

# Visualizing Changes in the Great Lakes

Which Great Lakes factors will increase and which will decrease as a result of climate change?

## EXTENSION ACTIVITY

This activity is adapted from “Visualizing Changes in the Great Lakes,” a lesson in Ohio Sea Grant’s *Great Lakes Climate Change Curriculum*. The original lesson is available at [climategreatlakes.com/curriculum-visualizing-changes-in-the-great-lakes](http://climategreatlakes.com/curriculum-visualizing-changes-in-the-great-lakes), and reading through it might help in running the activity

There’s little doubt that climate change will have wide-ranging impacts on the Great Lakes region. While knowing about individual effects of a changing climate is important, many impacts are interconnected, and understanding those connections is an important part of planning for future climate scenarios.

This activity visualizes the connections between different climate change effects, and encourages thinking beyond obvious factors like increased temperatures. It can be used to introduce the topic of climate change to an audience, or it can be a culminating activity to draw different aspects of multiple topic areas together. Depending on the impact cards used, the activity can be part of a wide range of topic area presentations.

### Instructions

- Determine whether the activity will be done in one large group or multiple smaller groups.
- Assemble materials by placing the MORE/LESS cards in a pile and spreading out the impact cards. Place the INCREASE IN GLOBAL TEMPERATURE or the CLIMATE CHANGE IN THE GREAT LAKES card in the center of a large table or board.

- Invite attendees to come forward one at a time to select an impact card that is a direct result of a previously placed card. They should use either MORE or LESS as a connector between the two impacts and place them in the web to show a sequence of events. For example, the first participant may decide that an INCREASE IN GLOBAL TEMPERATURE (center card) leads to MORE INSECT PESTS or LESS DRINKING WATER. They must be able to justify the position of the cards they add and their choices of MORE or LESS impact.
- As attendees use the cards, it will become apparent that there are various interpretations of the impacts. For instance, more weeds and insect pests would probably invade the region, and soil moisture would probably decrease if global warming occurred. However, annual temperatures would be higher and growing seasons longer. The net result could be either more or less crop production. Much would depend on the fertility of northern soils; where and when precipitation falls; and which crops are grown. Lead the group in a discussion of all interpretations.
- If there are multiple groups completing the activity simultaneously, have them give a short presentation of their maps, analyzing the thinking about interrelationships that produced the array.

### Tips & Notes

- To make the discussion more easily relevant, the central “Global Warming” card can be replaced with the “Climate Change in the Great Lakes” card.
- Impact cards can be printed on different paper colors based on general topic areas. For example, “snow” and “drought” would fall under weather impacts, while “tourism” and “income” are both related to economic impacts of climate change. In many exercises, direct impacts of climate change tend to come from one or two topic areas, and indirect impacts from other topic areas. This pattern can open up a



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discussion about how to address climate change impacts in planning situations – secondary and tertiary impacts (health, economic impacts) may create more sense of urgency than primary impacts.

- Before starting the map, attendees can place checkmarks or stickers on the impact cards they feel are most relevant to their own work. This may help guide the activity and follow-up discussion.
- Encourage expansion beyond the central card, as shown in the example map on the PowerPoint slide. These secondary and tertiary impacts can be just as important to outreach work as primary impacts like warmer temperatures.
- Attendees must be able to justify placement of more/less cards and impact cards. There aren't necessarily right and wrong answers, but the thought process should be shared to encourage discussion, and to determine specific areas of uncertainty that should be addressed in more detail.
- Discussion can take place during or after the activity, depending on time available and the size of the group.
- Previous experience has shown that people tend to build off the central card, but do not add secondary or tertiary impacts off of the initial central spoke. Some encouragement to think beyond direct impacts may be needed before and during the activity.

**Increase in global  
temperature**

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**Climate change in  
the Great Lakes**

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**Evaporation**

**Snow**

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**Drinking water**

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**Severe storms**

# **Insect pests**

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# **Flooding**

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# **Recreation**

# **Water pollution**

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## **Winter**

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## **Biological diversity**

# Ducks

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# Income

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# Fertilizer use

**Shoreline  
development**

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**Extinction**

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**Lake levels**

**Lakefront  
property**

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**Rain**

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**Air pollution**

# Electricity use

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# Fear

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# Shipping

**Disease**

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**Soil moisture**

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**Pesticide use**

**People**

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**Wetlands**

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**Crop  
production**

# Cooperation

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# Fish

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# Tourism

# **Forests**

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# **Dredging of waterways**

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# **Debate**

# Summer

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# Air conditioning

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# Weeds

**Water  
diversion**

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**Drought**

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**Ice cover**

**Summer  
tourism**

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**Winter  
tourism**

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**Fisheries**

**Invasive  
species**

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**Combined  
sewer overflows**

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**Spawning  
habitat**