Wisconsin Water Use
Agricultural Irrigation Rates

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AWRA-WI Section
Olympia Resort
Oconomowoc, WI

Source: USGS
Wisconsin Water Use
Agricultural Irrigation Rates

• Ground Water Withdrawals in Wisconsin – Overview and Trends

• Water Use for Irrigation

• Using Data to Promote Conservation
Water Use in Wisconsin Overview
250 billion groundwater gallons from 10,901 active sources in 2013. Total volume was down 14% from 2012.

- Agricultural irrigation decreased 25% but still remained the top user of groundwater.
- Could cover the land area of Wisconsin with ¼ inch of water.
- Enough water to fill Lambeau Field over 500 times.
Wisconsin Water Use
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High Capacity Well Construction by year
Wells > 70 gpm 1955-present

- Green line: Irrigation Wells
- Black line: Industrial Wells
- Blue line: Municipal Wells
- Gray line: Other Wells
- Green dotted line: Irrigation Acres
Wisconsin Water Use
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High Capacity Well Approvals by year
Wells > 70 gpm 1955-present
Wisconsin Groundwater Withdrawals
Groundwater Use and Management Through Time

High Capacity Wells
Circa 1960
Wisconsin Groundwater Withdrawals
Groundwater Use and Management Through Time

High Capacity Wells
Circa 1970
Wisconsin Groundwater Withdrawals
Groundwater Use and Management Through Time

High Capacity Wells
Circa 1980
Wisconsin Groundwater Withdrawals
Groundwater Use and Management Through Time

High Capacity Wells
Circa 1990
Water Use for Irrigation
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Estimate from FSA and DNR data that average 1000 gpm well has a coverage radius of 1,270 ft.

$$r = \sqrt{\frac{\text{Well gpd} \times 3.5 \text{ ft}^2/\text{gpd}}{\pi}}$$

Withdrawal Data reported to WDNR

USDA Cropscape data
Wisconsin Water Use
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2011-2013 Average Irrigation Rates - Statewide

- **All Crops**: 9.9”
- **Potatoes**: 13.7”
- **Sweet Corn**: 11.0”
- **Snap Beans**: 8.4”
- **Field Corn**: 9.4”
- **Soy Beans**: 8.8”
- **Alfalfa / Hay**: 8.3”

**KEY**
- **2012**: Drought
- **2011-2013 Average Irrigation Rate**

**Excessively Drained Soil**
Wisconsin Water Use
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Irrigated Crop Rotations

- Potato and vegetable rotations in the Central Sands and Northeast
  - 41% of the wells
  - 53% of the 2013 total withdrawal

- Corn grain rotations across state
  - 47% of the wells
  - 42% of the 2013 total withdrawal

- A few areas of alfalfa and hay
  - 8% of the wells
  - 4% of the 2013 total withdrawal
June - August Evapotranspiration, Precipitation and Irrigation
Hancock, WI

- 2011: 18
- 2012: 19
- 2013: 18
- 2014: 17
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June - August Evapotranspiration, Precipitation and Irrigation
Hancock, WI

- **2011**
  - PET: 18
  - Precip: 9

- **2012**
  - PET: 19
  - Precip: 5

- **2013**
  - PET: 18
  - Precip: 10

- **2014**
  - PET: 17
  - Precip: 14
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June - August Evapotranspiration, Precipitation and Irrigation
Hancock, WI

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June - August Evapotranspiration, Precipitation and Irrigation
Hancock, WI

*Irrigation is total for entire growing season
Average June – August Evapotranspiration and Precipitation
Hancock, WI and Boise, ID

- Hancock, WI
  - PET: 18.0
  - Precip: 9.5
  - (PET-Precip): 8.4

- Boise, ID
  - PET: 26.3
  - Precip: 2.0
  - (PET-Precip): 24.4
Using Data to Promote Conservation
Wisconsin Water Use
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- **Certification process through which growers are certified as sustainable water managers**
  - Recognizes current effort and advantages for water conservation in Wisconsin
  - Adds value and promotes Wisconsin products
  - Identifies top performers and practices
  - Initiated by state, managed long term by separate entity
  - Governance/oversight by economic, scientific and environmental interests

- **Conservation standards**
  - Conservation practices identified and tested by growers and scientists
  - Standards set by diverse group
  - Periodic audits
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• Example practices:
  • Reduce withdrawals
    • Deficit-Deferred Irrigation
    • Precision Irrigation
  • Mitigate impacts
    • High infiltration areas
    • Riparian buffers
    • Restore stream meanders
  • Reduce water demand
    • Value added crop systems
      • Organic
      • Local
      • Specialty
    • Coordinated rotations
Thank You

For more information, contact

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