G-WOW Sugar Maple and Paper Birch Lifeway Unit

Investigate the Science Activity Guide

Now that you've investigated this unit's Ojibwe Traditional Ecological Knowledge, place-based evidence, and Scientific Ecological Knowledge of climate trends affecting sugar maple and paper birch--what do you think?

Do culture and science agree that climate change is affecting sugar maple, paper birch and other trees species now?

Write down your hypothesis:

If climate change is occurring, then how might it affect sugar maple and paper birch?

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Do the Research: How Has Wisconsin's Climate Changed?

Establish a "baseline" for your climate investigations. Open the **Historic Trends and Future Projections Climate Change Maps** using this link or from the website's Toolkit. Focus on maps showing "historic" climate trends. These are observed changes based that have already occurred and are recorded.

List four changes in Wisconsin's climate from 1950-2024 that have already been recorded based on "historic" trends:

1.

2.

3.

4.

continue

Do the Research: What's the Future?

Now open the Statistical Downscaling Tool . The tool allows you to investigate how these environmental climate variables could change under different climate change futures over different time periods.

Choose between three future scenarios:

- The A1B Scenario is similar to the RCP 4.5 scenario. It is a future where the use of fossil fuels and carbon emissions stays at about the same level as today.
- The A1 scenario is a future with greater carbon emissions and more warming.
- The B1 scenario is a future with lower carbon emissions.

Investigate projected changes in climate variables under each scenario for these time periods:

- 1980 to mid-century (1980-2055)
- 1980-end of century (1980-2090)

Analyze potential climate change impacts under each of these scenarios, and time periods, on the environmental variables that are critical to the sustainability of sugar maple and paper birch.

1. How are temperature and precipitation projected to change under each climate future scenarios and over different time periods?

2. Which climate change scenario offers the best opportunity for sustaining these tree species and why?

3. What scenario suggests for the greatest threats for the sustainability of these tree species, and why?

Test Your Hypothesis and Gather More Information

Develop an experiment or investigation of your own to test your hypothesis. Consider what other factors or variables could be causing the results you are observing.

Here are some ideas of investigations you can conduct to test your hypothesis:

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- Investigate Climate Change with the Great Lakes Indian Fish and Wildlife Commission. This website contains highlights Ojibwe Traditional Ecological Knowledge of climate change. Open the Aanji-bimaadisiimagak o'ow aki (The World is Changing) booklet to investigate the vulnerability of paper birch (page 89) and sugar maple (page 83) based on Ojibwe Traditional Ecological Knowledge.
- Explore the Climate Change Tree Atlas. Examine current distributions and modeled future-climate habitats for different tree species. Select a tree species to open a species page where you can manipulate a number of variables to see impacts of different climate change scenarios.
- **What growing zone do you live in?** Explore this story map to discover how growing zones have shifted in Wisconsin and the United States since 1990. Navigate to the "Plant Hardiness Zone" slider map. What do these trends suggest for the sustainability of sugar maple and paper birch? What do these shifts in growing zones mean for the sustainability of other tree species or production of agricultural crops?
- **Where Will Your Climate in 60 Years?** Zoom in on this mapping tool and select a community near you to see what it may be like in 60 years. Consider whether or not the habitat will be suitable for sugar maple and paper birch in the future? How could this effect culture and economies?

Does your research support your hypothesis?

Will current or future climate change impact the sustainability of sugar maple and paper birch?

List three pieces of evidence you've gathered that supports (or does not support) your hypothesis:

1.

2.

3.

If your research did not support your hypothesis, create a new hypothesis based on your observations and re-test it.

continue

What is Your Conclusion?

What do these changes in our climate suggest for the sustainability of Wisconsin's forests, especially tree species like sugar maple and paper birch?

How could these changes affect Ojibwe cultural practice of maple sugaring and birch bark harvesting?

How could these changes affect business and industries, like logging, that our communities depend on?

How could these same climate change trends affect your lifestyle and cultural practices you enjoy such as making or eating maple syrup, other recreational activities, hobbies, foods, or customs?

What can we do to help Sugar maple and Paper birch trees?