

Planning For Drought

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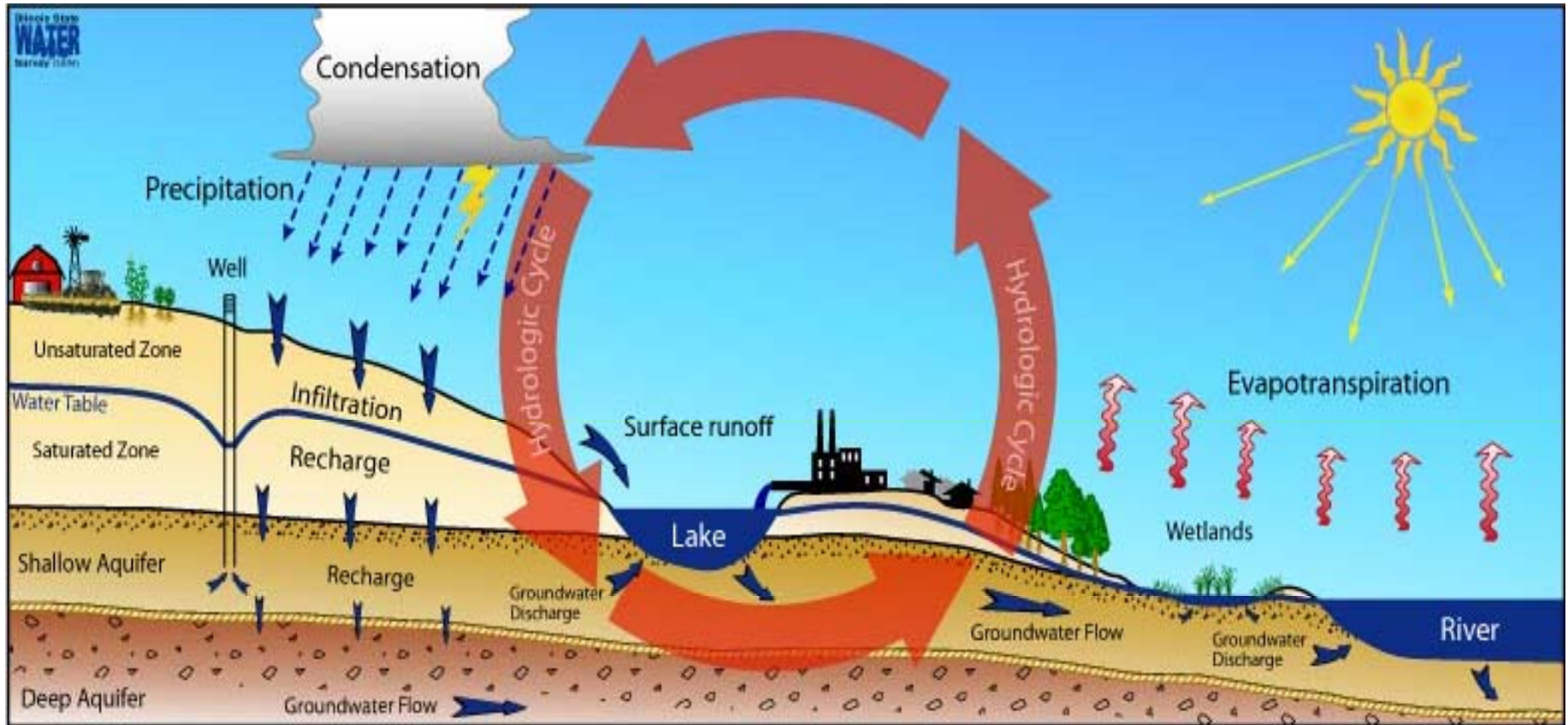
- Introduction
- Historical droughts
- Response of surface waters and groundwater
- Water supplies, use, and demand
- Future droughts
- Drought analyses for CMAP/Regional Water Supply Planning
- Recommendations



Introduction

1. Climatic conditions are major factors in water supply and water demand
2. Droughts (low precipitation and high temperatures) reduce water availability and increase water demand

The Water Cycle

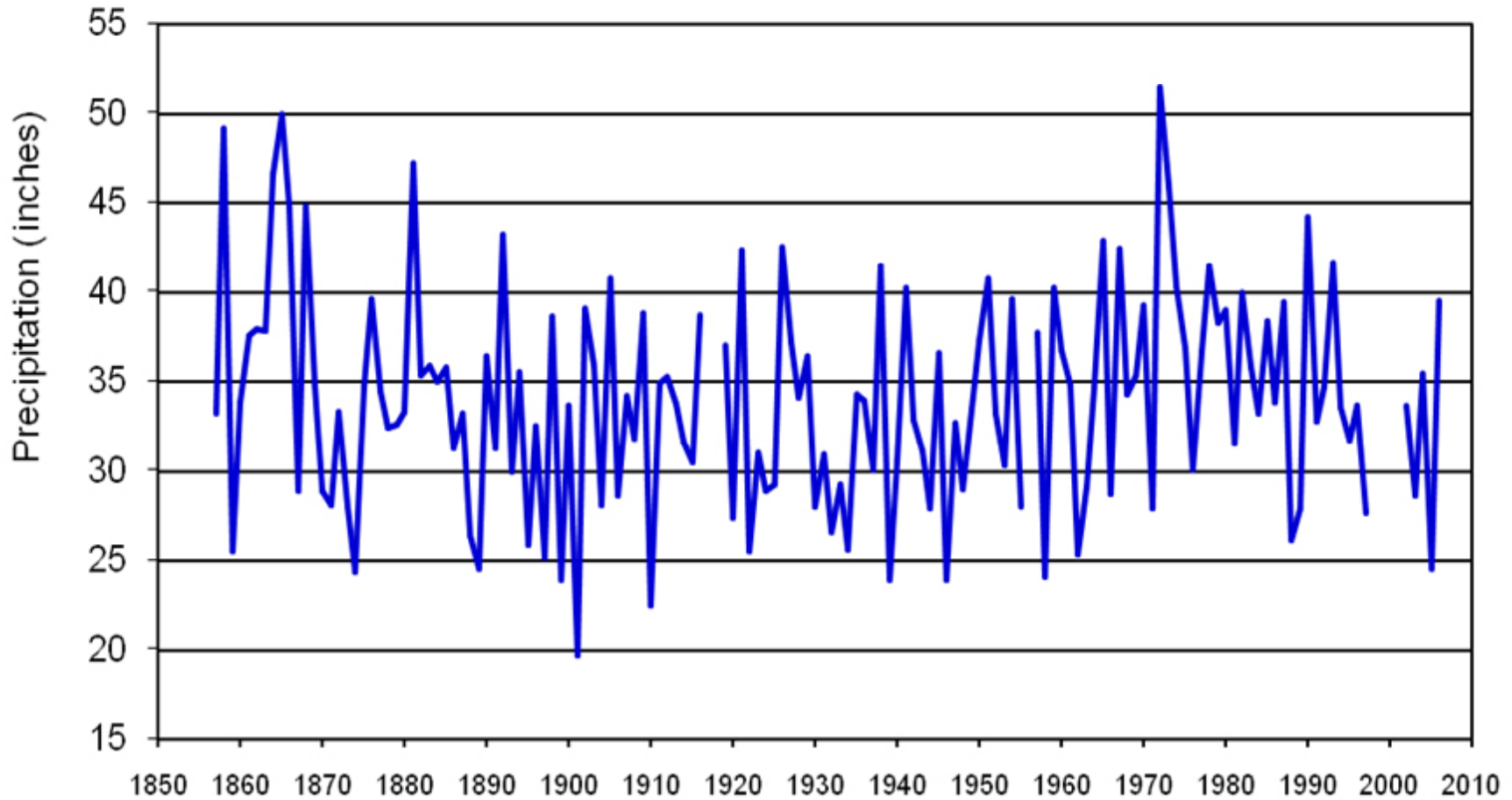


PRECIPITATION

RUNOFF

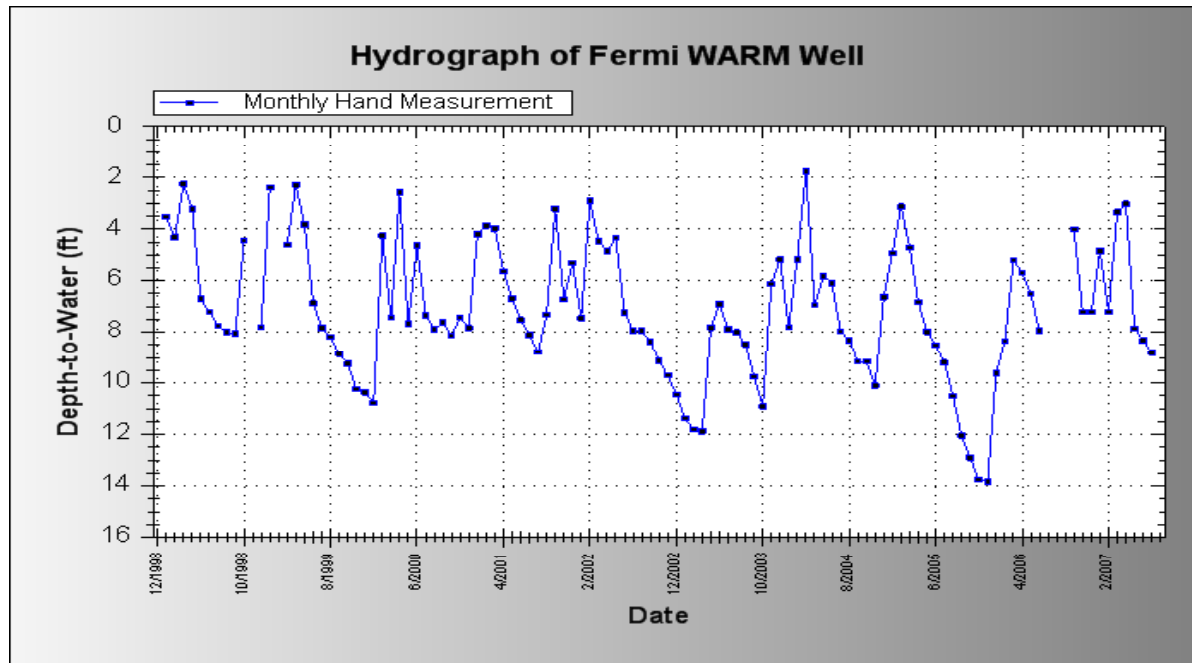
RECHARGE

Annual Precipitation – Marengo, Illinois



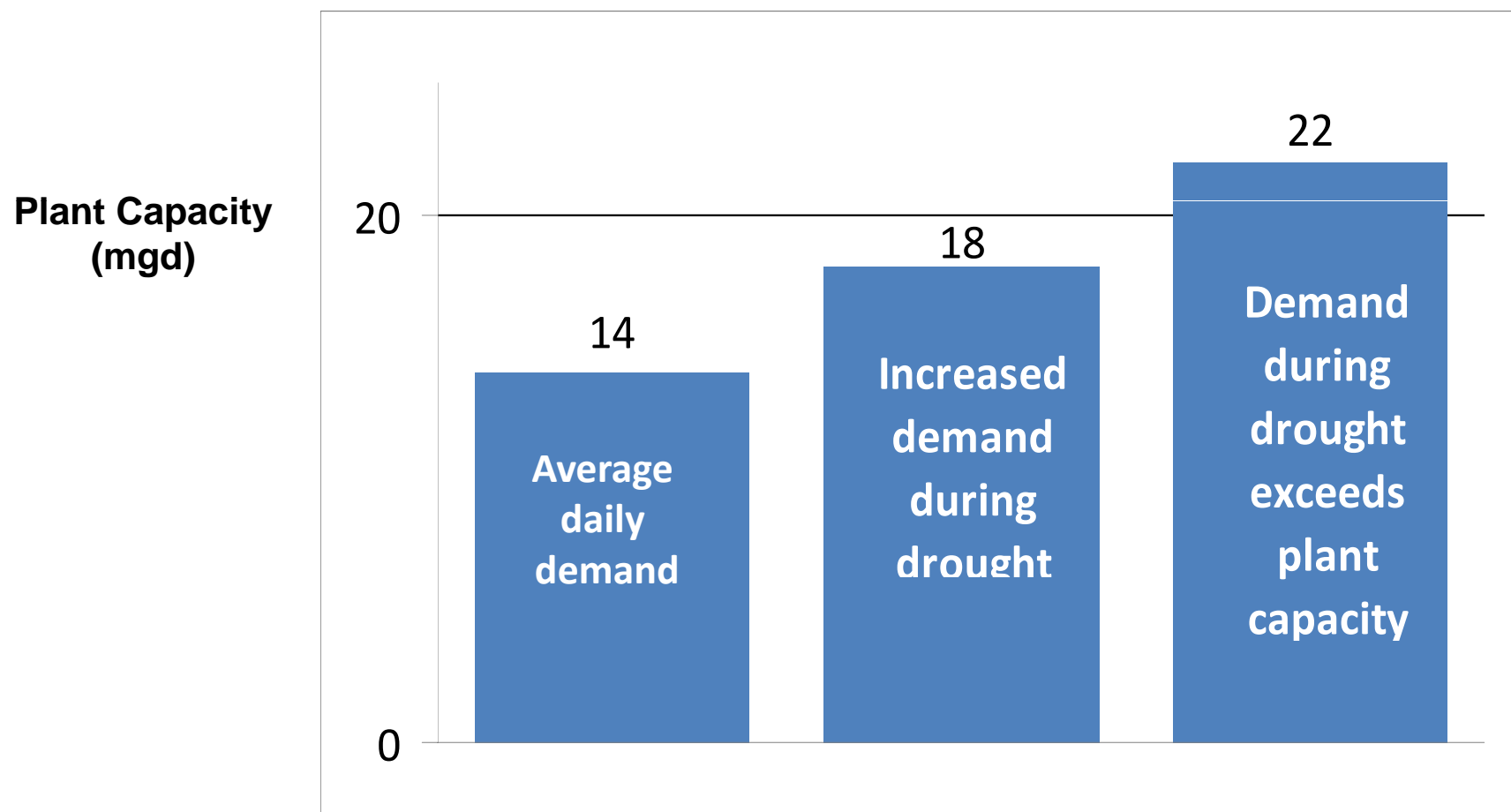
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Drought Effects



- Reduces streamflow (10% precipitation decline typically results in a 20-40% streamflow reduction)
- Decreases water levels in shallow wells
- Deep aquifers are buffered from drought but could be impacted by long-term climate change.
- Increases water demand (peak use up to 50-60% higher than average daily use).

Relationship of Increased Water Demand to Plant Capacity



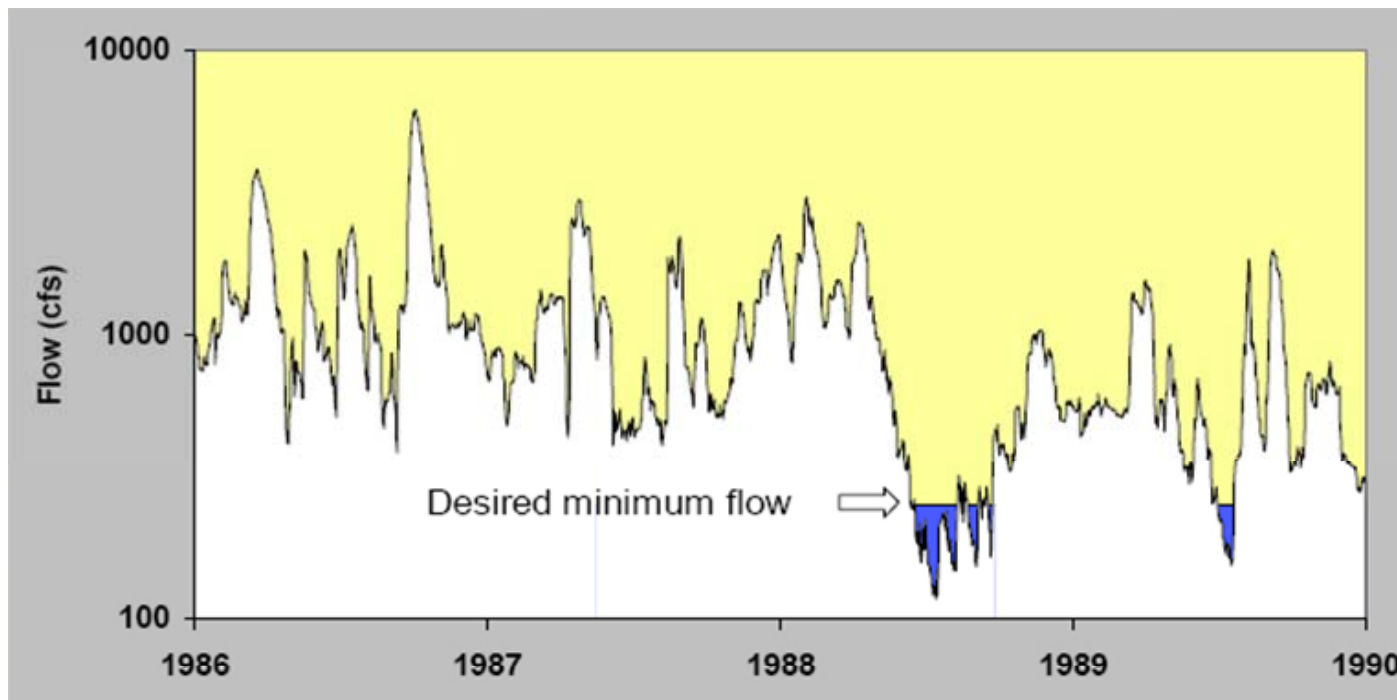
Public Bodies of Water in Illinois

The State's authority to protect flows extends only to these rivers.



Protecting Instream Flows

Streamflow is usually abundant and its use for water supply is not a concern in most years. But during low flows, instream flow uses become a priority issue.



Vern Knapp (ISWS)



Future Climate

- Natural processes and human influences affect future climate.
- There are two guides to possible future climate conditions
 - The past record (what has occurred can occur again)
 - Climate modeling



Future Droughts Based on History

Expected Precipitation in Kane County

(mean annual precipitation: 36 inches, 1971–2000; 25 inches, 2005)

Drought duration	50-year return period	200-year return period
12 months	19	15
24 months	24	21
60 months	28	26

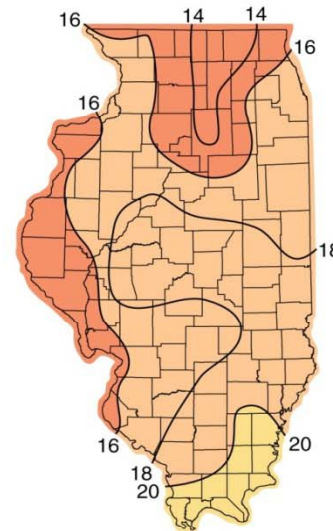
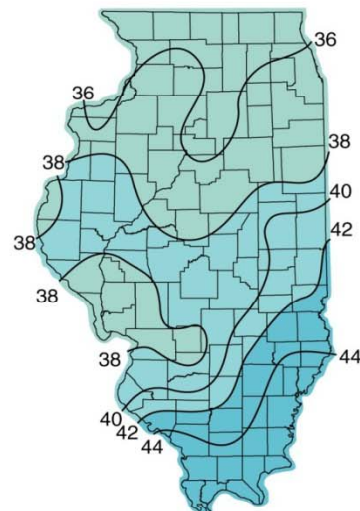
1 in 200 Year Drought

(ISWS Informational/Educational Materials 2006-02)

The Water Cycle and Water Budgets in Illinois: A Framework for Drought and Water-Supply Planning

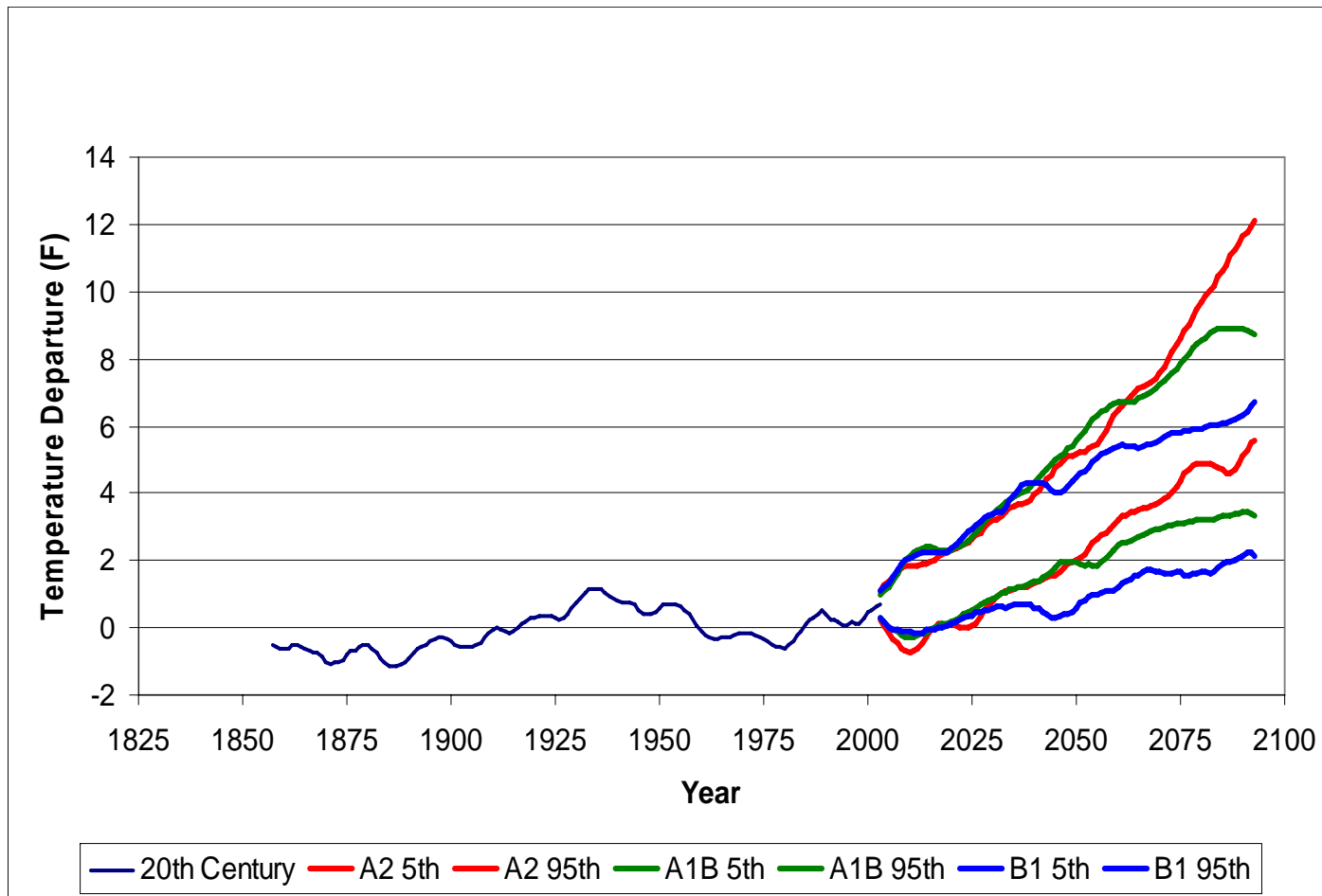
Derek Winstanley, James R. Angel, Stanley A. Changnon, H. Vernon Knapp,
Kenneth E. Kunkel, Michael A. Palecki, Robert W. Scott, and H. Allen Wehrmann

ARE WE PREPARED...



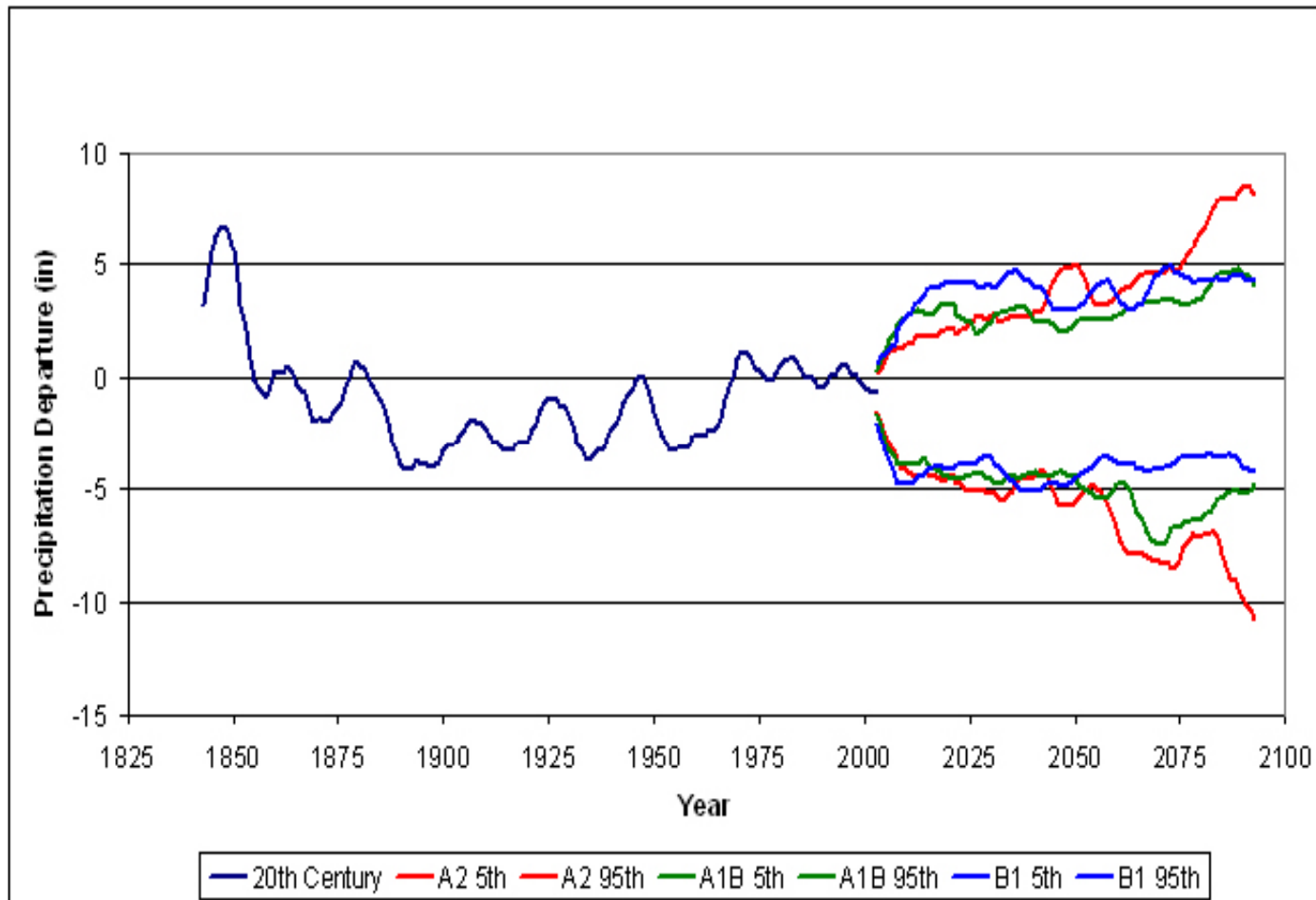
...FOR SEVERE DROUGHT?

Illinois Annual Temperature: Departure from 1971–2000 Normal



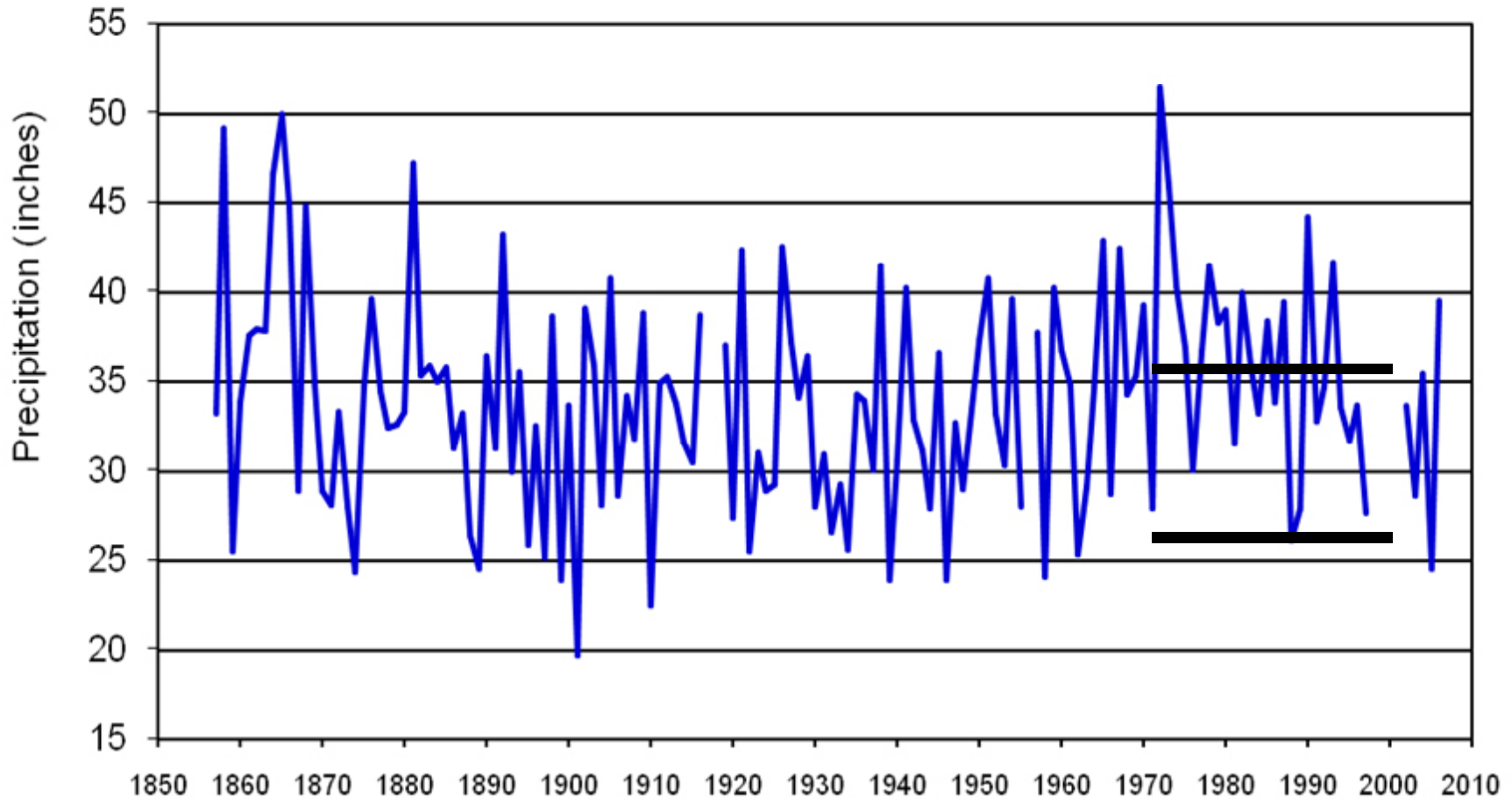
http://www.sws.uiuc.edu/wsp/climate/ClimateTom_scenariosmap2.asp

Illinois Annual Precipitation: Departure from 1971–2000 Normal



http://www.sws.uiuc.edu/wsp/climate/ClimateTom_scenariosmap1.asp

Annual Precipitation – Marengo, Illinois



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Northeastern Illinois Regional Water Supply Planning Group

- Analyze water supply and demand to 2050
 - Temperature change: 0 to +6°F
 - Precipitation change: -5 inches to +5 inches



Managing Water Supplies

- Plan and be prepared for drought.
- Know your risks and costs.
- Increase supply: additional withdrawals and treatment plants; increased cost
- Decrease demand: conservation (voluntary and mandatory); water reuse