

# Climate: Trends & Implications for Recreation & Tourism

*Presented Thursday, September 25, 2003  
At TICOM's Quarterly Meeting in Okemos, MI*

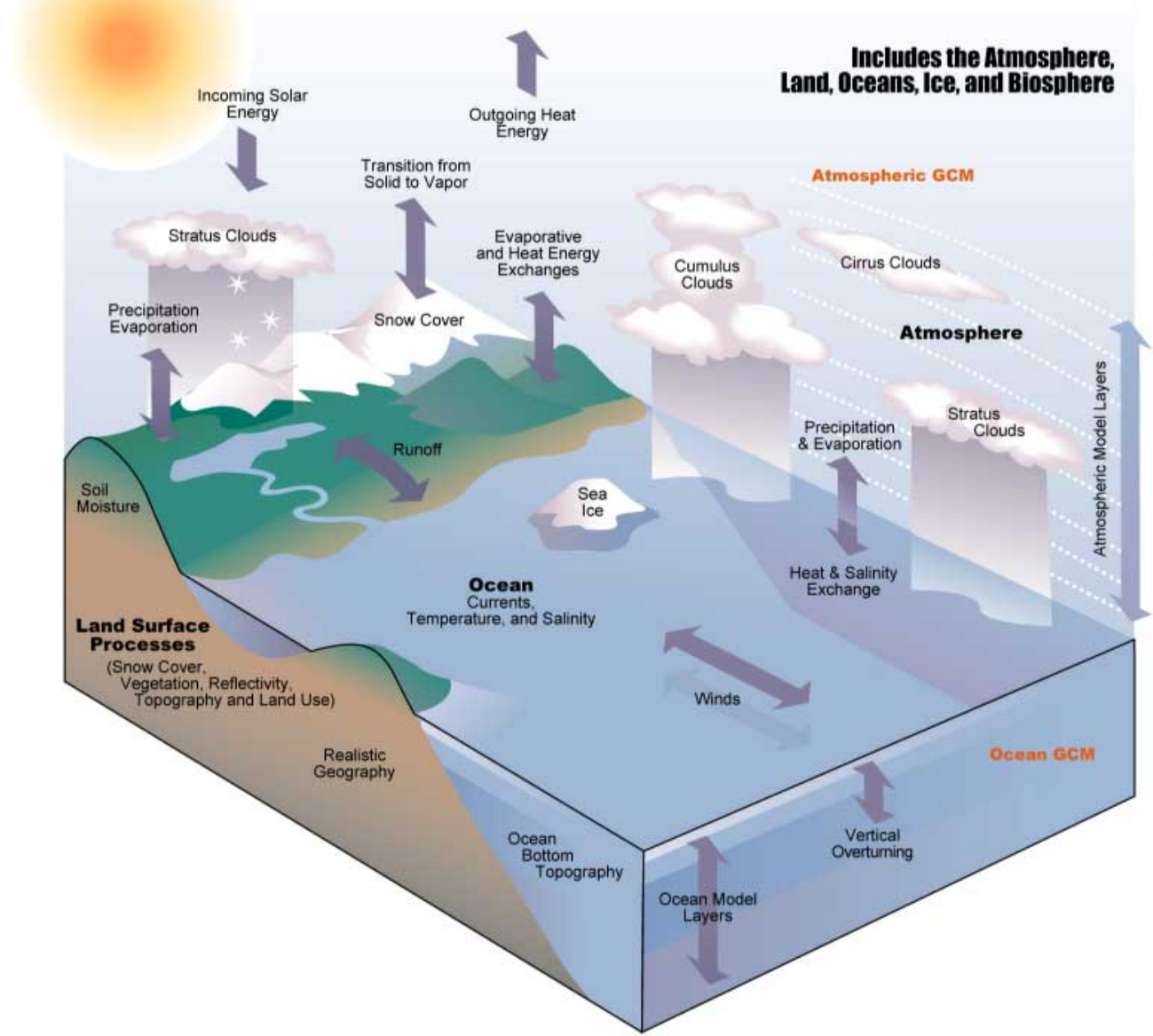
Donald F. Holecek, Ph.D. & Lori A. Martin  
Michigan State University  
Travel, Tourism & Recreation Resource Center

Research Colleagues: Sarah Nicholls, Ph.D.,  
& Charles Shih, Ph.D. Student

# Presentation Overview

- 1) What do we “know” about climate change in the Great Lakes Region?
- 2) What is the Pileus Project and what are the objectives of its research team?
- 3) How will the demand models being developed by Pileus Project researchers help recreation and tourism businesses in Michigan cope with weather variability and climate change?

# Modeling the Climate System



**Includes the Atmosphere,  
Land, Oceans, Ice, and Biosphere**

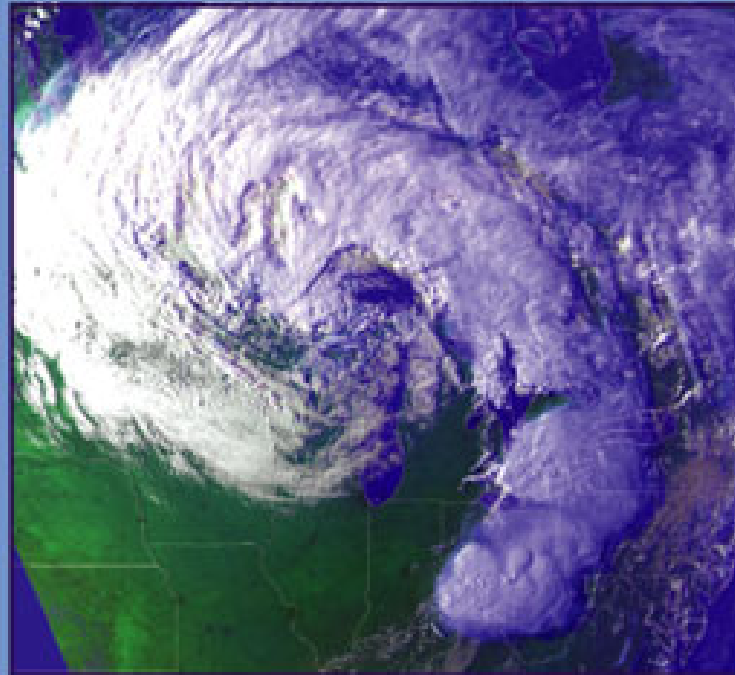
1) What do we “know” about climate change in the Great Lakes Region?

# Great Lakes Regional Assessment

- \* The Global Change Research Program in the U.S. EPA's Office of Research & Development initiated this assessment process in 1998.
  - To examine the potential consequences of climate variability & change for the Great Lakes region
  - To translate scientific information into timely & useful insights that inform policy & resource management decisions, despite the existence of scientific uncertainties
  - A stakeholder-oriented process, which included analysis of adaptation options to improve society's ability to respond effectively to risks & opportunities as they emerge

# Climate Change in the Upper Great Lakes Region

*A Workshop Report*



May 4-7 1998

Atmospheric, Oceanic, and Space Sciences Department

University of Michigan • Ann Arbor, Michigan

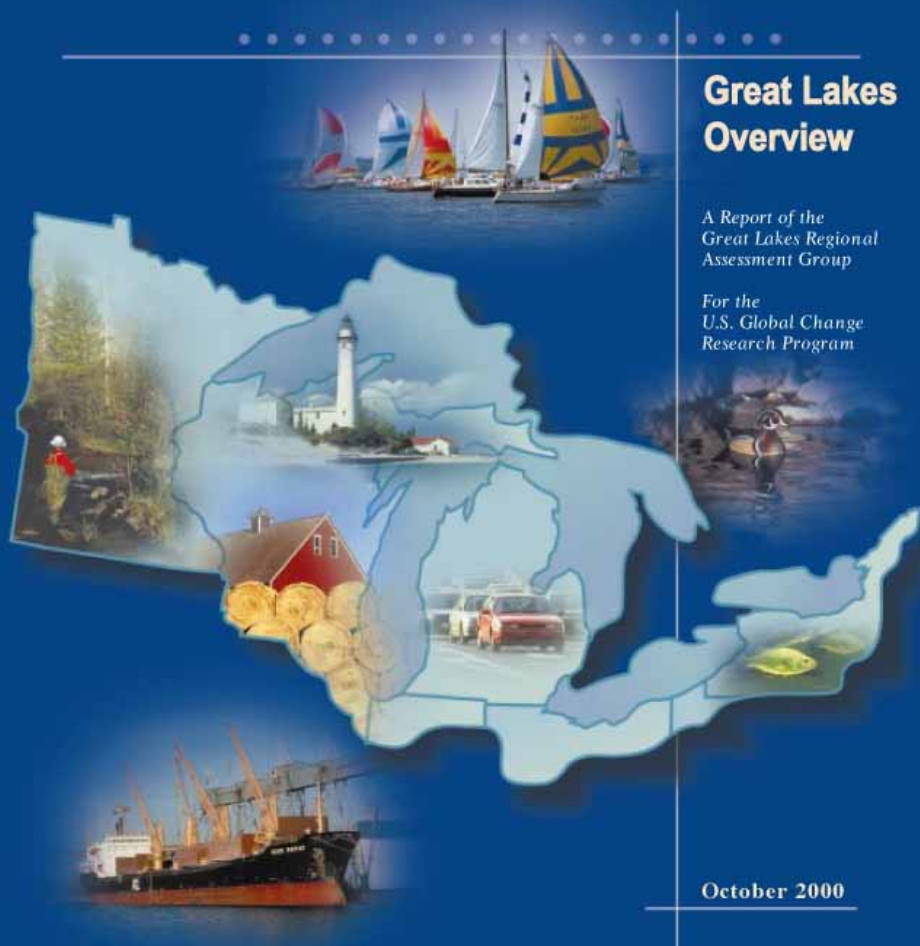
# GLRA Conclusions

- \* The latest, most reliable projections of future climate change combine 100 years of historical data for Michigan with the most up-to-date general circulation models (GCMs) of the Earth's climate system.
  - By the end of the 21<sup>st</sup> century, temperatures are projected to rise 6-10°F in winter and 7-13°F in summer
  - Seasonal precipitation is likely to increase by 10-25% in winter and possibly changing in summer by +20 to –5%.

- By 2030, Michigan summers may resemble those of Kentucky in terms of average temperature and rainfall.
- However, by the end of the century, the Michigan summer climate will generally resemble that of current eastern Arkansas.
- Winters will also change, such that by century's end, they may be much like those in current-day Missouri.

# PREPARING FOR A CHANGING CLIMATE

*The Potential Consequences  
of Climate Variability and Change*



# GLRA's Assessment of Impact to Recreation & Tourism in Michigan

- \* Millions of anglers will be affected by range shifts, loss of habitat, & increases or declines of their preferred catch.
- \* Warmer winters mean trouble for states such as Michigan where winter recreation has long been an integral part of people's sense of place. Communities & businesses dependent on revenues from cross-country or downhill skiing, snowmobiling, and, especially, ice fishing could be hard-hit.

- \* Loss of habitat or food resources for migratory songbirds, shorebirds & waterfowl will affect Michigan's multimillion-dollar bird watching & hunting industries.
- \* The summer recreation season will likely expand as temperatures warm further, but extreme heat, heavy downpours, elevated ozone levels & possible increases in risk from insect-borne & waterborne diseases may dampen outdoor enthusiasm.

2) What is the Pileus Project and what are the objective of its research team?

# Pileus Project

A stylized graphic illustration of a landscape. At the top, a light blue arc represents a rainbow. Below it are several rounded, overlapping shapes representing clouds in shades of light blue and teal. The background behind the clouds is a dark teal color.

Climate Science for  
Decision Support

# What is the Pileus Project?

- \* This project is funded by a 3-year U.S. Environmental Protection Agency (EPA) research grant.
- \* The research team is comprised of geography, tourism & agricultural economics researchers from Michigan State University.
- \* One group will be examining the impact of climate change on agriculture (tart cherries, wheat & corn), while the other examines the impact of climate change on outdoor recreation/tourism (downhill skiing, camping & general tourism volume).

# Tourism Project Overview

- \* Objective: To develop tools that tourism & recreation businesses in Michigan can use to incorporate climate variability and change into their planning activities
- \* Focus Industries: Downhill skiing and snowboarding, camping, and general tourism in NW Michigan
  - Why did we select these particular industries?
- \* Dependent Variables in Models: Numbers of lift tickets sold, numbers of camping nights, and MDOT traffic counts from NW Michigan

# Overview of Research Strategy

- \* Literature review
- \* Develop conceptual model, identify data needs & identify cooperators
- \* Establish general stakeholder group & technical stakeholder advisory group
- \* Identify data sources & develop databases
- \* Develop "pilot" empirical model
  - Volume of capacity =  $f$  (selected economic, demographic, technology & weather/climate variables)

- \* Collect primary data, assess conceptual variables and identify probable missing variables
- \* Develop and field test "refined" empirical model
- \* Critical review by stakeholders
- \* Develop operational model for stakeholder application
- \* Evaluation and adaptation of models

# Literature Review Summary

The over-riding themes of the existing literature indicate that:

- \* Climate change could dramatically change recreation and tourism as we now know it.
- \* This is an understudied area that warrants further investigation.
- \* Barely any research has attempted to relate demand for recreation/tourism to changing climate conditions.

# Example of Stakeholder Involvement: Meetings w/Ski Resorts

- 1) Develop ski industry **stakeholder/researcher relationships**
- 2) Introduce what we are striving to achieve with our project and what we have accomplished to-date
- 3) Discuss our commitment to maintaining confidentiality of individual stakeholder data
- 4) Examine and discuss the configuration of our proposed **decision-support model**
- 5) Explain how stakeholders will be able to utilize the model for planning purposes
- 6) Review and discuss the **types of data** that should be input into the model we are developing and whether that data is available

3) How will the demand models being developed by Pileus Project researchers help recreation and tourism businesses in Michigan cope with weather variability and climate change?

Stakeholders will be able to use the Web-based decision support tools, developed by the Pileus Project research team, to help them develop strategic plans for operational sustainability in the face of a changing climate.

# Benefits of the Pileus Project

- \* The development of web-based tools that stakeholders & policy decision makers can use to evaluate the impacts of various climate change scenarios on volume of business – in order to help them make decisions on how to act and/or adapt
- \* Cultivation of researcher-stakeholder relationships
- \* Active participation of stakeholders to evaluate the impacts of climate change on their sector(s) of interest
- \* A better understanding of regional impacts from long-term climate change & short-term variability

## Contact Information:

Don Holecek & Lori Martin  
Michigan State University  
Travel, Tourism & Recreation Resource Center  
172 Natural Resources Bldg.  
East Lansing, MI 48824-1222  
Phone: (517) 353-0793  
[dholecek@msu.edu](mailto:dholecek@msu.edu) or [marti362@msu.edu](mailto:marti362@msu.edu)