1.09	2.86
Clare	4	0.00	0.00	0.92	0.92
Clinton	14	0.00	0.00	1.86	1.86
Crawford	5	0.00	0.00	0.68	0.68
Delta	7	2.51	0.00	0.13	2.64
Dickinson	7	0.00	0.00	2.60	2.60
Eaton	14	0.00	0.00	3.27	3.27
Emmet	31	0.00	0.00	3.57	3.57
Genesee	45	0.00	0.00	4.90	4.90
Gladwin	7	0.00	0.00	0.44	0.44
Gogebic	10	0.00	0.00	1.63	1.63
Grand Traverse	24	5.30	0.00	1.75	7.05
Gratiot	11	0.00	0.67	1.79	2.46
Hillsdale	11	0.00	0.00	1.78	1.78
Houghton	19	0.00	0.00	3.51	3.51
Huron	20	1.40	0.00	0.88	2.28

Water Withdrawn (MGD)

County	Number of Systems Served**	Water Withdrawn (MGD)			Total
		Great Lakes	Surface Water	Ground Water	
Ingham	24	0.00	0.11	42.27	42.38
Ionia	18	0.00	0.00	4.82	4.82
Iosco	10	1.28	0.00	0.01	1.30
Iron	17	0.00	0.00	1.78	1.78
Isabella	11	0.00	0.00	3.19	3.19
Jackson	26	0.00	0.00	10.95	10.95
Kalamazoo	22	0.00	0.00	24.96	24.96
Kalkaska	1	0.00	0.00	0.39	0.39
Kent	45	48.13	0.00	8.42	56.55
Keweenaw	4	0.01	0.00	0.06	0.06
Lake	4	0.00	0.00	0.24	0.24
Lapeer	11	0.00	0.00	0.46	0.46
Leelanau	15	0.00	0.00	0.49	0.49
Lenawee	28	0.00	2.76	3.29	6.05
Livingston	46	0.00	0.00	7.61	7.61
Luce	3	0.00	0.00	0.50	0.50
Mackinac	5	1.07	0.00	0.01	1.08
Macomb	12	3.99	0.00	0.75	4.74
Manistee	12	0.00	0.00	1.97	1.97
Marquette	24	2.86	0.00	2.43	5.28
Mason	9	2.02	0.00	0.10	2.12
Mecosta	12	0.00	0.00	1.38	1.38
Menominee	5	1.24	0.00	0.15	1.40
Midland	6	0.08	0.00	0.15	0.23
Missaukee	2	0.00	0.00	0.42	0.42
Monroe	8	13.02	0.72	0.12	13.86
Montcalm	12	0.00	0.00	3.57	3.57
Montmorency	3	0.00	0.00	0.13	0.13
Muskegon	23	15.94	0.00	2.20	18.14
Newaygo	9	0.00	0.00	2.51	2.51
Oakland	79	0.00	0.00	22.92	22.92
Oceana	5	0.00	0.00	1.03	1.03
Ogemaw	7	0.00	0.00	0.36	0.36
Ontonagon	5	0.38	0.00	0.08	0.46
Osceola	6	0.00	0.00	2.66	2.66

County	Number of Systems Served**	Water Withdrawn (MGD)			Total
		Great Lakes	Surface Water	Ground Water	
Oscoda	6	0.00	0.00	0.08	0.08
Otsego	10	0.00	0.00	1.15	1.15
Ottawa	31	46.64	0.00	0.34	46.98
Presque Isle	4	0.00	0.00	0.61	0.61
Roscommon	13	0.00	0.00	0.22	0.22
Saginaw	25	12.22	0.00	0.38	12.60
Saint Clair	75	170.44	0.00	0.46	170.89
Saint Joseph	19	0.00	0.00	3.61	3.61
Sanilac	18	0.16	0.00	1.44	1.60
Schoolcraft	3	0.00	0.36	0.02	0.38
Shiawassee	26	0.00	0.00	2.79	2.79
Tuscola	16	0.00	0.00	2.52	2.52
Van Buren	29	1.72	0.00	3.15	4.87
Washtenaw	23	0.00	12.58	8.11	20.69
Wayne	75	425.16	0.00	0.00	425.16
Wexford	6	0.00	0.00	2.92	2.92
Total	1,410	815.66	17.19	244.54	1,077.39

* This report is provided by the Michigan Department of Environmental Quality and was generated using data collected for the water use reporting program.

** Water withdrawn in one county is often delivered to community public water supply systems in several counties, where the water is used. In those cases, the number of systems served reported in this table represents systems both within and outside of the withdrawal county.

Index Map of Michigan Counties

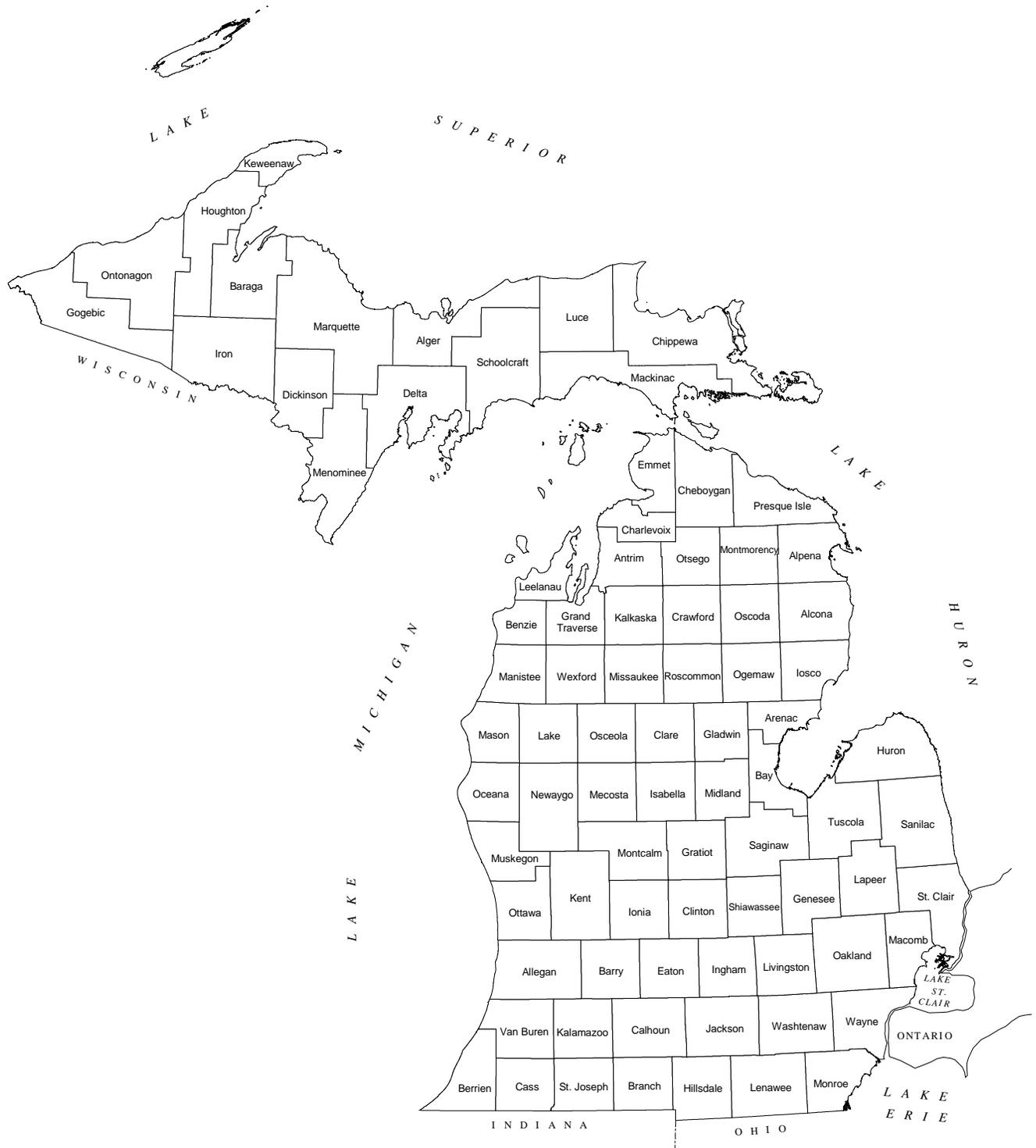


Table 2: 2006 Water Withdrawals for Community Public Water Supply Systems in Michigan, by Hydrologic Basin*

Hydrologic Basin Code	Number of Systems Served**	Water Withdrawn (MGD)			Total
		Great Lakes	Surface Water	Ground Water	
04010302	2	0.00	0.00	0.89	0.89
04020101	7	0.00	0.00	0.69	0.69
04020102	6	0.38	0.00	0.13	0.52
04020103	23	0.01	0.00	3.57	3.57
04020104	1	0.00	0.00	0.00	0.00
04020105	15	3.47	0.00	1.42	4.89
04020201	8	0.00	0.00	0.50	0.50
04020202	3	0.00	0.00	0.50	0.50
04020203	1	0.00	0.00	0.05	0.05
04030106	17	0.00	0.00	1.78	1.78
04030107	1	0.00	0.00	0.13	0.13
04030108	10	0.00	0.00	2.71	2.71
04030109	2	1.24	0.00	0.05	1.29
04030110	6	0.00	0.00	0.85	0.85
04030111	7	2.51	0.00	0.12	2.63
04030112	1	0.00	0.00	0.02	0.02
04040001	10	3.29	0.00	0.15	3.44
04050001	125	7.48	0.00	22.43	29.91
04050002	43	50.11	0.00	0.60	50.71
04050003	81	0.00	0.00	36.97	36.97
04050004	62	0.00	0.11	55.38	55.49
04050005	20	0.00	0.00	2.57	2.57
04050006	62	48.13	0.00	14.60	62.73
04050007	29	0.00	0.00	3.99	3.99
04060101	38	11.27	0.00	3.58	14.86
04060102	46	6.69	0.00	9.56	16.24
04060103	11	0.00	0.00	1.90	1.90
04060104	26	0.00	0.00	1.89	1.89
04060105	82	6.15	0.00	8.76	14.91
04060106	5	0.00	0.36	0.05	0.41
04060107	1	0.00	0.00	0.00	0.00
04070001	4	1.77	0.00	1.00	2.77

Hydrologic Basin Code	Number of Systems Served**	Water Withdrawn (MGD)			Total
		Great Lakes	Surface Water	Ground Water	
04070002	3	1.07	0.00	0.04	1.12
04070003	8	0.00	0.00	0.53	0.53
04070004	17	0.00	0.00	0.95	0.95
04070005	2	0.00	0.00	0.23	0.23
04070006	6	2.08	0.00	0.67	2.76
04070007	24	0.08	0.00	2.07	2.15
04080101	29	34.01	0.00	0.37	34.38
04080102	3	0.12	0.00	0.02	0.15
04080103	20	0.43	0.00	0.89	1.32
04080104	65	158.49	0.00	0.32	158.82
04080201	21	0.08	0.00	1.54	1.62
04080202	16	0.00	0.67	4.42	5.09
04080203	57	0.00	0.00	9.12	9.12
04080204	45	0.00	0.00	3.75	3.75
04080205	14	0.00	0.00	2.68	2.68
04080206	36	21.57	0.00	0.00	21.57
04090001	28	11.35	0.00	1.96	13.31
04090002	8	5.51	0.00	0.01	5.51
04090003	50	6.21	0.00	17.31	23.52
04090004	82	419.12	0.00	0.83	419.94
04090005	70	0.00	12.58	13.15	25.73
04100001	4	2.95	0.00	0.05	3.00
04100002	36	10.07	3.48	6.13	19.67
04100003	4	0.00	0.00	0.06	0.06
04100006	7	0.00	0.00	0.61	0.61
Total	1,410	815.66	17.19	244.54	1,077.39

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** Water withdrawn in one hydrologic basin is often delivered to community public water supply systems in several basins, where the water is used. In those cases, the number of systems served reported in this table represents systems both within and outside of the withdrawal basin.

Index Map of Michigan Hydrologic Basins

