

Navigating Global Warming in the Great Lakes

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Headlines:

- Lake Superior record low lake levels
- Worsening drought conditions in the West
- Lake Okeechobee hits record low levels
- Arctic ice sheet in decline
- Closer to home: Poor ice forces cancellation of Golden Rainbow Ice Fishing Contest (Forest Lake, MN)

So, who cares?

- U.S. Navy: Planning for Naval operation in an Ice Free Arctic.
- Canada is positioning itself to deal with commercial shipping through the Northwest Passage.
- The recreation and tourism business predicts dramatic changes and begins planning for change and reinvestment.

Global Change and Tourism: one strategy for adaptation

- Planning for change
 - Climate modeling scenarios
 - Predicting range of impacts
 - Selecting prudent adaptation strategies
 - Examining BOTH threats and opportunities
 - Considering social & behavioral change and potential population movement (economic shift)
 - Modifying long-term investment plans
- Mitigation strategies were not considered (slowing impacts of existing climate trends)

“...A changed climate could create new opportunities, as well as some important challenges. Assessing the risks and opportunities to both winter and warm weather activities is essential for understanding the net impact of climate change...”

Dr. Daniel Scott, University of Waterloo, Ont.

Predicting the future...what will I do next?

- There is a great deal of uncertainty in the science of climate predication and multiple models exist.
- Inter-annual climate variability creates confusion
- Our best efforts center around 20-30 year averages
- Our projections assume a 30 to 50 year baseline period (this is still a very short time)
- Mean temperature changes are far less informative than “seasonal shift, or physical change” (precipitation, days over 80 F, ice thickness, etc.).

Some level of climate change is unavoidable...

- Regardless of how successful our efforts are to reduce human impacts.
- Consequently, climate change adaptation is a necessary planning strategy for governments and businesses.

Impacts for Great Lakes

Maritime Trade

- **Period of ice-in to ice-out getting shorter, predicted to be +9-days/decade**
- **Ice is thinner (year-round shipping?)**
 - Timing for fleet maintenance
 - Crewing and general staffing
 - New Markets (increased seaway pressures*)
- **Fewer, but more dramatic storm events**
 - Dredging and impacts on overall fleet lift capacity
 - Pollution/Erosion (higher cost for dredging)
 - Stress on Break Waters and protective structures
- **Lower and Higher water levels predicted (Upper and Lower Lake variations)**
 - New vessel designs & facilities adaptation
 - Financing for new equipment
 - dock modifications, etc.

**Variation is the
only constant:**

- Observe**
- Communicate**
- Plan**
- Adapt**