



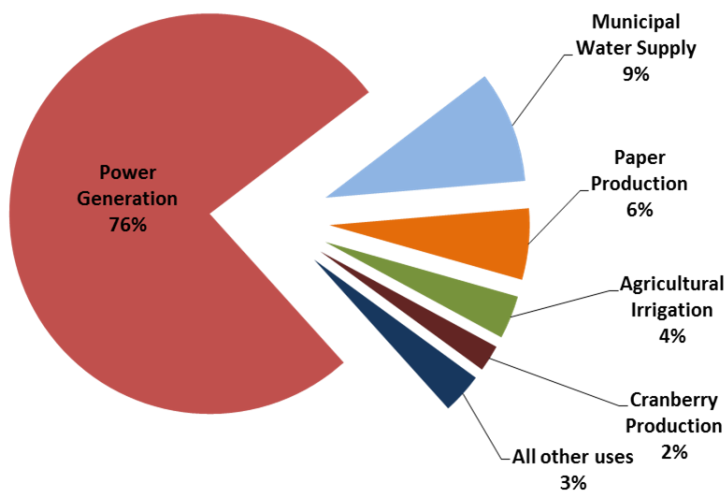
# Wisconsin Water Use

## 2011 Expanded Withdrawal Summary

**Water supply systems in Wisconsin** capable of withdrawing 100,000 gallons per day are required to register and report withdrawals. For 2011, reported withdrawals exceeded 2.156 trillion gallons of water from over 12,500 wells, ponds, streams, rivers and lakes.

### 2011 Withdrawals by Use

Total Withdrawals = 2.156 Trillion Gallons



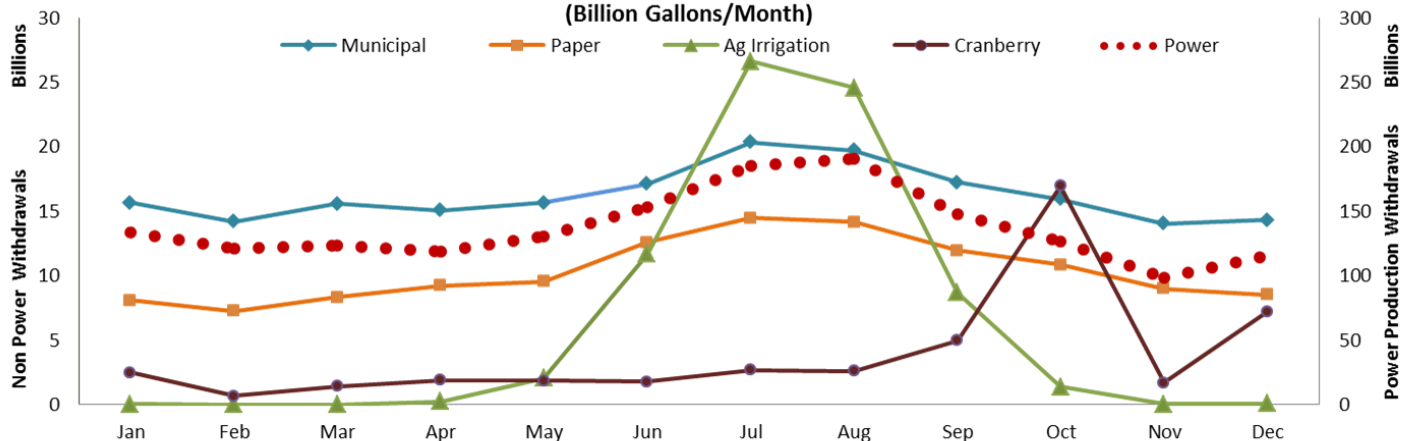
**Withdrawals** occur when someone takes water from a surface or groundwater source making it unavailable for other purposes, even if only temporarily. The impact of a withdrawal on the resource or to other potential withdrawers depends on a number of factors. Monitoring water withdrawals by sector, source type and location will allow us to assess the scale and impact of water use in Wisconsin and promote sustainable water use.

**Seasonal Variation** affects how and when water is withdrawn. Monthly withdrawals varied greatly throughout 2011 and followed temperatures and precipitation. For instance:

- Summer heat drives municipal water demand and cooling water demand for power and paper production.
- Agricultural irrigation peaks in July and August when crops typically require the most water.
- Cranberry production requires large withdrawals in fall for harvest flooding and in early winter for frost protection.

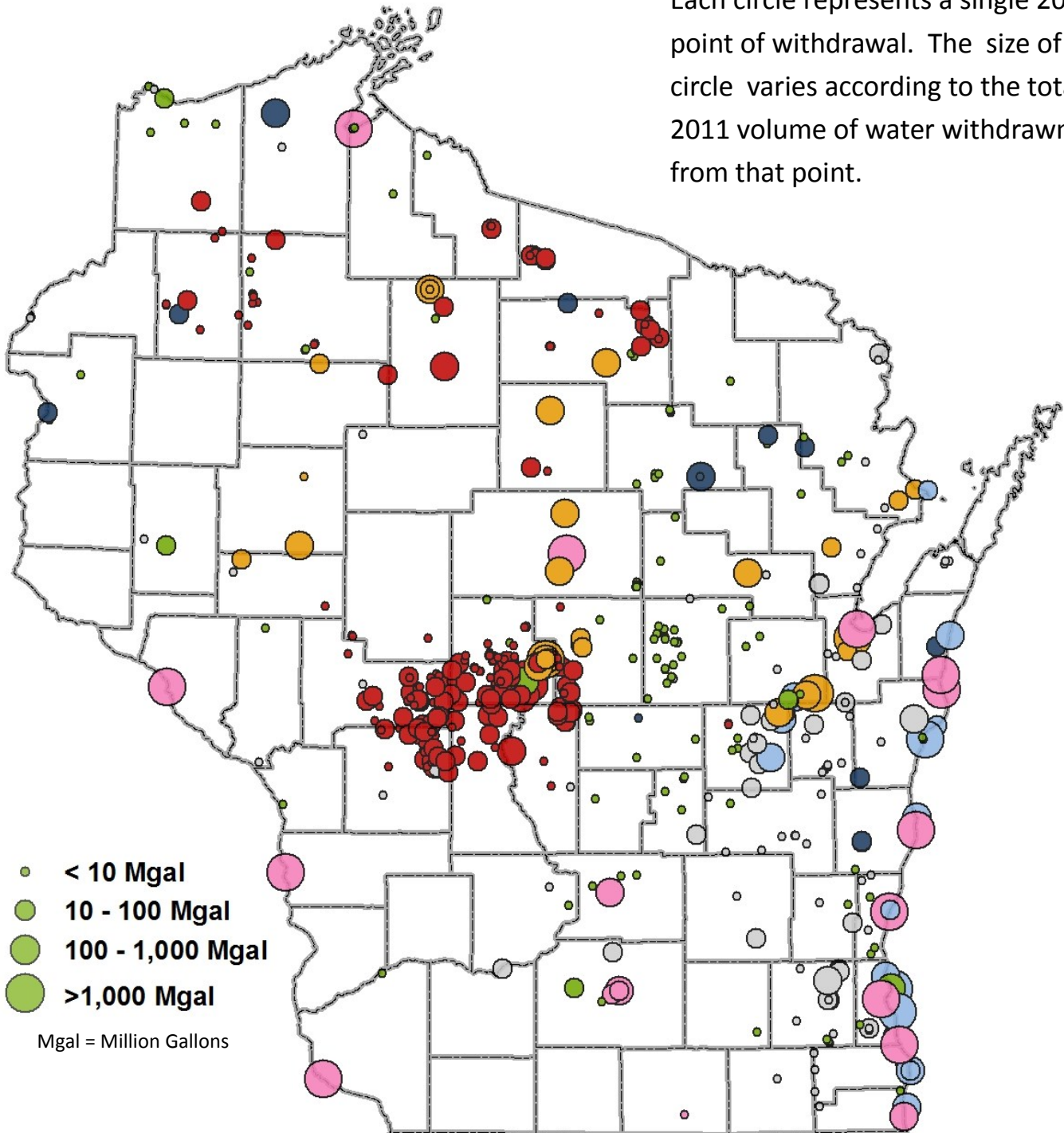
### Monthly Variation in Top 5 Withdrawals

(Billion Gallons/Month)



# 2011 Surface Water Annual Withdrawals

Each circle represents a single 2011 point of withdrawal. The size of the circle varies according to the total 2011 volume of water withdrawn from that point.

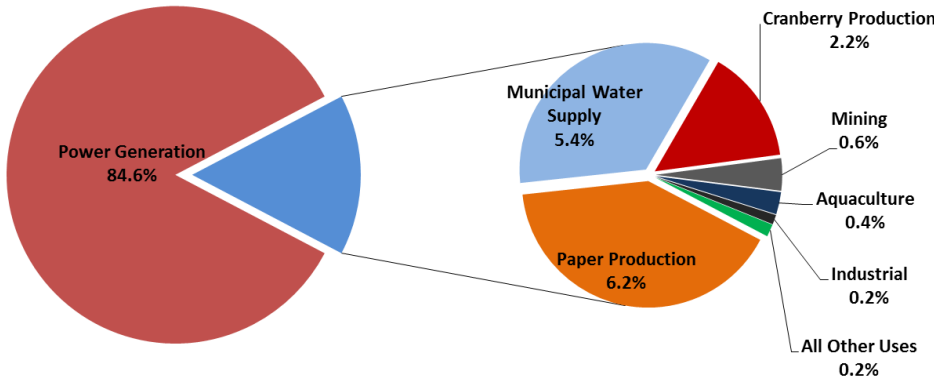


- < 10 Mgal
  - 10 - 100 Mgal
  - 100 - 1,000 Mgal
  - >1,000 Mgal
- Mgal = Million Gallons

- |                          |                        |                  |
|--------------------------|------------------------|------------------|
| • Power Generation       | • Cranberry Production | • Industrial     |
| • Paper Production       | • Mining               | • All other uses |
| • Municipal Water Supply | • Aquaculture          |                  |

# 2011 Total Surface Water Withdrawals by Water Use

1.9 trillion gallons statewide

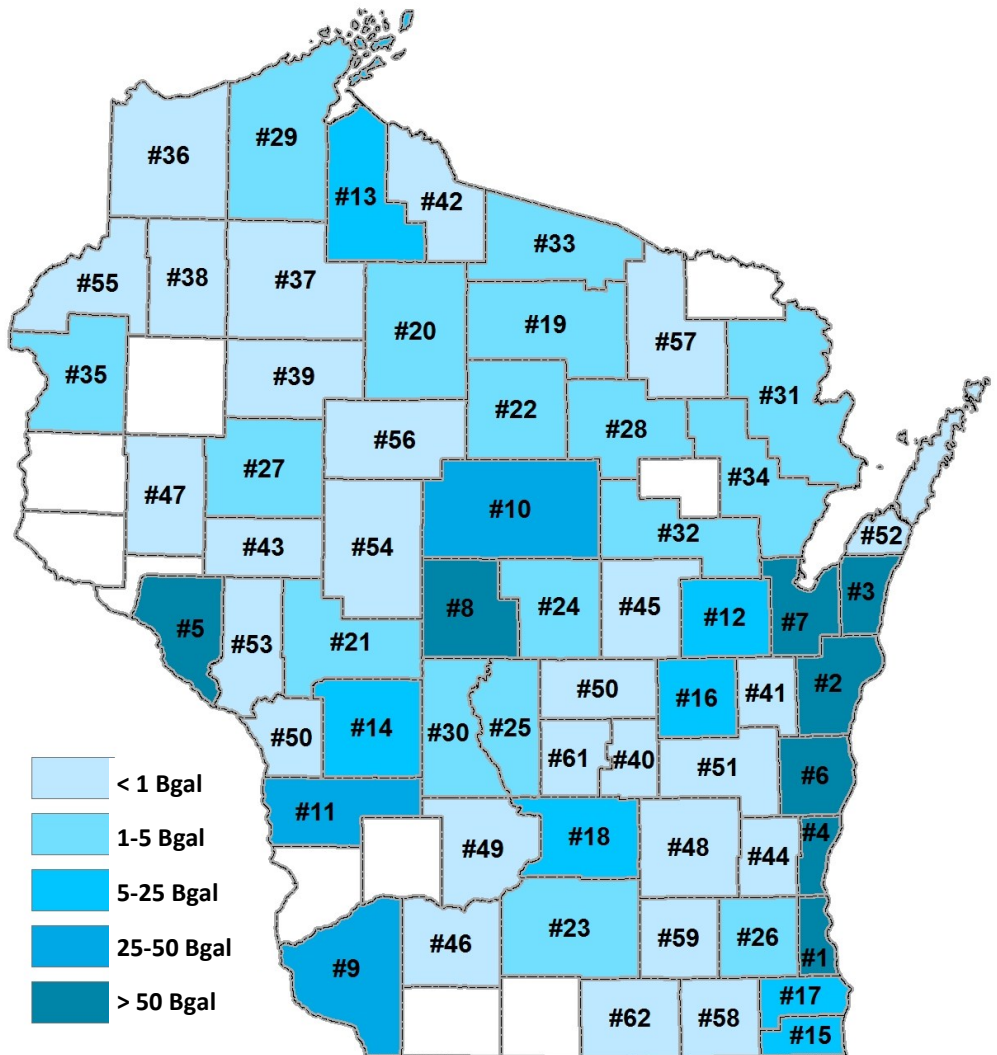


- Surface water withdrawals totaled 1.942 trillion gallons from 826 sources.
- The largest volume of water withdrawn in the state (1.6 trillion gallons) was used by power production facilities for non-contact cooling. These facilities are concentrated adjacent to Lake Michigan and the Wisconsin and Mississippi Rivers.
- Many surface water withdrawals are used and discharged near their point of withdrawal. This results in little water loss from the original source relative to the size of the withdrawal.

## 2011 Total Surface Water Withdrawals by County

Number indicates ranking of total withdrawal (#1=highest, #62 = lowest)

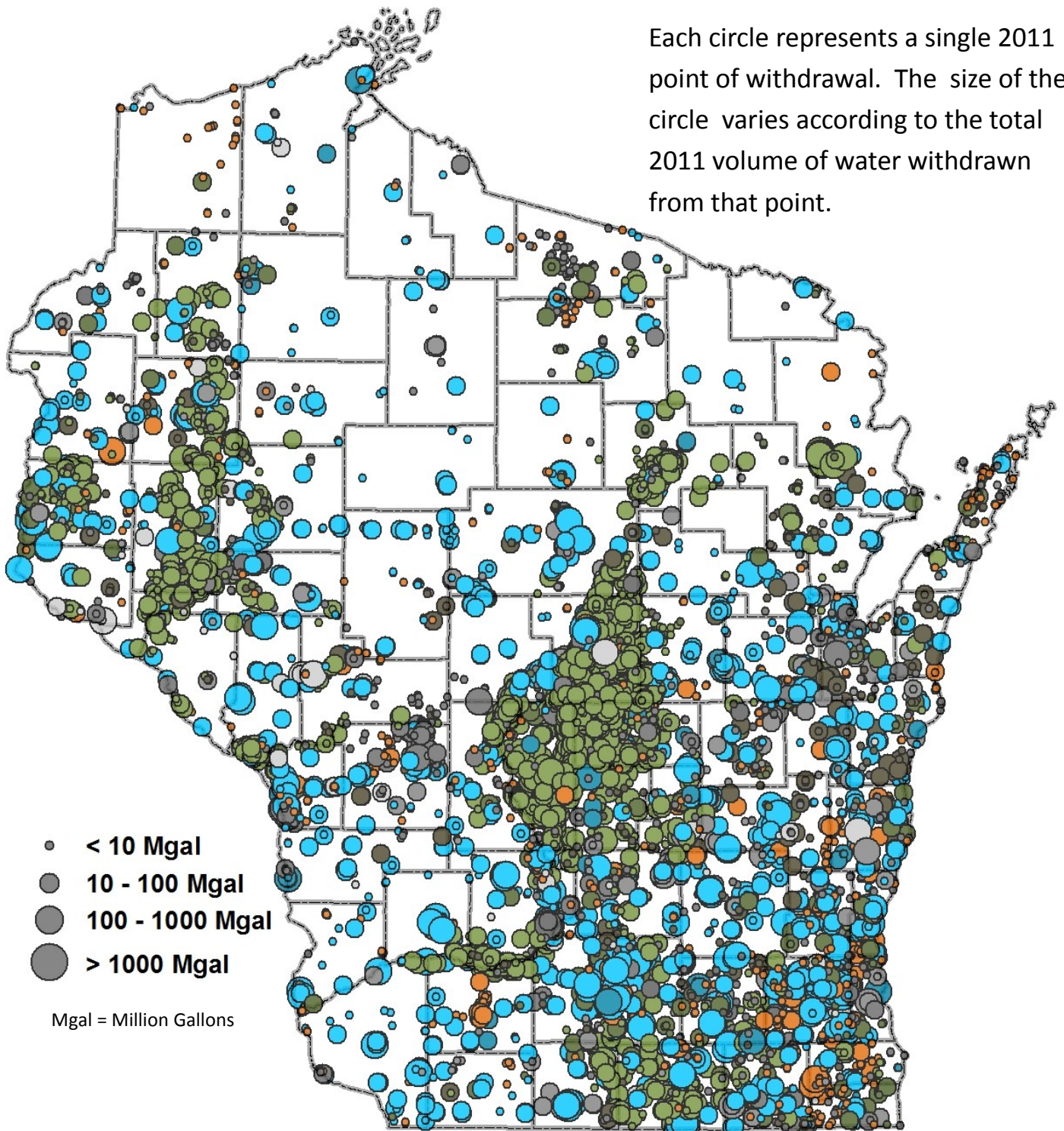
- Power production withdrawals for non-contact cooling were by far the largest withdrawals in the state.
- Power plants represented the majority of withdrawals in the five top ranked counties of Milwaukee (#1), Manitowoc (#2), Kewaunee (#3), and Ozaukee (#4) and Buffalo (#5)
- Surface water is a key component to producing some of Wisconsin's top products:
  - Paper production is most notable in Brown (#7), Wood (#8), Marathon (#10) and Outagamie (#12) counties.
  - Cranberry production is most concentrated in Wood (#8), Monroe (#14), and Jackson (#21).



Bgal = Billion Gallons

# 2011 Groundwater Annual Withdrawals

Each circle represents a single 2011 point of withdrawal. The size of the circle varies according to the total 2011 volume of water withdrawn from that point.



- < 10 Mgal
- 10 - 100 Mgal
- 100 - 1000 Mgal
- > 1000 Mgal

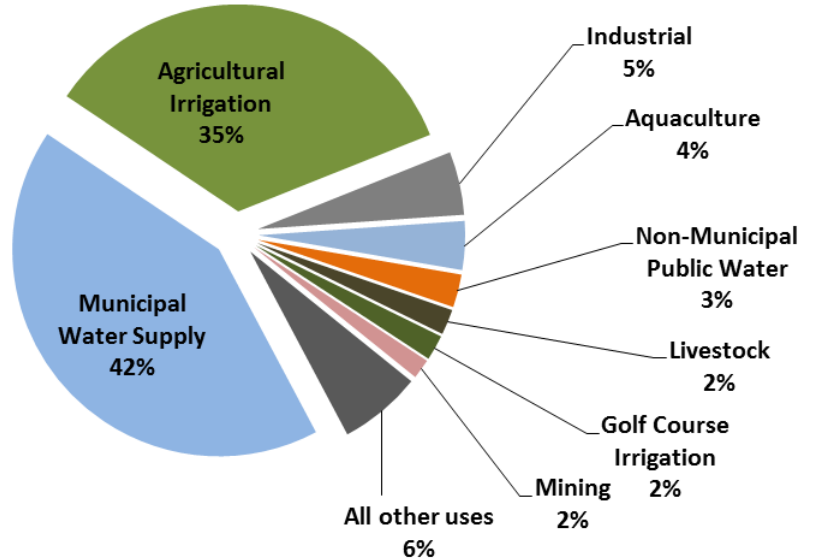
Mgal = Million Gallons

- |                           |                       |                          |
|---------------------------|-----------------------|--------------------------|
| ● Municipal Water Supply  | ● Aquaculture         | ● Golf Course Irrigation |
| ● Agricultural Irrigation | ● Public Water Supply | ● Mining                 |
| ● Industrial              | ● Livestock           | ● All Other Uses         |

## 2011 Groundwater Total Withdrawals by Water Use

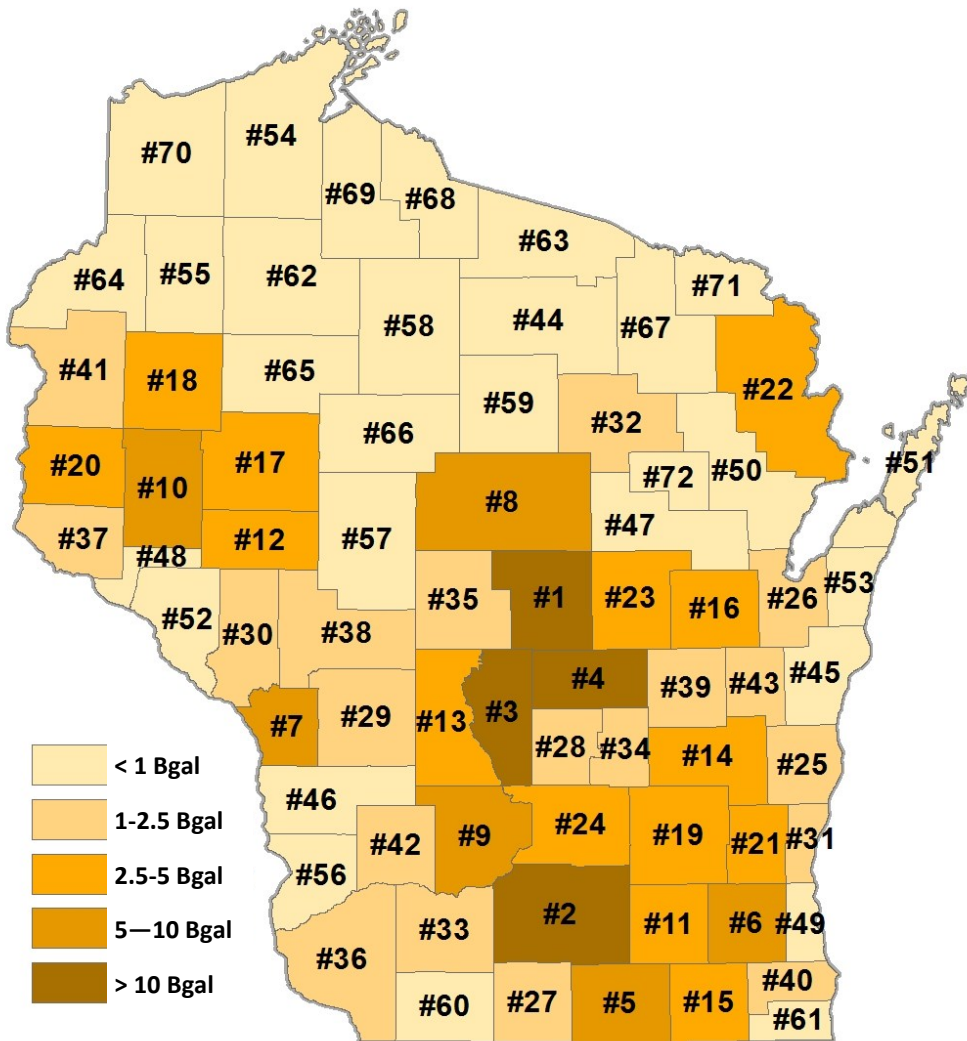
213 billion gallons statewide

- Groundwater withdrawals totaled 213 billion gallons from 11,754 wells.
- Municipal water supply comprises the largest withdrawal (90 billion gallons) of groundwater in Wisconsin. They are typically owned by cities and deliver water for residential, commercial, institutional and industrial uses.
- Agricultural irrigation is the second largest use of groundwater in the state and necessary for growing many high value vegetable crops.



## 2011 Groundwater Total Withdrawals by County

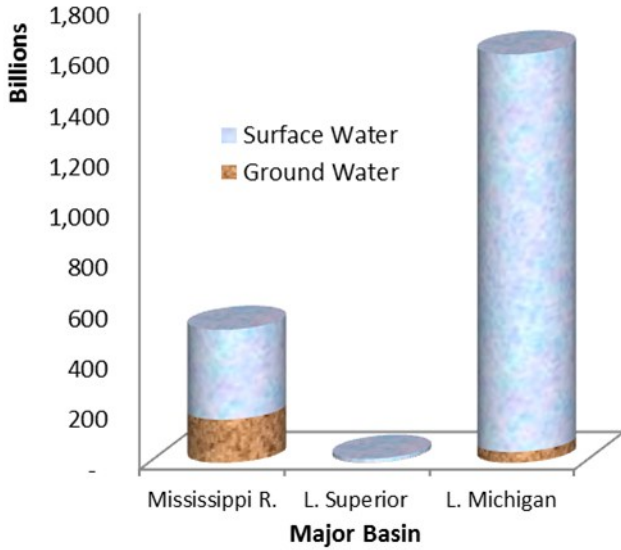
Number indicates ranking of total withdrawal (#1=highest, #72 = lowest)



Bgal =Billion Gallons

- Withdrawals were most concentrated in urban areas not supplied by Great Lakes water and vegetable-producing regions with high irrigation demand.
  - Portage (#1), Adams (#3), and Waushara (#4) comprise much of the central sands area of the state known as a globally significant vegetable and potato producing region.
  - Dane (#2), Rock (#5), and Waukesha (#6) have large urban/suburban populations that rely on groundwater to meet their needs.
- Groundwater withdrawals are smallest in the far north where populations are low and groundwater is less readily accessible.

### Withdrawals by Basin and Source



- Wisconsin water withdrawers rely much more heavily on surface water in the Great Lakes Basin than in the Mississippi River Basin.
- Despite Lake Superior being the largest freshwater lake in the world (by surface area) Wisconsin makes relatively few surface water withdrawals from it.
- 90% of the statewide withdrawals by volume were made from surface water. 10% were made from groundwater.

Water Use	Number of Sources	% of Statewide 2011 Total Withdrawal
Agricultural Irrigation	3886	3.49%
Public Water Supply	1781	0.28%
Municipal Water Supply	1665	9.04%
Domestic Supply	1045	0.02%
Livestock	728	0.20%
Industrial	652	0.66%
Commercial	519	0.09%
Cranberry Production	479	2.15%
Golf Course Irrigation	476	0.22%
Irrigation - Other	376	0.05%
Mining	357	0.72%
Misc	283	0.28%
Aquaculture	159	0.77%
Paper Production	100	5.75%
Power Generation	74	76.29%

- For 2011, there were 12,580 total sources in the state. 11,754 were wells while only 826 were surface water.
- Power generation accounts for more than 75% of the total withdrawals in the state, but comprises .6% of the total number of sources in the state.
- Agricultural irrigation accounts for 33% of the sources in the state but only 3.5% of the total withdrawal.

Reporting Method	Percent of Total 2011 Withdrawal	Percent of Sources
Hour Metered by Withdrawer	63.7%	27%
Estimated by Withdrawer	22.4%	25%
Flow Metered by Withdrawer	11.4%	22%
Measured by area and depth	2.0%	5%
Unreported - Estimated by Wisconsin DNR	0.6%	9%
Source Reported Unused in 2011	-	11%
<b>Total</b>	2.155 Trillion Gal.	12,583

- 25% of the source withdrawals were estimated by the withdrawer using a formula provided by the DNR. This was most common for dairy farms and registered low capacity wells.
- 11% of registered sources were reported having zero withdrawals in 2011.
- Reports were not supplied for 9% of the state's sources. Withdrawal amounts for these sources were estimated by the DNR based on water use and capacity of the source.

For more information regarding the Water Use Reporting program or to request more specific information on withdrawals, please visit our website or contact Water Use Program staff

[dnr.wi.gov](http://dnr.wi.gov) keyword "Water Withdrawal Reporting"

[DNRWaterUseRegistration@Wisconsin.gov](mailto:DNRWaterUseRegistration@Wisconsin.gov) 606.266.2299