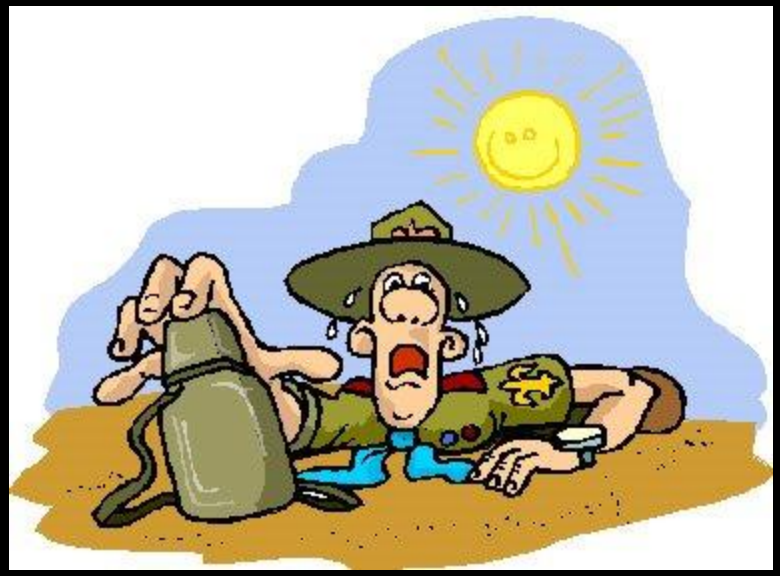
Water Resources Action Plan



Subsection B9) Planning for the Future
Drought and Contingency Planning

Importance of a Water Contingency Plan

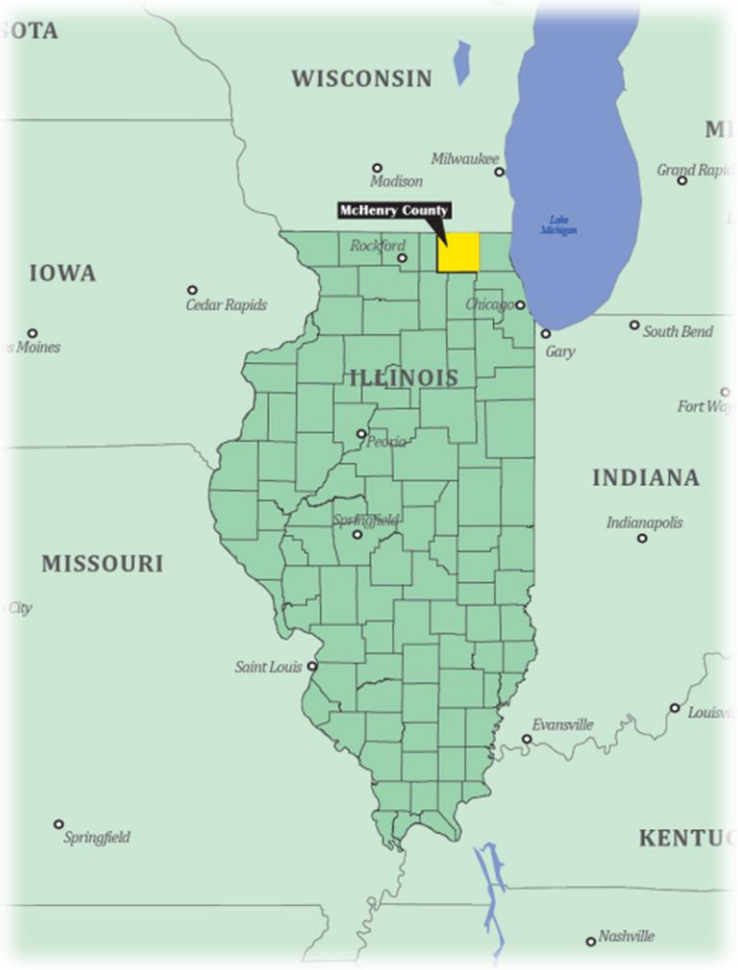
- Planning and preparation will help protect water supplies in times of emergency
- Kinds of emergencies:
  - Long term power outage
  - Contamination of aquifer
  - Drought

Definition of Drought

A period of unusually persistent dry weather that continues long enough to cause serious problems such as crop damage and/or water supply shortages.

Drought in Illinois

- The worst drought on record in Illinois resulted in a 40% decrease in precipitation (SIUC).
  - Multi-year droughts
  - 1930's and 1950's
  - Average Precipitation 39.23 in



Ten Driest Years in Illinois since 1895

Percentages are based on a 1971-2000 statewide normal of 39.23 inches.

Year	Amount (in.)	Percent of Normal
1901	26.3	67
1930	27.9	71
1963	27.9	71
1953	28.1	72
1914	28.6	73
1976	28.9	74
1940	29.3	75
1988	29.6	76
1936	30.3	77
1956	30.7	78

The Water Cycle and Water Budgets in Illinois: A Framework for Drought and Water-Supply Planning . (page 10, 2006)

How does water use change?

- In times of drought water use increases across all sectors (SIUC):
  - Public-supply withdrawals increase by 5%
  - Commercial and Industrial withdrawals increase by 5.5-5.6%
  - Irrigation and Agricultural withdrawals increase by 50%

Recent Example

- The 2005 drought
  - McHenry County used 50.3 MGD in 2005
    - In 2000 Average Annual Water Use was 34.6 MGD
    - In 2020 we're projected to use 51 MGD
- Drought caused water use throughout Illinois to increase by 8% across all sectors (ISWS and CMAP).

Climate Change?

Climate Change…

- According to an SIU study, by 2050 the temperature in Illinois is expected to increase by 6°F
  - Using the *current average precipitation*,
    - Public water supply water withdrawals are expected to increase by 8.4% to 134.4 MGD
  - Using the *best case scenario* for the precipitation (+2.5 inches increase), coupled with the 6°F increase in temp,
    - Public water supply withdrawals are expected to increase by 7.2% or 112.9 MGD.

Regional Water Demand Scenarios for Northeastern Illinois: 2005-2050. Dziegielewski, B and Chowdhury, J. June 15, 2008

Drought in Illinois

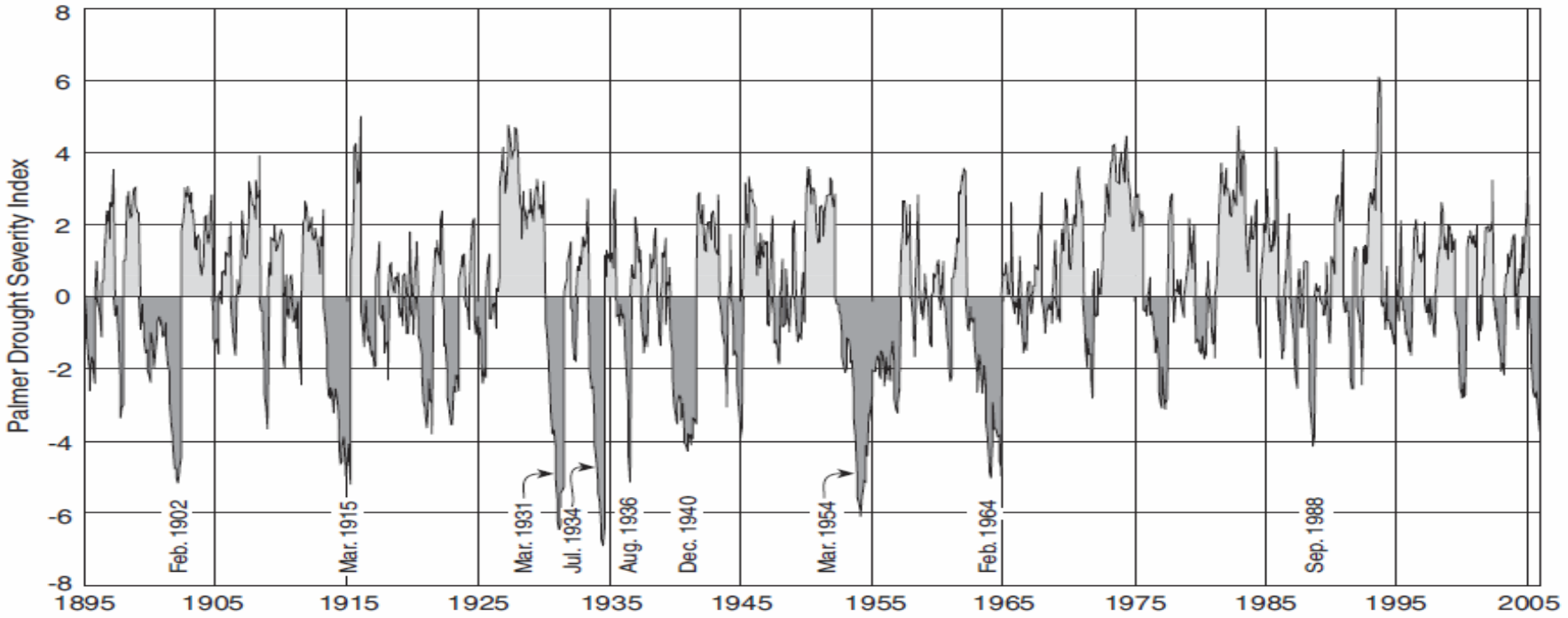


Figure 2. Monthly Statewide Palmer Drought Severity Index for Illinois since 1895.

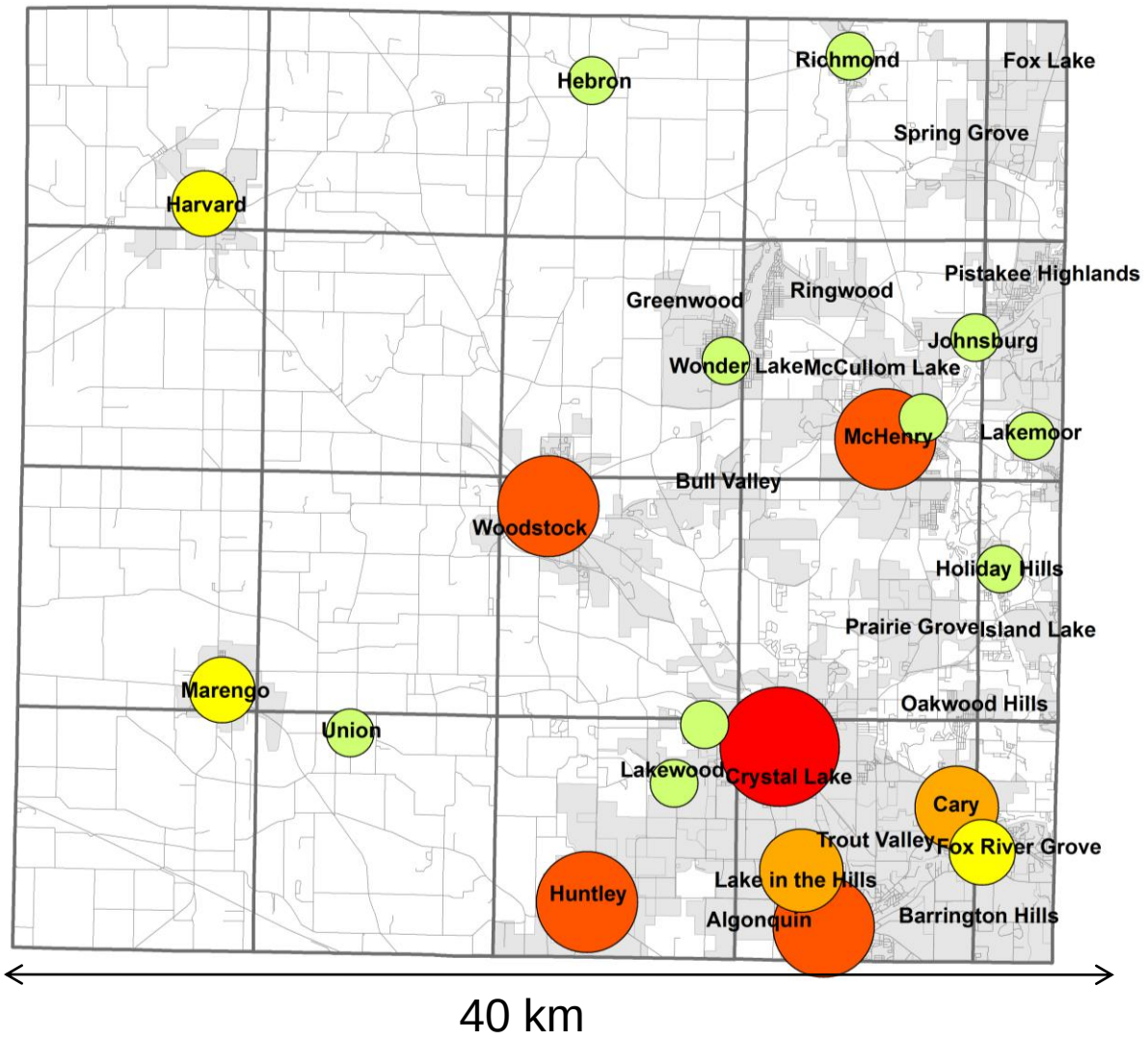
- The Palmer Index tells you how bad a drought is or is going to be.
- If the number is above 0, you are getting above normal precip.
- If the number is below 0, you are getting into dry conditions.
- Between -2 and 2 is considered near normal conditions
- Below -4 is severe drought.

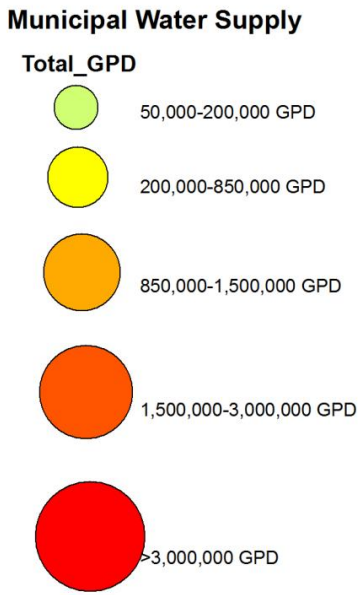
The State of Water in McHenry County, Illinois

McHenry County Challenge

- McHenry County is solely dependant on groundwater for all of its potable water needs
- Adequate groundwater quantity *and* quality is essential to the present and future well being of McHenry County
  - Including things like recreation, aesthetics, food production…
- The groundwater supply is:
  - Limited
  - Vulnerable to pollution

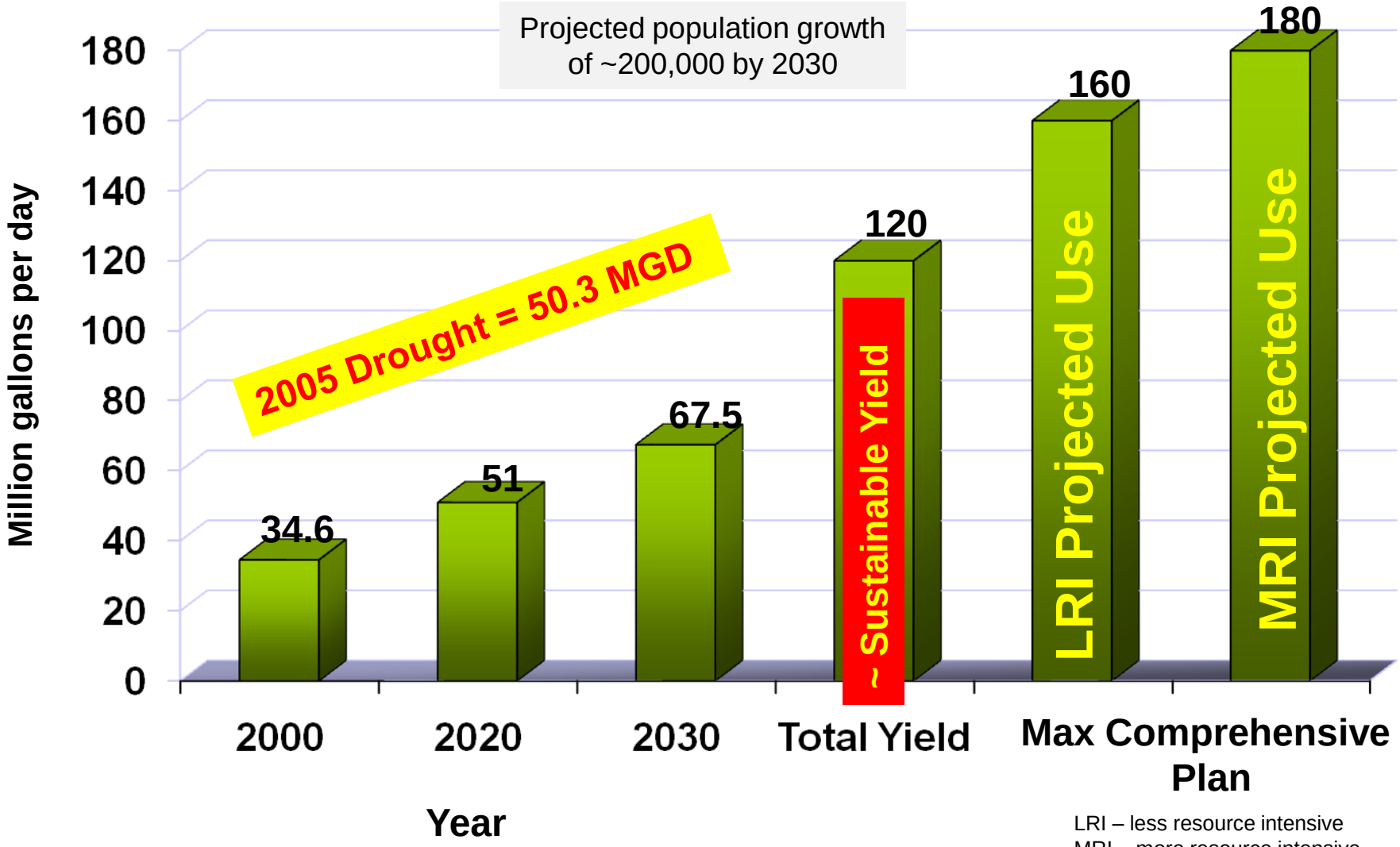
Municipal Water Supplies





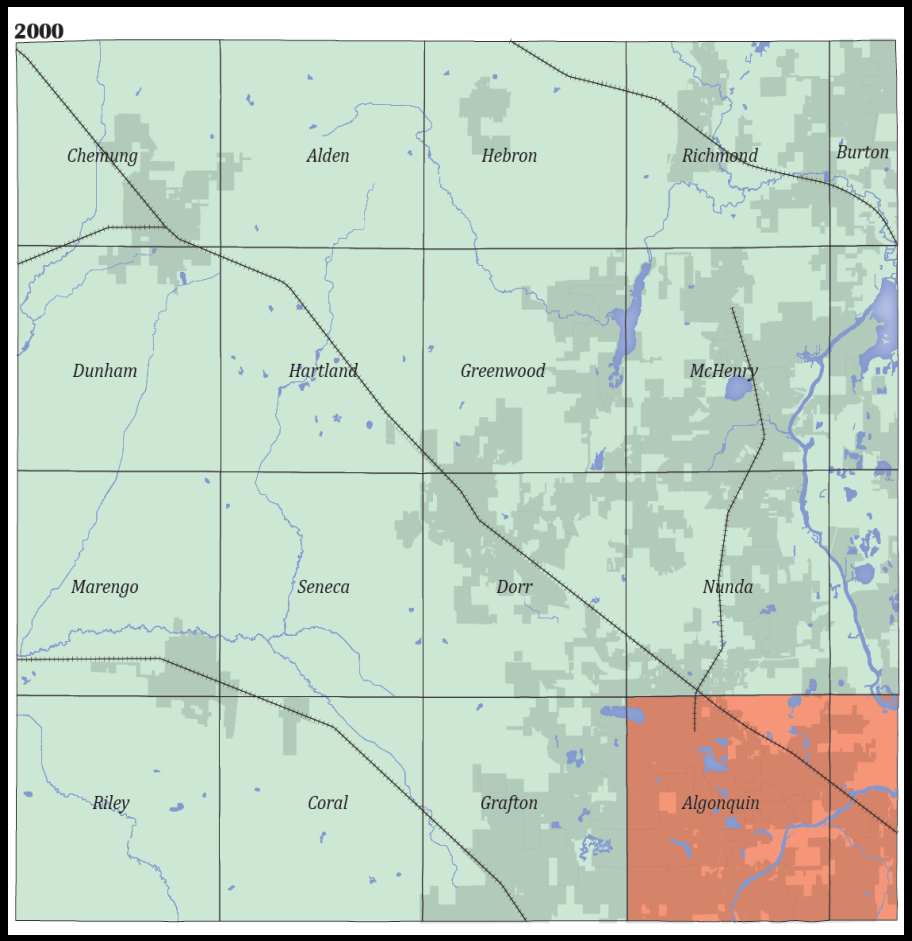
Water Supply:
100% Groundwater
~60% Sand and Gravel

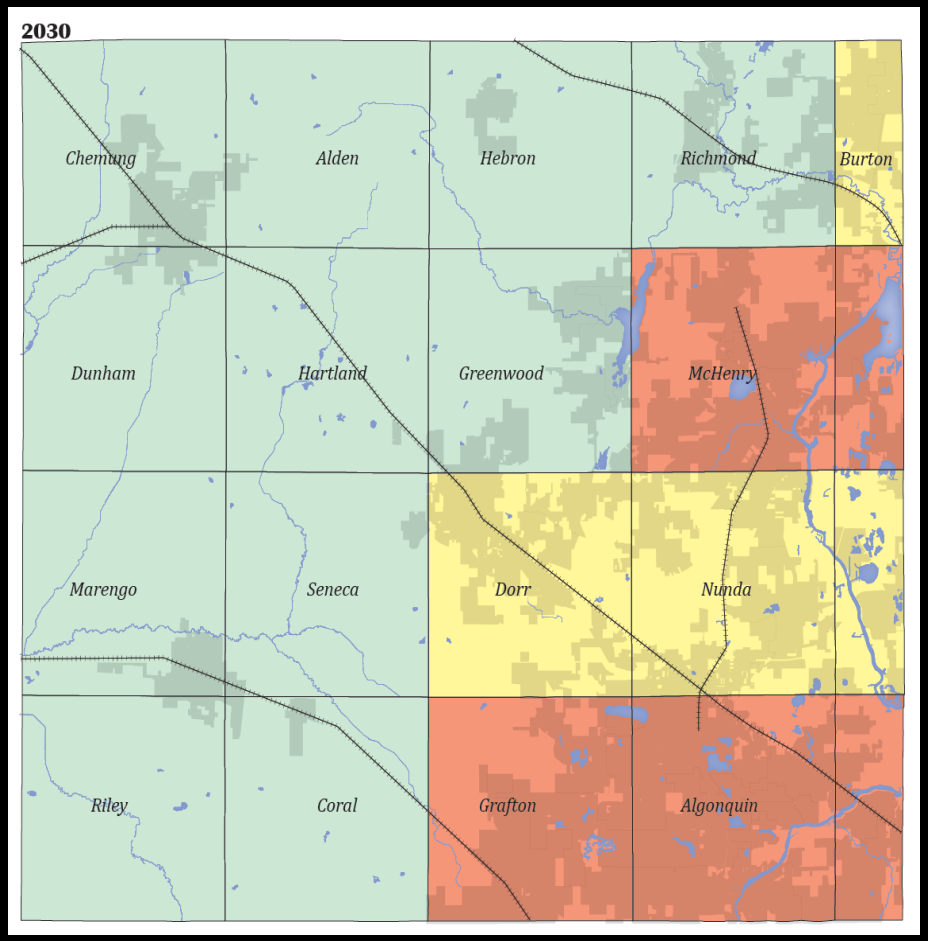
How Much Water Do We Use in McHenry County?



LRI – less resource intensive
MRI – more resource intensive

McHenry County Water Supply Projections





Map Legend

- Townships/Areas with Surplus Groundwater Capacity (Ratio 0.0 - 0.6)
- Townships/Areas of Groundwater Concern (Ratio 0.6 - 0.8)
- Townships/Areas with Potential for Groundwater Shortage (Ratio > 0.8)
- Water Features
- Railroads
- Incorporated Municipality

The Future of a Community

Water Supply Planing

- Healthy Economy
- Healthy Environment
- Open Space & Agriculture
- High Quality of Life
- Sustainable & Safe Water Supply
- Drought Planning

Smart Growth

What about Public Safety and Fire Protection?

Lack of Water Supply Planning

- Loss of Jobs, Retail & Industry
- Degraded Natural Areas & Loss of Open Space
- Loss of Agriculture
- Decreased Quality of Life
- Decreased Property Values
- Stagnation

Sprawl

Drought Planning

Drought Risks According to the McHenry County Natural Hazards Mitigation Plan Chapter 2 – Section 8

- McHenry county can be significantly impacted by a drought through impacts to:
  - Groundwater supply,
  - agricultural activities, and
  - recreational activities

Summary of Impact on Natural Hazards

Hazard	Impact on Health and Safety	Impact on Buildings	Impact on Critical Facilities	Economic Impact
Tornado	High	High	Moderate	Moderate
Floods	Moderate	High	Moderate	High
Severe Winter Storms & Extreme Cold	Moderate	Moderate	Moderate	Low
Severe Summer Storms	Moderate	Moderate	Moderate	Low
Extreme Heat	High	Low	Low	Low
Drought/Groundwater	High	Moderate	Low	Moderate

Drought as a public health issue

CDC Publication – When Every Drop Counts

- Quantity of water for people with private wells
- Lack of public hygiene
- More pathogens in water since less fresh water is introduced into system (primarily surface water)
- More farmers driven to use improperly treated recycled water
- Mental stress and suicide (especially farmers) whose livelihood or is affected by extreme drought

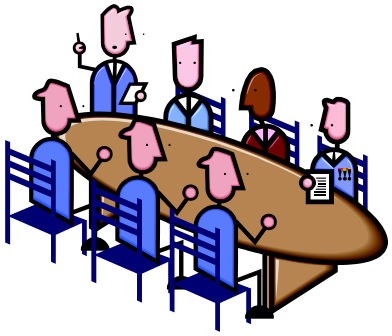
Developing A Drought Management Plan

Drought Management Handbook

- Main Goals
  - To identify the conditions that amount to a water emergency.
  - Specify the actions that need to be taken in response to a water emergency.

Step 1:
Obtaining Public Input and Involvement

- Create a task force to discuss a fair and reasonable drought management plan
- Make sure to involve the public
  - Goal is to obtain their willingness to comply with water conservation measures



Step 2:
Defining Goals and Objectives

- What can be restricted?
- What are water priorities in a time of shortage?
- Don't forget:
  - Environmental concerns such as fish and wildlife
  - Legal requirements that might conflict with drought management plan
  - Possible change in the cost of water during a time of shortage

Step 3:
Assessing Water Supply and Demand Conditions

- How have previous droughts impacted the County?
- What is the maximum amount of water that can safely be withdrawn?
- What are alternate sources of fresh water that the County has access to?

Step 4: Defining Drought Indicators

- Ways to measure the severity of a drought
  - Palmer Index (PI)
  - Groundwater Levels
  - Precipitation
  - Stream Flow Data

Step 5:
Identifying and Assessing Drought Mitigation Measures

- Educate the public on water conservation and measures that they can expect to take in the event of a water emergency.
- Establish communication with the press in order to effectively get word out to the public in a time of drought.
- Have enforcement mechanisms in place before a drought occurs.
  - incentives for those who conserve water
  - ways to penalize excessive water users

Example – Algonquin has a fine that charges $100.00 for watering illegally (depends on water system status and current watering restrictions)

Step 6: Developing a Drought Index and Management Strategy

- This is the stage where the plan is adopted.
- Appoint a Drought Coordinator (or assign to existing position, Example – EMA)
  - administer the program
  - contact for the media
  - contact for members of the public with questions or concerns
- Regulate the water conservation efforts
  - important to show public that
    - Regulations are fair
    - excessive water users are being penalized

Water Conservation

- Raising awareness for water conservation now will make a drought situation less drastic:
  - People will be educated as to the importance of protecting our limited water resource
  - People will know, and hopefully will already be applying different water conservation methods
  - Decrease in water demand before a drought occurs will make sure that the water supply is better preserved when a drought does strike.
  - Makes implementing a drought management plan easier and costs less money in enforcement of the plan.

Water Resources Action Plan
Section 3 –
Water Conservation

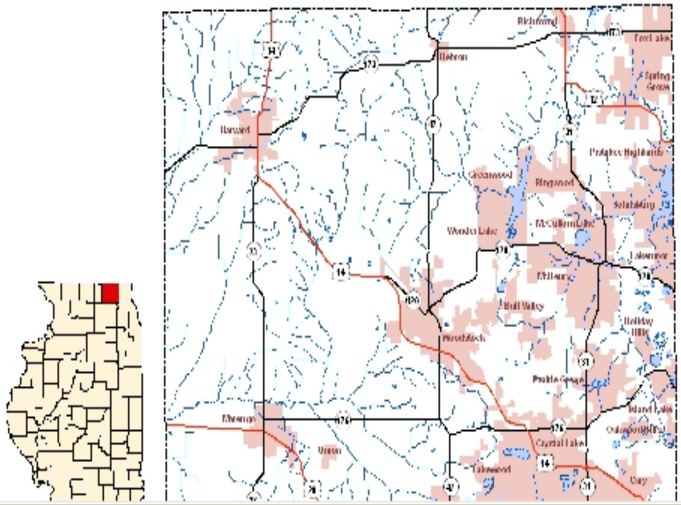
Inventories and Forecasting Research/Development

RESEARCH & DEVELOPMENT

- Sensitive Aquifer Recharge Map
- Research:
  - 3-D Hydrogeological Mapping
  - Groundwater Flow Modeling
  - 41 Observation Wells
  - 2 Stream Gauges
  - Water Quality Sampling
  - Real-time Wells and Stream Gauges

McHenry County Data Home Page

Welcome to the McHenry County website



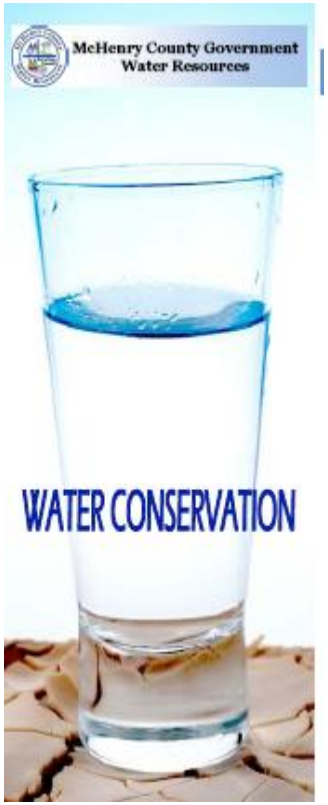
McHenry County Hydrologic Information McHenry County, Illinois has current and long-term issues with water resources in providing drinking water, responsible handling of stormwater, and balancing these needs while preserving the rich and diverse ecological systems. In the effort to supply and present timely data to assist in determining the hydrologic conditions of the area, the U.S. Geological Survey (USGS) Illinois Water Science Center presents a near real-time data network of groundwater wells, streamgages and rain gages, in addition to other relevant information such as water-quality data for many of these sites.

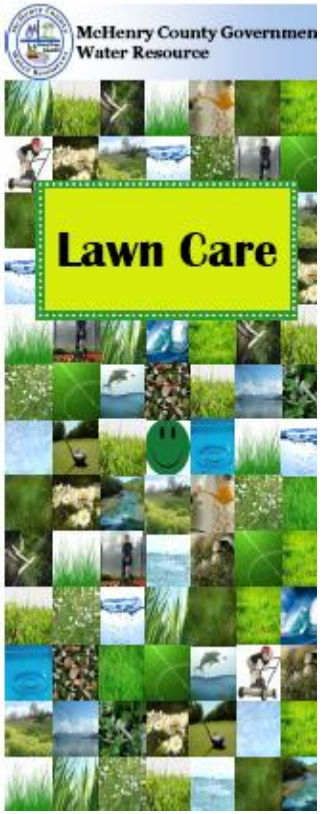
The groundwater wells are all in glacial deposits and have well depths ranging from 20 to 345 feet. These wells have multiple owners, including those owned by the McHenry County, the Illinois State Geological Survey (ISGS) and the

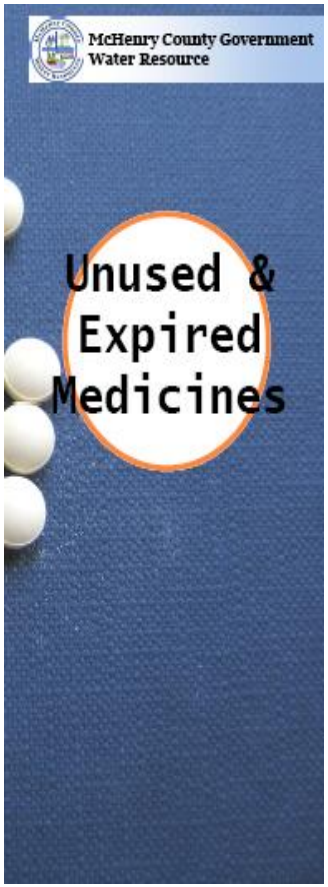
Upcoming Webinars

- ILWARN Webinar
- Toilet Rebate Webinar

Educational Materials Available







www.mchenryh2o.com

QUESTIONS?

"We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."

Aldo Leopold, A Sand County Almanac

Cassandra McKinney

Department of Planning and Development
Water Resources Manager - Division of Water Resources

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