



Mining and Water in Wisconsin: Water Use for Non-Metallic Mining



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Water Use Reporting Program: Non-Metallic Mining Products

Dimension Stone

- Landscape stone
- Building stone



Aggregate

- Crushed stone
- Gravel
- Sand



Industrial Sand

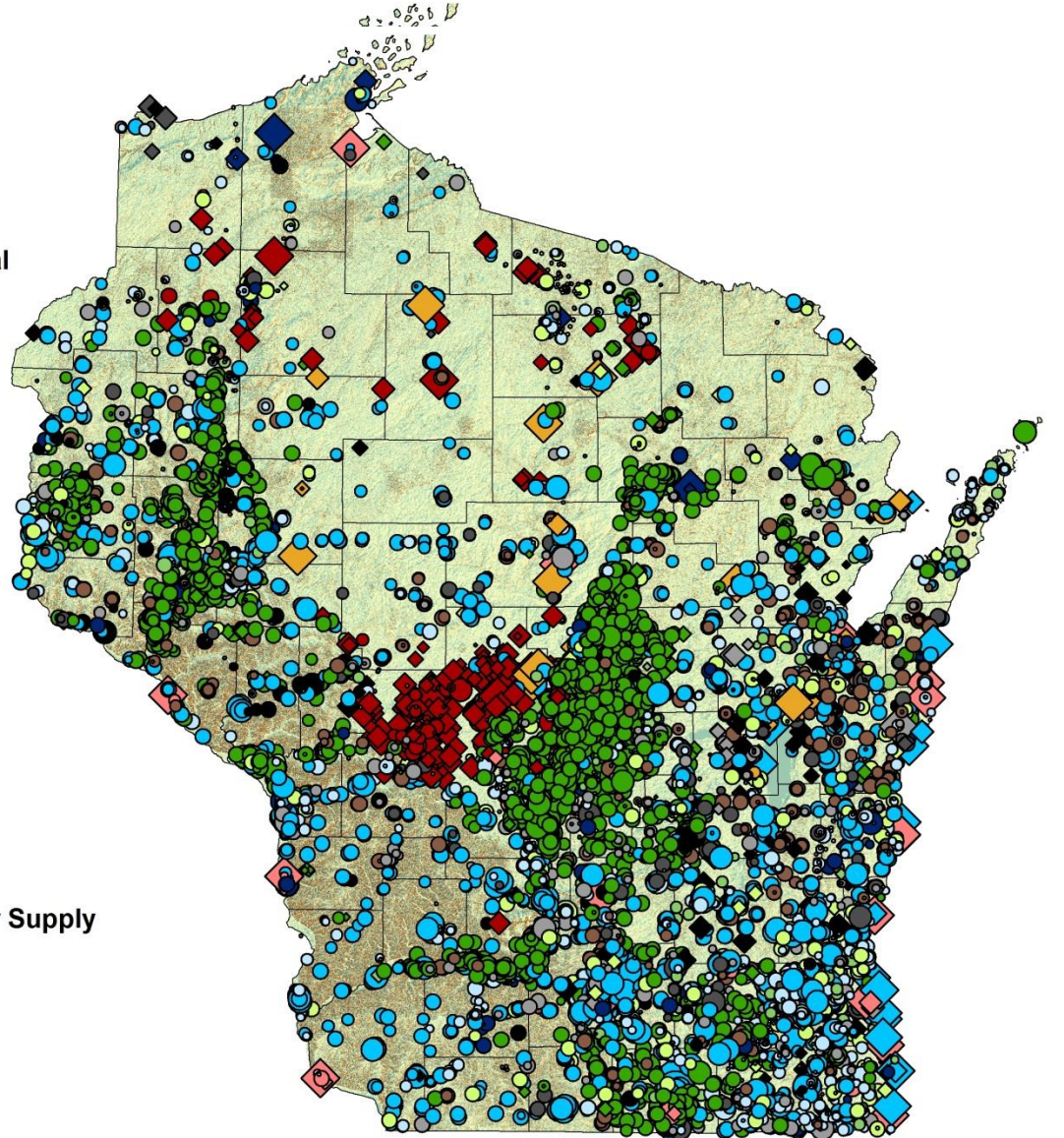
- Glass
- Castings
- Proppant or “frac” sand





Water Use in Wisconsin : 2012 Withdrawals

- <100 kGal
 - 100 kGal - 1,000 kGal
 - 1,000 kGal - 10,000 kGal
 - 10,000 kGal - 100,000 kGal
 - 100,000 kGal - 1,000,000 kGal
 - > 1 Billion Gallons
-
- ◆ Surface Water
 - Groundwater
-
- Agricultural Irrigation
 - Aquaculture
 - Cranberry Production
 - Golf Course Irrigation
 - Industrial
 - Livestock
 - Misc Irrigation
 - Municipal Water Supply
 - Non-Municipal Public Water Supply
 - Non-Metallic Mining
 - Paper Manufacturing
 - Power Generation
 - All other uses

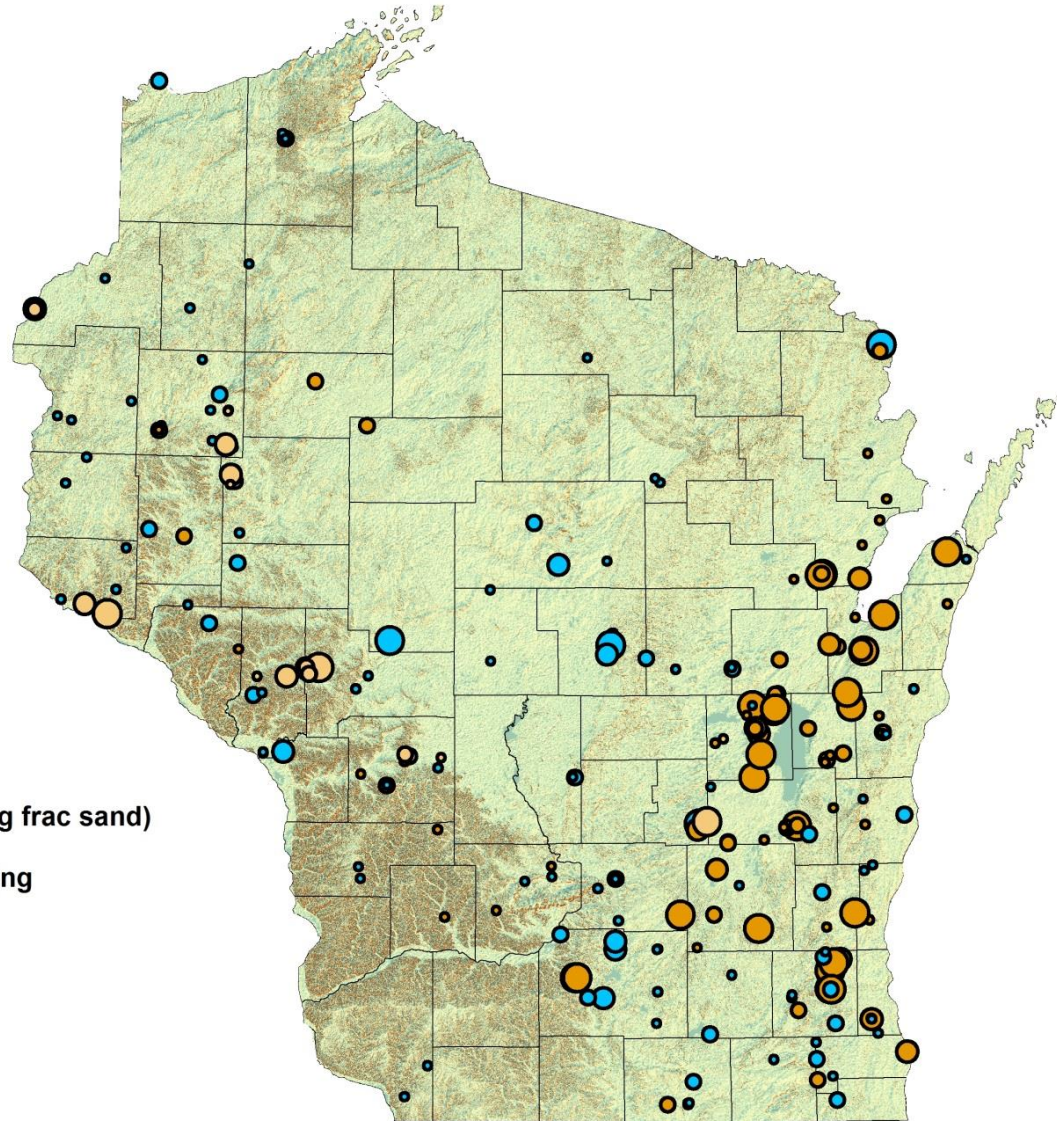




Water Use in Wisconsin : 2012 Non-Metallic Mining Withdrawals

- < 10 Mgal/yr
- 10 - 50 mGal/yr
- 50 - 100 Gal/yr
- 100 - 500 mGal/yr
- > 500 mGal/yr

- Dewatering Water
- Process Water (excluding frac sand)
- Industrial Sand Processing





Water Use in Wisconsin: 2012 Withdrawals

In 2012, total withdrawals exceeded 2.25 trillion gallons of water from over 14,000 wells, ponds, streams, rivers and lakes.

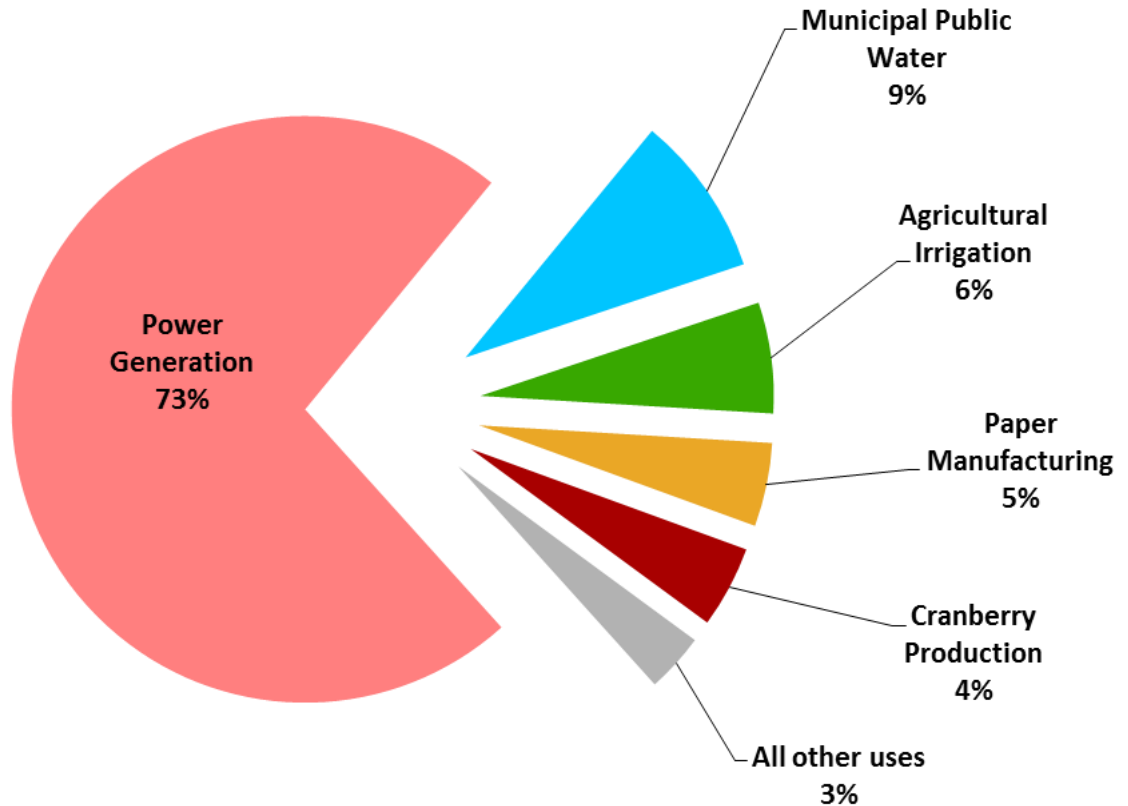
- This is roughly equal to 3 times the water in Lake Winnebago
- Enough water to cover the surface of Wisconsin in about 2" of water.

Total 2012 withdrawals were up 4.80% from 2011.

Non-metallic mining ranked 7th in total withdrawals with 13 bGal or .56% of the total withdrawal.

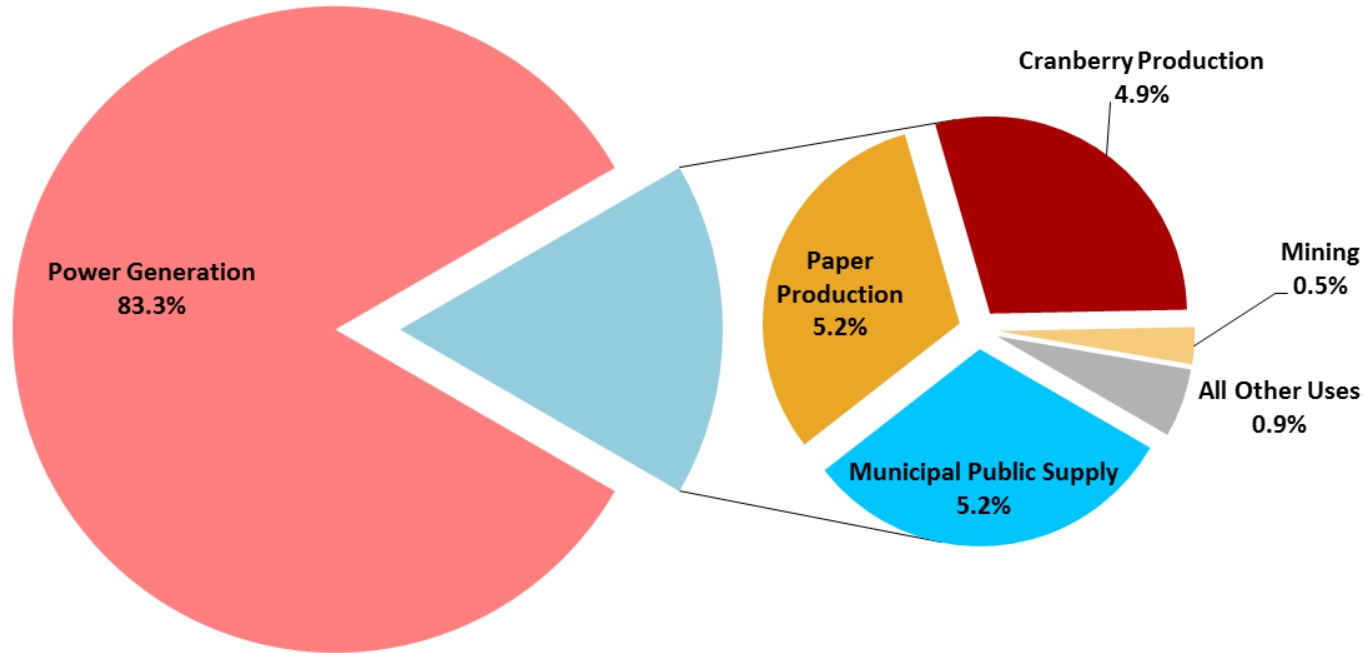
2012 Withdrawals by Use

Total Withdrawals = 2.258 Trillion Gallons





Surface Water Use in Wisconsin: 2012 Withdrawals



2012 Surface water withdrawals totaled 1.963 trillion gallons from 995 sources up 1% from 2011.

Non-metallic Mining Ranked 5th with 10 bGal or .5% of the total surface water withdrawal.

Several sectors reported decreased withdrawals including Aquaculture (-10%), Mining (-8%), Power (-2%), and Municipal Supply (-2%).

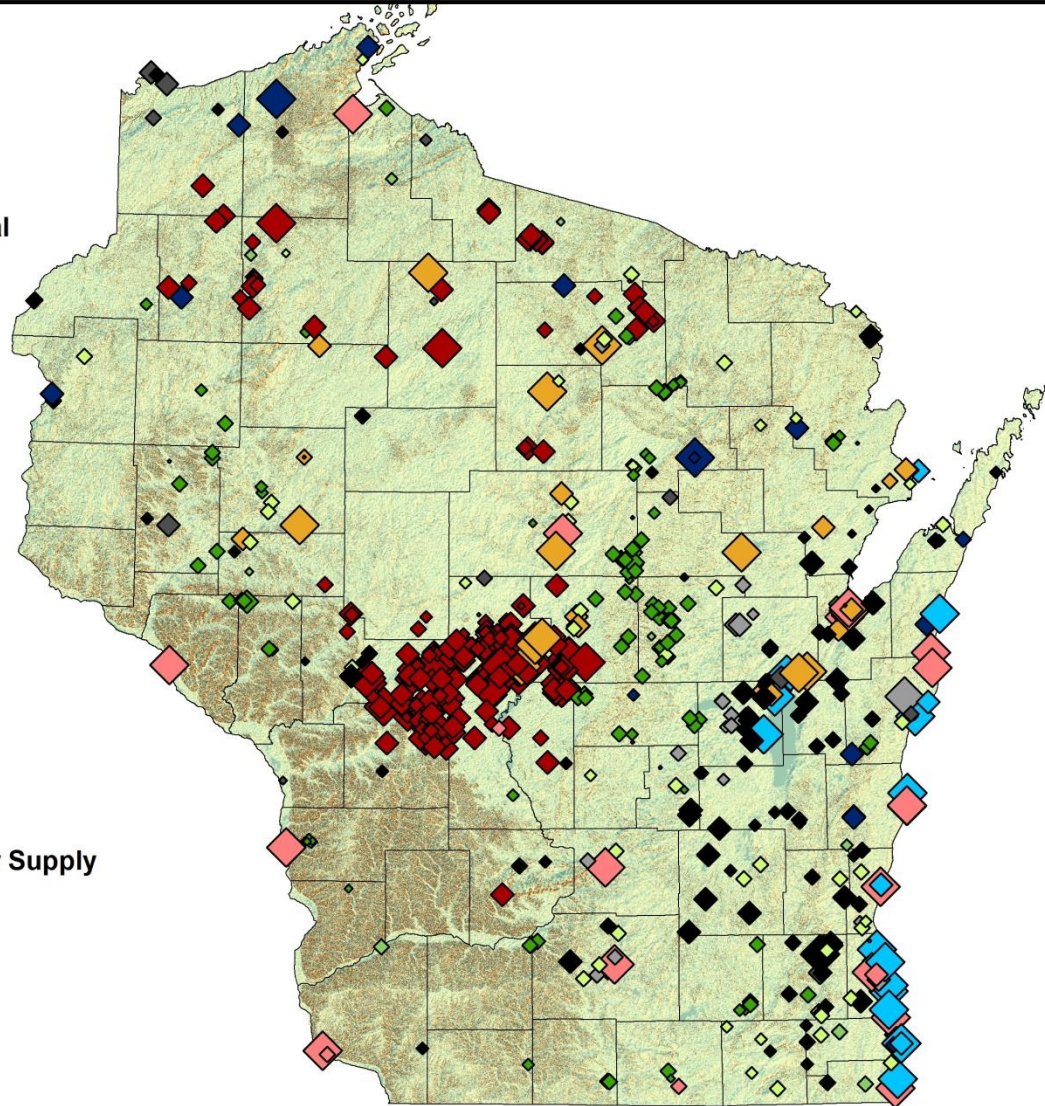
Increases were reported in Paper (+5%) and Cranberry Production (+122%)



Surface Water Use in Wisconsin : 2012 Withdrawals

- <100 kGal
- ◊ 100 kGal - 1,000 kGal
- ◊ 1,000 kGal - 10,000 kGal
- ◊ 10,000 kGal - 100,000 kGal
- ◊ 100,000 kGal - 1,000,000 kGal
- ◊ > 1 Billion Gallons

- Agricultural Irrigation
- Aquaculture
- Cranberry Production
- Golf Course Irrigation
- Industrial
- Livestock
- Misc Irrigation
- Municipal Water Supply
- Non-Municipal Public Water Supply
- Non-Metallic Mining
- Paper Manufacturing
- Power Generation
- All other uses

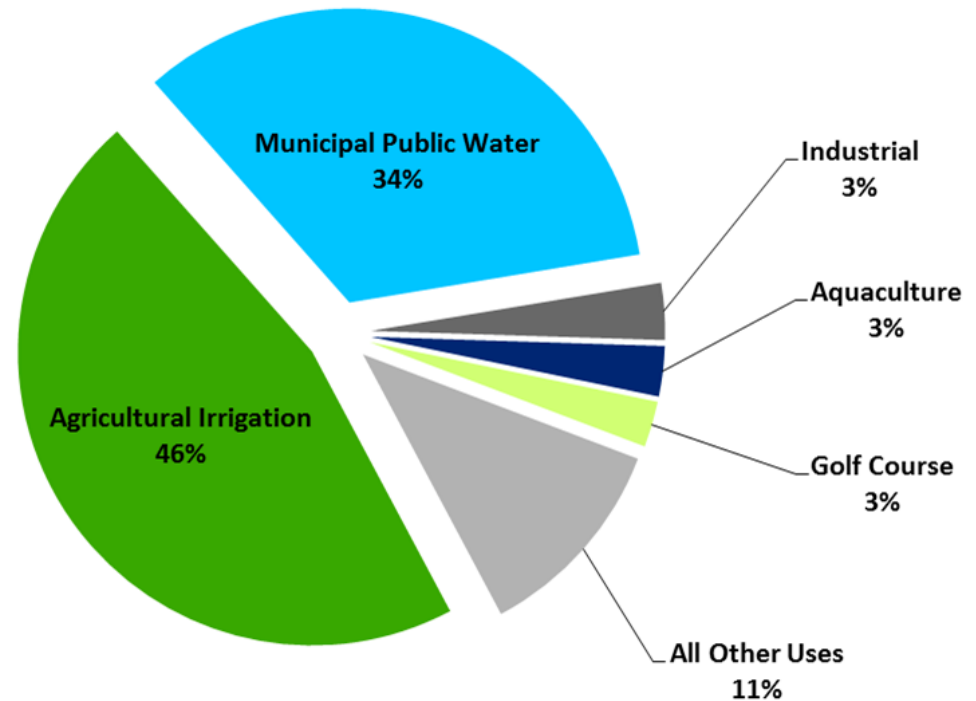




Groundwater Use in Wisconsin: 2012 Withdrawals

292,303,941,228 groundwater gallons from 13,000 sources in 2012, up 37% from 2011.

- Agricultural Irrigation surpassed municipal public water in 2012 due to the drought.
- Could cover the land area of Wisconsin with $\frac{1}{4}$ inch of water.
- Enough water to fill Lambeau Field over 600 times.

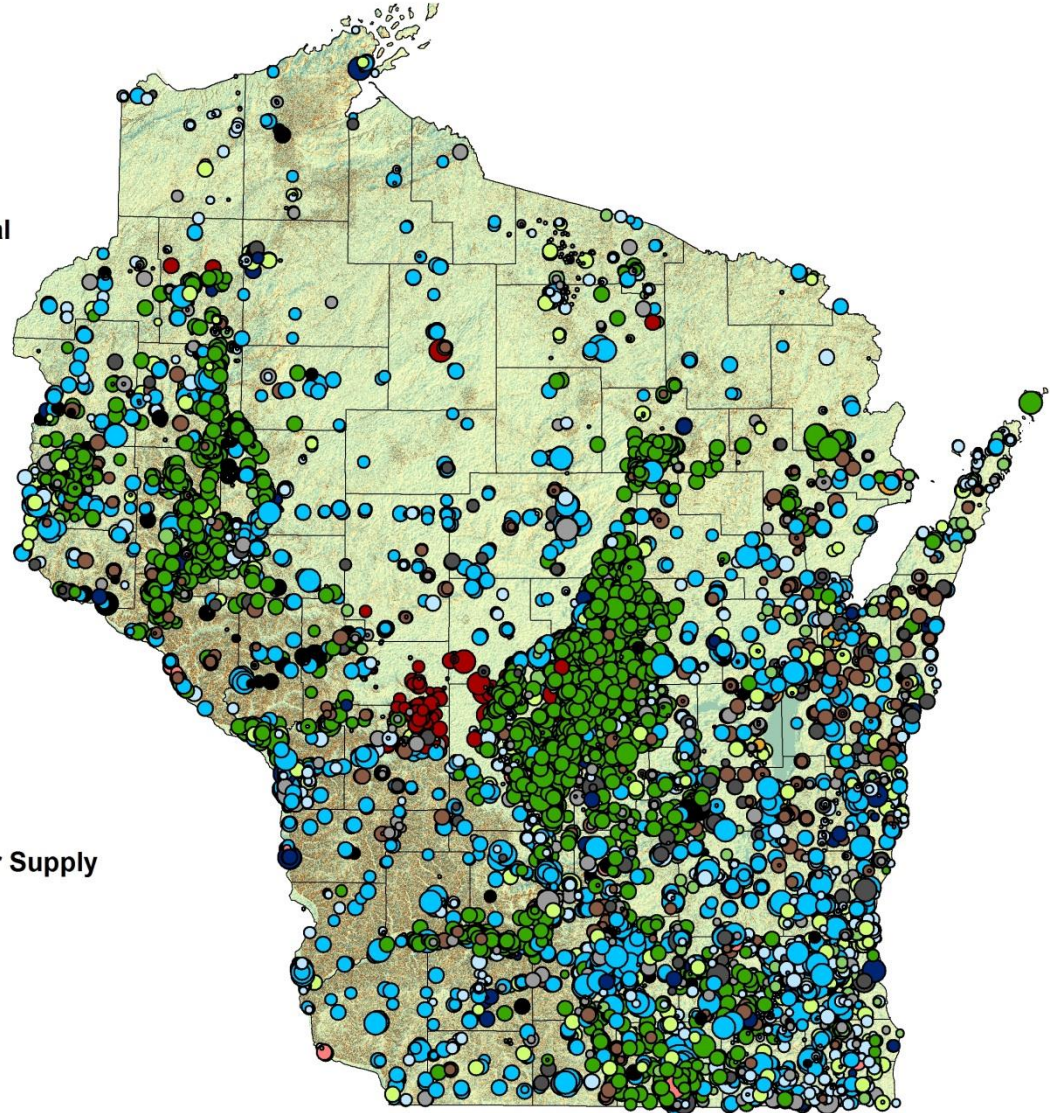




Groundwater Use in Wisconsin: 2012 Withdrawals

- <100 kGal
- 100 kGal - 1,000 kGal
- 1,000 kGal - 10,000 kGal
- 10,000 kGal - 100,000 kGal
- 100,000 kGal - 1,000,000 kGal
- > 1 Billion Gallons

- Agricultural Irrigation
- Aquaculture
- Cranberry Production
- Golf Course Irrigation
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- Municipal Water Supply
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- Non-Metallic Mining
- Paper Manufacturing
- Power Generation
- All other uses





Water Use Reporting Program: Required Registration

One or more wells or surface water pumps capable of withdrawing at 70 gpm.

- Annual report
- \$125 fee

Multiple wells or surface water sources that are cumulatively capable of withdrawing at 70 gpm.

- Annual report

Temporary sources or temporary sites should be registered, but

- Annual report only if needed
- In rare case a fee could be needed





Water Use Reporting Program: Water Usage for Non-Metallic Mining - Dewatering

Dewatering

- For mining activities below the water table.
- Many have discharge permits.
- Water table varies by years, so do withdrawals.





Water Use Reporting Program: Water Usages for Non-Metallic Mining

Material wash and processing

- Used to wash sand, aggregate or rock.
- Most is drained back to settling ponds and reuses.
- Dust Suppression
- Wash water might be exclusively groundwater, exclusively storm water or a combination of both.

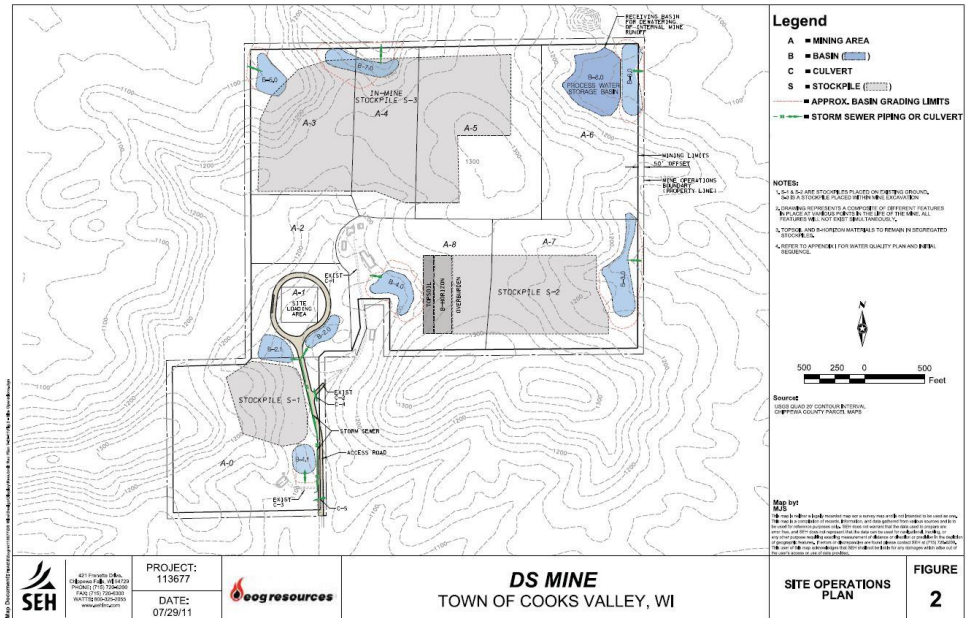




Water Use Reporting Program: Water Usages for Industrial Sand Mining

Industrial sand wash and processing

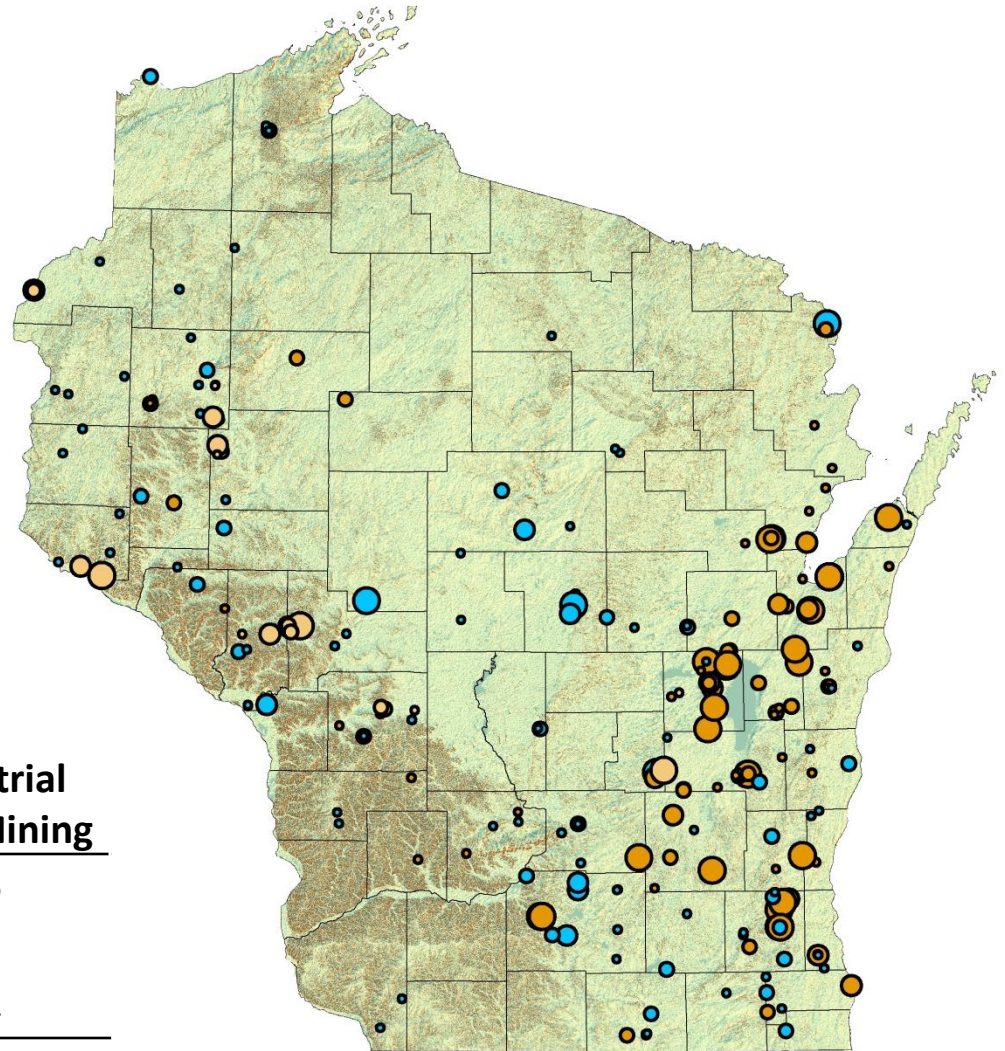
- Used to slurry sand for easier movement.
- Sand is frequently quarried and crushed at mining site and trucked to a process center.
- Used to wash sand, aggregate or rock.
 - Much is drained back to settling ponds and reused.
 - However, sand facilities lose water to evaporation during drying.
 - Drying operations may run year long.
- Dust Suppression





Non-Metallic Mining Withdrawals: Site Locations and Counts

- Dewatering Water
- Process Water (excluding frac sand)
- Industrial Sand Processing

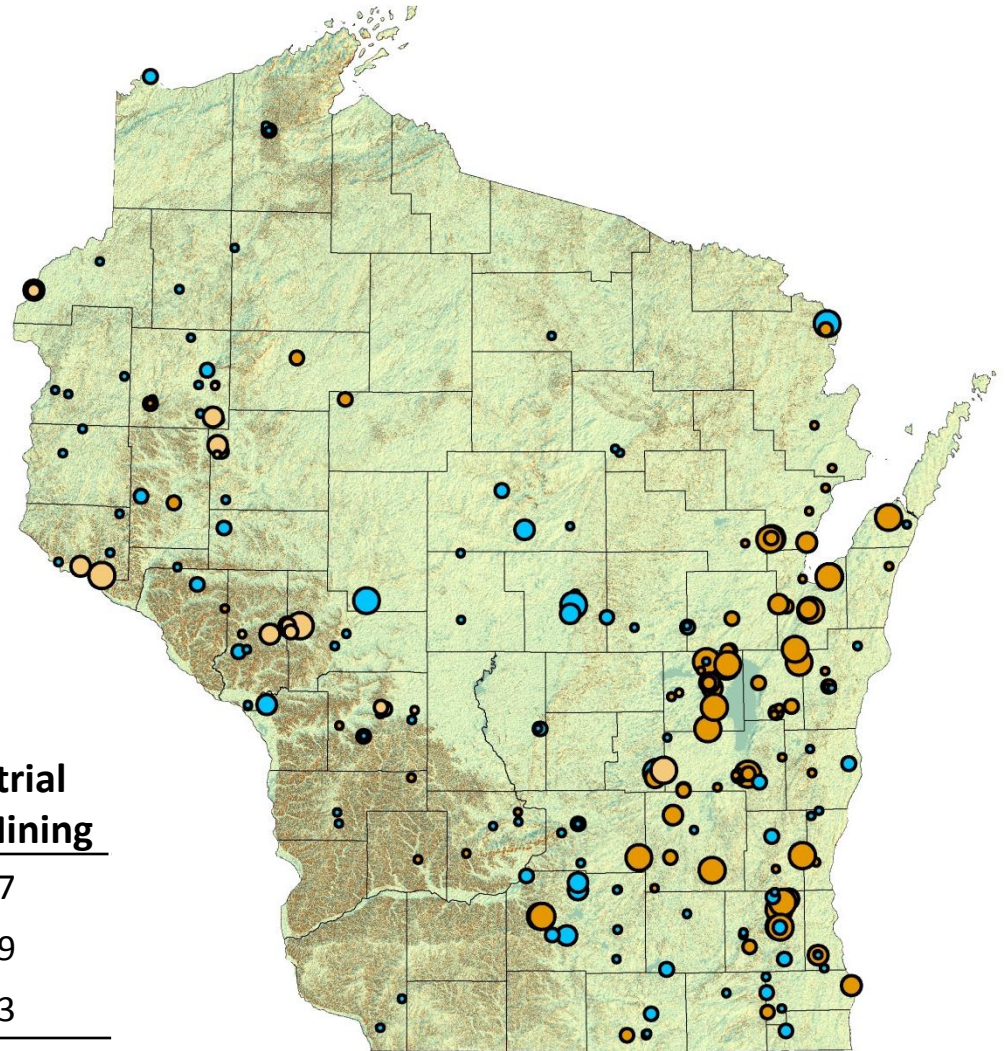


	Non-Metallic		
	Quarry Dewatering	Mining Processing	Industrial Sand Mining
2011	85	136	26
2012	88	147	47
2013	92	126	44



Non-Metallic Mining Withdrawals: Total Withdrawal Volume

- Dewatering Water
- Process Water (excluding frac sand)
- Industrial Sand Processing

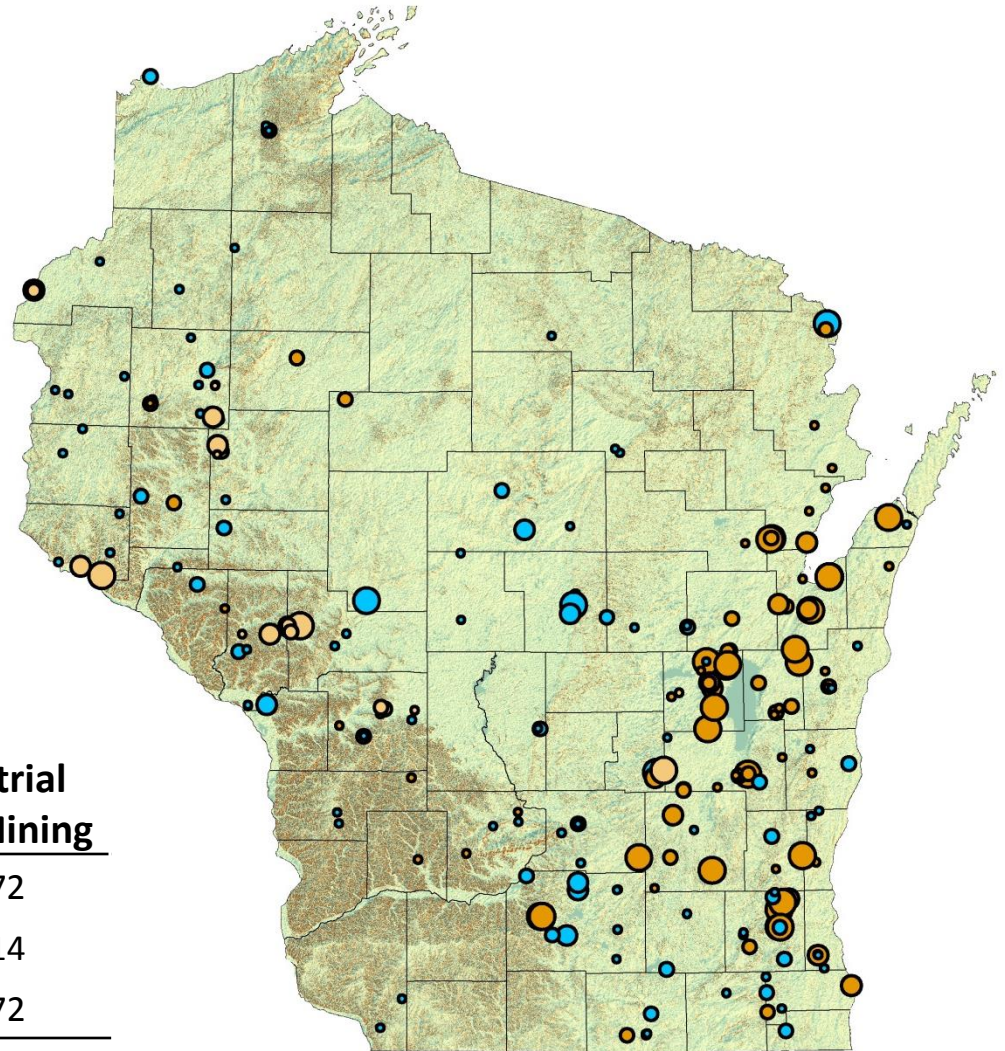


Billion Gallons/yr	Non-Metallic		
	Quarry Dewatering	Mining Processing	Industrial Sand Mining
2011	9.24	4.49	1.47
2012	7.41	3.29	1.89
2013	9.95	2.01	1.53



Non-Metallic Mining Withdrawals: Average Withdrawal Volume

- Dewatering Water
- Process Water (excluding frac sand)
- Industrial Sand Processing



Million Gallons/yr	Non-Metallic		
	Quarry Dewatering	Mining Processing	Industrial Sand Mining
2011	108.73	33.04	56.72
2012	84.22	22.38	40.14
2013	108.20	15.94	34.72



Non-Metallic Mining Withdrawals: Location, Size and Type

Defined by several very large withdrawers at and several very withdrawal locations.

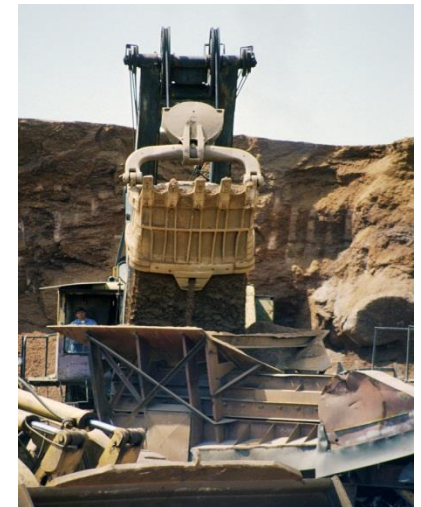
- Ten companies withdrew 75% of the water withdrawn by non-metallic mining operations.
- Ten facilities withdrew 46% of the water withdrawn by non-metallic mining operations.





Conclusion

- Non-metallic mining has been and continues to be an important component of Wisconsin's industrial and transportation sector.
- Non-metallic mining relies on withdrawing and using water for multiple purposes.
- Non-metallic operators reported their withdrawals at a strong rate (94.3%).
- Registration, conservation and reporting presents several challenges for non-metallic mining operations.





QUESTIONS?

For additional questions or copies of this presentation, please contact:

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