

# Mississippi Valley Conservation: A Local Response to Climate Change

Inter-agency Workshop  
January 31, 2008

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# Climate Change Impacts

## - Great Lakes/St Lawrence Lowlands

- Temperature
  - Generally warmer temperatures
  - Average temperature increase of 4.5° C by 2055
- Precipitation
  - Less snow (20 – 80%) & more rainfall in winter and spring
  - Greater rainfall in fall
  - Greater storm intensities
- Evaporation
  - Higher evaporation rates and lower soil moisture

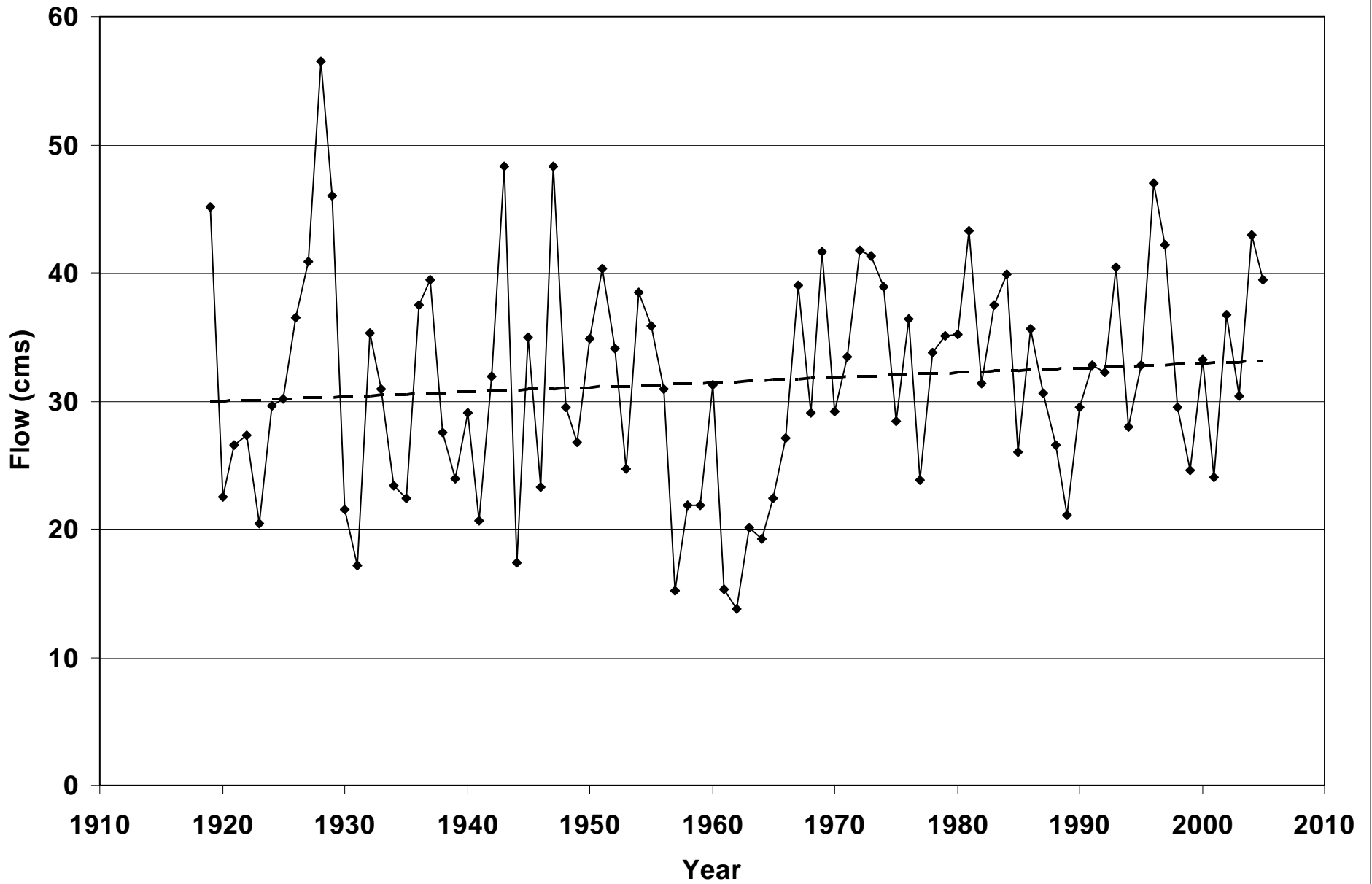
# Water Resource Impacts

Water Sector: Vulnerability and Adaptation to Climate Change,  
J. Bruce et al, 2000

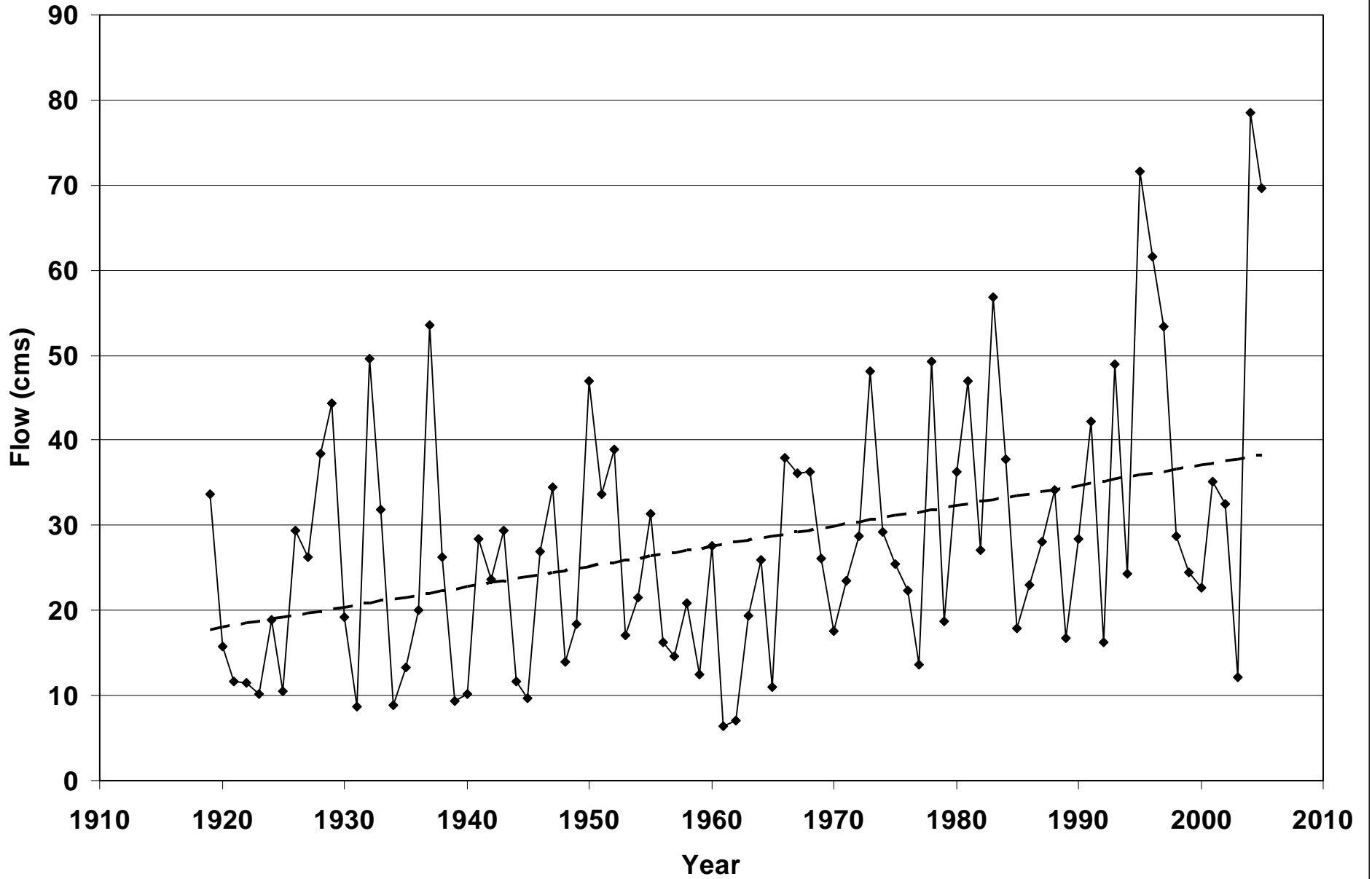
- Higher streamflows (September – January)
- Lower streamflows (April – September)
- Lower summer low flows
- Earlier & lower spring freshets
- Greater frequency of high intensity rainfalls
- Higher water temperatures
- Earlier spring break-up

What does this mean to us?

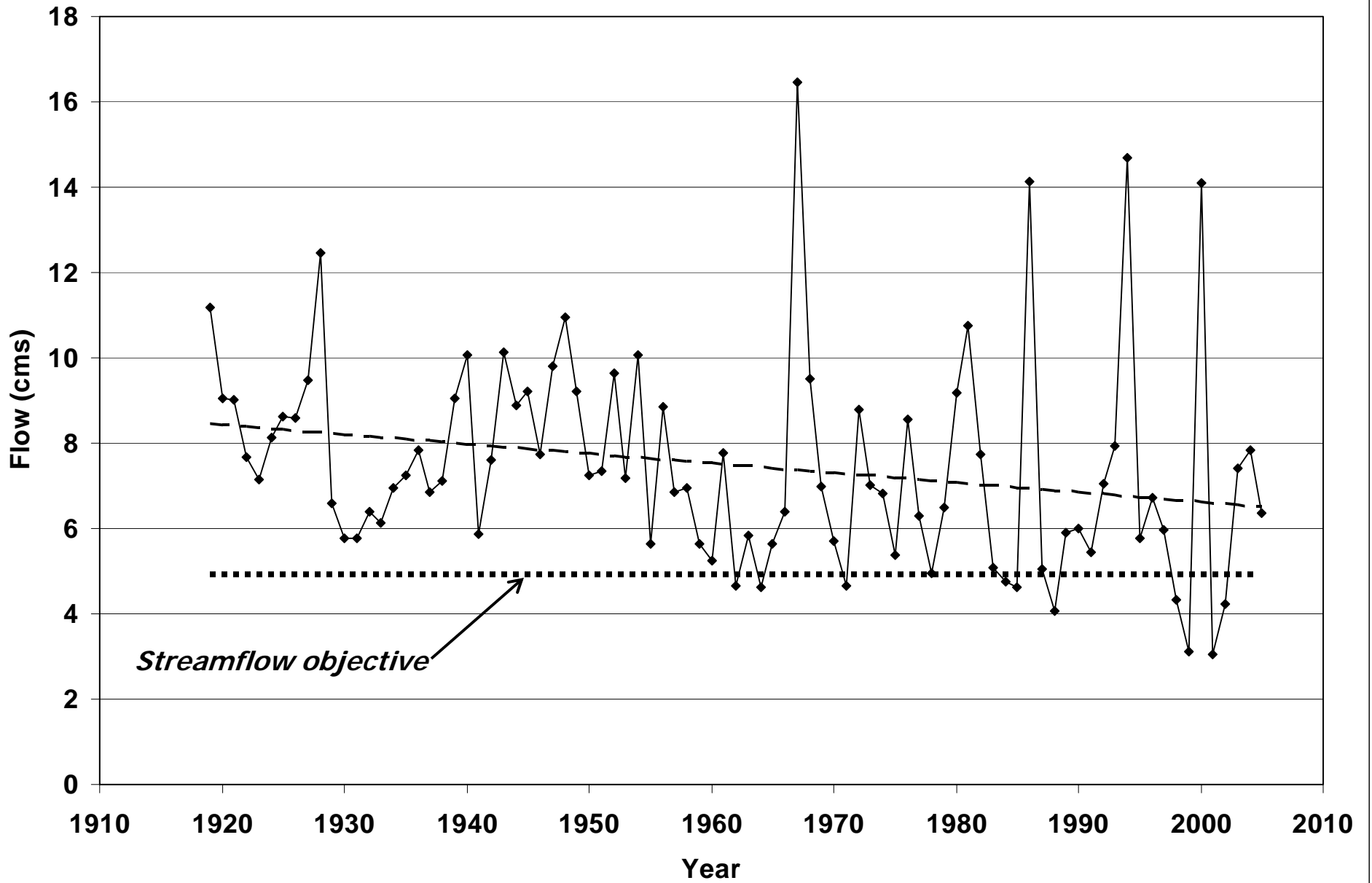
**Average Annual Stream Flow  
Mississippi River @ Appleton (WSC 02KF006)**



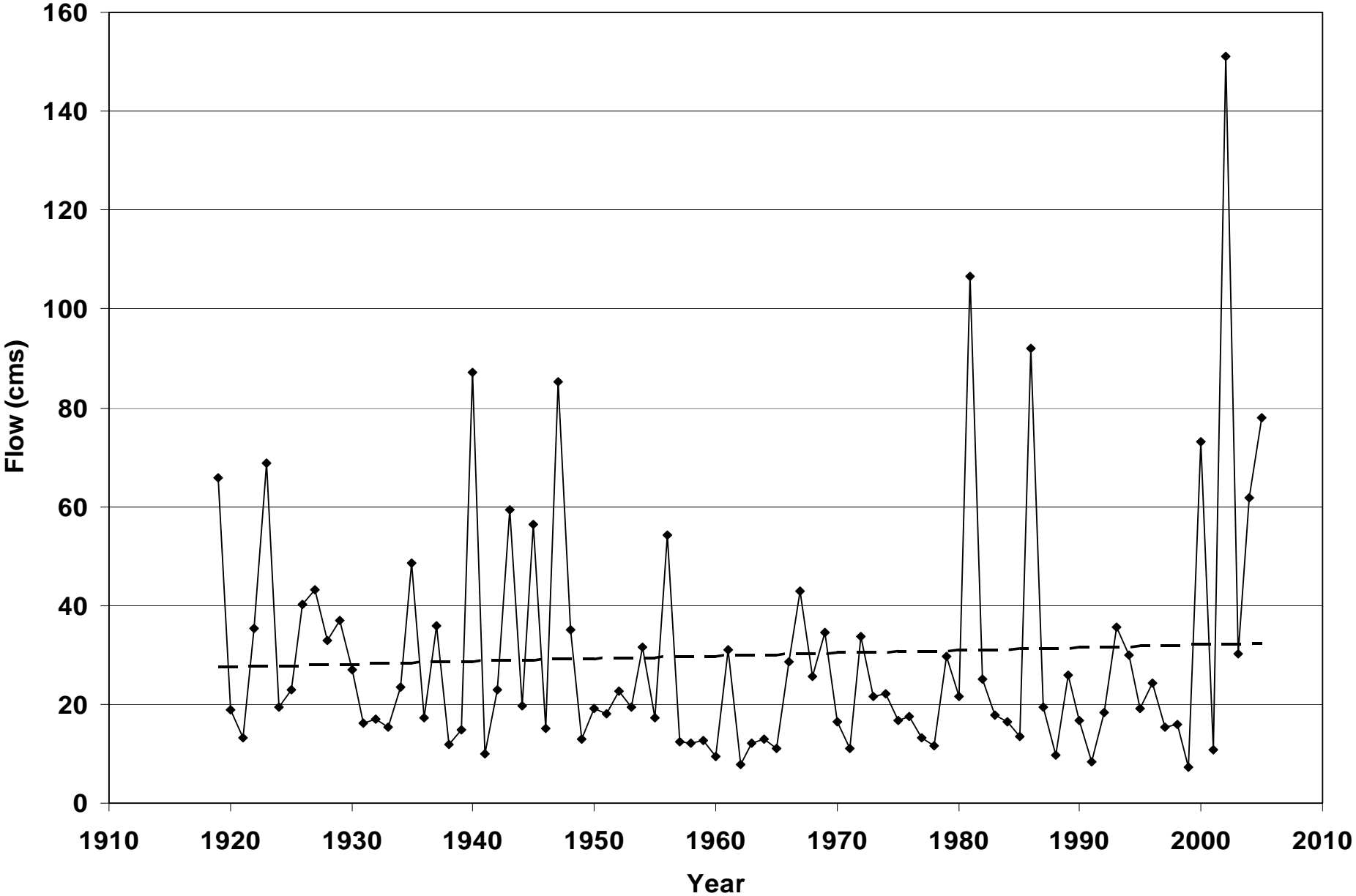
**Average Winter Stream Flow  
Mississippi River @ Appleton (WSC 02KF006)**



**Minimum Summer Stream Flow  
Mississippi River @ Appleton (WSC 02KF006)**



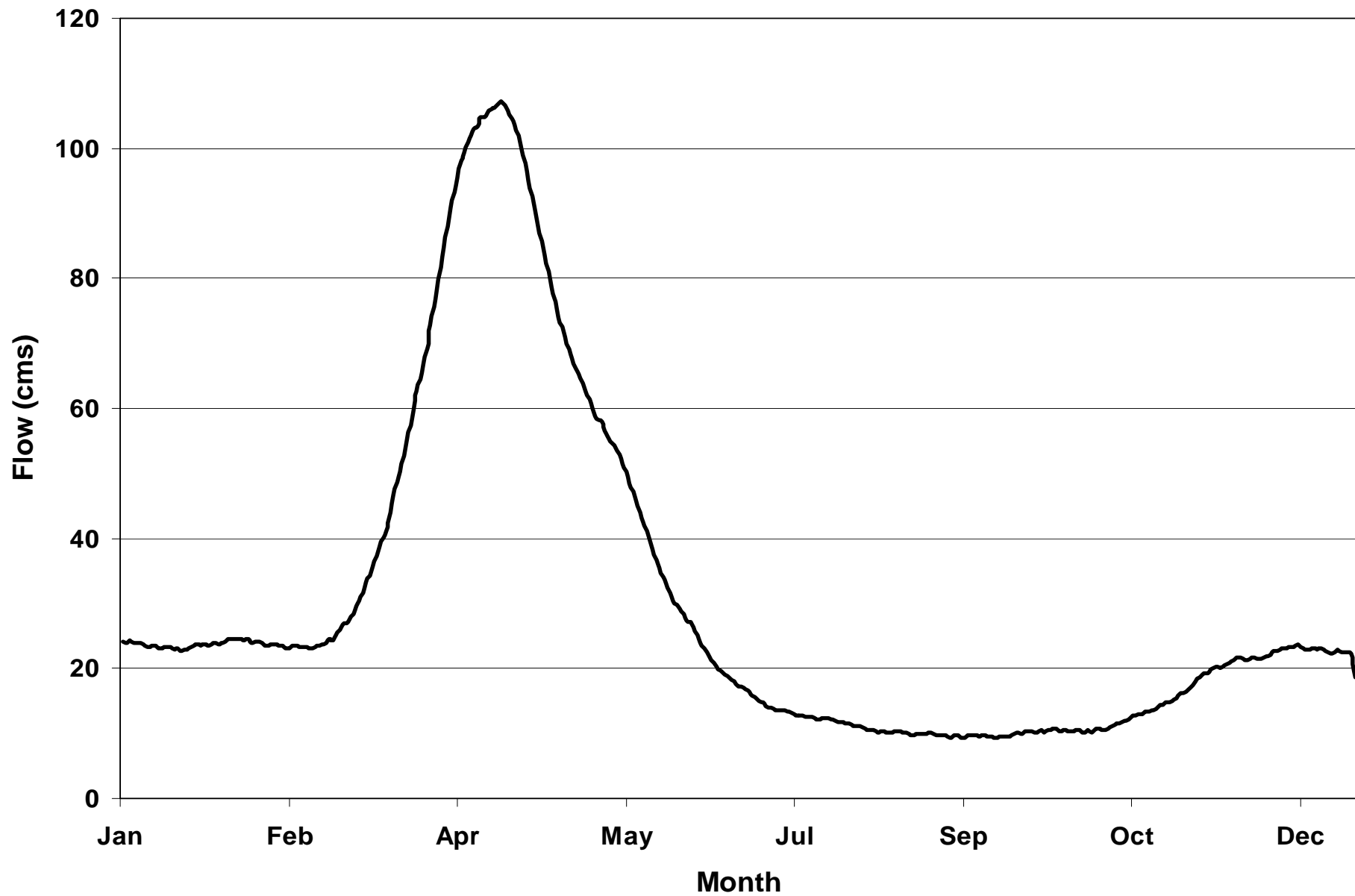
**Maximum Summer Stream Flow  
Mississippi River @ Appleton (WSC 02KF006)**



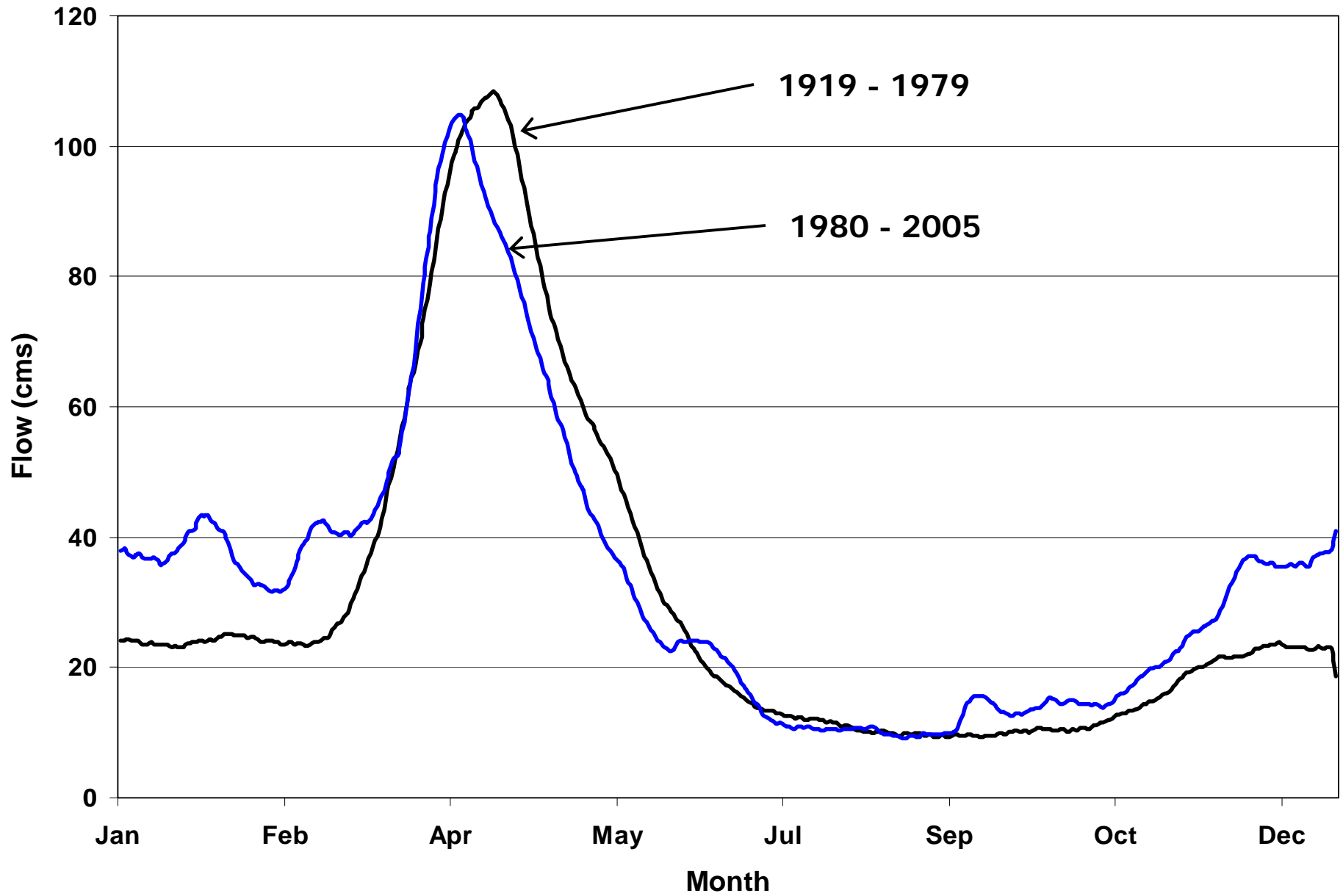
# Climate Change Implications

- Seasonal shifts in runoff
  - Inconsistent with historical operating policy
  - Balancing recreational demands with fish habitat, water supply requirements
- Increased flood threat in summer
  - Insufficient flood storage reserve
- Decreased summer streamflows
  - Failure to satisfy streamflow objectives
- Increased nutrient loading/lower flushing rates
  - Wastewater assimilation
  - Lower Dissolved Oxygen levels

**Mean Streamflow (1919 - 1979)**  
**Mississippi River @ Appleton (WSC 02KF006)**



**Mean Streamflow (1919 - 1979/1980 - 2005)  
Mississippi River @ Appleton (WSC 02KF006)**



# Mississippi River Watershed

Water control structures



Storage reservoirs



Hydro-electric generating facilities



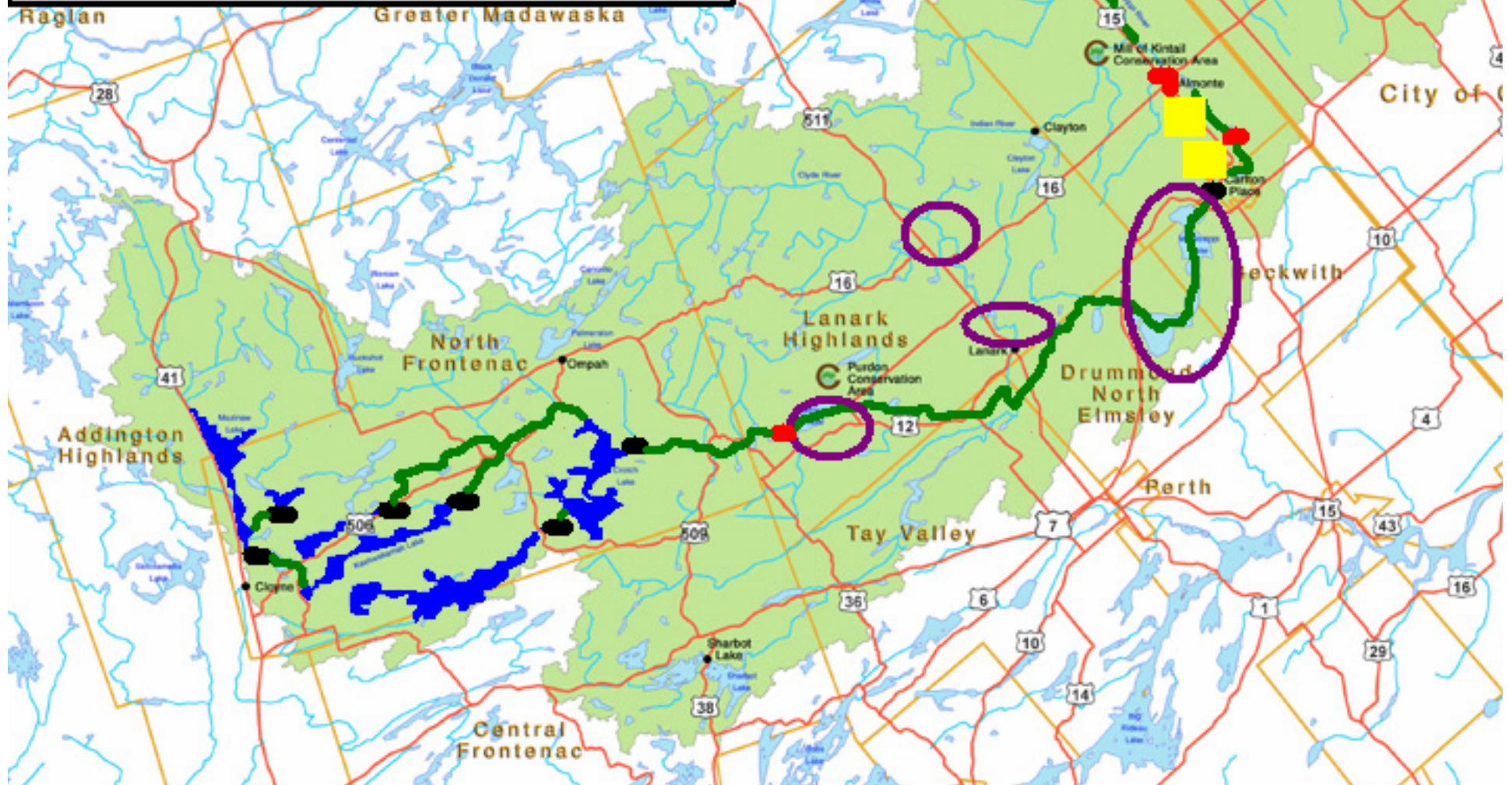
WMP planning area



Municipal water/waste water systems



Flood damage zones



# Water Management Response

- Reservoir operation policy
  - Risk management
- Flood storage reserve
- Water supply capacity
- Shift from waste assimilation to source control
- Fisheries impacts
- Integration

# Current Studies

- NRCan/Queen's University/MVC/Guelph University/MVFN
  - Fish, fisheries and water resources: Adapting to a changing climate
    - Fish and fisheries
    - Economic consequences
    - Stakeholder workshops
    - Water management response opportunities

# MVC Climate Change Adaptation Strategy

- Improve scientific understanding of local impacts
  - Research, monitoring & stakeholder input
- Future watershed response scenarios
  - Risk assessment
    - Flooding
    - Drought
    - Water supply
    - Fish habitat
    - Navigation/recreation
- Risk Management/Integration

# Integration

- Adaptation driven locally
- Multiple sectors affected
  - Communities
  - Agriculture
  - Health
  - Forestry
  - Water
  - Tourism
  - Ecosystems
- Adaptation in one sector will have consequences for others

# The Almonte Communiqué

Released by delegates of "Weathering the Change" workshop

Many important economic and social decisions are being made today on long-term projects and activities in our watershed based on the assumption that past climate data are a reliable guide to the future. This is no longer a good assumption.

We believe that all levels of government are key players in this issue and must raise awareness and incorporate climate change into planning, decision making and leadership.

## Phase II

- Economic assessment
  - Flood risk
  - Water supply/waste assimilation
  - Fish/aquatic habitat
  - Hydro generation
  - Recreation/navigation
- Structural/policy modifications
- Opportunities for adaptation/integration

Thank you!