

# Using Science to Communicate About Culture and Environmental Changes... Making Complex Environmental Issues More Understandable



Wisconsin Lakes Convention - April 25, 2015

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# Climate Change – A Case Study

- Challenges
  - Long term and not intuitive
  - Uncertainty
  - Effects not uniform in Wisconsin
  
  - How do we make sense of the information?
  - How do we discuss what we have learned with others?
  - Polar bears work for some but not others
- Step 1 – Learn about the basics (Nancy and Shiba)
  - Understand the lingo
- Step 2 – Translate (Cathy)

## Learn the Lingo:

# Climate Change Terminology

### Weather

- The state of the atmosphere at a particular time, as defined by variables such as temperature, precipitation or winds.

### Climate

- The "average weather" over a period ranging from months to thousands or millions of years.

### Climate Change

- A departure from the expected average weather patterns.

# Learn the Lingo

## Climate Change Terminology

### Mitigation

- The action of reducing the severity, seriousness, or painfulness of something

### Adaptation

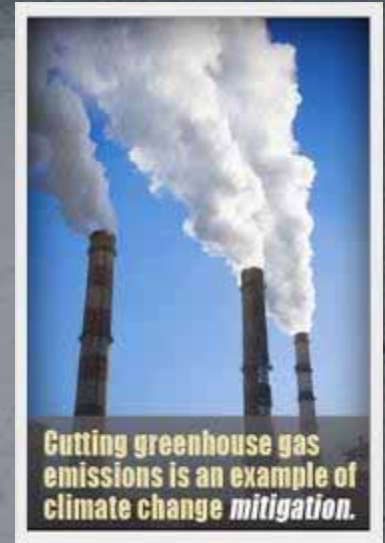
- A change or the process of change by which an organism or species becomes better suited to its environment

### Preparedness

- A state of readiness

### Resiliency

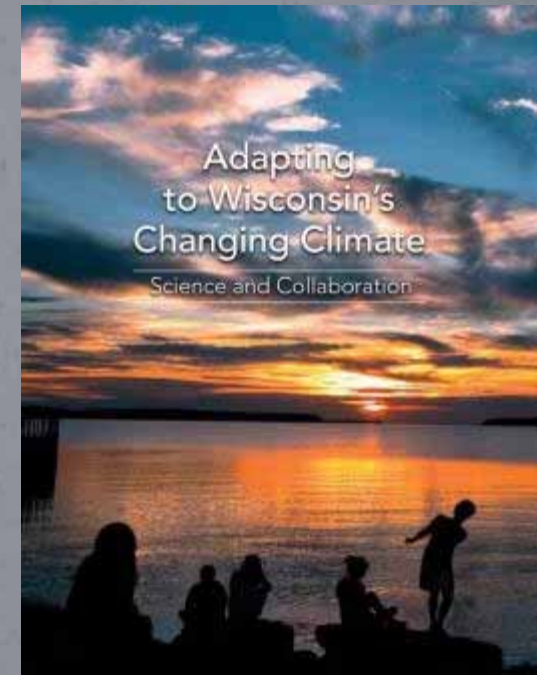
- An ability to recover from or adjust easily to misfortune or change



# Find “easy to read” or predigested information: Wisconsin Initiative on Climate Change Impacts – WICCI, 2011



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### Wisconsin's Changing Climate: Impacts and Adaptation

 In 2011, the Wisconsin Initiative on Climate Change Impacts released its first comprehensive report, *Wisconsin's Changing Climate: Impacts and Adaptation*. The report serves as a resource for business executives, government, natural resource managers, public health officials and other decision makers as they take strategic steps to preserve jobs, invest resources wisely, build resiliency and protect our built and natural environment in the face of a changing climate. [Download your copy.](#)

### Telling Stories of Climate

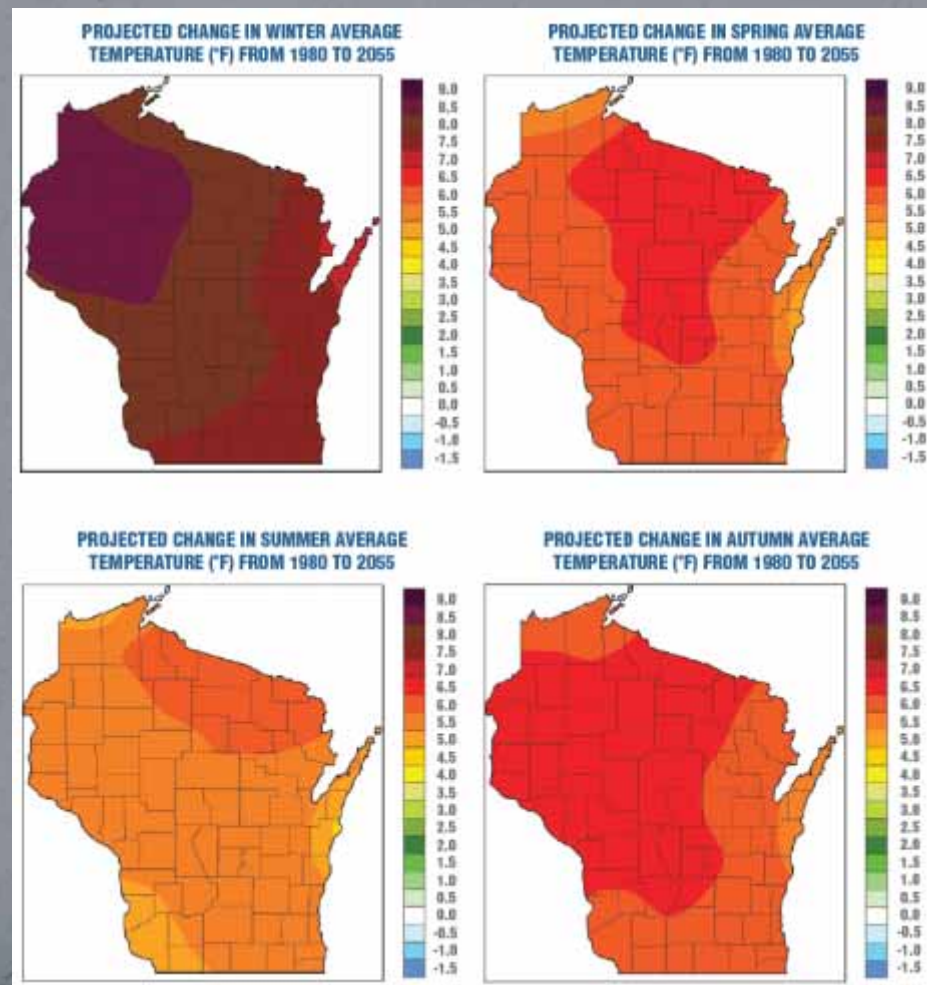
Climate change affects our everyday lives. From warming trout streams to decreasing snow pack, lower lake levels to extreme weather, WICCI helps people understand how climate change is affecting Wisconsin. One of the ways WICCI does this is through telling stories.

- [WICCI News](#)
- [Adapting to Wisconsin's Changing Climate](#)
- [Climate Wisconsin videos](#)
- [WICCI in Wisconsin Natural Resources Magazine](#)
  - [Preparing to adapt](#)
  - [Managing our future: Getting ahead of a changing climate](#)

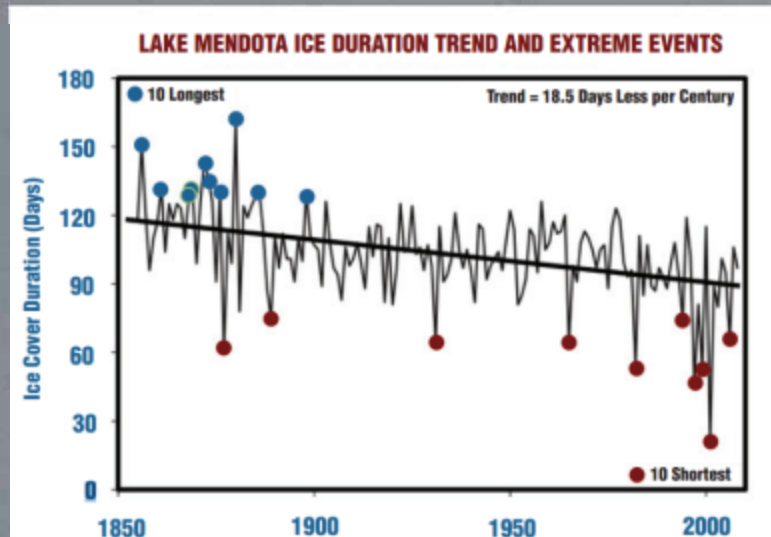
Images courtesy of Dan Hammond and Apple Box Studios / iStockPhoto.com



Scale the information to a relevant region:  
Predictions for Central Wisconsin  
Year round increase in average temperatures and  
increased temperature extremes



# Learn about/think about the effects of the data: Shorter Periods of Ice on WI Lakes



- Less ice fishing and snowmobiling
- Shorter or no ice cave visitors
  - \$12 million in 2014
- Increased evaporation
  - Lower lake levels
- Longer growing season during the summer
  - More algae and aquatic plants
  - More lakes with hazardous algal blooms (HABs)



Petenwell Flowage Adams County



# Aquatic Invasives

Warmer water temperatures will allow more aquatic invasive species to exist and even thrive.

Gizzard Shad

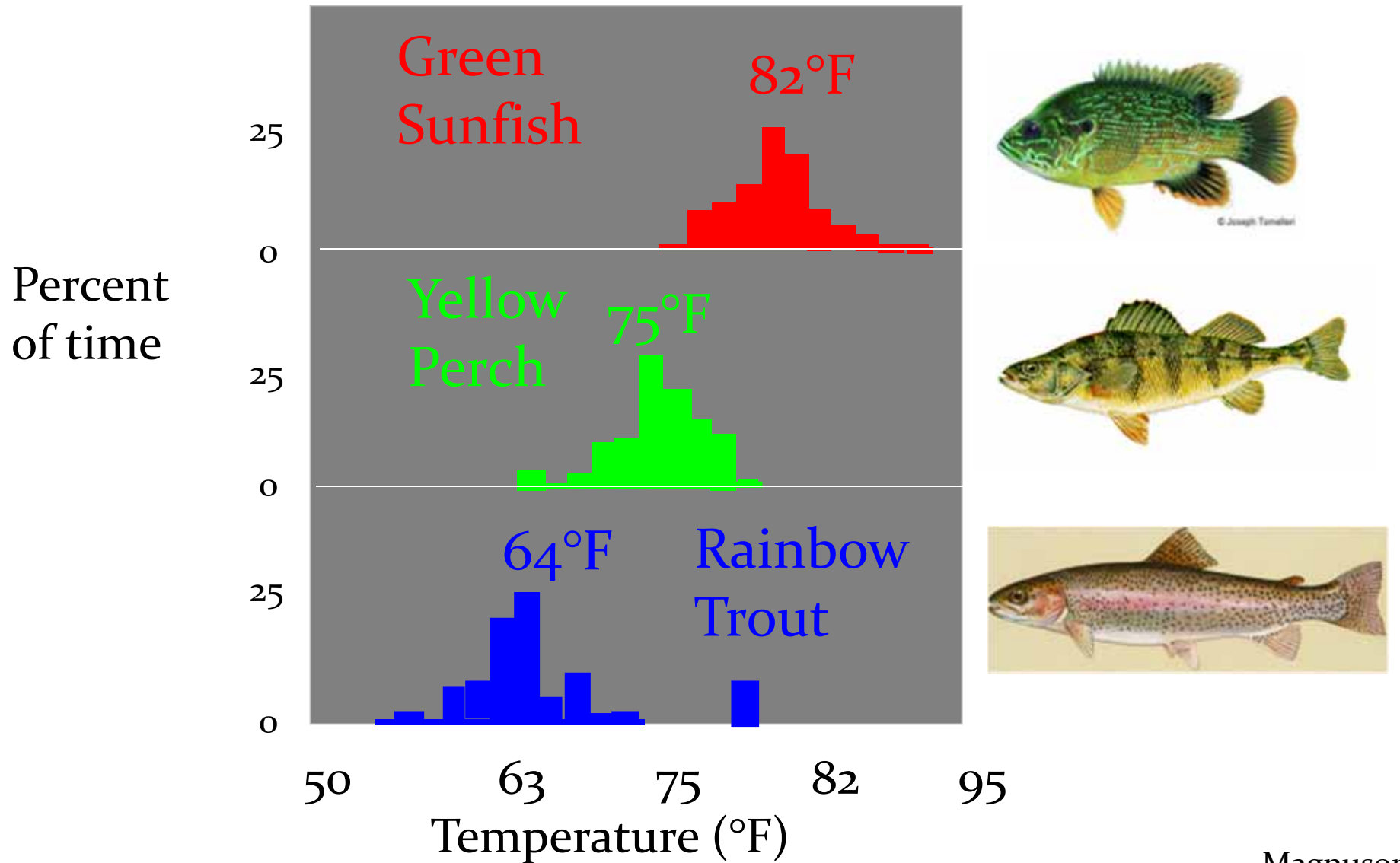


Hydrilla



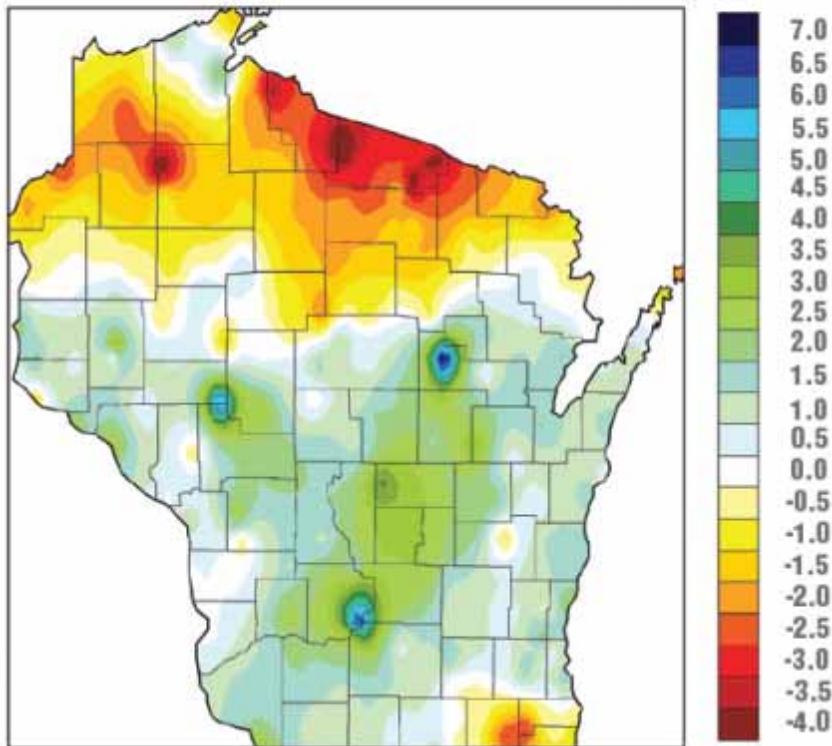
# Warmer Water Temperatures

Warm, Cool, and Cold Water Fishes

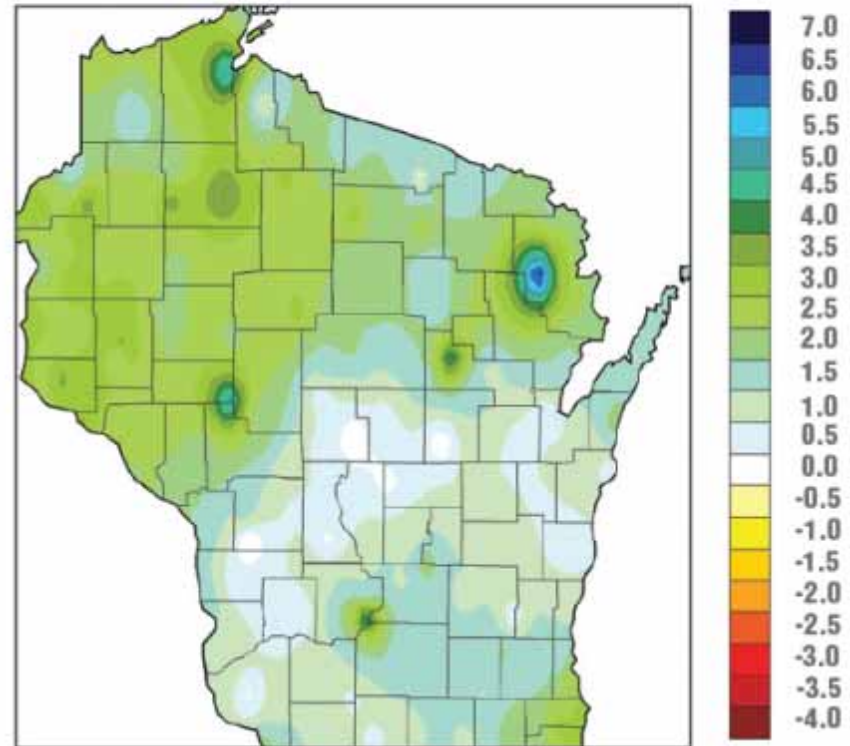


# Changes in Precipitation in Wisconsin: 1950-2006

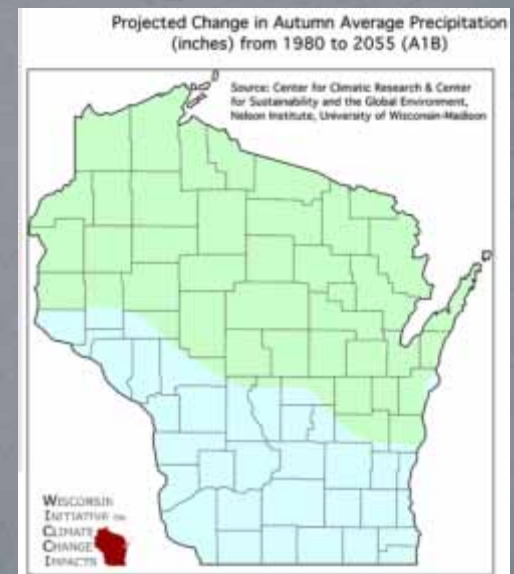
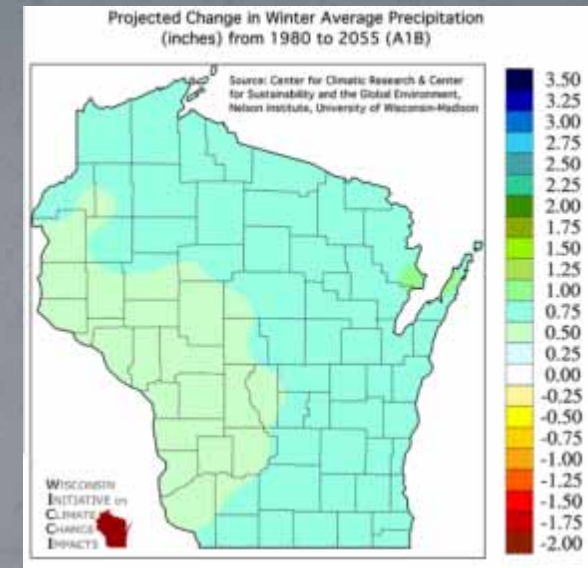
**CHANGE IN SUMMER AVERAGE PRECIPITATION  
(INCHES) FROM 1950 TO 2006**



**CHANGE IN AUTUMN AVERAGE PRECIPITATION  
(INCHES) FROM 1950 TO 2006**



# Seasonal Precipitation Predictions



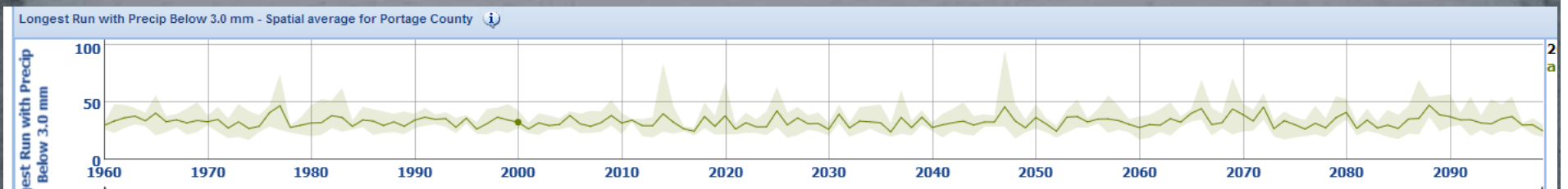
[http://ccr.aos.wisc.edu/climate\\_modeling/Wisconsin\\_Climate/](http://ccr.aos.wisc.edu/climate_modeling/Wisconsin_Climate/)

# Precipitation Predictions for Wisconsin: **More Extremes!**

## Number of Days with Precipitation above 3 inches



## Number of Days with Precipitation Below 3 mm



<http://cida.usgs.gov/climate/derivative/>

# Changes in Stream Flow and Precipitation 1950-2006

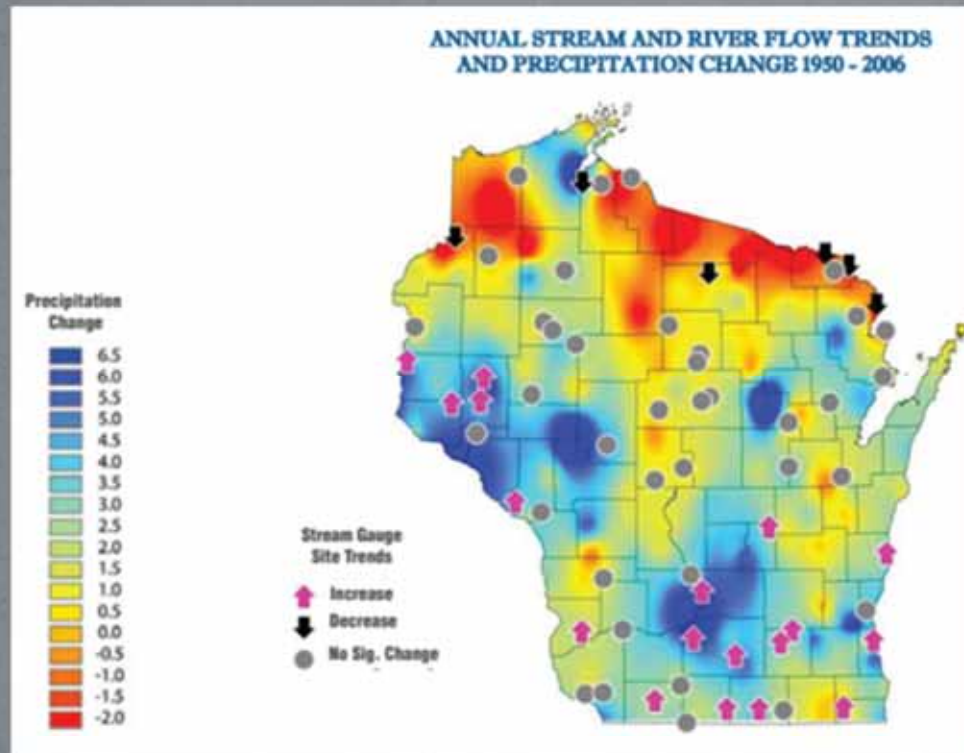


Photo:  
Barb Feltz

Little Plover River, Portage  
County, 2005



Photo: Roger L. Larson

Groundwater flooding in Spring Green, Wisconsin, July 12, 2008.

## Brook trout



Current



1.4°F = 44% loss



4.3°F = 94% loss



7.2°F = total loss

## Projected changes in mid-century fish distributions (stream miles)

Response of 50 common stream fishes to highest temperature scenario:

- All 3 coldwater species decline
- All 16 coolwater species decline
- 4 warmwater species decline
- 23 warmwater species increase

# References

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Water Resources in Wisconsin and Climate Change



## Water: Climate Change and Water

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You are here: Water » Science & Technology » Climate Change and Water » Midwest Climate Change and Water

# Midwest Climate Change and Water

- Water Home
- Drinking Water
- Education & Training
- Grants & Funding
- Laws & Regulations
- Our Waters
- Pollution Prevention & Control
- Resources & Performance
- Science & Technology
  - Analytical Methods & Laboratories
  - Applications & Databases
  - Climate Change & Water
  - Contaminants of Emerging Concern
  - Drinking Water Monitoring & Assessment
  - Research & Risk Assessment
  - Surface Water Standards & Guidance
  - Wastewater Technology
- Water Infrastructure
- What You Can Do



- Home
- Alaska
- Caribbean Islands
- Great Plains
- Midwest
- Montane
- Northeast
- Pacific Islands
- Pacific Northwest
- Southeast
- Southwest

The Midwest's climate is influenced by the proximity of the Great Lakes and the region's position in the middle of the North American continent. This location, far from the temperature-moderating effects of the oceans, contributes to large seasonal swings in air temperature—from hot, humid summers to cold winters.

Issues of particular concern in this region include extreme variability in precipitation and temperature and challenges in preserving the ecological integrity of the Great Lakes. For more information about the overall impacts of climate change in the Midwest, in addition to water impacts, visit EPA's main climate change website.

### Highlights of EPA and Partner Activities

EPA's energy management system for public water and wastewater utilities (PDF) (2 pp, 459K, About PDF) is being implement by states in Region 7 and has resulted in more than 14.5 million kilowatt-hours per year in energy savings.

### Change and Water Strategy Our Goals:



EPA programs in the Midwest region will strive to meet a number of goals, including understanding vulnerability of water-related infrastructure; improving the Great Lakes community's understanding of the ecosystem and population impacts of climate change; protecting ground water and surface water quality and quantity; and protecting vulnerable populations.

To learn more about the goals and strategic actions at the regional level, read the EPA water program's 2012 Strategy: Response to Climate Change.

### EPA Regions in the Midwest

EPA Region 7, including New York's

# NEWS + MEDIA

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- Stories
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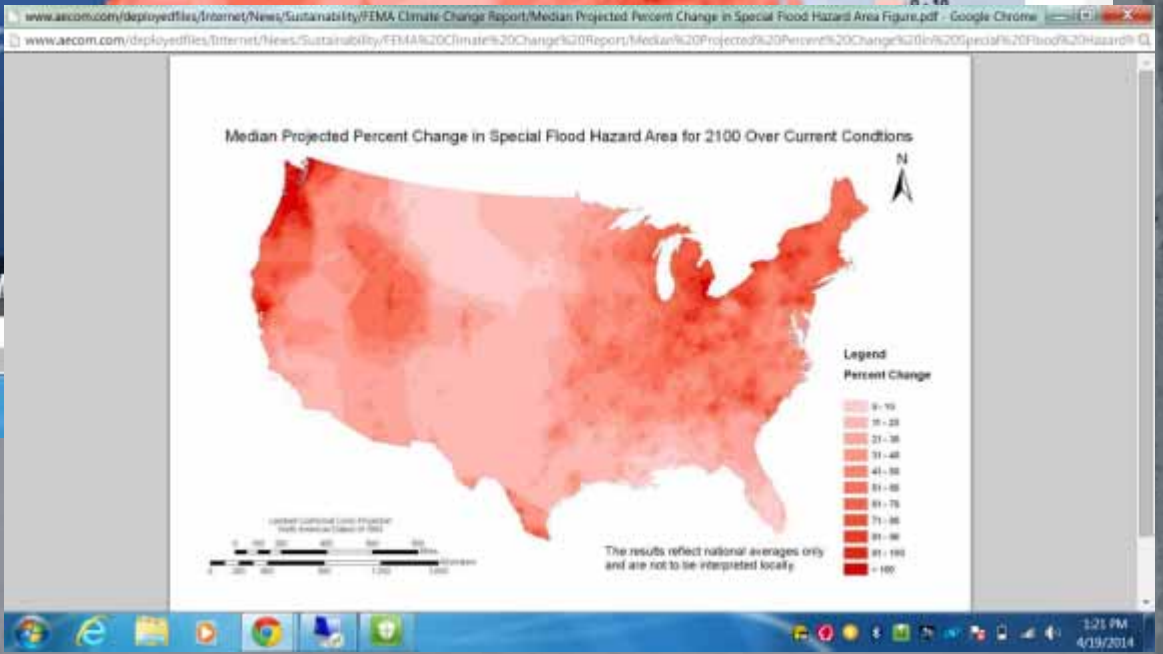
**The IMPACT of CLIMATE CHANGE  
and Population Growth  
on the National Flood Insurance Program  
Through 2100**

presented by  
Federal Insurance and Mitigation  
Federal Emergency Management Agency

presented by  
**AECOM**  
in association with  
Michael Baker Corp., Inc.  
Dewberry Consulting, LLP

June 2013

**AECOM releases FEMA**



# CLIMATE WISCONSIN STORIES FROM A STATE OF CHANGE

ABOUT THIS PROJECT  
CREDITS



## STORIES

Sugaring  
Farming  
Shipping  
Adaptation & Mitigation

Phenology  
Extreme Heat  
Ice Fishing

Fly Fishing  
Polaron  
Birkebeiner

## INTERACTIVES

Temperature Change  
Ice Cover

Connect us with your stories and comments.


Climate Wisconsin is a project of Educational Communications Board

with funding from Corporation for Public Broadcasting

# Trout Fishing and Climate Change

CLIMATE WISCONSIN STORIES FROM A STATE OF CHANGE ABOUT THIS PROJECT ENGAGE

PRE STORY




0:21

SHARE

## FLY FISHING

"The two best times to fish is when it's open and when it isn't," said biologist Patrick Westburn. Wisconsin's 231,000 anglers live the same way. The state's 13,000 miles of trout streams—80% of them rated high-quality—are home to some of the best trout fishing in the U.S. The concern when progressive Trout Unlimited angler and Wisconsin's trout management programs see "an example of habitat stewardship that other states should emulate." In particular, the Driftless Area—an unglaciated landscape found in southwest Wisconsin, southeast Minnesota, northeast Iowa and northwest Illinois—offers some of the best trout fishing opportunities in the state. A report commissioned by Trout Unlimited found that recreational angling in the Driftless Area generates \$1.1 billion annually. In addition to economic benefits, trout fishing has led to new culture, especially among those who cast themselves like into the currents and seek in anticipation to hear that winking sound of a "fish up."

How will climate change affect fly fishing in the Driftless Area? Researchers at the University of Wisconsin-Madison predict that the Driftless Area can expect a 5.1°F (3.5°C) increase in annual average temperatures by 2050, with a 2.5°F (1.4°C) and 6.5°F (3.6°C) increase in average annual highs and lows, respectively. The predicted increase in average annual surface air temperatures will in turn increase stream water temperatures to some degree. However, some streams will likely be able to buffer the warming effect by an increase in groundwater flow from predicted increases in precipitation, to assume that do not have a buffering capacity, the increase in water temperature could lead to stress in species adapted to cooler water. Other warmer-water species may be able to expand their previously out of



LOCATE THE DRIFTLESS AREA

## TEACHING TIPS

1. Learn more about Wisconsin's trout streams and how to be "fish" to ensure both trout & fishermen the best opportunity to get out!
2. We just finished our teaching tool so get it first with over 100 copies of this tool! We're offering to help create water quality of our rivers and streams and to help Wisconsin's trout streams be the best!
3. Learn more about climate change effects on our community, choose a local water quality issue and do research on what you can do to help. We'll be there to help you with it!

<http://climatewisconsin.org/story/fly-fishing>