

# Climate Change, Water Levels and Ontario Tourism: Risks and Opportunities

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**ENVIRONMENT**

[environment.uwaterloo.ca](http://environment.uwaterloo.ca)



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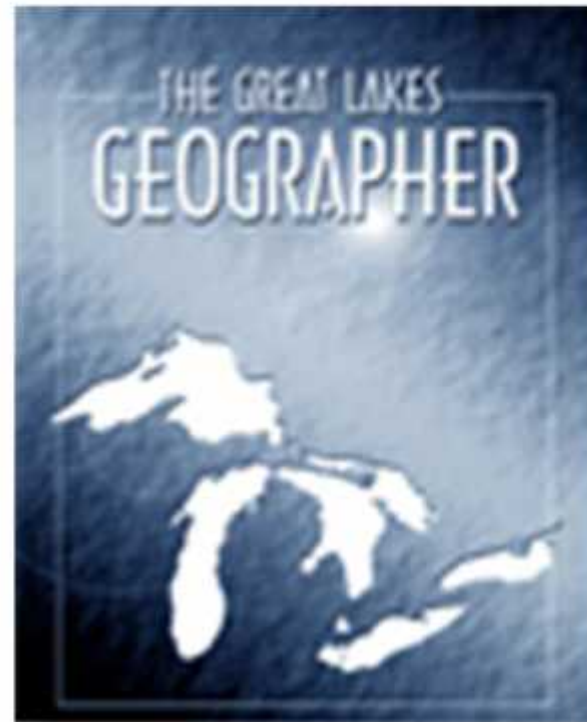


# Outline

- Extending the Timeline  
Climate Change and Tourism in RTO7
  1. Altered Recreation/Tourism Seasons
  2. Nature-based Tourism Assets
    - *water level projections and impacts*
- Is Tourism Future Ready?
  - ... *the climate change adaptation imperative*

# ONTARIO COTTAGES: IMPACTS AND RESPONSES TO THE GREAT LAKES SHORELINE HAZARD

Daniel J. Scott



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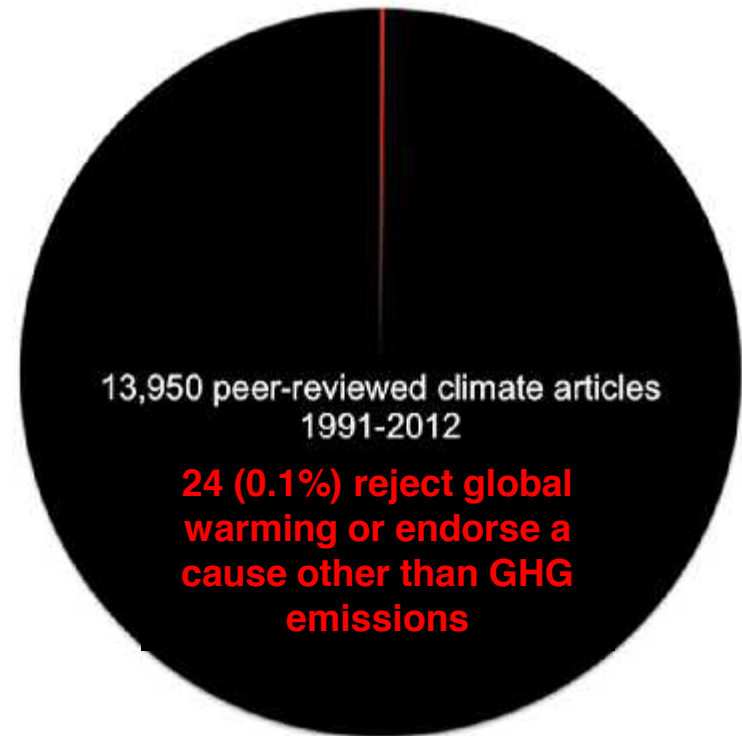


## Innovative:

Valuing innovation means ***we strive to be on the leading edge.*** Creativity, experimentation and a willingness to ‘push the envelope’ characterize our approach to ***opportunities and challenges*** alike. Although we do not fear failure – rather, we embrace it as a means to continuously improve – we will always ***mitigate risks*** by making intelligent and disciplined decisions.

***... get future ready –  
putting climate change on the radar***

# 'Clearing the Air' on Climate Change

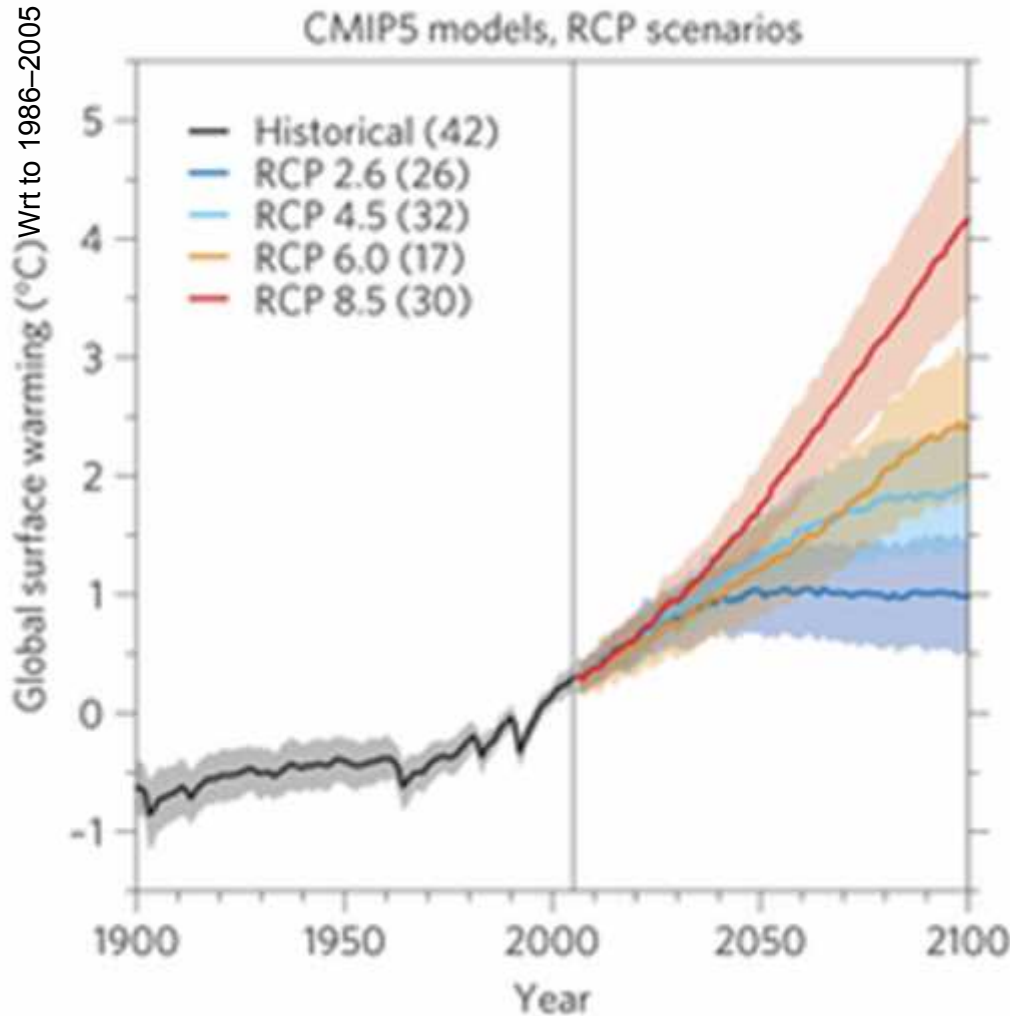


# Global Temperature Projections

20<sup>st</sup> century warming  
+0.8° C

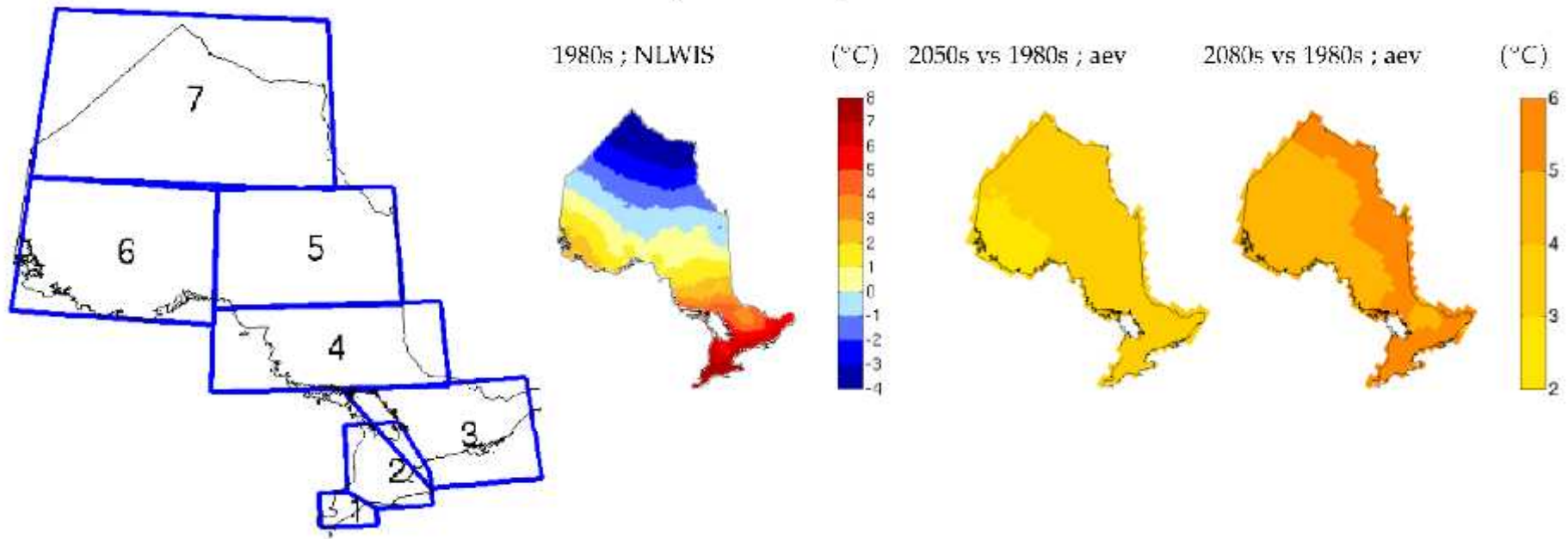
21<sup>st</sup> century warming  
+1° C to +4.2° C

Current emissions  
trajectory slightly higher  
than 'worst case' scenario



# Climate Change Projections for Ontario

Mean Daily Mean Temperature

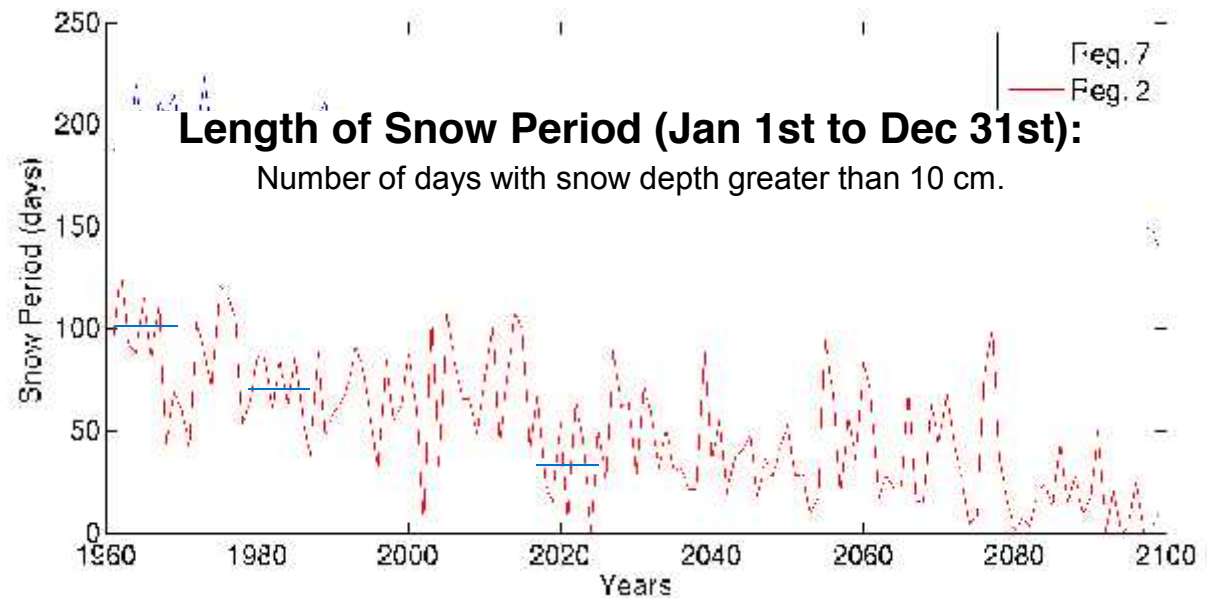


 [www.ouranos.ca/Ontario/Results\\_html/Rapport.pdf](http://www.ouranos.ca/Ontario/Results_html/Rapport.pdf)

# Altered Tourism Seasonality: Net + or – for RTO7 ?



# Winter Season Risks

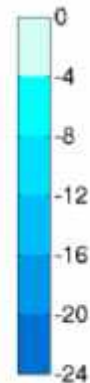


## Mean Temperature of the Coldest Quarter

1980s ; NLWIS



(°C)



2050s vs 1980s ; aev



2080s vs 1980s ; aev



(°C)



# Climate Change Impact on Ski Seasons

(with advanced snowmaking)



## Thunder Bay

	<u>2020s</u>	<u>2050s</u>
Best Case	-2%	-4%
Worst Case	-17%	-36%

## Mont Tremblant

	<u>2020s</u>	<u>2050s</u>
Best Case	-1%	-3%
Worst Case	-11%	-28%

## Collingwood

	<u>2020s</u>	<u>2050s</u>
Best Case	-5%	-8%
Worst Case	-17%	-44%

**Demand Implications**  
**2050s Analogue (2001-02)**  
skier visits down 15% OSRA wide

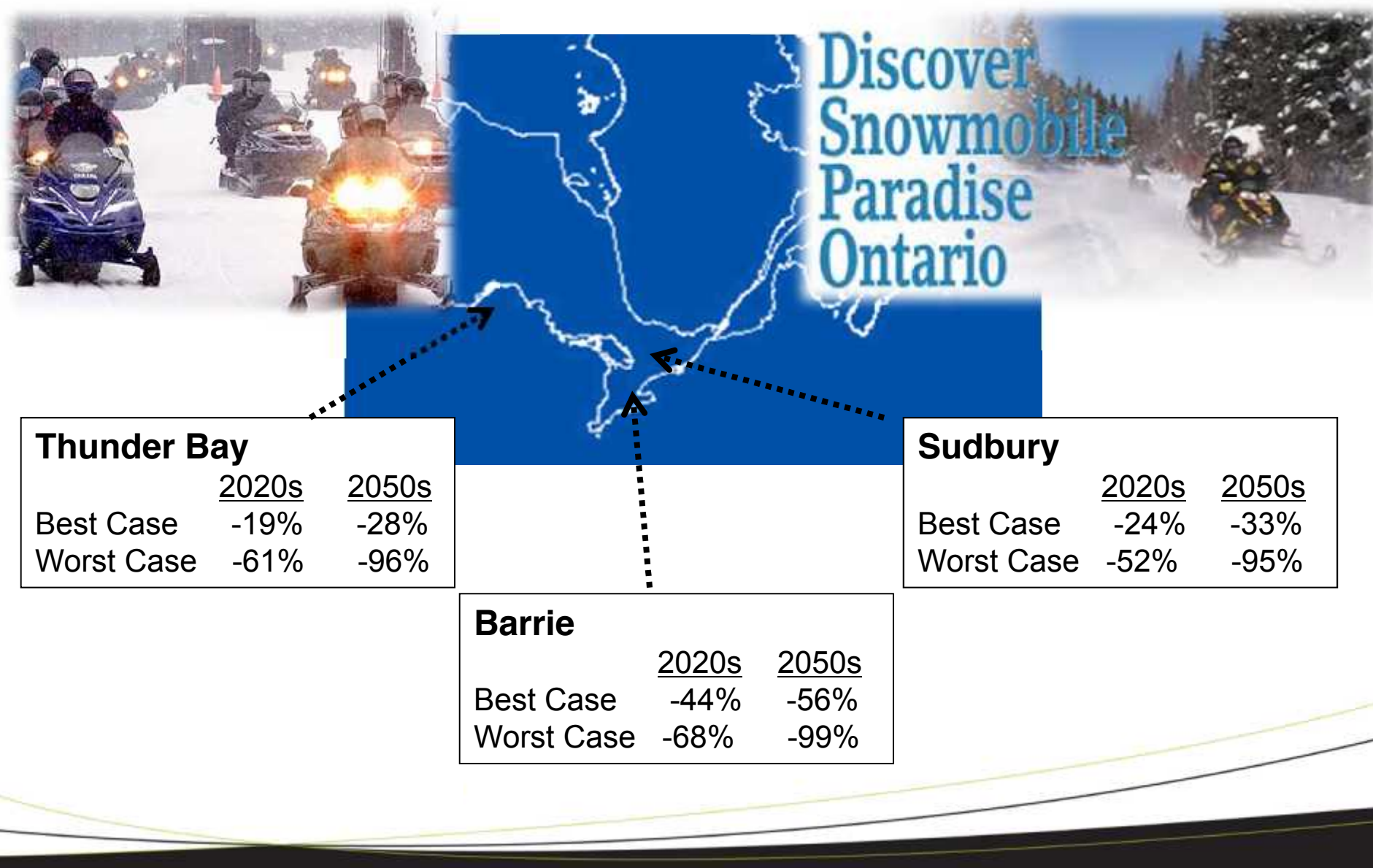
# Implications of Ontario Ski Market Contraction and Consolidation

- Long-term demand if lose beginner ski areas near urban markets?
- Can continued Blue Mountain expansion make up for lost Provincial capacity?
- Real-estate values?



**Federal Reserve Bank of San Francisco**  
study (2010) revealed climate/snow variability has begun to influence vacation home real-estate values at ski destinations in Western North America.

# Climate Change Impact on Snowmobile Seasons (snowmaking adaptation not feasible)



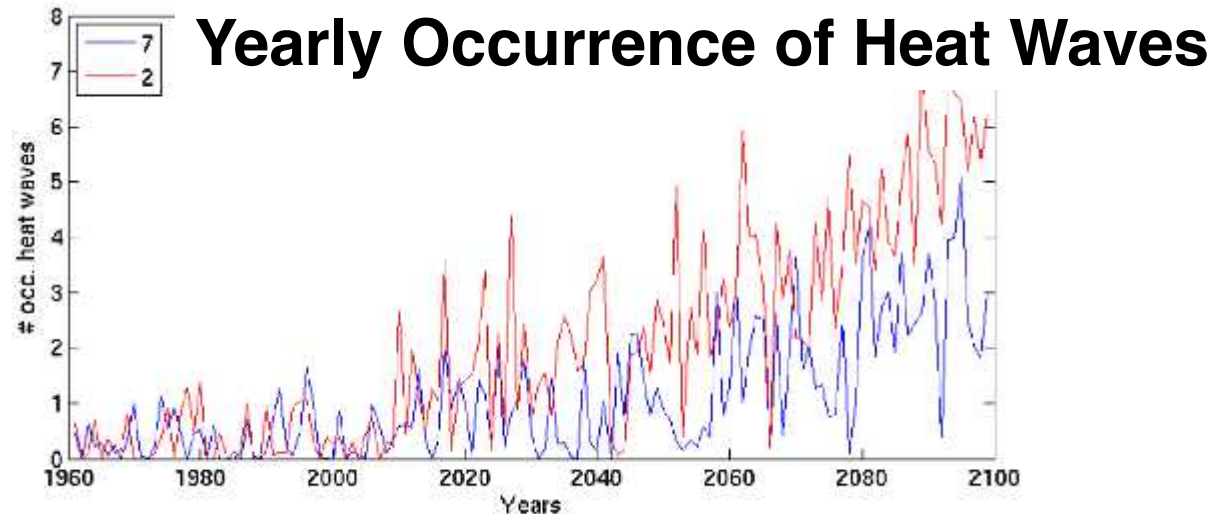
# The Last Generation of Snowmobile Tourism?

- Public safety hazard
- Volunteer liability costs
- Continued public investment in trails?
- Limited adaptive capacity
  - Reroute trails away from water crossings
  - Transition to ATV trail tourism

‘The Extinction of  
Snowmobiling by 2050’  
*TripAtlas.com – March 2008*



# Green/Summer Season Opportunities

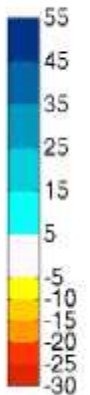
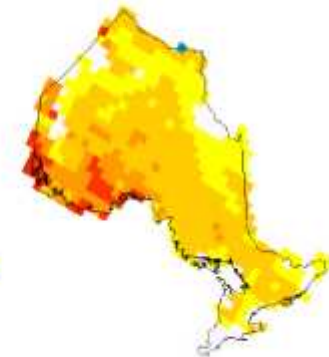
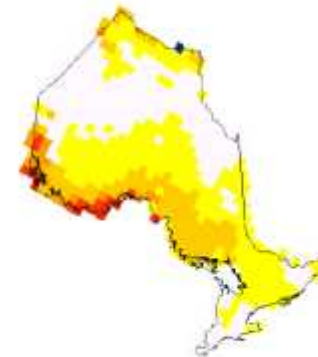


## Summertime Soil Moisture

2050s vs 1980s ; aev

2080s vs 1980s ; aev

(%)



# Climate Change Implications for Visitation to National and Provincial Parks



## Projected Increases in National Park Visitation

	<u>2020s</u>	<u>2050s</u>
Ontario	+5 to 14%	+7 to 31%

## Projected Increases in Ontario Park Visitation

System-Wide	+11 to 27%	+15 to 56%
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# Beach and Water Sports Seasons



## Beach Use Season–Georgian Bay

Current 152 days  
2020s 161 to 182 days  
2050s 166 to 216 days



## Swimming Season–Georgian Bay

Current 59 days  
2020s 76 to 99 days  
2050s 83 to 135 days



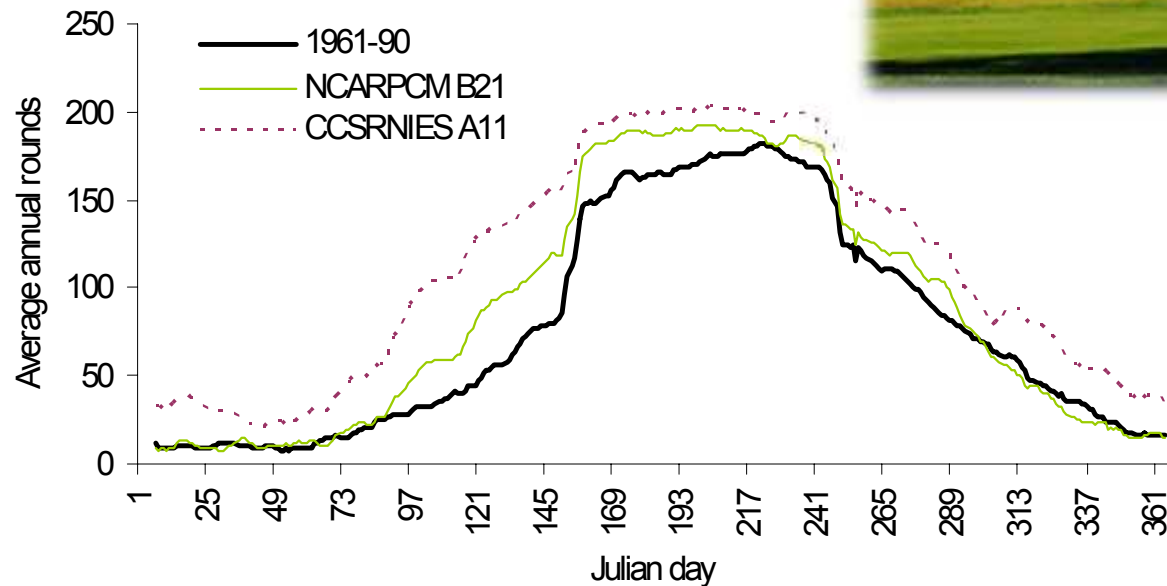
## Warmer Summer Temperatures and Maintaining Water Quality



# Changes in Golf Season Length and Rounds Played (Orillia Area)

## Season Length

Current	192 days
2020s	202 to 218 days
2050s	202 to 229 days



## Rounds Played

2020s	+21 to 35%
2050s	+25 to 49%

# Increased Water Use Pressures



## Ontario Allied Golf Associations

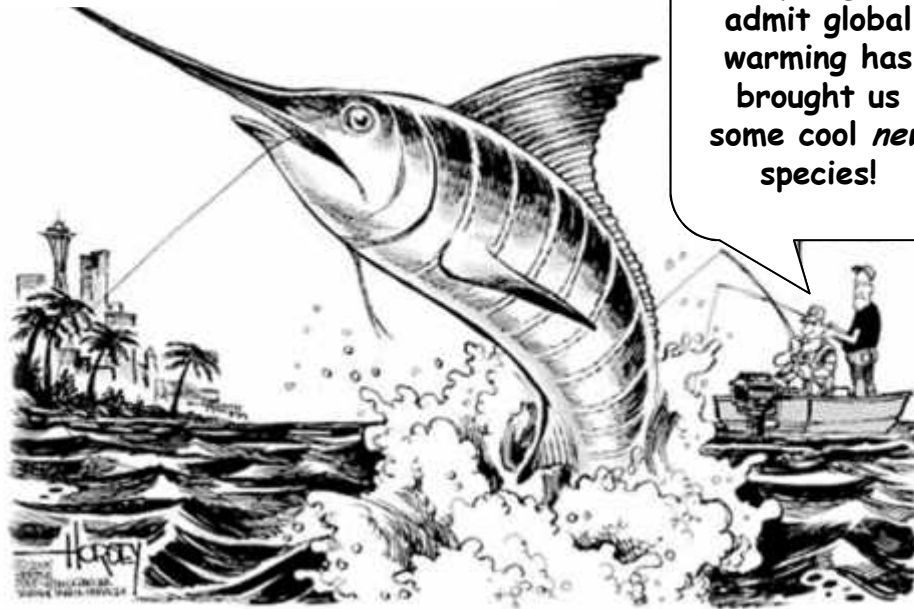
c/o Royal Canadian Golf Association • 1333 Dorval Drive, Oakville Ontario • L6M 4X7

### GOLF AND THE ENVIRONMENT

A briefing report to the Premier of the Province of Ontario, the Minister of the Environment and Members of the Provincial Parliament

# Nature-Based Tourism Assets

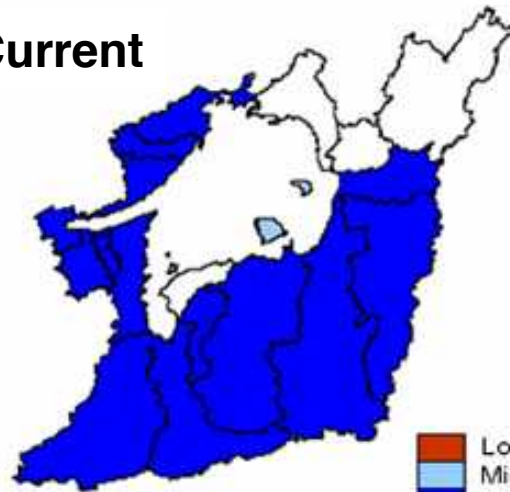
## Club Muskoka...2050 ?



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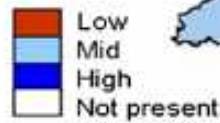
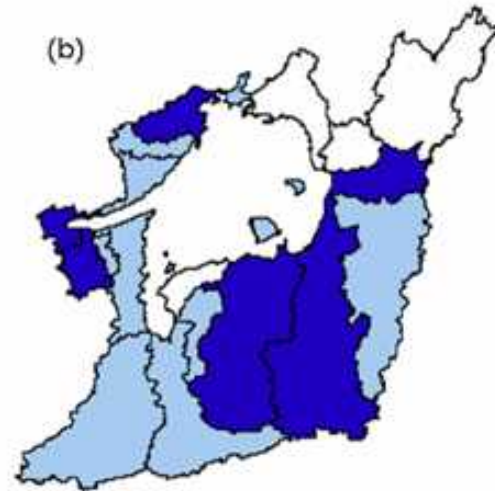
# Likelihood Watersheds will Retain Coldwater Fish Species

Current

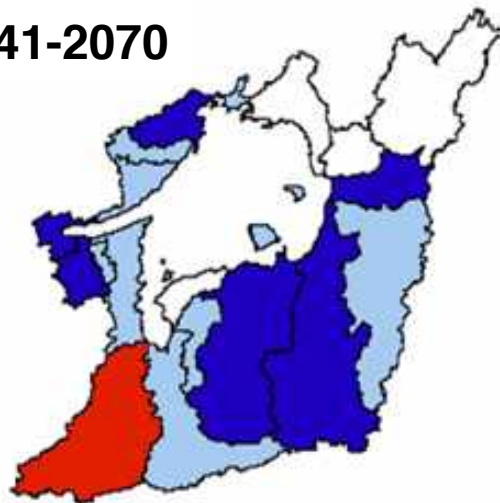


(b)

2011-2040

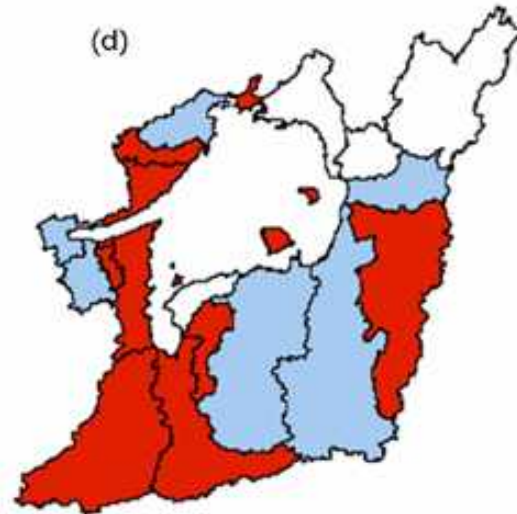


2041-2070



(d)

2071-2100



# Great Lakes Water Levels:

## *Beaches, Boating, Ferries*



# Survey of 58 Marina Owners in 2009: Potential Closures Under Lake Level Scenarios

## Scenario One: 30 cm decline

- 8 marina closures
- Loss of 613 boating slips

## Scenario Two: 45 cm decline

- 17 marina closures
- loss of 1614 boating slips

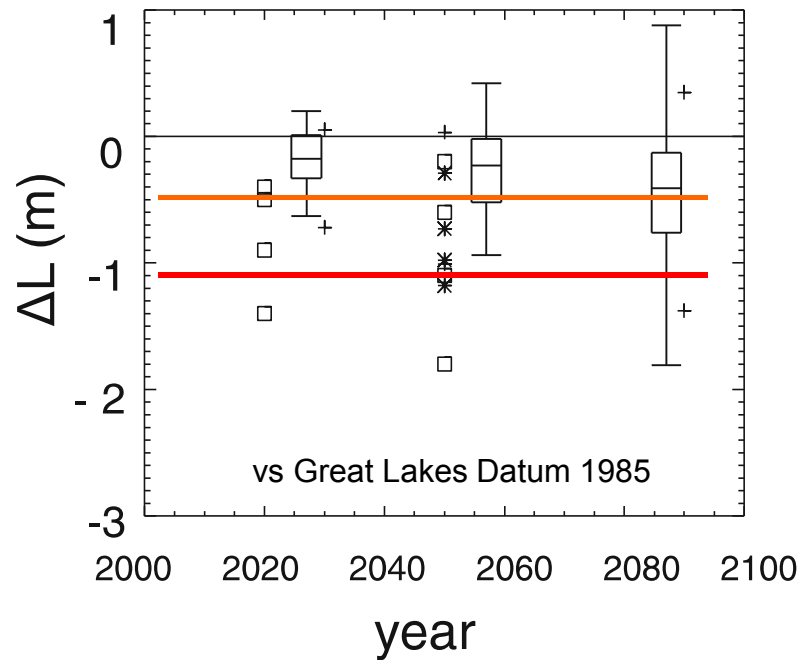
## Scenario Three: 60 cm decline

- 24 marina closures
- Loss of 2306 boating slips

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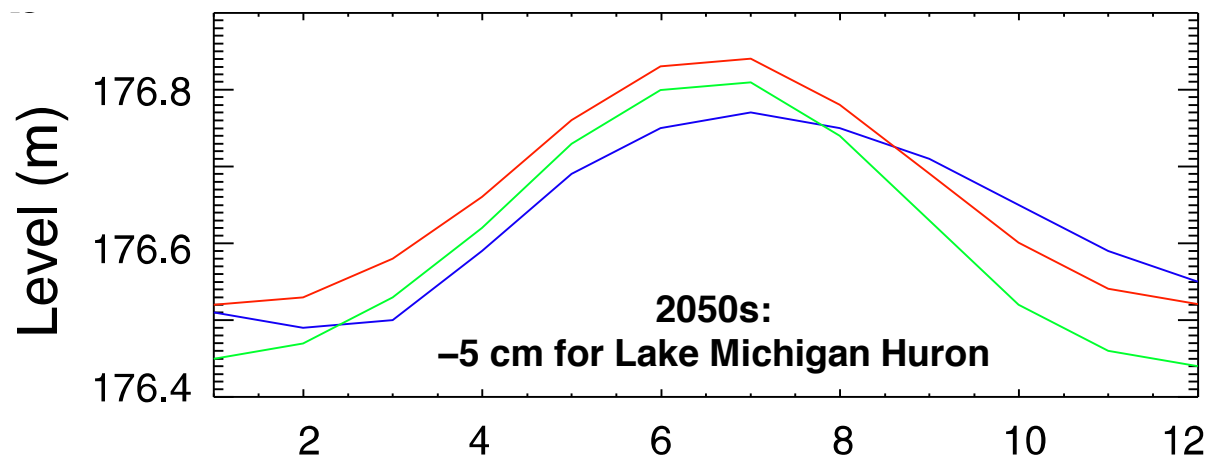


## Pre-2010 Studies (Michigan-Huron)



# Water Level Projections Under Climate Change

## Lake Level Mean Seasonal Cycle Lake Michigan – Huron (MacKay and Seglenieks 2013)



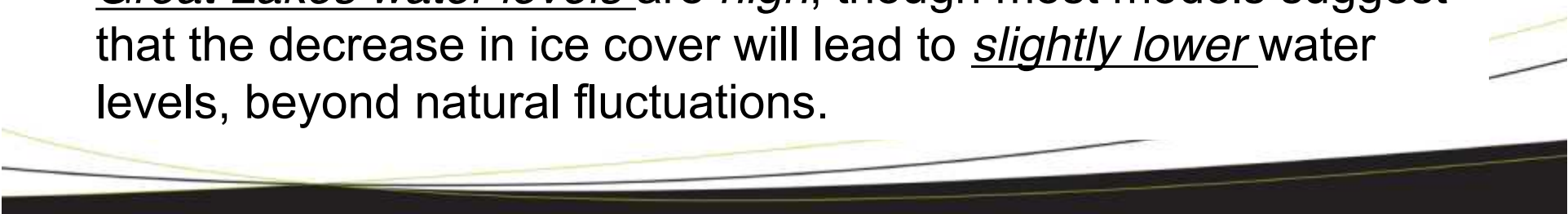
Blue-observed 1962–1990  
Green-GLRCM 2021–2050

# 2013 US National Climate Assessment: Chapter 18 - Midwest

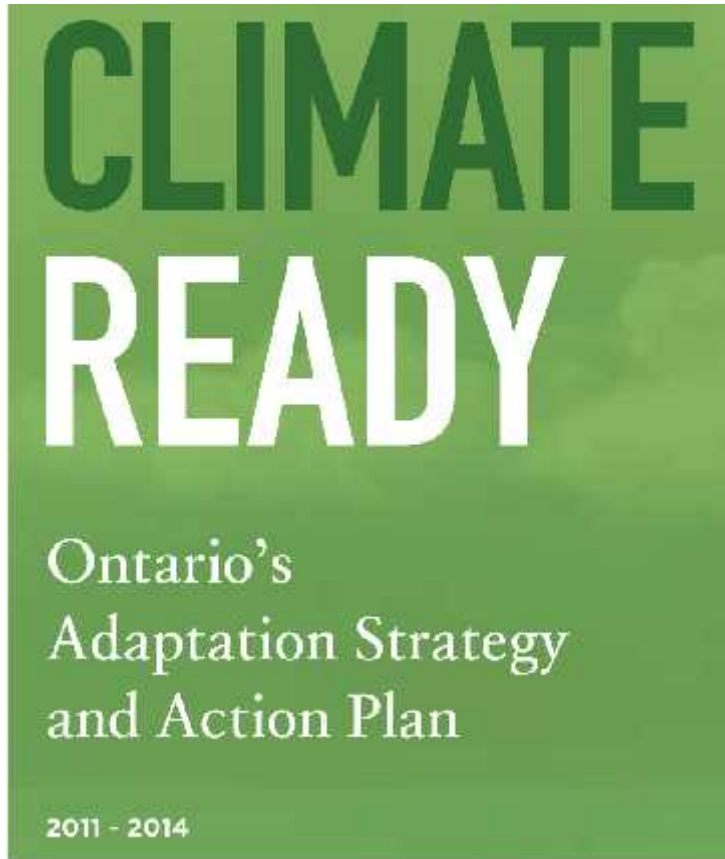
## **Key Message #4** (very high confidence):

Climate change will exacerbate a range of risks to the Great Lakes region, including changes in the *range and distribution* of important commercial and *recreational fish species*, increased invasive species, *declining beach health*, and harmful blooms of algae. Declines in ice cover will continue to lengthen the commercial navigation season.

(high confidence for lake levels changing): *Uncertainties about Great Lakes water levels are high*, though most models suggest that the decrease in ice cover will lead to *slightly lower* water levels, beyond natural fluctuations.



# Is Tourism Ready?



## ACTION 15

### PILOT ADAPTATION STRATEGIES IN THE TOURISM SECTOR

The Government of Ontario is encouraging actions to help build the climate-resiliency of the tourism sector through initiatives to expand summer tourism.

***... need to understand risks and opportunities first!***

# Headlines Matter:

## Misinformation Can Impact Destination Image / Brand



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Interdisciplinary Centre on Climate Change



# Extras for Q&A

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# Most Preferred Future Water Level Scenarios Among Cottage Owners

Body of Water	Long Term Maximum	Long Term Average	Long Term Minimum
Lake Superior	no change	no change	no change
Lake Huron	>25 cm lower	5-10 cm higher	>25 cm higher
Lake Erie	>25 cm lower	no change	no change
Lake Ontario	no change	no change	>25 cm higher
St. Lawrence River	no change	no change	>25 cm higher

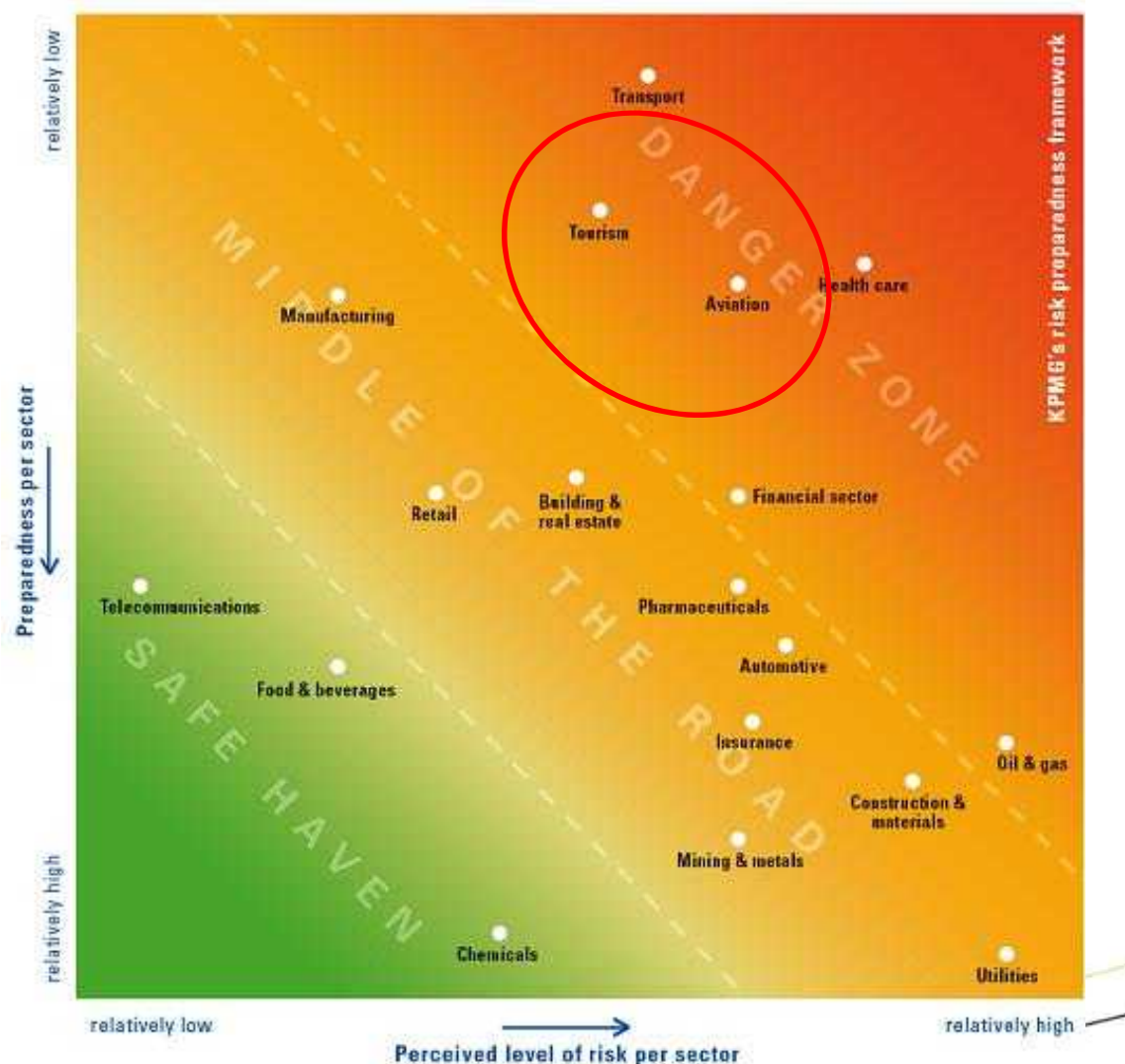
Scott 1993

# Tourism Remains in the 'Danger Zone'



- Regulatory Risks
- Financial Risks
- Physical Risks
- Litigation Risks
- Reputational Risks
- Competitive Risks

Increased investor demands for disclosure of physical climate risk

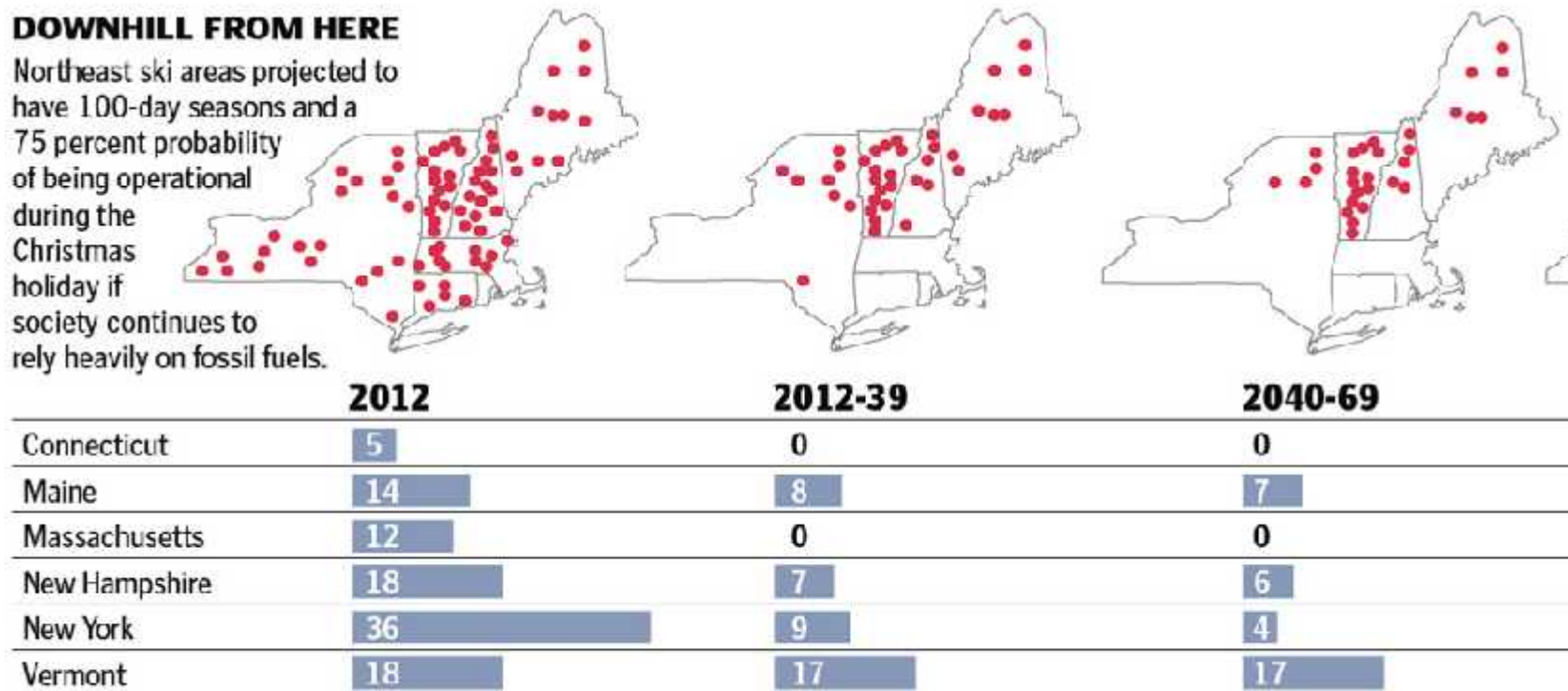


# Impacts in Competing Ski Markets:

## Contraction and Consolidation in New England

### DOWNHILL FROM HERE

Northeast ski areas projected to have 100-day seasons and a 75 percent probability of being operational during the Christmas holiday if society continues to rely heavily on fossil fuels.



SOURCE: Daniel Scott, University of Waterloo

NOTE: Some dots represent more than one ski area in the same community

PATRICK



## Climate Change and the Lake Simcoe Watershed:

### A Vulnerability Assessment of Natural Heritage Areas and Nature-based Tourism

