Whose ^ Science?

Climate

A "How to" Guide for Weaving Scientific, Place-Based, and Traditional Ecological Knowledge For Climate Change Awareness

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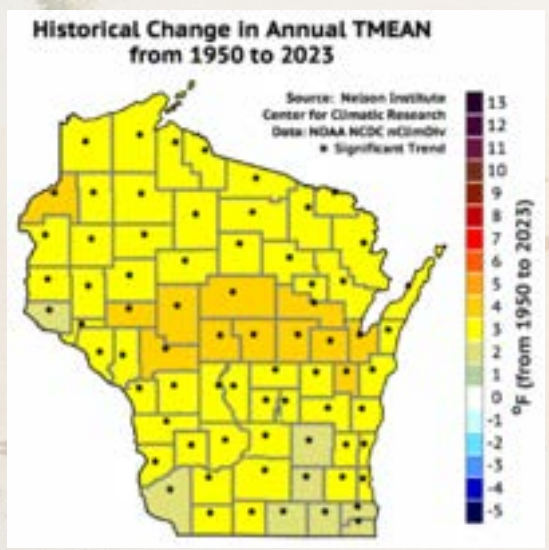
Weaving these knowledges together provides stronger evidence of climate change and how it is affecting what people value more than any one source can provide

People tend to act on what they value

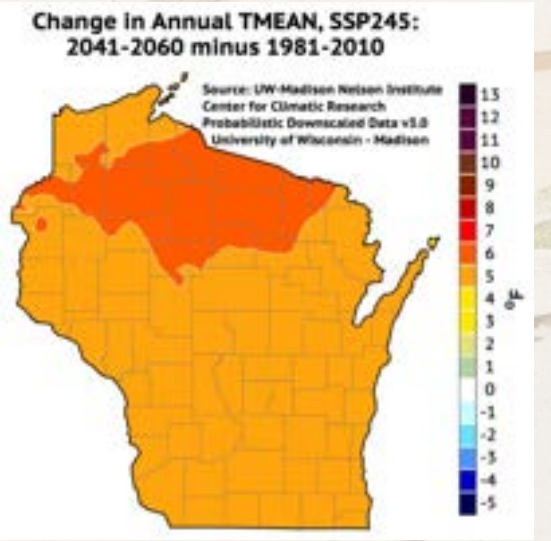
Scientific Ecological Knowledge or "SEK"

- Called "western" science, "academic" science
- Long term quantitative evidence of change in environmental variables (temperature, precip, drought, etc.) based on historic measurements and projections of future change based on different climate "scenarios."
- *Issue:* May not relate to most stakeholders without additional context.

HISTORIC EVIDENCE



CLIMATE PROJECTIONS



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Place-Based or Local Ecological Knowledge

- **Qualitative knowledge based on short term observations of change in environmental variables that people see and experience.**
- **More effective than simply using SEK for increasing climate awareness.**
- ***Issue*--may reflect weather variability, rather than climate change.**

"…local, place-based evidence of climate change gained through experiential learning is as, or more effective than, simply studying analytical climate change data to increasing climate change literacy."

"The Psychology of Climate Change Communication", Columbia University 2009

Traditional Ecological Knowledge or "TEK"

- **Long-term qualitative evidence based on generational place-based knowledge of an environment and beings.**
- **Knowledge embedded in Indigenous culture and language.**

Wild rice harvesting (ca. 1900)

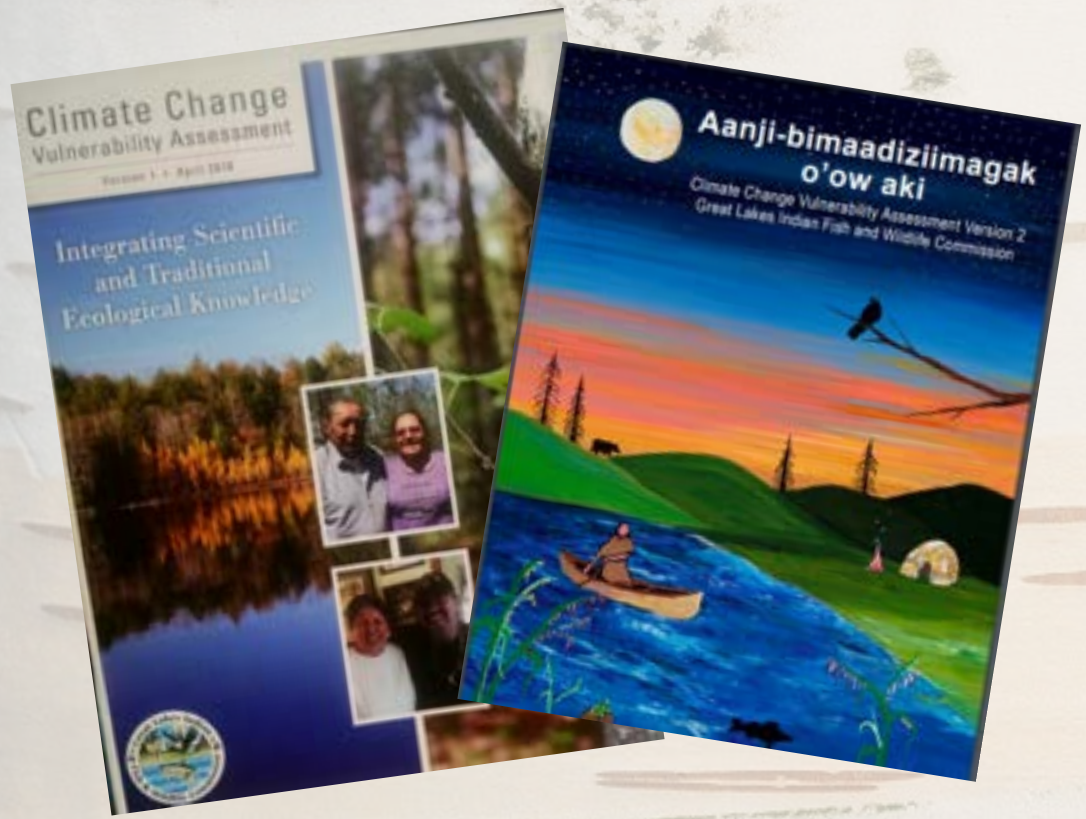
Wild rice harvesting today

Because TEK is based on long-term continued relationship with the environment, it provides a "baseline" for evaluating place-based evidence of climate change beyond weather variability

Some Sources of TEK

Great Lakes Indian Fish and Wildlife Commission's

Climate Change Vulnerability Assessment-Edition 1 & 2



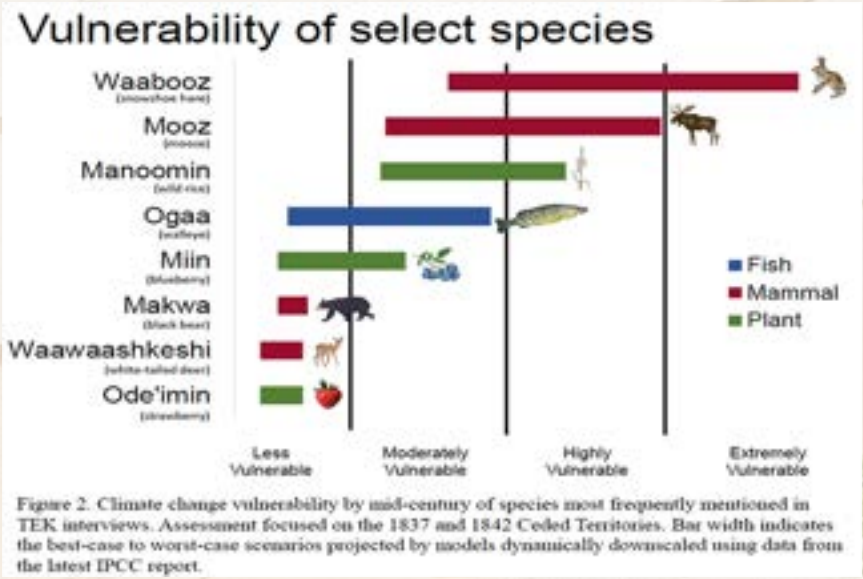
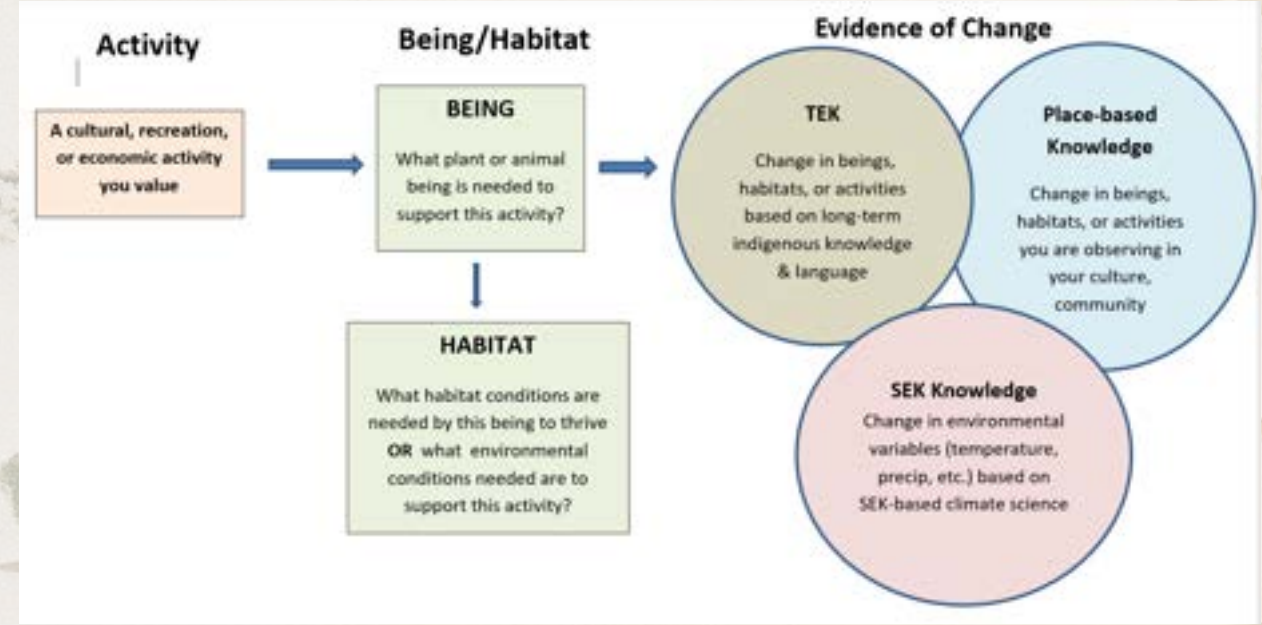


Figure 2. Climate change vulnerability by mid-century of species most frequently mentioned in TEK interviews. Assessment focused on the 1837 and 1842 Ceded Territories. Bar width indicates the best-case to worst-case scenarios projected by models dynamically downscaled using data from the latest IPCC report.

https://glifwc.org/ClimateChange/

Elders, Knowledge Keepers, Language Speakers in your community

“How To” Guide to Weaving TEK, Place-based, and SEK Together for Climate Investigation & Communication



1. Identify an activity that is valued by your audience. People act on what they value.

2. What plant, animal, or habitat is needed to support this activity?

3. What evidence is there that climate change is affecting the activity or sustainability of the plant, animal, or habitat that supports this activity based on TEK, place-based, and SEK?

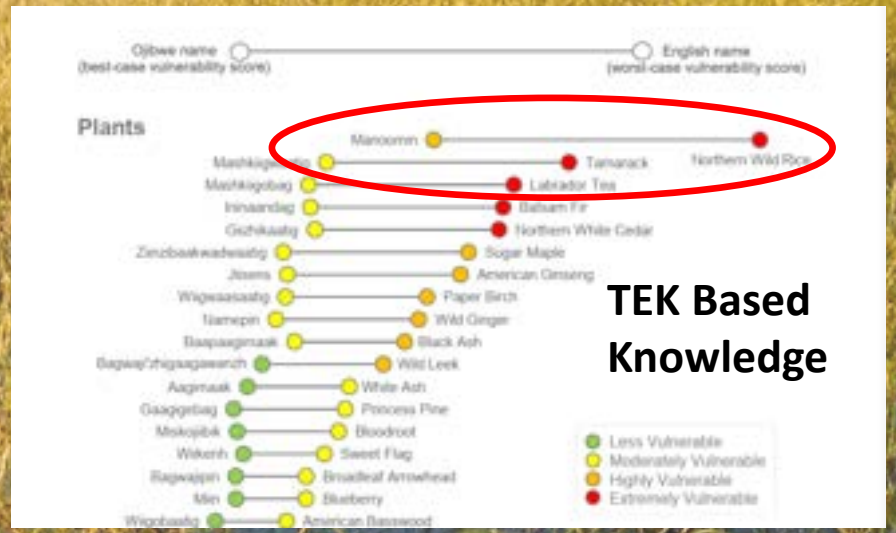
4. How could climate change affect this valued activity? What can be done to reduce climate impacts on what is valued or increase its resiliency?

Examples

Wild Rice Harvesting

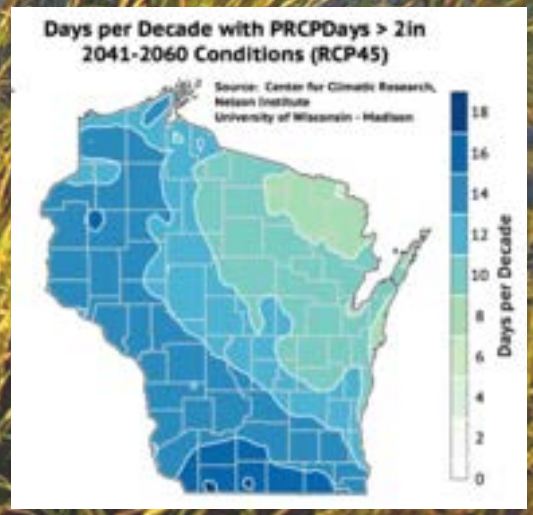
TEK, Place-based, and SEK Evidence of Change

Requires shallow water, moderate water level changes, cool growing seasons



TEK Based Knowledge

https://glifwc.org/ClimateChange/



SEK-based Knowledge

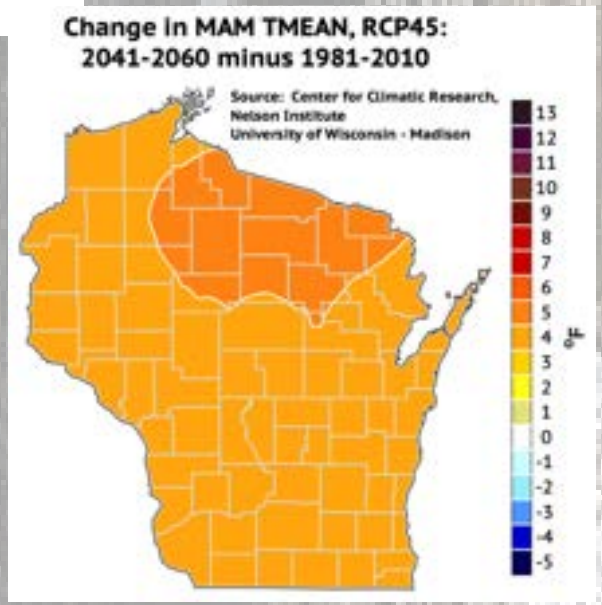
Days per decade with 2”+ rain events by mid-century

How could climate change affect the cultural practice of wild rice harvesting?

Maple Sugaring

TEK, Place-based & SEK Knowledge

Requires cold spring nights for good sap production

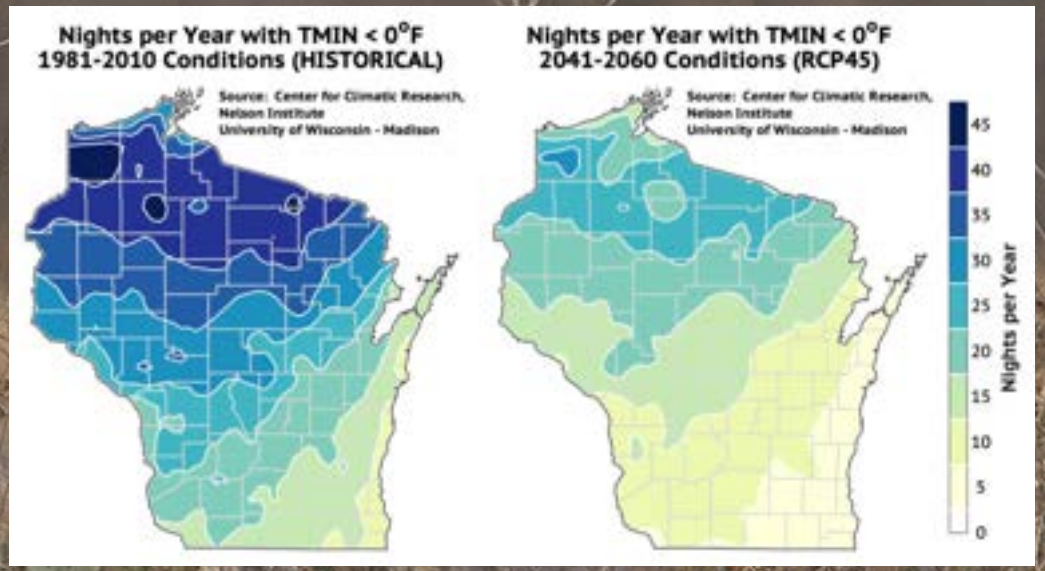


How could climate change affect the cultural or economic practice of maple sugaring?

Projected change in spring temperatures by mid-century

Whitetail Deer Hunting

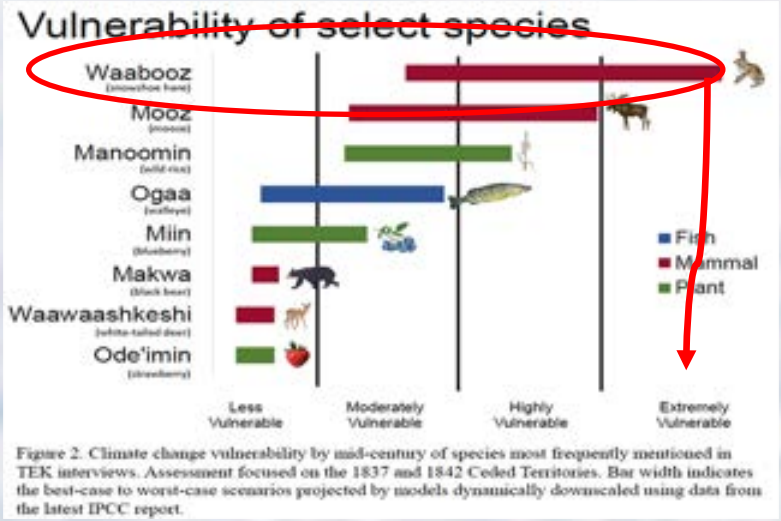
Highly adaptable to a variety of habitats, warmer winters reduce energy loss and stress



Everything is connected. What factors might limit the sustainability of white tail deer and how could they be affected by climate change?

An Example Applying this Model Without an Activity

Wabooz, the Snowshoe hare, needs snowy habitats to provide winter camouflage requiring temps below 32ºF



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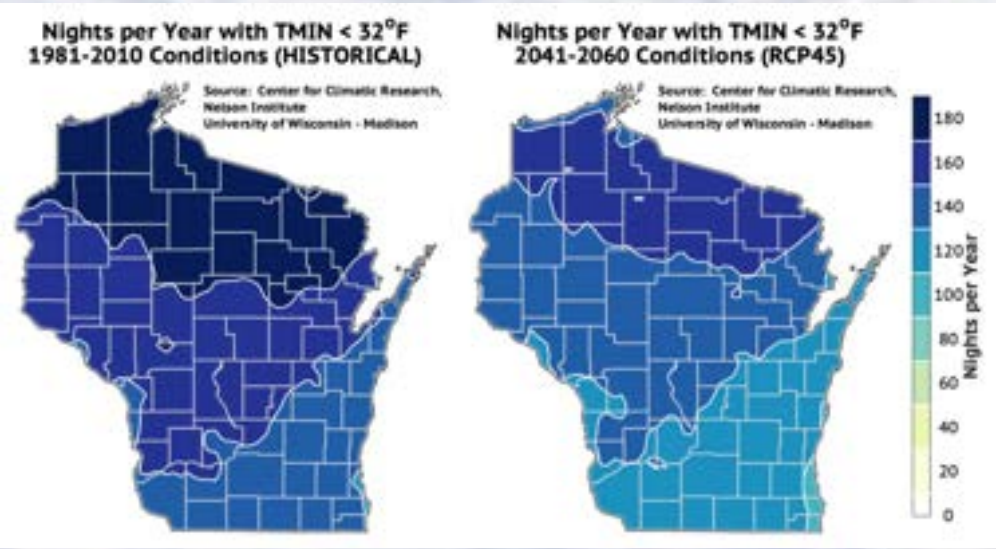
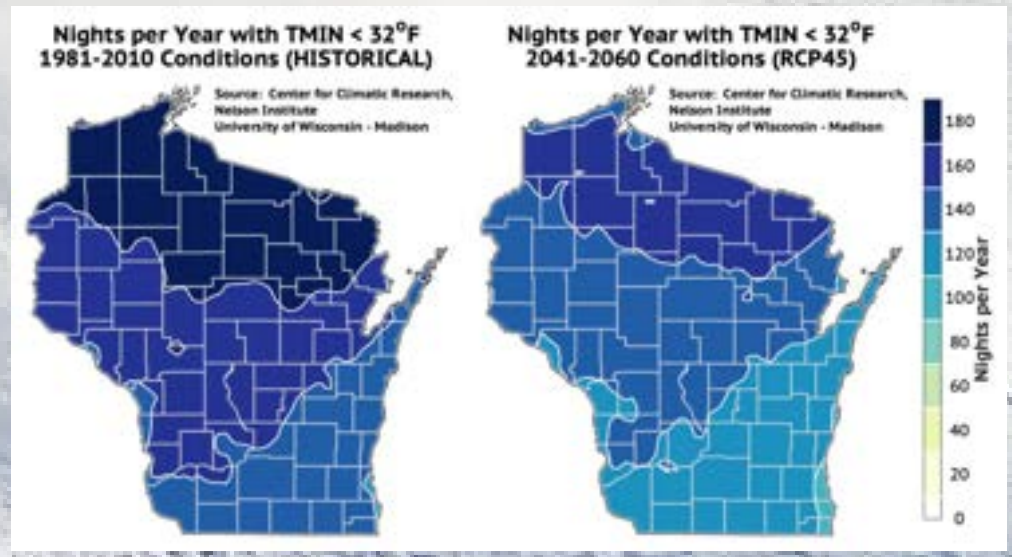


What is Wabooz teaching us about climate change and winter activities we value?

Winter Recreation: Skiing, snowmobiling

Also requires snowy "habitats" with temps below 32ºF



How could climate change affect winter recreation, businesses and community economies?

Winter Logging

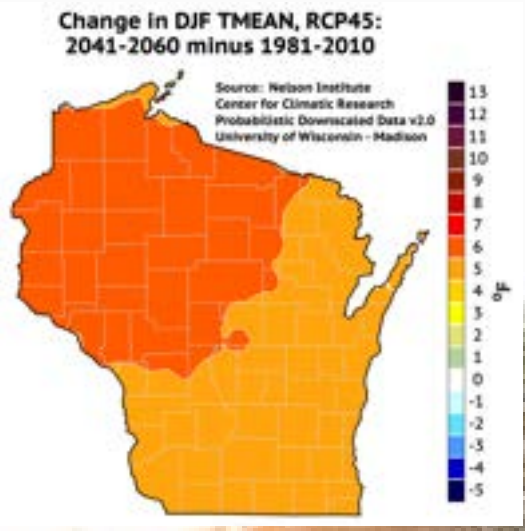
Requires temperatures below 32ºF for frozen roads and ground

Warmer winters = less frozen ground

Decreasing number of weeks with frozen ground

Reduced transport of logs to market =

Less $$$



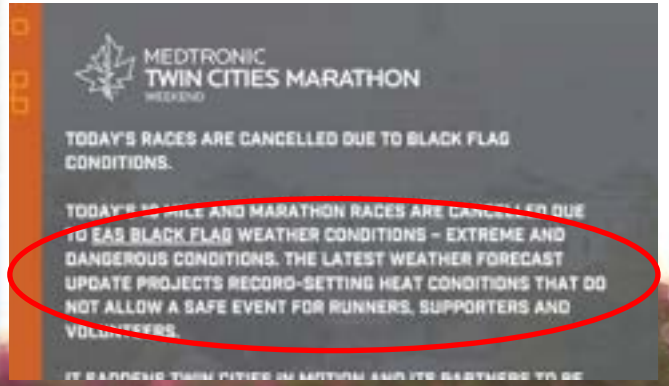
Change in mean winter temps by mid-century

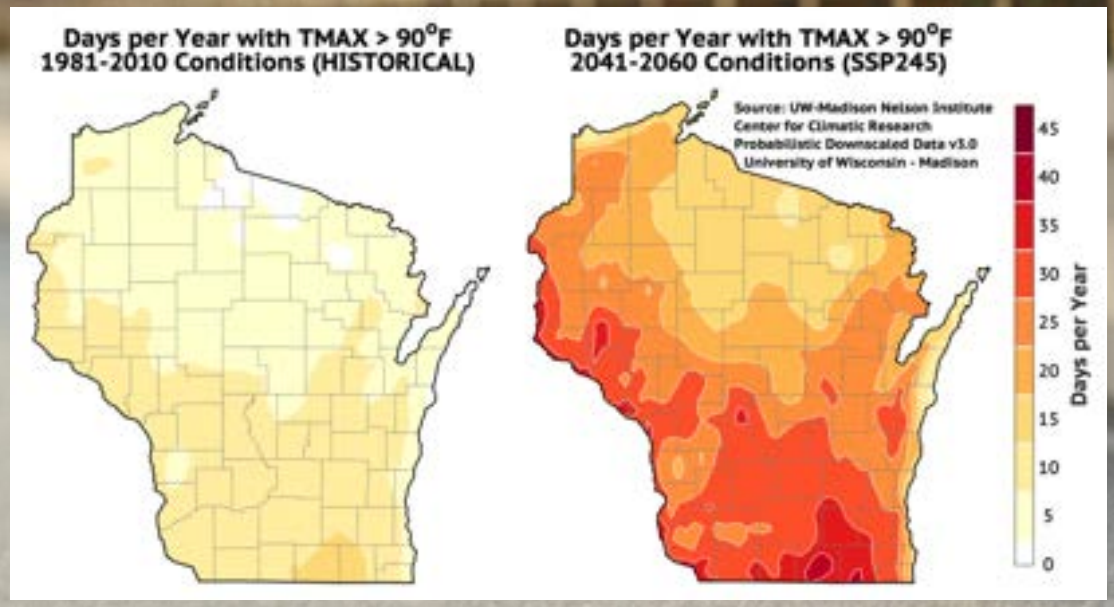
"Warmer winters are the biggest impact we've seen. We are always struggling with having enough frozen days to log."- Scott Koerner, Wisconsin logger

Running

Ideal temperatures are between 44° F and 59° F

Integrating only place-based knowledge and SEK





How could climate change affect this recreational activity and summer events?