

Table 1: 1998 Water Withdrawals for Golf Course Irrigation in Michigan, by County*

County	Number of Courses	Irrigated Acres	Water Withdrawn (MGD)			Total
			Great Lakes	Surface Water	Ground Water	
Alcona	4	177	0.00	0.05	0.11	0.16
Allegan	11	680	0.00	0.23	0.43	0.66
Alpena	2	216	0.00	0.09	0.07	0.16
Antrim	6	449	0.00	0.31	0.25	0.56
Arenac	1	68	0.00	0.00	0.14	0.14
Barry	6	486	0.00	0.16	0.24	0.40
Bay	5	206	0.00	0.16	0.05	0.21
Benzie	4	320	0.00	0.00	0.57	0.57
Berrien	13	844	0.00	0.47	0.38	0.85
Branch	4	116	0.00	0.11	0.19	0.30
Calhoun	11	586	0.00	0.21	0.38	0.59
Cass	5	409	0.00	0.04	0.32	0.35
Charlevoix	6	358	0.00	0.06	0.21	0.27
Cheboygan	3	277	0.00	0.15	0.11	0.26
Chippewa	4	240	0.04	0.00	0.14	0.18
Clare	3	96	0.00	0.09	0.04	0.13
Clinton	5	178	0.00	0.04	0.19	0.23
Crawford	2	150	0.00	0.06	0.13	0.19
Delta	6	351	0.09	0.07	0.04	0.19
Dickinson	3	142	0.00	0.24	0.13	0.37
Eaton	7	351	0.00	0.15	0.16	0.31
Emmet	9	1,059	0.00	0.00	0.99	0.99
Genesee	23	1,171	0.00	1.02	0.75	1.77
Gladwin	2	84	0.00	0.00	0.07	0.07
Grand Traverse	8	625	0.00	0.14	0.71	0.86
Gratiot	5	260	0.00	0.10	0.12	0.22
Hillsdale	4	98	0.00	0.09	0.01	0.10
Houghton	1	80	0.00	0.00	0.00	0.00
Huron	5	383	0.07	0.00	0.34	0.41
Ingham	12	863	0.00	0.26	0.41	0.67
Ionia	7	235	0.00	0.10	0.20	0.29
Iosco	4	144	0.00	0.36	0.04	0.40
Iron	1	115	0.00	0.00	0.08	0.08

County	Number of Courses	Irrigated Acres	Water Withdrawn (MGD)			Total
			Great Lakes	Surface Water	Ground Water	
Isabella	7	375	0.00	0.42	0.14	0.56
Jackson	18	940	0.00	0.20	0.67	0.87
Kalamazoo	15	1,078	0.00	0.52	0.70	1.22
Kalkaska	2	95	0.00	0.00	0.10	0.10
Kent	34	2,048	0.00	0.68	1.65	2.33
Keweenaw	1	33	0.02	0.00	0.00	0.02
Lake	2	105	0.00	0.03	0.07	0.10
Lapeer	6	309	0.00	0.03	0.22	0.25
Leelanau	7	312	0.01	0.05	0.26	0.31
Lenawee	7	241	0.00	0.18	0.08	0.26
Livingston	14	1,139	0.00	0.34	0.67	1.01
Luce	1	28	0.00	0.00	0.01	0.01
Mackinac	3	57	0.02	0.00	0.08	0.09
Macomb	28	2,217	0.00	1.69	0.46	2.15
Manistee	6	366	0.00	0.00	0.37	0.37
Marquette	4	176	0.00	0.15	0.01	0.16
Mason	3	73	0.00	0.05	0.07	0.11
Mecosta	5	357	0.00	0.37	0.21	0.58
Menominee	2	89	0.00	0.08	0.00	0.08
Midland	2	71	0.00	0.06	0.01	0.07
Missaukee	1	70	0.00	0.00	0.07	0.07
Monroe	11	714	0.00	0.35	0.47	0.83
Montcalm	8	459	0.00	0.17	0.22	0.39
Montmorency	2	196	0.00	0.26	0.00	0.26
Muskegon	12	683	0.02	0.25	0.57	0.84
Newaygo	5	278	0.00	0.06	0.27	0.33
Oakland	61	4,884	0.00	2.38	3.55	5.93
Oceana	5	229	0.00	0.16	0.28	0.44
Ogemaw	5	283	0.00	0.15	0.06	0.21
Ontonagon	1	15	0.00	0.00	0.01	0.01
Osceola	2	91	0.00	0.02	0.07	0.09
Oscoda	3	453	0.00	0.26	0.26	0.52
Otsego	12	1,208	0.00	0.06	0.77	0.83
Ottawa	14	703	0.00	0.45	0.37	0.82
Presque Isle	2	123	0.00	0.02	0.09	0.11
Roscommon	5	301	0.00	0.30	0.11	0.41

County	Number of Courses	Irrigated Acres	Water Withdrawn (MGD)			Total
			Great Lakes	Surface Water	Ground Water	
Saginaw	12	545	0.00	1.84	0.15	1.99
Saint Clair	14	606	0.14	0.39	0.11	0.64
Saint Joseph	3	132	0.00	0.24	0.00	0.24
Sanilac	4	161	0.02	0.00	0.16	0.18
Schoolcraft	1	32	0.00	0.06	0.00	0.06
Shiawassee	4	101	0.00	0.20	0.02	0.22
Tuscola	4	197	0.00	0.10	0.02	0.12
Van Buren	6	232	0.00	0.11	0.21	0.32
Washtenaw	26	1,543	0.00	0.88	0.67	1.55
Wayne	30	1,800	0.25	1.45	0.32	2.01
Wexford	7	351	0.00	0.13	0.23	0.36
Total	619	38,316	0.68	19.91	22.86	43.45

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

Index Map of Michigan Counties



Table 2: 1998 Water Withdrawals for Golf Course Irrigation in Michigan, by Hydrologic Basin*

Hydrologic Basin Code	Number of Courses	Irrigated Acres	Water Withdrawn (MGD)			
			Great Lakes	Surface Water	Ground Water	Total
04020103	3	128	0.02	0.00	0.02	0.03
04020105	2	91	0.00	0.07	0.01	0.08
04020202	1	28	0.00	0.00	0.01	0.01
04020203	1	40	0.00	0.00	0.08	0.08
04030106	1	115	0.00	0.00	0.08	0.08
04030108	4	192	0.00	0.31	0.13	0.44
04030109	2	42	0.00	0.01	0.00	0.01
04030110	2	85	0.00	0.08	0.00	0.08
04030111	4	328	0.09	0.07	0.00	0.16
04030112	1	20	0.00	0.00	0.03	0.03
04040001	3	140	0.00	0.10	0.05	0.15
04050001	30	1,731	0.00	1.07	1.03	2.09
04050002	8	268	0.00	0.29	0.07	0.36
04050003	41	2,417	0.00	0.80	1.78	2.59
04050004	35	2,034	0.00	0.58	1.20	1.78
04050005	4	247	0.00	0.05	0.15	0.20
04050006	43	2,477	0.00	0.97	1.93	2.90
04050007	13	777	0.00	0.36	0.25	0.61
04060101	19	936	0.02	0.33	0.92	1.27
04060102	24	1,488	0.00	0.95	0.99	1.95
04060103	10	598	0.00	0.10	0.49	0.59
04060104	13	757	0.00	0.14	0.95	1.09
04060105	31	2,598	0.01	0.42	2.24	2.66
04060106	1	32	0.00	0.06	0.00	0.06
04060107	1	20	0.00	0.00	0.08	0.08
04070001	4	202	0.04	0.00	0.06	0.10
04070002	1	35	0.01	0.00	0.00	0.01
04070003	4	152	0.00	0.05	0.09	0.13
04070004	8	883	0.00	0.12	0.65	0.77
04070005	1	58	0.00	0.02	0.07	0.08
04070006	6	537	0.00	0.35	0.18	0.52
04070007	13	1,236	0.00	0.77	0.59	1.36
04080101	9	409	0.00	0.15	0.24	0.40
04080102	5	157	0.00	0.07	0.06	0.14

Hydrologic Basin Code	Number of Courses	Irrigated Acres	Water Withdrawn (MGD)			
			Great Lakes	Surface Water	Ground Water	Total
04080103	4	249	0.07	0.09	0.13	0.28
04080104	5	329	0.09	0.02	0.22	0.33
04080201	8	271	0.00	0.20	0.14	0.34
04080202	11	606	0.00	0.58	0.18	0.76
04080203	24	1,304	0.00	1.67	1.07	2.74
04080204	27	1,420	0.00	1.21	0.87	2.08
04080205	9	407	0.00	0.55	0.11	0.65
04080206	1	80	0.00	0.03	0.08	0.10
04090001	10	435	0.06	0.32	0.15	0.52
04090002	9	554	0.01	0.26	0.26	0.53
04090003	48	3,764	0.00	2.48	1.53	4.00
04090004	43	2,902	0.25	1.69	1.00	2.94
04090005	47	3,483	0.00	1.80	2.09	3.89
04100001	11	771	0.00	0.48	0.41	0.89
04100002	12	389	0.00	0.12	0.21	0.33
04100006	2	94	0.00	0.11	0.01	0.12
Total	619	38,316	0.68	19.91	22.86	43.45

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Hydrologic Basins in Michigan: U.S. Geological Survey

04020103	Keweenaw Peninsula	04050007	Thornapple	04080103	Pigeon-Wiscoggin
04020105	Dead-Kelsey	04060101	Pere Marquette-White	04080104	Birch-Willow
04020202	Tahquamenon	04060102	Muskegon	04080201	Tittabawassee
04020203	Waiska	04060103	Manistee	04080202	Pine
04030106	Brule	04060104	Betsie-Platte	04080203	Shiawassee
04030108	Menominee	04060105	Boardman-Charlevoix	04080204	Flint
04030109	Cedar-Ford	04060106	Manistique	04080205	Cass
04030110	Escanaba	04060107	Brevoort-Millecoquin	04080206	Saginaw
04030111	Tacoosh-Whitefish	04070001	Saint Marys	04090001	Saint Clair
04030112	Fishdam-Sturgeon	04070002	Carp-Pine	04090002	Lake Saint Clair
04040001	Little Calumet-Galien	04070003	Lone Lake-Ocqueoc	04090003	Clinton
04050001	Saint Joseph	04070004	Cheboygan	04090004	Detroit
04050002	Black-Macatawa	04070005	Black	04090005	Huron
04050003	Kalamazoo	04070006	Thunder Bay	04100001	Ottawa-Stony
04050004	Upper Grand	04070007	Au Sable	04100002	Raisin
04050005	Maple	04080101	Au Gres-Rifle	04100006	Tiffin
04050006	Lower Grand	04080102	Kawkawlin-Pine		

Index Map of Michigan Hydrologic Basins

